

Comparison of the revised and the old CPI

During the first 6 months of 1987, the revised all items CPI-U, based on 1982–84 expenditure patterns, increased 2.7 percent, and the old series, based on 1972–73 expenditures, rose 3.1 percent

MARY LYNN SCHMIDT

The Bureau of Labor Statistics introduced a revised Consumer Price Index (CPI) with the release of January 1987 data in February. Periodic revisions of the expenditure weights are necessary so that the CPI reflects price changes of the current spending patterns. Updated expenditure weights were based upon data tabulated from 1982, 1983, and 1984 Consumer Expenditure Surveys (CES), replacing the old expenditure weights based on the 1972–73 CES. The revised expenditure weights reflect the geographic distribution of consumers as of the 1980 census of population, replacing the 1970 census distribution.

As in previous revisions, for a period of 6 months following the introduction of the CPI based on revised weights, BLS continued to compile and publish a CPI using the old expenditure weights (hereafter called old series). Unlike earlier revisions, however, these old series overlap indexes were not based on the old sample of items and outlets, but on the prices collected in the new sample of items and outlets. The old series indexes, therefore, can differ from the revised indexes only as result of differences in their expenditure weights. These differences reflect definitional changes in some item strata, as well as the changes in consumer preferences between 1972–73 and 1982–84.

The difference in movements between the old series and revised indexes can be analyzed in terms of the effects of various items on the respective CPI all items indexes. The effect of an item or group of items is how much the all items index changes as a result of the change in a particular item or group.

Both the old series and the revised CPI were linked to the indexes for December 1986 to provide a continuous series. The linking was accomplished by setting the index levels of the revised CPI (with the updated expenditure weights and samples) equal to the index levels published for the old series in December 1986. Each index was moved upward or downward from the December 1986 level in accordance with subsequent weighted changes in prices.

The CPI is divided into seven major expenditure groups—food and beverages, housing, apparel and upkeep, transportation, medical care, entertainment, and other goods and services. The expenditure weight for each item within an expenditure group is an estimate of total expenditure by the index population for that item.

In a fixed-weight index such as the CPI, the quantity of any item used in calculating the index remains the same each month. In a revision, the quantity weights change to reflect changes in consumption that have taken place. Relative importances show the share of total expenditures that would occur if quantities consumed actually remained constant while only prices to consumers changed. Items whose prices

Mary Lynn Schmidt is an economist in the Office of Prices and Living Conditions, Bureau of Labor Statistics. Crystal G. Konny, an economist in the same office, assisted in the preparation of this article.

rise faster than average become relatively more important in the market basket. The new expenditure weights introduced in the revision of the CPI reflect the revised quantities implicit in the new expenditure levels. The relative importances as of December 1986, based on the 1972-73 and the 1982-84 expenditure patterns, are shown in table 1 for the Consumer Price Index for all urban consumers (CPI-U).

This article compares the behavior of the old and the revised CPI-U's for the 6 months following the revision (January through June 1987).¹ It discusses the differences between the two CPI-U's for items in seven major expenditure categories and examines the effect of each category on the all items index. The all items CPI rose 2.7 percent during the first 6 months of 1987. (See table 1.) The old series index rose 3.1 percent during the same period. Most of this 0.4-percentage point difference (0.395 before rounding) reflects the revised weights for energy and used cars. While differences at aggregate levels of the index come primarily from differences in the relative weights of items in the index,

differences at lower levels (like motor fuels and new vehicles) come from combinations of different weights for more detailed items and/or difference in the population distribution between the two indexes.

As an initial step in comparing the old series and revised indexes, we will look at those categories that have lower relative importances in the revised CPI—food and beverages, transportation, and medical care. Then we will look at the four categories with larger relative importances in the revised CPI—housing, apparel and upkeep, entertainment, and other goods and services—of which housing had, by far, the largest difference.

Food and beverages

The December 1986 relative importance for the food and beverages category was 17.824 percent, based on the updated 1982-84 expenditure patterns, a good deal less than the 20.123 percent based on 1972-73 expenditures. While part of this smaller importance is attributable to a 7-percent

Table 1. Comparison of the revised and old series Consumer Price Indexes for all urban consumers for the first 6 months of 1987, relative importance, percent change, and effect of selected categories on the all items index

Category	Relative importance ¹ (Dec. 1986)			Percent change			Effect (percent) ¹		
	Revised CPI	Old series	Difference	Revised CPI	Old series	Difference	Revised CPI	Old series	Difference
All items	100.000	100.000	0.000	2.7	3.1	-0.4	2.725	3.120	-0.395
Food and beverages	17.824	20.123	-2.299	2.6	2.7	-.1	.476	.554	-.078
Food	16.246	19.008	-2.762	2.7	2.8	-.1	.443	.535	-.092
Food at home	9.974	12.687	-2.713	3.3	3.4	-.1	.328	.423	-.095
Food away from home	6.272	6.321	-.049	1.8	1.8	.0	.115	.111	.004
Alcoholic beverages	1.578	1.115	.463	2.1	1.7	.4	.033	.019	.014
Housing	42.947	38.131	4.816	2.5	2.6	-.1	1.087	1.002	.085
Shelter	27.822	23.022	4.800	2.4	2.1	.3	.664	.483	.181
Renters' costs	8.000	7.599	.401	3.0	1.9	1.1	.235	.145	.090
Rent, residential	6.094	6.597	-.503	1.3	1.3	.0	.075	.081	-.006
Other renters' costs	1.906	1.002	.904	8.3	6.3	2.0	.159	.063	.096
Lodging while out of town	1.676	.639	1.037	9.4	9.3	.1	.158	.060	.098
Lodging while at school .....	.193	.275	-.082	.4	.8	-.4	.001	.002	-.001
Homeowners' costs	19.600	14.901	4.699	2.1	2.2	-.1	.427	.331	.096
Fuel and other utilities	7.909	7.536	.373	4.5	5.7	-1.2	.354	.432	-.078
Fuel oil .....	.267	.741	-.474	11.6	11.3	.3	.031	.083	-.052
Electricity	2.742	2.518	.224	9.4	10.5	-1.1	.258	.265	-.007
Utility (piped) gas	1.321	1.745	-.424	3.2	3.7	-.5	.042	.065	-.023
Household furnishings and operation	7.216	7.572	-.356	1.0	1.1	-.1	.069	.086	-.017
Apparel and upkeep	6.335	5.005	1.330	1.7	1.7	.0	.108	.085	.023
Apparel commodities	5.767	4.175	1.592	1.6	1.5	.1	.094	.063	.031
Apparel services .....	.568	.830	-.262	2.3	2.6	-.3	.013	.022	-.009
Transportation	17.217	19.893	-2.676	3.9	5.2	-1.3	.674	1.037	-.363
New vehicles	5.607	4.027	1.580	-.2	-.3	.1	-.011	-.011	.000
Used cars	1.249	4.086	-2.837	7.4	7.4	.0	.092	.301	-.209
Motor fuels	2.903	3.752	-.849	16.8	16.6	.2	.488	.621	-.133
Medical care	5.420	6.870	-1.450	3.2	3.4	-.2	.176	.237	-.061
Medical care commodities	1.083	1.132	-.049	3.8	3.8	.0	.041	.043	-.002
Medical care services	4.337	5.738	-1.401	3.1	3.4	-.3	.134	.193	-.059
Entertainment	4.403	4.290	.113	1.8	1.7	.1	.078	.074	.004
Entertainment commodities	2.120	2.427	-.307	1.6	1.9	-.3	.035	.046	-.011
Entertainment services	2.283	1.864	.419	1.8	1.5	.3	.043	.028	.015
Other goods and services	5.855	5.687	.168	2.2	2.3	-.1	.126	.132	-.006
Special indexes:									
Energy	7.360	8.932	-1.572	11.2	11.6	-.4	.822	1.036	-.214
All items less energy	92.640	91.068	1.572	2.1	2.3	-.2	1.904	2.084	-.180
All items less energy and used cars	91.391	86.982	4.409	2.0	2.0	.0	1.811	1.783	.028

¹ Because of independent rounding, components may not add to indicated totals.

reduction in the size of the average consumer unit, it is also a continuation of a long-term trend of generally declining importance of food and beverages in consumer expenditures. Because of lower relative importance in the revised index, during the first 6 months of 1987, the overall effect of food and beverages on the all items index was .476 percent for the revised measure, compared with .554 percent for the old series. (See table 1.)

While the percent changes over the January-June 1987 period differed little between the revised and old series for either the food at home or food away from home components, there were some differences in effects on the all items index. The food at home effect on the all items index in the revised CPI was .328, while in the old series, it was .423. This difference reflects the smaller relative importance of grocery store foods in the revised index. The relative proportion of groups within the foods at home component did not shift substantially, however, resulting in very similar price movements at the aggregate level for both the new and old series. The effect of food away from home differed little between the revised and old series because there was no major difference in the relative importances.

Transportation

The second major category with a smaller relative importance is transportation, which changed from 19.893 percent, based on 1972-73 consumer expenditure patterns, to 17.217 percent, based on 1982-84 expenditures. This lower weight resulted largely from smaller relative importances of motor fuels and used automobiles.

While total consumer expenditures for gasoline increased between the two survey periods, it increased substantially less than the rise in gasoline prices because of a decline in the number of gallons of gasoline used per consumer unit. The Arab oil embargo of 1973-74, which resulted in a sharp increase in gasoline prices, led to unprecedented energy conservation interest in the United States, including legislating standards for fuel efficiency for new cars and lower speed limits throughout the country. Therefore, the revised relative importance of 2.903, based on 1982-84 expenditures, is nearly one-fourth less than the 3.752 percent, based on 1972-73 expenditures.

During the 6-month period, January-June 1987, gasoline prices increased nearly 17 percent in both series, substantially more than the average of other items. This increase was a direct consequence of the December 1986 agreement between members of the Organization of Petroleum Exporting Countries (OPEC) to cut production of crude oil supplies, followed by several non-OPEC members also restraining output and, thereby, reducing the supply of gasoline. Reflecting these changes, the difference in effect of gasoline between the revised CPI and old series was $-.133$ during this period.

The second factor in the lower relative importance of the transportation component was the shift in the weights of new and used vehicles—the 1982-84 based relative importance

of used vehicles is sharply lower and that for new vehicles, substantially higher. This shift reflects a conceptual change in the treatment of trade-ins for new and used cars. In the old series, all expenditures for vehicles were valued at their net transaction price, that is, the negotiated price less any trade-in value. In the revised CPI, the value of all trade-ins have been deducted from the used car weight rather than against its corresponding new or used car purchase. This treatment reflects the net purchases of each by the index population from other groups. The revised used car index represents the value of used cars purchased from business and government sectors plus the value added by used car dealers who buy the vehicle from one consumer and sell to another. The resulting relative importance of new vehicles in the revised index is 5.607 percent—nearly 40 percent greater than in the old series. The higher relative importance of new vehicles is partially because of this definitional change in the index, but much of the increase reflects greater consumption of vans, small trucks, and motorcycles, as well as higher quality vehicles. A small difference between the average movement in new vehicle prices in the revised CPI and the old series during the first 6 months of 1987 offset the weight difference in the two series and resulted in the same overall effect on the all items index.

The December 1986 relative importance of used cars, based on the 1982-84 expenditure pattern, was less than one-third of that in the old series. With virtually no difference in price change of used cars between the old series and revised CPI during the 6-month period, there was a difference of $-.209$ in the effect of the two used cars series on their respective all items indexes.

The difference in the transportation effects between the revised CPI and the old series during the first 6 months of 1987 was larger than in any other major category. Used cars and motor fuels accounted for $-.342$ of the $-.363$ difference for transportation, which, in turn, was equal to almost all of the difference at the all items level.

Medical care

While total economywide spending for health care has been expanding rapidly, health care financing by government and employers has grown even faster. Thus, because the CPI covers only purchases by consumers, there was an approximately one-fifth reduction in the relative importance of medical care in the CPI, from 6.870 percent, based on the 1972-73 consumer expenditure pattern, to 5.420 percent, based on 1982-84 expenditures. Because of its smaller relative importance, medical care had a .061-percentage point smaller effect on the all items CPI in the revised index.

Housing

Among the major groups, the largest difference in relative importances between the old series and the revised CPI was in the housing category. The relative importance of the housing index is now 42.947 percent, based on updated 1982-84 expenditures, compared with 38.131 percent,

based on updated 1972–73 expenditures. Price movements in housing during the first 6 months of 1987 were essentially the same for both the old series and revised CPI, so that the difference in effects between the two indexes (.085 percentage point) was virtually all attributable to the difference in relative importance.

Shelter costs in the revised CPI had a larger effect than in the old series. This was primarily due to the larger weight in the revised measure for homeowners' costs and lodging while out of town. The 1982–84 based relative importance of homeowners' costs was nearly one-third larger than in the old series (19.600 to 14.901). This reflects both increases in the proportion of homeowners and changes in the housing stock and makeup between 1972–73 and 1982–84.

The increased relative importance for lodging while out of town reflects a definitional change. The definition of lodging while away from home, a component of other renters' cost, has been expanded to include an imputed value for owners' use of their vacation property. This was an element of consumer expenditures not previously included in the CPI. According to data from the 1982–84 CES, 6 percent of all consumer units own some sort of vacation property for their own use. The broader definition resulted in the relative importance of lodging while out of town increasing from .639 percent in the old series to 1.676 percent in the revised CPI.

The relative importance of the residential rent component in the renters' cost index is slightly lower at 6.094 percent, based on the 1982–84 expenditures, compared with 6.597 percent based on 1972–73 expenditures. This reflected proportionately fewer renters, in addition to the shift towards exclusion of utilities from rental payments, as more landlords converted to individual utility meters.

The difference in effects of the fuel and other utility component on the overall CPI partially offset that of shelter costs. A smaller price increase than for the old series more than offset the greater weight of this component in the revised CPI. The price change for the individual fuel components were generally similar, but substantial differences in the relative importance between the old series and the revised measure were responsible for the smaller percentage change in the revised index. This shift in relative importances reflects a geographic shift of the population into the southern and western regions as well as changing relative prices among the fuels between the early 1970's and early 1980's. The relative importance of home heating oil is

nearly two-thirds lower, .267 percent, compared with .741 percent in the old series; utility (piped) gas is one-quarter lower, 1.321 percent, compared with 1.745 percent. The shifts also reflect the fact that the number of homes with air conditioning rose 45 percent between 1970 and 1980. But, the relative importance of electricity is larger—2.742 percent, compared with 2.518 percent.

Apparel and upkeep

The revised relative importance of apparel and upkeep is 6.335 percent, one-fourth greater than the 5.005 percent in the old series. The revised relative importance reflects greater importance in all major components of apparel commodities, particularly women's apparel. Comparisons of the effects of the new and old apparel series showed a difference of only .023 percentage points, reflecting its higher relative importance in the new series.

Entertainment

The relative importance of the entertainment category is only slightly higher in the revised CPI. The overall price change in the entertainment component during the first 6 months of 1987 was essentially the same in both indexes, resulting in virtually no difference in their effects. However, because entertainment services have greater importance in the revised index, they had a greater effect on the all items revised index than on the old series. Similarly, the lesser importance of entertainment commodities resulted in an offsetting smaller effect.

Other goods and services

The relative importance of other goods and services are only slightly higher in the revised index. Shifts within this category, however, are notable. They include relatively more expenditures on day care and nursery schools and especially personal expenses such as legal fees, personal financial services, and funeral services. Somewhat offsetting these shifts were smaller relative importances for personal care goods and services, as well as for tobacco products. The percent changes in the 6-month period, January–June 1987, showed only a small difference between the old series and the revised indexes. Combining the small difference in relative importance and price movements between the revised CPI and the old series resulted in a difference in effects of only $-.006$ percentage point in this category. □

—FOOTNOTE—

¹ Previous *Monthly Labor Review* articles on the 1987 CPI revision described the availability of local area indexes, new series titles, and spending patterns. See John Marcoot, "Revision of the Consumer Price Index is now underway," April 1985, pp. 27–38; John Marcoot and Richard Bahr, "The

revised Consumer Price Index: changes in definitions and availability," July 1986, pp. 15–23; and Charles Mason and Clifford Butler, "New basket of goods and services being priced in revised CPI," January 1987, pp. 3–22.