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COST OF LIVING INDEXES FOR SPECIAL CLASSES OF CONSUMERS

Eleanor M. Snyder

Scope of Report

To some degree, the scope of this paper is limited by the availability of the price-quantity-expenditure information basic to the construction of indexes of consumers' prices. Under ideal circumstances, the function of the paper would be threefold:

a. To determine the extent to which indexes for particular subgroups in the population (or for the population as a whole) would differ from the current CPI for urban wage and lower salaried workers.
b. To analyze the types of problems that would be encountered in the construction and maintenance of indexes in addition to those currently prepared.
c. To specify the appropriate scope of consumers' price indexes published by the federal government.

The demand for indexes for specified subgroups in the population, as well as for a comprehensive index relating to the total population, is based on the premise that the movement of such indexes would deviate from that shown by the present CPI. The most conclusive empirical evidence as to whether the basic premise is true or false, for each separate index, obviously would be obtained by construction of actual indexes completely comparable to the CPI in construction and statistical reliability, so that any variation in the indexes would reflect only real differences in changes in living costs of specified populations and not differences due to sampling or procedural innovations.

Valid test indexes cannot be constructed at the present time because of the lack of basic data; estimates of probable differences in indexes of special subpopulation groups therefore must be based on incomplete and isolated information. On this account the scope of this paper falls far short of the ideal. Nevertheless, although the available data are extremely limited, it will be possible to indicate possible sources of variation in movement of consumers' price indexes relating to different populations.

Population Groups To Be Considered

The population for which consumers' price indexes are in greatest demand falls into four classes: one, the total population in the United States; two, special classes of consumers (low and high income, the aged, single working men, single working women, public assistance recipients, etc.); three, total population in communities of varying

sizes, individually and in combination; four, total population in specified economic or geographic areas.

This listing does not exhaust all the special indexes for which some demand exists, and not all those listed will be considered here in detail. For illustrative purposes, the empirical work has been focused on indexes for low and high income groups, in the belief that these extremes would give some indication of the possibility of variation in the movement of indexes for different classes of consumers, because of substantial differences both in the items purchased and in the quantity weights.

Limitations of Available Data

It has been stated that reliable and complete test indexes cannot be constructed at the present time because of basic limitations in the two types of data required—the details of the distribution of consumption expenditures of the specified populations and adequate samples of representative prices over a reasonably long period of time.

A. CONSUMER EXPENDITURE MATERIAL

Inadequacy of the basic data is to be expected. The major purpose of federally conducted consumer expenditure surveys, such as those undertaken by the BLS and the Department of Agriculture, is to find out what "index" families buy. While the current BLS cross section surveys attempt to cover the total urban population, the emphasis, especially in the design of the questionnaire, is placed on families of wage and lower-salaried workers. Items thought to be most important in the current purchases of this group, or of increasing importance in the near future, tend to be those for which information is recorded separately. Other items frequently are recorded as residuals combined into a single total within the appropriate subgroup of items. The more important items are those which will subsequently be priced for the index; expenditures on nonpriced items are needed only to build up to subgroup, major group, and total expenditure weights. From the most recent survey of food expenditures, conducted in 1955 by the Department of Agriculture, for example, separate data are available for about 135 separate food items, and about 85 combined totals based on two or more items. Out of the total list of items recorded separately or in combinations it was possible to identify only 34 that were of greater importance,[1] absolutely and relatively, to low income families than to high income families, and, one-fourth of the 34 were "combined" items for which separate details are not available.

Another difficulty in calculating test indexes lies in the fact that the item detail recorded in the consumer surveys for various dates has undergone some changes—items have been added, dropped, or combined with other items. These changes apparently reflect not only changes in items currently available in the market but also changes in the relative income position of "index" families. As the index population moves up the income scale, items for which the greatest detail is recorded in the consumer surveys are similarly upgraded. As to be expected, therefore, earlier cross-section surveys included relatively more detailed information on items purchased by low income families than the more recent studies. While the

[1] Items with a negative or zero income elasticity.

number of food item line-entries rose from about 135 in the 1936 study to 220 in 1955, the number of "low income" items that could be identified did not increase proportionately, rising from 30 to 39. The comparison appears below in Table 1.

TABLE 1.—*Number of Food Items Recorded in Specified Consumer Surveys, U.S. Urban, 1936–55*

Date	Number of food items			Number with negative or zero income elasticity for urban families
	Total	Separate items	Grouped item entries	
1936	135	111	24	30
1942	176	118	58	31
1950	222	128	94	(1)
1955	220	130	90	39

[1] Quantity data not available.

Analysis of the food category produces the most clear-cut example of changes in item detail, since customarily information is recorded (or can be derived) on prices paid and quantities purchased as well as expenditures, and, in addition, items are more narrowly defined. For other categories of consumption, particularly clothing, housing, medical and personal care, differences in spending patterns of low income families and other families are concentrated more heavily on the quality of item purchased rather than on the items themselves—all men wear suits, but one man pays a price of $25 and another $200 for the same type of suit—i.e., serving the same function in terms of seasonal wear. Since price distributions for particular line-entries on the expenditure schedule can be derived, expenditure weights for indexes for special classes of consumers could be constructed from the available data most readily for categories other than food.

The decreasing amount of detail on low income goods and services obtained in the successive cross section studies of the Departments of Labor and Agriculture inevitably has meant that greater detail has become available for families with incomes relatively higher on the income scale. On this account, it would be less difficult to construct a set of expenditure weights for high income families than for low income families.[2]

B. RETAIL PRICE DATA

Detail price series, the other basic component of consumers' price indexes, are equally inadequate, if not more so, than the expenditure data available for populations other than index families. Price collection on a regular recurring schedule is an expensive undertaking and the official collection agencies quite naturally have limited their coverage to prices of goods and services represented in the major indexes. And, following the same trend evidenced in the cross-section material, items included in the CPI retail pricing program in recent years, by and large, are the middle-to-higher-cost items. This is il-

[2] This is true only if one were content to base the weights on the data available from, say, the 1950 BLS survey, for urban consumers with annual incomes of $10,000 or more. There is no breakdown in the published figures by income classes above $10,000 because of the limitations of sample size.

lustrated by the fact that in 1935, of the 84 foods for which the BLS published average prices, only 17 were those that displayed a negative or zero income elasticity in the 1936 consumer survey. Of the 97 foods for which prices are available currently, 15 are low income items but, to a greater degree than in 1935, the low income foods currently priced have a smaller relative importance in low income diets. In the meat, poultry, and fish group, for example, the items that displayed a negative income elasticity in the 1955 study and are included in BLS pricing are limited to frankfurters, canned luncheon meat, and pink salmon. This compares with the following low income items priced in 1935: plate beef, strip bacon, salt pork, lamb breast for stews, and pink salmon.[8]

Not only are relatively few items and qualities of particular importance to low income groups included in the official retail price collections, but also the usefulness of the available retail price series is further limited by the type of outlet from which the prices were obtained. The outlet sample for the CPI is designed to be representative of sellers frequented by the "index family." Such a sample would not be equally appropriate for families for other classes of consumers. Prices paid for identical items vary substantially between sellers and it is possible that price trends may also vary between types of outlets. To a large degree, stores patronized by some low income groups constitute a separate market within a given community; their supply and demand functions probably are quite independent of those of stores catering to higher income consumers.

C. PRICE DATA FROM THE CROSS-SECTION SURVEYS

In addition to consumer expenditures, the surveys also include retail prices paid (and quantities purchased) for some categories of consumption, notably food, clothing, and some consumer durables. While these are not "specification" prices, since they represent the average, per income class, of different qualities of items, nevertheless they are an important source of price information.

Index Formula Assumed

We assume in this discussion that any additional indexes for special population groups (or for the total population) are to be Laspeyres indexes, and that the terms "cost of living index" or "consumers' price index" are not synonymous with the "true" cost of living index as described in the general theory of index numbers. (The true cost of living index is, of course, a measure of the changing cost of a constant [equivalent] level of satisfaction and in theory there is no limit to the time span for which it may be calculated.) The current CPI is based on a standard variation of the Laspeyres formula,

$$\frac{\Sigma p_1 q_0}{\Sigma p_0 q_0},$$

while all formulae for estimating the "true" index in effect are weighted averages of two separate indexes. In this respect the latter resemble Fishers' Ideal Index formula.

[8] In 1940, following a revision of the index, plate beef, strip bacon, and lamb stew meat were dropped from the index.

In actual calculation, nevertheless, the CPI methodology does represent an effort to approximate the true index over very short periods of time and therefore presumably so would any additional indexes for other population groups, since it is assumed that the same methodology would apply.

While index number theory is not included in the scope of this paper, it may not be amiss to examine briefly the theoretical base of the assumption that cost of living indexes would differ between economic groups.[4]

Arrow says, for example, "The consumption pattern of the rich is quite different from that of the poor and a shift in prices which increases the cost of living to one may decrease it for another . . . . There should be a separate cost-of-living index number for each income level." [5] The assumption of most economists that the true index varies by income level is in turn based on the assumption that expenditure-equivalence curves are nonlinear. (The expenditure-equivalence curve is the theoretical curve that relates minimum expenditures yielding the same level of satisfaction in two periods, prices and quantities being allowed to vary.) Since indifference maps cannot be derived empirically, neither can expenditure-equivalence curves, although Wald and others have suggested methods by which they may be approximated from cross-section data.

Simple Hypothetical Illustrations of Effects of Varying Prices and Quantities

As an introduction to exploration of differences in index movements, it might be useful to construct simple arithmetic models illustrating some of the effects of changes in prices and weights in index level.

In the simplest case, in which the array of prices in each index is identical and only the weights vary, the total differences, if any, in price indexes for different groups is due to variation in relative importance of identical items. While unrealistic, hypothetical indexes so constructed may be somewhat useful in indicating the extent to which weighting diagrams must vary before significant differences in the weighted price movements emerge.

Algebraically, the total effect of weight differences can be expressed in terms of the correlation between the relative quantities and the relative prices.[6]

[4] Ulmer suggests that ". . . perhaps three or four separate vocational index numbers might be required (e.g. to measure the cost of living experience of all numerically important groups in the United States)—one each (say) for urban wage earners and lower-salaried workers, farm workers, farm proprietors, and business executives and professionals," Melville J. Ulmer, *The Economic Theory of Cost of Living Index Numbers*, Columbia University Press, 1949.

[5] Kenneth J. Arrow, "The Measurement of Price Changes," a paper appearing in *The Relationship of Prices to Economic Stability and Growth*. Joint Economic Committee, U.S. Congress, March 31, 1958.

[6] I am indebted to Dorothy S. Brady for showing me that these expressions are the same as the formula originally presented by Bortkiewicz for comparing a chain index with a fixed weight index. ("Zweck und Struktur einer Preisindexzahl," Bortkiewicz, *Nordisk Statistisk Tidskrift*, III, 1924.)

$$I_b = I_a\left[1 + r_{xy}\frac{\sigma_x\sigma_x}{\overline{xx}}\right] \tag{1}$$

where

$$I_a = \frac{\Sigma p_1 q_a}{\Sigma p_0 q_a},\ I_b = \frac{\Sigma p_1 q_b}{\Sigma p_0 q_b},$$

and the

$$p_0 q_a\text{'s are weights } X = \frac{p_1}{p_0},\ Y = \frac{q_b}{q_a},$$

r is the weighted correlation coefficient and $\sigma_x\sigma_y$ the weighted standard deviations. I_a and I_b are cost of living indexes for two different population groups; p_0, p_1, prices in periods 0 and 1; q_a and q_b are the quantities purchased by income groups a and b, in period 0.

To facilitate calculation, the equation can be rendered as follows:

(2, 3, and 4 can be calculated directly).

Where $I_a = \frac{\Sigma p_1 q_a}{\Sigma p_0 q_a}$, and $I_b = \frac{\Sigma p_1 q_b}{\Sigma p_0 q_b}$,

then

$$I_b = \frac{\Sigma p_1 q_a}{\Sigma p_0 q_a}\left[\frac{\Sigma p_0 q_a}{\Sigma p_0 q_b}\cdot\frac{\Sigma p_1 q_b}{\Sigma p_1 q_a}\cdot\frac{\Sigma p_0 q_a}{\Sigma p_0 q_a}\right], \tag{2}$$

$$= \frac{\Sigma p_1 q_a}{\Sigma p_0 q_a}\left[\frac{\dfrac{\Sigma p_1 q_b}{\Sigma p_0 q_a}}{\dfrac{\Sigma p_1 q_a}{\Sigma p_0 q_a}\cdot\dfrac{\Sigma p_0 q_b}{\Sigma p_0 q_a}}\right], \tag{3}$$

$$= \frac{\Sigma p_1 q_a}{\Sigma p_0 q_a}\left[\frac{\dfrac{\Sigma p_0 q_a \cdot \frac{q_b}{q_a}\cdot\frac{p_1}{p_0}}{\Sigma p_0 q_a}}{\dfrac{\Sigma p_0 q_a \frac{p_1}{p_0}}{\Sigma p_0 q_a}\cdot\dfrac{\Sigma p_0 q_a \frac{q_b}{q_a}}{\Sigma p_0 q_a}}\right] \tag{4}$$

Time-to-time differences in the cost of two fixed-quantity budgets with the same sets of prices equal the weighted covariance of the price changes and the quantity ratios. In the equation above, the numerator of the bracketed term is simply the relative difference between hypothetical expenditures on Budget a in the base period and hypothetical expenditures on Budget b in the second period. The denominator is the cross-product of a price index with Budget a weights and a quantity index with base year price weights; it thus shows the separate effects of price and quantity changes.

Some simple examples will serve to illustrate how indexes for different economic levels might vary. All of the following illustrations assume prices are rising. (If the price situations were reversed, the resulting indexes would be the reciprocals of the indexes found in the case of rising prices.)

Case 1: Interaction Effects=0 [7].

Items	Prices ($)		Quantities		Relative importance (%)			
					Period 0		Period 1	
	Period 0 (p_0)	Period 1 (p_1)	Budget a (q_a)	Budget b (q_b)	Budget a (p_0q_a)	Budget b (p_0q_b)	Budget a (p_1q_a)	Budget b (p_1q_b)
1	10	10	10	15	21	20	16	15
2	20	25	6	8	26	22	25	20
3	30	50	4	6	26	24	33	31
4	40	50	2	4	17	21	16	20
5	50	70	1	2	10	13	10	14
					100	100	100	100

$$I_a=\frac{\Sigma p_1q_a}{\Sigma p_0q_a}=131.9^+,$$

and

$$I_b=\frac{\Sigma p_1q_b}{\Sigma p_0q_b}=132.0$$

In this example, while quantities are substantially larger in Budget b than in Budget a, the relative importance of each item in the two budgets is fairly similar. Level of prices and relative changes vary between items.

Case 2: Interaction Effects of Some Significance (+4%).[8]

All q's the same as in Case 1; p's also the same except for item 5, where the price in period 1 is changed to 200. Then,

Item	Relative importance (%)			
	Period 0		Period 1	
	Budget a	Budget b	Budget a	Budget b
1	21	20	13	12
2	26	22	20	16
3	26	24	27	24
4	17	21	13	16
5	10	13	27	32
Σ	100	100	100	100

$$I_a=160,$$

and

$$I_b=167.$$

In this example as in Case 1, the distributions of expenditures in Budgets 1 and 2 in the base period are not significantly different. In period 1 the item with the highest price but lowest relative importance in the base period was allowed to rise by 300 percent as compared with a much smaller rise in the prices of the remaining items, thereby more than doubling its relative importance. Nevertheless,

[7] Interaction effect as measured by expression in bracket, equation (3) or (4).
[8] See footnote 7.

the separate effects of the combined price and quantity differences were identical, so that half of the difference between I_a and I_b was caused by the price change, and half was due to the differences in weights. (I should confess that in setting up this example exact symmetry was unplanned; it was a result of the fact that $\Sigma p_1 q_a$ and $\Sigma p_0 q_b$ happened to be numerically equal.)

Case 3: Interaction Effects=23%.[9]

Item	Prices ($)		Quantities		Period 0 (%)		Period 1 (%)	
	Period 0 (p_0)	Period 1 (p_1)	Budget a (q_a)	Budget b (q_b)	Budget a	Budget b	Budget a	Budget b
1	10	20	200	50	47	7	56	9
2	20	40	40	80	19	19	22	29
3	40	50	15	30	14	11	10	14
4	80	90	5	12	10	12	6	10
5	200	210	2	20	10	48	6	38
Σ					100	100	100	100

$$I_a=171.9, \text{ and}$$
$$I_b=132.9.$$

In this example, the lowest priced item in period 0 represents nearly one-half of Budget a in the base period, while the highest priced item equals half of Budget b. This might be considered as an exaggerated illustration of very low income and very high income budgets. As stated, this example assumes that the largest increase in relative prices occurred among the lowest priced items. If, on the other hand, relative price changes were reversed, so that the lowest priced items increased substantially less than the highest priced items, the relative level of the two indexes would also be reversed, I_b greater than I_a, a relationship which conceivably could occur. (Arrow stated, for example, that if servants' wages go up while the prices of manufactured goods fall, an index for the wealthy could rise and that for the poor could decline.)

The effect of the difference in weights was considerably greater than the effect of the price changes, with a quantity index

$$\left(\frac{\Sigma p_0 q_b}{\Sigma p_0 q_a}\right)$$

of 197, as compared with 172 for the price index

$$\left(\frac{\Sigma p_1 q_a}{\Sigma p_0 q_a}\right),$$

a difference of 15 percent.

The above illustrations assumed no uniformity of price change and were designed simply to provide some indication of relative effects of some combinations of price and quantity variations. It might be

[9] See footnote 7.

well to conclude these few hypothetical examples with a more general case in which certain conditions are specified.

The level of an index tends toward a maximum (or minimum) the greater the correlation between price changes and relative value weights per item. Thus, if there is perfect and positive correlation in a given case, the resulting index will have a higher value than with any other set of prices yielding price relatives with values between 100 and 200. If the correlation is perfect and negative, the index will have a minimum value.[10]

In Case 3, prices and quantities in the base period are highly (although not perfectly) correlated. With certain adjustments, these data can be used to illustrate correlation effects in this type of situation.

Case 4: Prices and quantities highly correlated in base period and price changes in period 1 are proportionate to relative importance of individual items in base period expenditures.

If the Q_a and the Q_b are the same as in Case 3, then:

Example A. If prices in period 1 are proportionate to the item relative importances in Budget a, the resulting index values are:

$$I_a=130,$$

and

$$I_b=115.$$

Example B. If prices in period 1 are proportionate to item relative importances in Budget b, the resulting indexes are:

$$I_a=123,$$

and

$$I_b=138.$$

In Example A, the price in period 1 of each item

$$P_1=P_0\left[1+\frac{P_0Q_a}{\Sigma P_0Q_a}\right]=P_0[1+W_a].$$

Then,

$$I_a=\frac{\Sigma P_0Q_a[1+W_a]}{\Sigma q_ap_0}$$

$$=\frac{\Sigma P_0Q_a}{\Sigma P_0Q_a}+\frac{\Sigma P_0Q_aW_a}{\Sigma P_0Q_a}$$

$$=1+\Sigma W_a^2.$$

[10] I am indebted to George Stigler for suggesting an illustration of the maxima and minima effects obtained when base period prices and quantity weights are given and second period prices are prefectly correlated with relative expenditure weights.

And, letting

$$P_oQ_b = W_b,$$

$$I_b = \frac{\Sigma P_oQ_b[1+W_a]}{\Sigma P_oQ_b}$$

$$= \frac{\Sigma P_oQ_b}{\Sigma P_oQ_b} + \frac{\Sigma P_oQ_bW_a}{\Sigma P_oQ_b}$$

$$= 1 + \Sigma W_aW_b.$$

ΣW_aW_b is the cross-product of the relative importances of the two budgets at base period prices. Hence, the similarity or dissimilarity of the two indexes will depend on the extent to which the weights (i.e., the relative importances) are correlated.

In Example B, the notation is the same except that in the price equation the Q_b are substituted for the Q_a.

In the above illustrations, the assumption that in the same market prices paid are the same for items common to budgets of different population groups does not imply the further assumption that all budgets include some quantity of every item; rather, zero quantities are admissible. It would, therefore, be possible to construct hypothetical indexes such that differences between them were caused by price changes of items included in one budget but not in the other. (It should be noted that the Brady formula as presented does not admit of zero quantities. This restriction is relaxed if the q's are taken as subgroup totals, and the p's are quantity weighted.)

Empirical Examination of Sources of Variation Between Indexes for Different Economic Groups

The contents of budgets at successive income levels, when residence and population characteristics are held constant, vary according to overall volume and the number, quality, and quantity of individual items. As compared with high income budgets, a typical budget for a low income group contains a smaller number of specific goods and services, its total contents add up to a substantially lower volume, and quantities of individual items are smaller, except for inferior goods purchased as substitutes for more preferred items. Finally, of the items for which varying qualities are available, the average low cost budget includes a preponderance of the lowest qualities.

Since all items do not have identical price movements, it is possible that different combinations of consumption goods and services display diverse price trends. To what extent can the separate sources of price differences be isolated and measured?

Analysis of budgetary differences, by major category of items, in part will indicate whether items that are low cost substitutes for more preferred items display the same relative price trends as items that are the cheaper versions of similar but higher quality items and whether these low income goods and services follow a price path similar to or different from items representative of higher income budgets. The food, transportation, and personal care categories in particular provide illustrations of item substitutions (margarine for butter, public transportation for automobile expenses, home beauty

care for purchased services, etc.). Housing and clothing budgets at different income levels, on the other hand, vary primarily in the quality of items purchased.

For the purpose of testing empirically for possible differences in price changes of items of particular importance in average budgets of families at various income levels, it was necessary to establish a procedure for item classification. For food, a category of consumption for which both quantity and price detail by income level is available or could be calculated, items were classified on the basis of their income elasticity.[11] Low income items were defined as those with a negative or zero elasticity, items with a moderate income elasticity were classed as middle income items, and high income items were those with the highest elasticity. (See Table 2.)

TABLE 2.—*Food Items Classified by Income Elasticity in 1936*

Item	Income elasticity		
	Negative or zero	Positive	
		Moderate	Highest
Meats, etc.	Chuck roast	Round steak	Rib roast
	Boiling beef	Liver	Sirloin steak
	Ground beef	Pork roast	Other steak
	Veal stew	Corned beef	Veal chops
	Lamb stew	Dried beef	Pork chops
	Pork sausage	Bacon	Lamb chops
	Strip bacon	Fresh fish	Whole ham
	Salt pork		Leg lamb
	Bologna		Bacon
	Canned salmon		Chicken
Dairy products	Loose milk	Bottled milk	Cream
	Buttermilk	Butter	
	Skim milk	Ice cream	
	Dry milk	Cheese	
	Evaporated milk		
Fats and oils	Lard	Mayonnaise	
	Margarine		
Cereals, etc.	White flour	Corn flakes [1]	Cake
	White bread	Rolled oats [2]	Whole wheat bread
	Rice	Wheat cereals	
	Macaroni		
Fruits and vegetables	White potatoes	Cabbage	Asparagus
	Canned green beans	Carrots	Celery
	Baked beans	Onions	Lettuce
	Canned tomatoes	Peas	Lima beans
	Dried beans [1]	String beans	Oranges
	Dried peas	Sweetpotatoes	Grapefruit
	Dried, other	Tomatoes	Melons
	Dried other canned vegetables	Bananas	Apples
		Berries	Pears
		Canned:	Canned:
		Peas	Pineapple
		Corn	Fruit juice
		Peaches	Beets
		Asparagus	
		Dried: prunes	
Sweets		Sugar [1]	Candy [1]
		Corn syrup [1]	Preserves
			Packaged desserts [1]
Miscellaneous		Peanut butter	Nuts
			Soft drinks [1]

[1] Not tabulated separately in 1936 summary pamphlet.
[2] No longer available.

[11] For some surveys, quantity data for clothing is also available but the 1950 BLS study tabulated quantities only to the first decimal and thus significant differences by income level do not emerge for the majority of items. The classification of items by income elasticity thus could not be employed for this category and others for which quantity data were not available.

Food

A. PRICE DATA

A detailed examination was made of food budgets, by income level, as recorded in the national urban consumer surveys of 1936, 1942, and 1955. Since all of these surveys recorded quantity as well as income and expenditure data, it was possible to classify items by their income elasticity. It was found that while some items shifted classification over the period 1936–55 no major changes occurred and some of the minor changes shown undoubtedly are artificial, resulting from sampling variations rather than a real change in tastes. Although the total number of line entries on the food schedules increased from 135 to about 220 in the 1936 and 1955 surveys, the number of items separately identified with a negative or zero income elasticity did not increase proportionately, rising from 30 to 39.[12] The relative importance in total food expenditures of the inferior items declined steadily across the income scale, measuring, in each of three surveys, from the next to lowest income class to the highest.[13] (See Chart 1.)

In current dollars, the relative importance of these items was about the same in 1936 and in 1955. (Information in these two surveys relate to households or families of two or more persons.) While inferior items appear to be of significantly less importance in 1942, about 40 percent of the apparent variation can be due to the fact that the 1942 survey presented combined data for households of one person and two or more persons. For all single-person households in 1955, average income was less than $1,700, and expenditures of these households on inferior items represented 13 percent of the food budget, as contrasted to about 25 percent for larger households. If one-person households with incomes around the average also spent about 13 percent of food expenditures on these items, then in 1955 the relative importance of these items for all households combined would be about 18 or 19 percent. The difference that remains, which is significant, is probably accounted for by changes in the economic regimen; in the Spring of 1942, when the survey was conducted, the United States had just entered the war. Market dislocations, however, had been building up since the beginning of World War II in September 1939 although governmental controls were not applied until 1942. In the face of rising demand and restricted supplies, shortages appear first, in many instances, in the low cost and inferior goods sector. On this account alone, one might expect that living costs of the lowest income groups would rise faster than others during such periods. (Throughout this paper, while "lowest income groups" is not quantitatively defined, it is taken to represent the 15 percent or so of the population at levels of living that are substandard; a significant portion of this group is not completely self-supporting.)

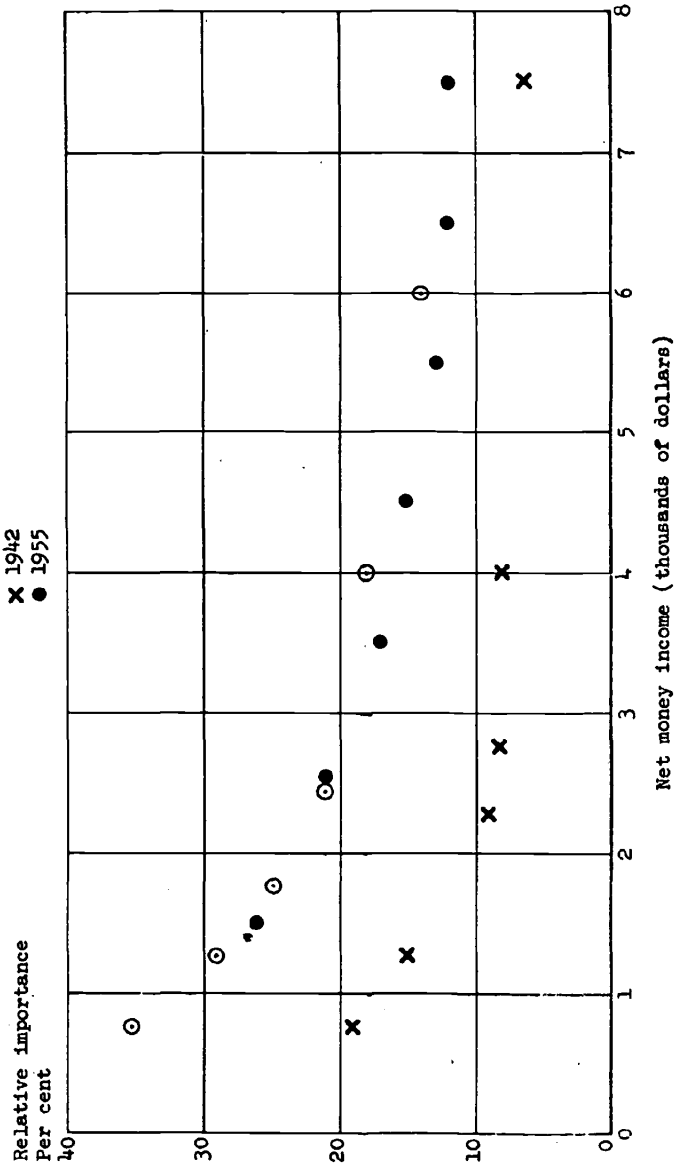
Given the differences between the two periods one would not expect the 1936 and 1955 curves to be at the same level. The virtual

[12] A few items display a positive elasticity from the lowest to the upper middle income groups, then become negatively elastic. Such items were not included in the negative or zero elasticity group.

[13] Lowest income class omitted since it contains families with negative and zero reported incomes and families living on savings.

CHART 1

Relative Importance of "Inferior" Items in Total Food Expenditures, Urban Households, 1936, 1942, 1955, in Current Dollars



identity can be explained only by differences in the structure of prices in the two periods.

An examination was made of differences in prices of items recorded in the three surveys. A comparison of price relatives of food items roughly classified by income elasticity (zero or negative, moderate, and most elastic) shows considerable variation between the three distributions. The items were grouped according to income elasticity as of the 1936 survey, then, insofar as possible, the same items were identified in the two later surveys and their prices compared.) Some attrition occurred between surveys and therefore a few additional items were added for the 1942–55 survey comparisons, based on estimated elasticity in 1942. These were items for which prices and quantities were not summarized separately in the U.S. urban summary for 1936, although regional data are available.[14]

During the period 1936–42, when the CPI food index increased by 22 percent, the "low income" items on the whole responded more quickly to the upward pressures on the market; only 10 percent showed no change in prices or registered a small decline, as contrasted to 30 percent of the "high income" items. Items classified as "middle income" averaged a higher rise; the great majority of these, however, are also purchased relatively more by the low income than the highest income classes, and it could thus be inferred that the cost of the total food budget would rise more for the lowest, not the highest income groups. (See Table 3.)

In the succeeding period, 1942–55, when the CPI food index showed an 81 percent rise, the low income items steadily forged ahead; 59 percent increased by more than the index, as compared with 47 percent of the high income items, and 37 percent of the middle income items. This calls attention to the fact that when the general price level continues an upward movement over an extended period, even though the average income level may also be rising, a portion of the population is experiencing no change or a decrease in real income. This group, as well as the group whose permanent income is low, seeks out lower cost substitutes with the result that there is always a substantial demand for such items.

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[14] This type of analysis requires price and quantity data for individual food items. To my knowledge, the only source of such data on individual food items from the 1936 survey for U.S. nonfarm families by income level is a mimeographed report prepared by the Department of Agriculture in 1940 and privately circulated within the Federal Government. The tabulations did not extend to all food items although none of major importance were omitted. These materials are based on two BLS surveys conducted in the periods of 1936 and conducted in large- and middle-sized cities and some smaller cities, and a survey conducted by the Bureau of Home Economics in small cities and rural nonfarm areas. Families on relief were not included. The data from the three sources were weighted together and then smoothed. Data from the later surveys were not smoothed before publication.

Inevitably, comparisons based on survey data for different dates also include the effects of methodological, definitional, and perhaps operational differences that affect the primary data. The 1936 material relates, for example, to nonfarm, nonrelief families; the 1942 data to all urban households, including those of single individuals, and the 1955 survey material to urban households of two or more persons. All of the 1936 summarized quantity data referred to in this paper are in terms of pounds, while those for the 1942 and 1955 surveys give dairy products (in part), in quarts, eggs in dozens, etc. Necessary conversions to a common unit of measurement introduce another level of estimation and hence are additional sources of error.

For reasons such as these, the empirical data presented are intended only as very rough approximations which presumably indicate the trend of possible differences in indexes for the different classes of consumers under consideration. The samples of items on which tentative conclusions are based are statistically small and, from one group to another, are associated with different levels of relative importance in total food expenditures. Such limitations are inherent in the published data; some could be overcome via retabulations, others only by the collection and tabulation of new material.

TABLE 3.—*Distribution of Price Relatives for Food Items, by Income Elasticity, 1936–42, 1942–55 (as Derived from Urban Cross-Section Data)*

Price relative	Income elasticity of items		
	Zero or negative	Moderate	Most elastic
	(1936=100)		
1942:[1]			
100 or less	10	18	30
100 to 110	33	11	8
110 to 125	14	18	25
125 or more	43	53	37
Total:			
Percent	100	100	100
Number	21	28	24
	(1942=100)		
1955:[2]			
140 or less	5	13	25
140 to 180	36	50	28
180 to 200	27	9	16
200 or more	32	28	31
Total:			
Percent	100	100	100
Number	22	32	32

[1] CPI relative, all food items, 121.
[2] CPI relative, all food items, 181.

Despite sustained demand for low cost foods by a significant portion of the population, supplies of some of these items were limited in 1942. In the meat line, for example, many of the low cost cuts were practically unavailable. As Margaret Reid points out, meat products add up to "the total animal." There are a number of ways in which a carcass can be cut up with no change in item prices, the overall realized price can be increased, decreased, or left unchanged. Individual cuts can be upgraded or downgraded, with no net loss to the butcher. When upgrading occurs, some of the cheaper cuts are absorbed into those of higher quality. The possibilities can occur with all items with a joint supply.

With only one exception, all of the low income meat items as of 1936 represent "scraps" of more expensive cuts, and the single exception, chuck roast, had become a preferred item by 1942. Further, hamburger, although it can be made from beef of varying qualities, had experienced a greater than average price change and was no longer considered an inferior item by 1942.

B. TEST INDEXES FOR FOOD

1. *Laspeyres Index.*—At the present time it is not possible to construct a standard Laspeyres index for low or high income families, due to lack of sufficient price information on many items they purchase. BLS retail price series that are representative of purchases of these two population groups are not sufficiently comprehensive to provide adequate budget coverage. Since far more material is available from the cross-section data, it would seem that test indexes must be derived from this source.

Although base period weights can be derived without difficulty for specific income classes, since the data are so tabulated, the price data

by income class, from successive surveys, obviously cannot be matched without prejudice since equivalent income levels are unknown, and average prices paid do vary by income level. On this account, an item rather than a family plan of classification was adopted.

Comparative indexes were calculated for all food items with a negative or zero income elasticity, food items displaying a positive income elasticity, and all foods combined. (See Table 4.) The weights represent total family consumption in 1936 for each set of items. The first set of items is of greatest importance to the lowest income groups (35 percent in budgets of families with incomes of $500–$1,000 in 1936 as contrasted to 14 percent for families with incomes of $5,000 or more. (See Chart 1.) The index calculation included adjusting the quantity data for the three surveys to a common unit of measurement (pounds), and computation of average prices from the quantity and expenditure averages.

TABLE 4.—*Test Food Indexes for Specified Types of Items, 1936, 1942, and 1955, U.S. Urban (Laspeyres Index Formula)*

Type of item	1936	1942	1955
	1936=100		
Total (all items)	100	119	200
Items with negative or zero income elasticity	100	124	257
Items with a positive income elasticity	100	117	190
CPI food index	100	122	221
	1942=100		
Total		100	168
Items with negative or zero income elasticity		100	208
Items with a positive income elasticity		100	164
CPI food index		100	181

Over the six-year period 1936–42 and the thirteen-year period 1942–55, the "low income" index increased more than the "higher income" index and the CPI. And, the increase in the CPI lies between that of the "low income" and the "higher income" indexes.

The comparison of the movement of the index of low income items (30 in all) and the CPI must be approached with considerable caution. In general, it is not surprising that the low income index rose substantially more than the CPI between 1942 and 1955, a period that included World War II and the Korean War, increased demand, and a continuing upward movement of prices during the postwar period. As the ranks of the permanently low income group are augmented by others whose real income is falling (e.g., the fixed-income group, etc.), sustained demand for the low income items acts as an upward pressure on prices and is further strengthened by the general upward movement of prices. Moreover, there is a "unit of measurement" effect also operating. Since the low income items are also those at the bottom of the price ladder, a small absolute change in price can be large in percentage terms as compared with the same dollar change for items with an initially higher price. In addition, low income groups make many of their food purchases at small neighborhood retailers whose total sales volume is low and unit markup relatively

high, compared with that of the large supermarkets patronized by middle income groups. Under such conditions, during upswings it seems possible that price rises in such outlets could lead the market.

2. *Unit-Cost Indexes for Food.*—A unit-cost type of index was constructed, again using the same basis for classifying items as established for the Laspeyres index and with prices as well as quantities derived from the survey data. (See Table 5.) The unit-cost index, however, allowed the contents of each basket of goods to vary at each survey date, by classifying items according to their elasticity as of the survey period. This type of index is an expenditure ratio,

$$\frac{p_1 q_0}{p_0 q_0},$$

where, in the case of the low income index, the p_0's and the q_0's relate to items with a negative or zero income elasticity in period $_0$, and the p_1's and q_1's to items that display similar elasticities in period $_1$. Since items and quantities are allowed to vary, as well as prices, indexes so calculated show greater fluctuation than a Laspeyres index. (See Table 4.)

TABLE 5.—*Test Unit-Cost Indexes for Specified Types of Food Items 1936, 1942, and 1955, U.S. Urban*

Type of item	Date		
	1936	1942	1955
	1936=100		
Total	100	141	253
Items with a current negative or zero income elasticity	100	156	269
Items with a current positive income elasticity	100	132	238
CPI food index	100	122	221
	1942=100		
Total		100	179
Items with a current negative or zero income elasticity		100	173
Items with a current positive income elasticity		100	180
CPI food index		100	181

Overall changes from 1936 to 1955, and changes from 1936 to 1942 were greatest for items with a negative or zero income elasticity, but items with a positive elasticity showed a slightly larger rise during the period 1942 to 1955, partly due to a greater increase in total quantities of items purchased. The index for the latter group of items (positive elasticity) was more comparable in movement to the CPI food index than to the index based on low income items, especially over the period 1942–55.

3. *CPI-Based Food Index.*—Finally, a Paasche index was calculated, using 1955 survey expenditure weights. The price change measured covered the period 1950–55. CPI item indexes were applied to 1955 expenditures of matching items, and the average change of priced items per subgroup applied to the total expenditure weight per subgroup. Indexes were prepared for three income levels, $1,000–$2,000, $4,000–$5,000, and $10,000 and over. No significant variation

was shown in the three indexes (108, 108, and 110) nor between them and the actual change in the CPI food index—110. The lack of differences between the three test indexes is explained by the relatively minor variations in relative importance of subgroups of items. No major differences were to be expected between the CPI and the index for the middle income group.

This comparison shows in part, the dangers inherent in item imputation. Although item weights vary in the three budgets, the lack of extreme variation in subgroup expenditure totals deadens item differences in price changes. The major difference in subgroup totals occurs in the food-away-from-home group, which is of minor significance (17 percent) in the low income budget, and of substantial importance in the highest income budget (33 percent). However, food away from home was an imputed, not a priced subgroup in the 1950 CPI.

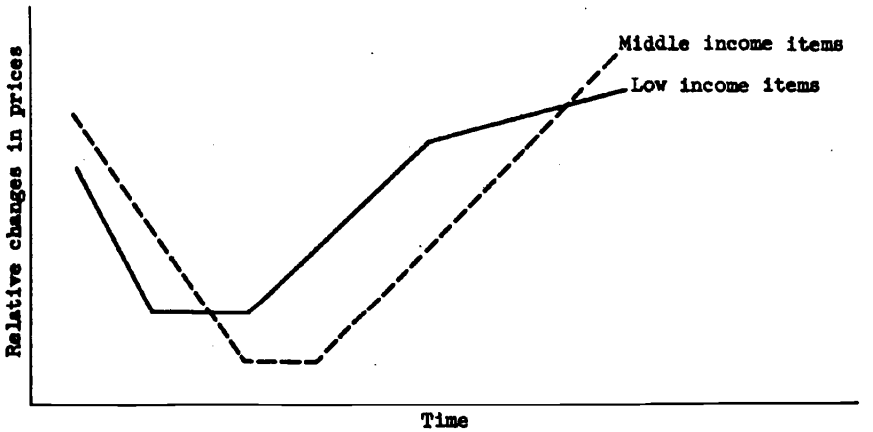
C. TENTATIVE CONCLUSIONS AND CONJECTURES: THE FOOD INDEX

Since the consumer surveys uniformly have been conducted during periods of rising prices, from these sources relative changes in retail prices of items purchased by families at varying economic levels can be estimated only during cyclical upswings. In such periods, the available data suggest that prices of items of particular importance to low income groups advance more rapidly than prices of other items. If this is true, it can then be inferred that a Laspeyres index of total food costs for this population group would show a greater increase than the CPI food index during such periods. While items with a relatively high income elasticity showed the smallest advance, on the average, a less positive inference can be drawn concerning the relative movement of an index for high income groups: it would depend upon the relative importance on the total budget of items with a high income elasticity as compared with items with a positive but relatively low elasticity.

Relative price movements during other phases of the business cycle can only be surmised. Assuming a free market, there exists a certain logic to support the assumption that prices of items with a negative or zero income elasticity tend to be inelastic during downswings, relative to items with a moderate income elasticity. Throughout such periods, the size of the low income population is expanding and hence demand for inferior and low cost items is sustained. Supply of such items probably is relatively inelastic in the short run since by and large these foods comprise the basic staples. If this is true, one might expect a relatively greater decline in prices of these items, unless demand was either sustained or increased. In recession periods, demand for low cost items would be least affected. Middle income items, on the other hand, are subjected to more severe market pressures as real income of this population group declines, total demand falls, and simultaneously is downgraded to lower quality goods. Supply is presumably rather inelastic but less so than that of low income items. In a similar vein, it could be argued that the price response of the highest income items may lie between that of the low and middle income items.

On the other hand, measuring from peak to trough, or trough to peak, it is possible that overall changes in indexes for the lowest and the highest income groups may not be as large as the change in the CPI for moderate income families.

On this hypothesis, indexes for the extremes of the income distribution might lead the CPI but their overall swings could be narrower. These possible relationships are illustrated in the diagram appearing below.



If middle income items on the average display the greatest overall changes, despite their lag, it must mean that at some later stage of an upswing prices of other items tend to reach an equilibrium level and display only a minimal response to the general increase in market prices. During such a stage real income is rising, the low income population declines, and low income food items tend to assume the characteristics of byproducts.

The above hypotheses assume no restrictions on supply. If, however, market disturbances such as those created during wartime cause low income items to disappear from the market more rapidly than other items or if their supplies become relatively more limited, a low income index conceivably could show a greater overall increase over a complete business cycle on this account.

Clothing and House Furnishings

The consumer surveys consistently have shown that the budgets of the lowest income groups are heavily weighted with "inferior" goods—the low cost substitutes of more preferred goods and services—and with the lower-priced qualities of items belonging to the same generic group (men's suits, women's street dresses, etc.). Inferior goods, which were broadly defined as having a negative or zero income elasticity, were discussed in the previous section where food items were discussed as an illustrative case. Here, some of the meager data available on differing qualities of clothing and furnishings items are examined.

Not all persons in the low income group regularly purchase the lowest available quality but in general the average purchase price of most items increases across the income scale. (I would expect, however, that if consumers were classified by their permanent income rather than current money income, distributions of prices paid, by income

level, would show less dispersion.) Nevertheless, it is probable that if the surveys could record purchase data for consumption items stratified by a high degree of specification (which index number theory incorrectly assumes to be standard procedure) differences in average purchase price of identical items would still be shown by income level. Transaction prices vary between types of outlets; stores frequented by the higher income groups incorporate a larger component representing the cost of extra services, prestige factors of various kinds, credit costs, and so on.

There are thus two separate questions to be answered, relative to changes over time in prices of items classified according to quality. First, do price trends of identical items vary between low income stores and middle and high income outlets? Second, what are the differences, if any, in price movements of items belonging to the same generic class but highly differentiated by quality level?

The first problem can be approached best by the agencies in charge of the price collections and will not be discussed further in this paper. The published price information is insufficient to provide a framework for quantitative analysis of this type. It is quite possible, if not probable, that such differences do exist.

We are only slightly better off, however, as regards data relevant to the second question. It has been pointed out that in recent years the number of items priced at different quality levels by the BLS has steadily declined. More and more, CPI policy has tended towards pricing one quality of an expanding list of items. This may result in a better CPI but places unfortunate limits on a study of price trends by quality level.

The category of clothing, like that of food, includes a smaller physical volume in the low income budget, but contains fewer low-cost item substitutes. Rather, it is characterized by the greater importance of the lowest cost qualities of identical items, items being defined generically.[15] (The same generalization can be made of the house-furnishings budget.)

It would appear that in the survey data a very much smaller proportion of the low cost clothing budget, as compared with food, consists of items with a negative or zero income elasticity. Clothing items displaying this characteristic primarily are those in the work clothing category. The apparent difference between categories undoubtedly results from the variation in item identification. Apparel is standardized as to items, across all income groups; everyone has to wear shoes, outer apparel, etc., and the quantity saturation point per item is reached more quickly than in a category such as food where greater substitution is possible between items. Thus, very few of the clothing items, as recorded in the consumer surveys, display a negative or zero income elasticity. However, if low cost items (the lower qualities) were recorded separately, as in the food schedule, undoubtedly these would show up as inferior goods.

Prior to World War II the regular CPI price collections included two or more qualities of a substantial number of clothing items, and a few house-furnishings items. This was also the case in the period im-

[15] This nomenclature differentiates "rib roast" and "chuck roast" as separate items, although both are roasts of beef, while "women's rayon street dresses" is a single item for which many different qualities are available. This differentiation, while somewhat artificial, is in line with the manner in which details are recorded in the consumer expenditure surveys.

mediately preceding World War I except that prices are available for many more furnishings. Both sets of price data, while limited, indicate that in the prewar-inflationary periods, mid-1914 to mid-1918, and from June 1939 to December 1941, average retail prices of the lower quality items in these two categories advanced significantly faster than did the higher qualities also included in the pricing list. The comparison appears in Table 6.

TABLE 6.—*Price Relatives for Selected Clothing and House-Furnishings Items, by Quality Level, June 1914–August 1918, and September 1939–December 1941, U.S. Urban*

[Number of items]

Item and date	Total	Largest increase shown by		Same change
		Lowest quality	Highest quality	
1939–41: [1]				
Clothing items	27	19	6	2
House-furnishings items	5	4	1	0
1914–18:				
Clothing items	19	18	1	0
House-furnishings items	13	11	2	0

[1] The items included in Table 6 are as follows:
1939–41: Clothing: Men's overcoats, topcoats, wool suits, wool sweaters, dress trousers, work trousers (2 types), business shirts, cotton trousers, semi-dress, felt hats, socks, pajamas, street and work shoes; women's dress coats, sport coats, dresses (wool, rayon, rayon prints, cotton), silk hose, slips, street shoes; girls' coats, shoes. *Furnishings:* blankets, sheets, floor covering, living room, dining room, and bedroom sets.
1914–18: Clothing: about the same as in 1939–41. *Furnishings:* blankets (2), sheets and sheeting, towels, dining room table, chair; bedstead, mattress, kitchen stove, table knives, skillets.

SOURCE: 1934–41: *U.S. Average Prices of Clothing, Shoes, Furniture, Household Equipment, Electrical Appliances, Drugs, and Miscellaneous Commodities, June 1939 to September 1942.* Ethel D. Hoover, Chief, Retail Price Division, Bureau of Labor Statistics, March 1943. Mimeographed report issued for use of Federal agencies only.
1914–18: *Average Retail Prices: Collection and Calculation Techniques and Problems.* Bul. No. 1182. June 1955. Bureau of Labor Statistics. (See Appendix F.) The price data were assembled from original schedules of reporters in 18 shipbuilding centers and formed part of a BLS study of changes in living costs in these areas that were experiencing an explosive expansion in industrial production, population, and living costs. While the Bureau made every effort to match qualities from one pricing period to the next in order to construct continuous price series by quality level, specification control under such circumstances could not be rigidly maintained. For items with a wide range in prices in the base periods, subgroups were established by price level, and an attempt was made to maintain comparable qualities in succeeding periods.

Both time periods are comparable in that they immediately preceded direct American participation in a major war, and they are characterized by rapidly rising prices, real and anticipated shortages of consumer goods despite expanded industrial activity, and sudden population shifts to production centers with attendant increases in income and consumer demand. Sellers' markets existed during both periods.

It could well be true that the price data for these periods present a biased picture. It would require very intimate knowledge of the relative supply and demand of each quality of the items included in Table 6 to be able to estimate how much of the apparent price rise was due to disappearance of lower quality items and the resulting upgrading within specifications. But, on the other hand, it must be remembered that in these time periods the full effects of wartime shortages, voluntary and compulsory rationing which occurred after U.S. entry into World Wars I and II, and the artificial relationships between relative prices resulting from price control had not yet developed. In any case, the recorded differences in relative price changes were, for the most part, of considerable magnitude, as shown in Table 7.

The limited data presented in Tables 6 and 7 suggest that when the general price level is rising rapidly, prices of low-quality, low-cost

TABLE 7.—*Relative Price Changes of Selected Clothing and House-Furnishings Items, by Quality Level, 1914–18, and 1939–41* [1]

Percentage change in price	Number of items	
	Clothing	House-furnishings
1939–41		
Price increase of lowest quality higher by:		
1 to 5 percentage points	6	1
5 to 10 percentage points	6	2
10 to 20 percentage points	5	----
20 or more percentage points	3	1
Price increase of highest quality higher by:		
1 to 5 percentage points	4	----
5 or more percentage points	1	1
No difference in price change	2	----
Total	27	5
1914–18		
Price increase of lowest quality higher by:		
1 to 20 percentage points	3	1
20 to 40 percentage points	8	4
40 to 80 percentage points	5	5
80 or more percentage points	2	2
Price increase of highest quality higher by:		
1 to 10 percentage points	1	1
Total	19	13

[1] See Table 6 for sources.

items tend to have the greatest advances in the short run. In this response they are similar to inferior goods as defined in the preceding section.

HOUSING

With the exception of the aged who have retained possession of owned homes, homeowners primarily are members of the middle and upper income groups. Except for the group noted, relatively few families at the lowest income levels are homeowners. The discussion on housing will therefore be limited to renters.

For the period 1935–40, the Bureau of Labor Statistics calculated indexes of rents by rent ranges for 33 large cities throughout the country.[16]

In each of these cities, the increase in rents over these 5 years was larger for the lowest rent class, as compared with the highest rent class.

During more recent years it would appear that rental costs, like those of other major components of the family budget, have also increased more rapidly for the lowest income families as contrasted to increases in costs of middle and upper income families.

It is possible to compare changes in identical rental-occupied nonfarm dwelling units between 1950 and 1956, as derived from the 1950 Census of Housing and the 1956 National Housing Inventory. Monthly contract rent is available for identical units cross-classified by rent level during both years.[17] These data show that the relative

[16] I am indebted to Ethel D. Hoover, of the Bureau's Price and Cost of Living Division, for bringing this report to my attention and making it available to me. The mimeographed report presents quarterly indexes for the cities there included in the CPI. Distribution did not extend beyond the Federal Government.

[17] *Components of Change, 1950 to 1956*, Vol. I, Part 1, 1956. National Housing Inventory, Bureau of the Census, 1958.

increases between 1950 and 1956, in rents of units classified by their 1950 rent level, were highest for the units with the lowest rents, and steadily declined at successively higher rent levels. (See Table 8.)

TABLE 8.—*Indexes of Rents by Rent Ranges, Selected Large Cities, 1935 to September 1940 (1935=100)*

[Rent index for September 1940]

City	Rent ranges						
	Under $15	$15 to $19	$20 to $30	$30 to $40	$40 to $50	$50 to $75	$75 and over
Atlanta	113	112	114	113	106	[1] 103	—
Baltimore	117	112	109	105	104	[1] 104	—
Birmingham	161	144	135	124	[2] 115	—	—
Boston	101	100	102	101	99	[1] 97	—
Buffalo	127	118	117	111	107	[1] 102	—
Chicago	120	119	122	121	117	112	107
Cincinnati	111	103	108	104	101	[1] 96	—
Cleveland	130	126	120	113	109	[1] 108	—
Denver	123	122	119	114	107	[1] 104	—
Detroit	—	[3] 156	136	123	118	[1] 114	—
Houston	—	[3] 120	119	111	107	[1] 97	—
Indianapolis	131	126	119	114	[2] 107	—	—
Jacksonville	123	115	107	100	[2] 94	—	—
Kansas City	109	107	107	105	103	[1] 101	—
Los Angeles	—	[3] 135	121	109	108	106	108
Manchester, N.H	106	102	102	100	[2] 99	—	—
Memphis	121	122	115	113	108	[1] 103	—
Minneapolis	130	122	119	113	112	[1] 103	—
Mobile	116	113	110	107	[2] 101	—	—
New Orleans	107	105	106	104	102	[1] 102	—
New York	106	104	106	105	103	102	100
Norfolk	110	104	102	105	102	[1] 100	—
Philadelphia	108	108	107	105	104	[1] 103	—
Pittsburgh	120	117	114	111	110	[1] 107	—
Portland, Maine	104	100	101	100	101	[1] 97	—
Portland, Oreg	124	122	122	118	[2] 108	—	—
Richmond, Va	110	106	108	107	105	[1] 104	—
San Francisco	—	[3] 112	108	106	105	102	102
Savannah, Ga	111	109	109	108	[2] 105	—	—
Scranton, Pa	102	98	96	98	98	[1] 97	—
Seattle	124	120	120	110	[2] 108	—	—
St. Louis	103	104	105	102	100	[1] 99	—
Washington, D.C	—	[3] 105	105	103	101	99	99

[1] $50 and over.
[2] $40 and over.
[3] Under $20.

SOURCE: "Indexes of Rents by Rent Ranges in 33 Large Cities" (for quarterly periods, March 1935 to September 1940). Retail Price Division, Bureau of Labor Statistics (mimeograph).

These comparisons of rates of change in rents are based on median values and hence are subject to some limitations. Medians were assumed to equal midpoints of class intervals, in the case of the year used as classification base, and for the other year were calculated from the distributions given. Use of midpoints as estimates of median values of the arrays by rent level in 1950 probably results in underestimates of rent changes, especially at the upper end of the rent distribution where class intervals are raised from $10 to $20.[18] Errors of estimate, however, would have to be unrealistically large before the trend toward smaller increases at the higher rent levels is eliminated.

Another drawback, of course, is the lack of quality control. Most appropriately, comparisons of time-to-time changes in rental values

[18] The second highest rent class includes units with rents from $80 to $99. Median value in 1956 of dwelling units with 1950 rents from $80 to $99 was calculated at $93.10 for all nonfarm units. If the 1950 median is taken as $90, the midpoint value, the percentage change in median value rose 3 percent between 1950 and 1956. If, on the other hand, the estimated median value is dropped to $85, the percentage change is 10 percent, a change still considerably below that shown at the lower end of the rent scale.

should be based on representative dwelling unit samples in which the quality-mix is held constant. Furthermore, rather than contract rent, a value that standardizes for utilities and furnishings should be used, such as a gross rent that represents contract rent adjusted to include utilities and excludes rental costs of furnishings.[19] In this connection it should be noted that the BLS rent index, which is calculated on an adjusted contract rent concept, eliminating the effects of changes in utilities or furnishings included in rent, increased by 22 percent between 1950 and 1956, as compared with an estimated 30 percent rise in median rents of identical nonfarm rental units, and a slightly smaller estimated rise in average (mean) rents (about 28 percent).

Among nonfarm renter-occupied dwelling units, those located outside standard metropolitan areas showed the smallest increase in costs. This was true at all rent levels. (See Table 9.) Within standard metropolitan areas, differences between rental changes of units in central cities and those in outlying areas were minor, except for the lowest rent class (less than $20 per month), and middle-priced units ($40 to $49). For these two sets of dwelling units median rents increased substantially more in central cities.

TABLE 9.—*Estimates of Changes in Monthly Contract Rent, 1950–56, Identical Renter-Occupied Dwelling Units, by Area* [1]

Rent level	U.S. nonfarm	In standard metropolitan areas		Outside standard metropolitan areas
		In central cities	Not in central cities	
	Median rent in 1956			
1950 RENT				
Total	$50.02	$54.20	$54.80	$37.83
Less than $20	22.91	26.06	24.12	(2)
$20 to $29	35.40	36.52	37.65	31.45
$30 to $39	47.08	48.44	48.89	41.03
$40 to $49	55.67	58.34	53.68	49.92
$50 to $59	62.84	68.16	68.76	58.01
$60 to $79	73.74	74.78	76.14	68.32
$80 to $99	93.10	95.08	90.22	90.00
$100 or more	(2)	(2)	(2)	(2)
	Percentage increases, 1950 to 1956, measured from 1950 midpoints of rent classes			
Total	30	38	37	26
Less than $20	1 52	1 74	1 61	(2)
$20 to $29	42	40	51	26
$30 to $39	35	38	40	17
$40 to $49	24	30	19	11
$50 to $59	14	24	25	6
$60 to $79	5	7	9	−2
$80 to $99	3	5	0	0
$100 or more	(2)	(2)	(2)	(2)

[1] Midpoint of 1950 rent class taken as $15.
[2] Not available.

SOURCE: See footnote 17.

[19] Lawrence N. Bloomberg, Office of Statistical Standards, Federal Bureau of the Budget, is obtaining special tabulations from the Census Bureau which will provide, on a gross rent basis, data comparable to that presented in Tables 8 and 9.

It would therefore appear that rental indexes for the period 1950 to 1956 would have increased most for low income families and least for the high income renters living in standard metropolitan areas. Nonfarm low income renters outside of such areas on the average experienced rental increases of about the same degree as families in standard metropolitan areas paying middle-to-upper rental costs.

Other Categories of Consumption

Time limitations have precluded undertaking a detailed study of the remaining categories of consumption. It is possible, however, to make a few general observations.

TRANSPORTATION

The transportation budget consists of two major components—private facilities (automobiles), and public services (local street cars, buses, and subways). Average expenditures on other methods of transportation are relatively small. Automobile purchase and upkeep are of greatest importance in the high income budgets and of least importance in low income budgets, while the converse is true of local transit. Between 1936 and 1955, local transit fares increased by 118 percent, as contrasted to a rise of 79 percent in the cost of car purchase and maintenance, as measured by the BLS item indexes.[20] Over this period, therefore, transportation costs of low income families, excepting those of limited mobility such as the retired, rose substantially more than that of middle income families.

Commencing from a 1936 base, and measuring relative changes over shorter time periods, however, increases in costs of public local transportation facilities did not always lead private facilities. (See Table 10.)

Between 1936 and 1942, local transit fares were stable while the cost of new cars[21] and car maintenance increased substantially.

Table 10.—*Price Indexes for Selected Transportation Items 1936–58, U.S. Urban*

[1936=100]

Date	Total transportation	Local transit fares	Automobile purchase and upkeep	New car purchase
1936	100	100	100	100
1942	111	102	118	113
1950	158	150	164	201
1955	180	218		220
1958	200	247	198	245
PERCENTAGE INCREASES, SUCCESSIVE DATES				
1936–42	11	2	18	13
1942–50	41	46	38	79
1950–55	13	45	8	9
1955–58	11	13	10	12

Source: Consumer Price Index, *Price Indexes for Selected Items and Groups*. Bureau of Labor Statistics, September 1959.

[20] Consumer Price Index. *Price Indexes for Selected Items and Groups*, Bureau of Labor Statistics, September 1959.

[21] Used cars were not priced for the index until 1953.

Thereafter, from 1942 to 1958, local public transportation costs rose more rapidly than charges for other transportation items. From 1955 through 1958, prices continued to rise, but at a slower rate; furthermore, there was no significant difference in price changes of the major components.

The lags and leads shown by these figures introduce an artificiality in time comparisons that do not span a complete cycle. Price data are not available for the period immediately preceding 1936, here used as the base date. If local transit fares increased more than private transportation costs during that period, then from the depression low in the early 1930's to 1958, the latest available date, the disparity between local public transportation costs and private transportation costs would be greater than the increase shown from 1936 to 1958. If the reverse were true, relative price changes would have been more nearly alike. It is also possible that following the 1955–58 period of relative equilibrium, costs of car purchase and upkeep may increase more rapidly than local transit fares in the short run, assuming a continuing rise in the general price level.

Over short periods, no definitive statement can be made relative to price changes in transportation costs of low-, middle-, and high-income families because of the lags and leads these items display. Disregarding the technical problems of measuring time-to-time changes in car prices, and assuming for the moment that the relationship between price changes in public and private transportation items shown by the BLS item indexes is reasonably accurate, it seems clear that in the long run the cost of the lowest and highest income budgets rose more than middle-income budgets. The indexes show that prices of new cars and local transit fares increased by the same relative amount over the 22-year period 1936–55. While middle-income budgets include both of these items, they also give the greatest relative weight to purchases of used cars. (Between 1953, when BLS began pricing used cars, and 1958, the item index for used cars declined by 10 percent while the new car index went up 6 percent.) Transportation budgets for the lowest income groups would be limited largely to public transportation; purchases of used cars and upkeep charges would have very little weight, in these budgets, as compared with those for middle- and high-income groups.

In comparing relative changes in local transit fares and prices of other items, perhaps it should be pointed out that a "unit of measurement" problem exists here also. In actual practice fares do not form a discrete price series since now the price of a single ride is based on five-cent multiples; prices in odd cents are possible only when cost of transfers or multiple sales are taken into account (BLS prices are for single rides only). Since the unit price is low, relative to prices of other prices, a small absolute change in price is bound to be large in relative terms.

MEDICAL CARE

Medical care costs have risen more rapidly than the all-items index (CPI) but inferences about indexes for low- and high-income groups that can be drawn from the BLS price series are rather limited in scope since the item coverage is not representative of low (or high) income budgets. The pricing list does include, however, three types

of hospital rates—for private and semiprivate rooms and men's pay ward.

Except for the period 1936–42, charges for a ward bed consistently increased more than charges for a private or semiprivate room. The overall change from 1936 to 1958 was somewhat more than substantial—396 percent for ward beds, 256 percent for private rooms. If costs actually paid by the consumer are compared, however, it is likely that charges paid by middle- and upper-income groups have shown a smaller rise than quoted hospital rates because of the expanding coverage of hospitalization insurance among these groups. On this argument the cost of hospital board has increased relatively more for low-income groups than the difference shown in the simple comparison of basic hospital rates, since hospitalization insurance is not a major item for families at the lowest end of the income scale (Table 11).

TABLE 11.—*Price Indexes for Hospital Board Rates 1936–58, U.S. Urban*

[1936=100]

Date	Hospital rates		
	Men's pay ward	Semiprivate	Private
1936	100	100	100
1942	118	117	114
1950	302	260	239
1955	400	329	308
1958	496	397	356
PERCENTAGE CHANGES, SUCCESSIVE DATES			
1936–42	18	17	14
1942–50	154	122	109
1950–55	32	26	28
1955–58	23	14	15

SOURCE: See footnote to Table 10.

The BLS subgroup index for drugs and prescriptions shows less than half the increase reflected in the all-items index since 1936 but this probably is not representative of the increases in costs actually incurred by the index population. (It is relevant to note here that the high and increasing costs of drugs and prescriptions has become a matter of public concern during the past year or two and there have been a number of public investigations concerning the "high" cost of medications.) This subgroup of consumer goods in particular is undergoing rapid changes and technical improvements, and in index construction the "new product" problem is especially acute. Expanding costs of medications for all income groups is partly a result of the availability of new treatments and new products—the "miracle" drugs and antibiotics, etc., items not yet included in the CPI. In order to estimate relative differences in medication indexes for families at different economic levels it would be necessary to construct appropriately weighted indexes based on treatment costs of a sample of illnesses and disabilities. The few simple prescriptions, plus aspirin, milk of magnesia, and vitamin concentrate, on which the CPI index

was based until the second quarter of 1960, represent a coverage too limited to provide any information on differential trends of drug prices paid by various economic groups. The sample of prescriptions included in the index has just been revised; 13 new items were added.

PERSONAL CARE

Personal care items, which include both commodities and services, show diverse price movements that are not completely correlated with the classification either by commodity or service. Of the three services currently priced for the CPI, two—men's haircuts, and shampoo and wave sets at beauty salons—have shown very substantial price increases during the entire period 1936–58, while prices of the third, permanent waves, following steady increases between 1936 and 1946, stabilized during the succeeding 12 years. Undoubtedly the stability in cost of permanent waves during the more recent period reflects two factors; simplification of the hair-waving process, and the introduction of a low-cost substitute, a "do-it-yourself" home permanent wave. Prices of refills of the self-applied permanent waves, on the other hand, have increased steadily since 1952 when it was first introduced into the CPI. For another item, shampoo and a simple wave at a beauty shop, the relationship between prices of the purchased service and self-applied commodity (shampoo) is exactly the converse (Table 12).

TABLE 12.—*Price Indexes for Selected Personal Care Items 1936–58, U.S. Urban*

Date	Personal care, total [1]	Men's haircuts	Item			
			Shampoo and wave set	Shampoo (bottle)	Permanent wave	Home permanent refill
	1936=100		1952=100			
1936	100	100	39	----------	58	----------
1942	121	107	53	----------	70	----------
1950	183	230	92	----------	98	----------
1952	202	270	100	[2] 100	100	100
1955	209	300	110	101	101	124
1958	233	340	130	101	102	149
PERCENTAGE INCREASES, SUCCESSIVE DATES						
1936–42	21	7	36	----------	21	----------
1942–50	51	79	75	----------	[3] 40	----------
1950–52	11	18	8	----------	2	----------
1952–55	3	11	10	1	1	24
1955–58	12	15	18	0	1	20

[1] From 1936 to 1950, subgroup total based on: men's haircuts, shampoo and wave set, permanent waves, toothpaste, face powder, toilet soap, razor blades, and sanitary napkins; home permanent refills were added in 1951, and cleansing tissue, shaving cream, face cream, and home shampoo in 1952.

[2] December 1952=100.

[3] This increase occurred during the period 1942–46. The item index for permanent waves has been relatively stable since 1946.

Source: See footnote to Table 10.

Toiletry commodities display similar diversity in price movements, ranging from decreases during the recent period (cleansing tissue, face powder), stable prices (razor blades, shampoo) to price increases (toothpaste, toilet soap, shaving cream, face cream, etc.). Faced with such variation in price trends, it is difficult to estimate relative price

movements of personal care items purchased by families at different economic levels. The group as a whole, however, has a relatively small importance in spending patterns of middle and upper income groups, and has least importance at the lowest end of the income scale.

RECREATION

Like the personal care subgroup, this set of items represents a combination of commodities and services. None, however, can be considered as direct, low-cost substitutes for more preferred items. Except for newspapers, which have a relatively high purchase rate at all income levels, and movies, the recreation group contains "luxury" items of relatively minor importance in spending patterns at the lowest end of the income scale, such as purchase of television sets and television repair services. For the lowest income families, therefore, movement of the price index for the recreation group will depend primarily on changes in newspaper prices and movies; between 1936 and 1958, these prices advanced steadily, with an overall increase larger than the change shown in the subgroup total—a rather meaningless statement in view of the changes introduced into the CPI pricing list in 1952. Since 1952, television repair charges, one of the newly introduced items, went up the most, while prices of heavy appliances, television and radio sets and toys and sporting goods either declined or remained relatively stable. It would thus appear that an index of newspaper and movie prices would show a greater advance, in the short and long run, than an index based on the remaining items in the recreation subgroup (Table 13).

TABLE 13.—*Price Indexes for Selected Recreational Items 1936–58, U.S. Urban*

Date	Reading and recreation total [1]	Newspapers	Item			
			Movies	Television set	Table radio	Television repairs
	1936=100		1952=100			
1936	100	100	100			
1942	116	116	118			
1950	174	178	174			
1952	181	191	178	100	100	[3] 100
1955	180	204	209	85	91	117
1958	197	239	233	90	88	136
PERCENTAGE INCREASES, SUCCESSIVE DATES						
1936–42	15	16	18			
1942–50	48	53	47			
1950–52	3	7	2			
1952–55	0	5	17	[3] 15	[3] 9	17
1955–58	9	17	11	7	[3] 8	16

[1] From 1936 to 1949, includes newspapers, motion picture admissions (adults and children), radios (changing models); table radio substituted in 1950; television sets added in 1951. Toys, sporting goods, and television repairs in 1953.
[2] December 1952=100.
[3] Decrease.

SOURCE.—See footnote to Table 10.

Summary: Expected Variations In Living Costs of Consumers At Different Economic Levels

The work thus far undertaken has been exploratory rather than comprehensive in nature, and the empirical studies are not sufficiently detailed to illustrate conclusively the extent to which indexes for special classes of consumers will vary at successive stages of the business cycle. The results obtained, while limited, perhaps are adequate to indicate the type of model that could be established for further detailed analysis. One suggested model is described below.

Stages of the Business Cycle

A. RECESSION, PRICES FALLING

1. The supply of commodities important in low-income budgets remains relatively stable, while that of middle and upper income budgets declines slightly.
2. Supply of all skilled services remains stable, while supply of unskilled services (not purchased by low-income groups) increases slightly.
3. Prices of commodities of inferior goods and other goods of major importance to low-income groups decline slowly, relative to prices of commodities most important to middle-income classes, while prices of the highest cost and highest quality goods remain relatively stable.
4. Prices of skilled services in low-income budgets decline slowly, relative to middle-income items, while high-income services remain stable.
5. Unskilled services, purchased by middle and upper income groups only, decline in price.

B. DEPRESSION, CONTINUED PRICE DECLINES

1. Supply of low-income goods increase in response to rising demand, and supply of middle and upper income items declines.
2. Supply of low-income skilled services relatively stable, since they are largely public facilities, while supply of other skilled services increases.
3. Prices of low-income commodities and services decline, in response to decline in the general price level, but fall relatively less than prices of other items. Middle-income items experience the largest price decline.

C. RECOVERY, RISING PRICES

1. Supply of low-income commodities and services relatively stable, supply of skilled services decline slightly, other supplies expand.
2. Prices of low-income commodities and services recover more rapidly than other items. Prices of high income items are the most sluggish.

D. FULL EMPLOYMENT, RISING PRICES

1. Supply of low-income items decline slowly, while supplies of middle and upper income items continue to expand.
2. Prices of low-income items rise with the general price level, but more rapidly than other items. Prices of high-income items rise the slowest.

This model assumes that prices of low-income items lead during periods of upswing, and lag during downswings. And, high-income items lag both during upswings and downswings. No inferences are made concerning the relative magnitudes of changes over a complete cycle; it is possible, in terms of the model, for middle-income items to show the greatest overall fluctuations.

It also assumes that low income items, and to a lesser degree, high income items are relatively inelastic in the short run. Low income prices are "sticky" during downswings as demand is sustained during the expansion of the low income group. High income prices are relatively inelastic, due to sustained demand on short downswings and, during periods of both falling and rising prices, to the greater prevalence of longer term contractual prices and advance purchasing of this income group.

Many low income commodities, particularly in such categories of consumption as clothing and house furnishings, represent the lowest qualities on the market, and are produced by low wage labor in small plants. In recent years, relatively large wage increases in wage rates have accrued to this labor group. Greater increases in the wage bill of producers of low quality goods, relative to that of other producers, may explain in part why prices of low cost goods could rise more rapidly than prices of the more preferred items. In similar vein, it is suggested that such items are most generally sold in the smaller outlets in the low income neighborhoods. With small sales volume and low inventories, rising production and distribution costs would tend to be quickly reflected by price increases in such outlets. Moreover, all retailers tend to follow income changes of the population they serve.

It has sometimes been argued that indexes for high income consumers would rise faster, in periods of upswing than indexes for low income consumers because the former place a heavier weight on services, which have more volatile price movements than the general run of commodities. On the other hand, in commodities typically purchased by low income groups, labor costs form an unusually large proportion of total production costs, and the labor employed is largely unskilled or semiskilled—the groups that have received the greatest increases in wage rates. The labor services supported by the low income groups thus are the services whose prices have advanced the most. It also has been shown, in preceding sections, that among some of the services (final products) purchased by all income groups, such as rent, those purchased by low income families have shown the greatest price increases.

As contrasted to low income families, middle and upper income families are the purchasers of new products which typically show a downward price movement. The presence of such items in these family budgets in periods of general price advances thus has a retarding effect on indexes for these income groups.

Special Classes of Consumers: The CPI Population vs. Other Groups

Certain aspects of the conceptual framework of the CPI and the related pricing program raise some questions as to the meaning of differences in the movement of this index and others that might be cal-

culated for a more limited population. The population to which the CPI relates is defined in terms of occupational status of heads of urban families of two or more persons, with the exception that an upper limit of family income of $10,000 (1950 dollars) excludes families with incomes in excess of this amount.[22] Since about 70 percent of all urban families are included in the index group of families of "wage earners and lower salaried workers," the index population is extremely heterogeneous in all characteristics affecting patterns of consumption. It is impossible to determine, on the basis of data now available, the extent to which cost of living indexes for homogeneous and relatively small subgroups within this broad population base would vary from one to another and from the CPI. It seems possible, however, that such indexes could show as much variation from the CPI as indexes for "low" or "high" income families.[23]

Since the CPI population coverage is so broad, it is inevitable that there would be some overlap of population if indexes were to be prepared for many of the special classes of consumers for which indexes are desired. Such double representation would tend to dampen real variations in changes in living costs of these groups and the rest of the CPI population. There is something to be said for the argument that if special indexes are calculated for relatively small and homogeneous classes of consumers, it would be more meaningful to compare such indexes (i.e., for the aged, the one-parent families, and other low income families, single working women, the wealthy retired, etc., etc.), with a comprehensive index that is based on the total universe, however defined—the United States (including or excluding the 49th and 50th states), or all urban, etc. Lacking a comprehensive index, it seems inevitable that the CPI as the best approximation available, would be substituted in evaluating the relative movement of indexes for smaller population subgroups. More correctly, in this connection the CPI should be regarded as an index relating to another, albeit broadly defined, subgroup in the total population.

Interpretation of Differences in the CPI and Indexes for Special Classes of Consumers

The CPI, and presumably indexes for other classes of consumers, differ from what index theory describes as the "true" index, in that in the long run it does not attempt to measure time-to-time changes in a constant level of satisfaction. Rather, its continuing purpose is to measure changing living costs of a specific population—a population, moreover, that has experienced a rising standard of living. Only in the short run is the effort made to price a constant level of satisfaction, empirically defined for the index as a relatively fixed market basket, as contrasted to budget changes that satisfy marginal utility functions. On this account, interpretation of sets of indexes will vary

[22] Presumably, this maximum may be raised at the next index revision period.

[23] George Stigler has brought to my attention an article that presents cost of living indexes for 3 components of a population that is somewhat similar to the CPI families. These indexes relate to West Germany, for the period since 1948 to October 1952 (also projected backwards in time to 1938). Separate indexes were prepared for four-person families of wage earners ("low income"), clerical workers ("middle income"), and lower salaried workers ("upper income"). It is my understanding that in the index calculations, the same set of prices was applied to the three different sets of weights. Over this period, the wage earner index showed the largest rise, 15 percent, the middle group the next largest increase, 11 percent, and the higher income index the smallest advance, 7 percent. See "Der neue Preisindex fur die Lebenshaltung," Dr. Gerhard Furst and Dr. Peter Deneffe, *Wirtschaft und Statistiek*, 1953.

according to whether short run or long run comparisons are being made. Since the real incomes of components of a particular population universe change at varying rates, indexes for components would incorporate the longer run effects of such differences. Assuming that if the level of living and hence the market basket of a particular group rises or declines, it is clear that if any difference exists in average price trends of the old and new market basket, the revised index will not follow the same path in time as would have been followed if the index level of living had remained unchanged. And a comparison of an index for this group with that of another would measure the combined effects of price changes and the differences resulting from the level of living changes.

To illustrate: it could well be true that as the relative income position of the aged has been raised as a result of deliberate public policy (OASI, expanded public assistance, etc.) during the past 25 years, a price index for the aged, if one had been calculated, might increasingly tend to converge on the CPI. This possibility can be presented graphically; it should be remembered, however, that the relationships that are charted are completely hypothetical and no inference as to the true relationships can be drawn from the graphs (Chart 2).

Chart 3 indicates what might have occurred if separate indexes had been calculated in the past for both types of families, and if, following a period in which new weights were linked into the index, indexes were calculated using both new and old weights.

The diagram assumes that if the CPI, following major revision periods such as 1952, had been carried forward on both the old and the new weights, the index with the older weights would have increased more rapidly since it represents a lower level of living. This assumption of relative change, of course, with the present stage of knowledge remains merely an assumption.

Uses of Indexes for Special Classes of Consumers

Requests for indexes for particular population subgroups originate, in the first instance, from a belief that the movement of such indexes will differ from the changes shown by the CPI for wage earners and clerical workers. Information concerning the direction and level of variation is sought for a variety of reasons and by a variety of individuals and organizations. In brief, questions such as the following are asked most frequently:

1. How do changes in the retail market affect the low-income group (or any other population class) as compared with the changes shown by the CPI?
2. How will a specific change in Government policy (such as introduction of or a change in excise taxes, retail sales taxes, public service fees and charges, etc.) affect the price of living of one population as opposed to another?
3. What are are the causes for the apparently differing trends in rate and level of retail price changes between communities or areas? Are the differences due to variation in the structure of demand or supply, or in the components of price?
4. Would the availability of a hierarchy of consumer price indexes improve current estimates and short- or long-run forecasts of changes in the population by levels of welfare; changes in supply and de-

mand of consumption goods and services; in aggregative and subaggregate estimates of consumption expenditures and gross national product?

The generality of the types of questions asked almost inevitably precludes definitive answers derived solely from price indexes. Those interested in comparing time-to-time changes in living costs of low income families as compared with those of other economic groups, for example, are primarily concerned with changes in the relative economic position of specific economic classes and with relative and absolute changes in their real income over specified periods of time.

These are two separate problems that can be further decomposed. Let us consider first the changes in the relative income position of the aged, a class that currently is receiving a considerable amount of public attention. It appears that in current dollars, of the families with incomes under $2,000, the proportion with aged heads is steadily increasing, rising from 25 percent in 1948 to 36 percent in 1958. And, 37 percent of families with aged heads had incomes under $2,000 in 1958, and 50 percent in 1948. By contrast, 10 percent of all other families had incomes below $2,000 in 1958, and 30 percent in 1948. Thus, measured in current dollars, the income position of aged families had risen less rapidly than that of other families.[24] At the present time, however, it is not known what changes have occurred in terms of real income; lacking appropriate price deflators, this measurement cannot be designed. Formulation of public policy and programs dealing with the aged are thus hampered by lack of appropriate quantitative information.

The second question—what are the changes in real income of the aged from one period to the next?—actually is only partially stated. Old age is commonly thought of as concomitant with low income. A consumer price index pertaining to all aged families and individuals probably would possess only limited application in public welfare analysis. Indexes for the aged generally are wanted to assist in making policy decisions, in assessing and administering welfare programs, and in evaluating unmet needs of this segment of the low income population. The aged as such represent too broad a group for those most in need of special price indexes; in this connection, for example, there is little public interest in the aged with adequate incomes. (Such an index would be useful, of course, in economic analysis of the type exemplified by studies of income-age distributions at constant dollars.)

Thus, we find that one classification of population—by age—overlaps another—by income. This, I think, brings us to the crux of the problem of indexes for special groups in the total population. There are many requests for indexes relating to the low income population, but it appears that what would be most meaningful, in terms of use value, would be a rather detailed stratification of the total low income group that distributes this population by a series of diverse characteristics. Conceivably, a classification plan such as the following could be set up and indexes calculated for all or some of the specified population groups.

[24] But, this may be due in part to undoubling, and refraining from doubling-up with other family units because of the increasing importance of OASI and other retirement income. It is probable that the number of aged families appearing in Census family tabulations has increased more than the actual number of all aged families.

THE LOW INCOME POPULATION, CLASSIFIED BY—

1. Location: urban, rural nonfarm, farm.
2. Size of community.
3. Region.
4. Size of family.
5. Family type.
6. Income level.
7. Age of head, sex, occupation, earnings of head.

These seven classification variables do not represent the totality of the factors that presumably could produce variations in the relative importance of consumption goods and services purchased by each of the specified subgroups within the low income population. If variations in price index weights would produce a different movement in the all-items index, it could be argued that such a battery of indexes is required to answer the questions that are asked relative to differential price changes. To take a simple illustrative case: medical care needs of the aged increase with age. A person aged 65 to 70 years, on the average, requires less medical care, and smaller expenditures on medical care than the average person aged 80 years or over. Not only is the older person typically in poorer health, it is also true that the type of treatment required tends to be more costly. Thus, if medical care costs increase more rapidly than other items, the price index for the very aged, other things being equal, would go up faster than a comparable index for the less aged. But this argument assumes that for persons at the same level of income there is a direct correlation between need and level of expenditures such that a single indifference map and budget line holds for all persons with the same age and income, other variables held constant. It would be difficult to prove such an assumption empirically.

A further problem arises from the fact that need sometimes is negatively correlated with income. Again considering the aged population, what welfare analysts and administrators really want to know is whether this group is disadvantaged in terms of relative changes in living costs that adequately reflect basic needs. If medical care needs of the aged are four times as great, say, as that of another, and the average cost of medical care doubles over a specified period of time, the overall price index of the aged, other things being equal, would show a larger change. In actuality, however, average expenditures of the bulk of the aged, except for those with the highest incomes, are not commensurate with basic needs, so that indexes with base weights equal to actual expenditures would not show as much divergence as indexes that did reflect basic requirements. In this situation price indexes for the aged might be the same as for other population groups but inferences drawn from such a comparison would foster false conclusions. There are significant differences in concepts, structure, functions, and appropriate uses of a cost of living index based on actual spending patterns of a given population, and a normative price index relating to the same population but based on weights designed to describe a specified level of adequacy—a level that could well be somewhat remote from that which the group actually achieves. If additional cost of living indexes are prepared for special classes of consumers, it is essential that the public understands their purposes

and their valid applications and uses. Any expansion of the Federal price index program that entails development of additional indexes for special classes of consumers that are comparable in methodology to the CPI inevitably will create new problems—not only of interpretation of possible divergences in movement of the separate indexes, but also of the measurement and interpretation of economic factors other than price that are underlying causes of the price differences that are shown by the indexes. Expanding the price program thus undoubtedly will require expansion of other statistical and analytical programs as well. It is clear, however, that there exists an urgent need for further basic research on price movements of goods and services purchased by various classes of consumers, and logically this research should precede expansion of the index program.

CHART 2

Hypothetical Illustration of Time-to-Time Changes in the Average Level of Living of Two Population Groups During a Period of Rising Incomes

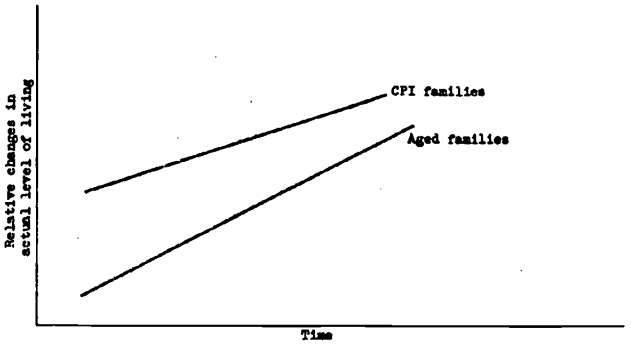


CHART 3

Hypothetical Indexes for Two Population Groups During a Period of Rising Income and Prices, Calculated Assuming No Change in Level of Living and Assuming a Rise in Level of Living