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IV

THE CONSUMER PRICE INDEX

1. The Concept and Purpose of the Index

It is often stated that the Consumer Price Index measures the price changes of a fixed standard of living based on a fixed market basket of goods and services. In a society where there are no new products, no changes in the quality of existing products, no changes in consumer tastes, and no changes in relative prices of goods and services, it is indeed true that the price of a fixed market basket of goods and services will reflect the cost of maintaining (for an individual household or an average family) a constant level of utility. But in the presence of the introduction of new products, and changes in product quality, consumer tastes, and relative prices, it is no longer true that the rigidly fixed market basket approach yields a realistic measure of how consumers are affected by prices. If consumers rearrange their budgets to avoid the purchase of those products whose prices have risen and simultaneously obtain access to equally desirable new, low-priced products, it is quite possible that the cost of maintaining a fixed standard of living has fallen despite the fact that the price of a fixed market basket has risen.

In periods of wartime, when specific goods in the fixed market basket are no longer freely available to the consumer, the divergence of such an index from practical reality becomes obvious. In this situation price quotations on the virtually unobtainable commodities may not show much increase, or even be rigidly fixed by price controls. Consumers are driven to available substitutes, which are more expensive relative to desired performance (forced uptrading) or rise rapidly in response to expanding demands. Few economists or consumers come to the defense of the rigidly fixed market basket approach under these circumstances. This suggests strongly that what is in fact being measured is not the cost of a fixed set of consumer goods and services, but rather the cost of maintaining a constant level of utility.

The present logic of revision of weights and the methods of introduction of new products into the index and adjustments for quality change are de facto recognition that at a practical level the index must reflect the impact which prices are having on the consumer's standard of living. At the same time many individuals involved in producing and using the index shy away from recognizing the underlying principles which guide the construction of the index and its application in the major analytic uses. There is often a tendency to try to adhere to the more comforting position of having an index of a fixed market basket of goods since acceptance of such a position avoids the difficult decisions required to approximate a utility-based price index.

A constant-utility index is the appropriate index for the main purposes for which the Consumer Price Index is used. The purpose of wage escalation, for example, is to adjust wage rates in periods of general price change so the wage earner (working a constant number of hours) will be able to maintain his "standard of living." The goal of price stability for monetary and fiscal policy can similarly be viewed as the goal of preventing adventitious transfers of real income between borrowers and lenders, landlords and tenants, etc. The growth of real income of consumers is to be measured by "deflating" an appropriate consumers' income series by the corresponding consumer price index.

The current CPI is avowedly not a constant-utility index in this sense. The BLS refers to it as a price index which measures only changes in average prices of goods and services consumed by the specified population of wage and salary earners' families, but the very fact that the weights by which the prices of these 300-odd goods and services are combined are drawn from family expenditure patterns is enough to indicate that the CPI is designed to approximate a constant-utility index, as it should.

The difference between the present CPI and a true constant-utility index may be illuminated by a brief discussion of some of the major respects in which the former differs from the latter.

Changes in Relative Prices.—Since consumers will substitute those goods whose prices rise less or fall more for those whose prices rise more or fall less—and within limits they can do this without reducing their levels of real consumption—the fixed-weight base CPI overestimates rises in the cost of equivalent market baskets.

The converse bias is displayed by fixed quantity weight indexes which are applied backward in time, and a roughly "correct" index can be constructed by averaging the two indexes. For current purposes this is of course impracticable, but we recommend that when the BLS next revises its index (in 1963), it calculate this latter index for the 1952–1963 period to provide an estimate of the maximum upward bias due to the use of a fixed-weight base. Our recommendation of more frequent weight revisions (III, 1) will, if adopted, reduce this bias considerably.

New Commodities.—In addition to those changes in consumer buying habits induced by relative price changes, a new set of changes arises because of the introduction of new commodities. If these new commodities are additional options open to the consumer, he will adopt them only if he prefers them (at their current prices) to goods previously available. But it requires no formal demonstration that the consumer benefits by the availability of electric light even if kerosene is unchanged in price, or by the availability of penicillin even if potato soup is unchanged in price. Conversely, the forced adoption of new products (which occurred during World War II) when customary products have disappeared can impose a welfare loss on the consumer even in the absence of price changes.

Our recommendations (III, 4) are designed to introduce new products into the consumer indexes at an earlier time, and hence to reduce this source of difference between the indexes and the ideal welfare index. A close approximation to a welfare index can sometimes be obtained if new commodities are introduced into a price index when

they first appear in any of the markets patronized by the index population. At such times their prices are likely to be high because of the limited extent of their production and the novelty of the techniques of making them. The fall in the prices of these commodities weighted by their current importance at each date is a minimum estimate of the welfare gain. It fails to include the welfare gain of the portion of the index population that bought the commodity at its high initial price, or would have done so were it not for the limited extent of the initial distribution. It also understates the gain to the extent that the spread of the new commodity is the result of people learning more about it rather than a result of a fall in its relative price.

Quality Changes.—The appearance of truly new products is only an extreme form of the pervasive phenomenon of quality change. More commonly the product undergoes continual (although not continuous) modification: the chicken has more breast; the refrigerator has a freezer unit; the horsepower of the automobile engine rises.

At present the CPI in principle introduces these changes by "linking," that is, by introducing the changed quality in such a way as not to affect the index at the time of introduction. (We say, "in principle" because often the exigencies of price collection demand comparisons of old qualities with what are judged to be equivalent new qualities.) A hypothetical example will pose the problem that is involved here. Suppose that a certain community has been using liquified petroleum gas supplied in tanks, and that piped natural gas is made available, with the expense of installing the pipes to the premises paid by the distributor. Suppose further that the cost of he natural gas per therm is below that of the liquefied petroleum gas. The CPI, because it regards the two commodities as different, would not show any change. A welfare index would note that the two provide the same kind of satisfactions to the user. The drop in a welfare index would, at a minimum, equal the drop in the cost of heat per therm. If the piped natural gas is more convenient to use because one does not have to worry about the tanks getting empty, then the welfare index should fall somewhat more than this. Unfortunately, there are few cases where so easy an approximation of the welfare index is available. Suppose we observe a transition from coal heating to gas heating in which the gas is more expensive per therm, but is cleaner and more convenient. The shift of consumers to gas will show that the cleanliness is worth more than the additional cost, but not how much more.

Although we have suggested lines of research on the measurement of quality change (III, 3), we are cognizant that our present knowledge does not allow the routine, let alone current, treatment of this problem in the price indexes.

Durable Goods.—The welfare of consumers depends upon the flow of services from durable goods, not upon the stocks acquired in a given period. The consumer is better off if he has $1,000 worth of shelter services a year than he is if he buys and lives in a $5,000 house. He may have attractive furniture although he has purchased no furniture for many years.

The CPI presently uses purchases of durable goods in the consumer expenditure survey period in place of the flow of services from such

goods enjoyed by the index population. It also prices one component of housing costs, interest on mortgages, on a current basis, although the average interest rate paid is actually the average of rates on all outstanding mortgages.

Our recommendations (III, 7) will diminish the major disparities on this score between the CPI and a welfare index, but a full treatment of the problems posed by durable goods calls for much additional research.

Insurance.—The purpose of the Consumer Price Index is to measure the changing cost of a given level of utility (or, as a substitute, a fixed market basket) for the *average* family in the population covered by the index. This purpose implies that only *net* expenditures of the population should be covered: a transfer of funds from family A to family B is an expenditure for one and a receipt for the other, and hence cancels out of the calculation. This has been recognized in the CPI: used cars were dropped from the index during World War II; trade-in values of used cars are deducted from the purchase of new cars at present (see III, 7).

This principle is recognized in the insurance field by the omission of life insurance from the index, since most of premium income is used to pay benefits to policyholders or their survivors or to accumulate assets. A better solution would be to include life insurance with a weight representing only the expenses and profits of life insurance companies, and we so recommend. For non-life insurance, we have not had time to determine whether there is double counting, though we suspect that there may be. For hospitalization insurance, the gross weight is used, and expenditures covered by insurance are omitted from the direct weight for hospital care. This is a satisfactory procedure, if the benefits of the insurance do not increase over time. Automobile insurance is treated in the same way, except that compensation for injury or loss of life (aside from medical bills) is ignored. We recommend a change to net weights for automobile insurance and a general review of practices in the weighting of other expenditures typically covered by insurance. If possible such a review should be prompt enough to permit the collection of additional data on receipts from insurance claims in the forthcoming survey of consumer expenditures if this is indicated. The pricing problem for insurance is very troublesome because the premiums measure the costs of supplying insurance only if the ratio of benefit to gross income is constant. Nevertheless, if the weights are appropriately reduced to a net basis, the use of premium rates instead of cost of insurance rates should not be a source of large distortion in the indexes.

Government Services and Taxes.—The consumer receives a variety of services from governmental units at all levels. Some are easily identified and can even be measured with perhaps tolerable accuracy—education and hospitals, for example. Others are more difficult to estimate, primarily because they are services to the business sector as well as to consumers.

To the extent that public services are paid for by indirect taxes (sales taxes, excises, etc.) they are already in (or are formally added to) the prices used to construct the CPI. Indeed minor paradoxes are easily created by using the CPI to deflate an inappropriate consumer income concept. Suppose a state reduces its sales tax, and raises the same amount by an income tax, without changing its serv-

ices to consumers. If consumer incomes are deflated by the CPI, they will show a rise in real income which is spurious, but the error would be avoided if the CPI were used to deflate "disposable income" (income minus direct taxes on the consumer).[1]

Much research will be necessary before a more comprehensive welfare index which includes governmental services can be constructed, and we are not prepared to recommend any changes in the present practices at this time.

Recommendations.—Our recommendation to modify the CPI in the direction of a welfare index is explicit and implicit in the foregoing discussion. In some respects, such as the treatment of durables and mortgage interest, the more frequent revision of weights, and the earlier introduction of new commodities, the modifications can easily be introduced when the revised index is launched in 1963.

But many of the problems in approaching a welfare index are much less easily solved. The Committee recommends that a program of research in prices, price indexes, and the measurement of welfare changes be established. The Committee is impressed with the extent to which the methods and concepts used in the construction of the Consumer Price Index are similar to those that were employed 30 or more years ago. The rapid intellectual and technological changes of the past three decades or more appear to have bypassed the field of price research. The Committee believes that the problems in this area are of sufficient national importance to warrant financial support for research both within the Government and in private research agencies and universities. The funds would undoubtedly be modest compared to those being spent in other areas in which support is being given to the search for new knowledge.

The major objective of the research program would be to establish the knowledge and to develop the techniques necessary to calculate an index that approximates a true cost of living index (i.e., a welfare index) as closely as possible. The final resolution between the need to have an unambiguous index produced on a monthly basis and the need for a conceptually sound index may turn out to involve the production of two indexes, a monthly "Consumer Price Index" and an annual "cost of constant living" index.[2] As knowledge and techniques in the field of welfare measurement develop and win acceptance, the "Consumer Price Index" may be modified continuously in the direction of becoming a welfare index to the extent that it is possible to produce one on a monthly basis.

Among the contributions which the BLS could make to this large project should be the following:

(a) An experimental attempt should be made to compute for publication in a scientific journal or for distribution to a professional audience a set of retroactive consumer price indexes using an end-of-period quantity weighting system. In the absence of experiments of this type, which this Committee is not able to undertake, discussion of weighting "biases" in the CPI must be largely speculative. The experimental indexes need not be continuous; they can be confined to widely separated starting and terminal dates. They should, for some components at least, involve reweighting at the item level.

[1] See Staff Paper No. 12.

[2] The annual revision of the monthly series proposed in III, 8, does not, of course, involve the large expansion of concept envisaged in the "cost of living" index.

(b) Along with the work with various weighting systems, experiments with the early introduction of new commodities, initially with low weights and subsequently with increasing weights, should be carried out.

(c) Experiments should be made with various methods of handling quality changes, including those mentioned in III, 3.

It is not necessary, of course, and perhaps not feasible, that work along all of these lines be carried out by the BLS itself or only within the Government. It might well prove advantageous to contract out some or even much of the developmental work to private research agencies or universities.

2. The Scope of the Index

The coverage of a Consumer Price Index can be broad or narrow in terms of the population group for which it is constructed. The number of indexes for which there is some demand is very large; income, geographical area, occupation, and family composition are examples of the bases that have been used to define the index population. Our discussion will be restricted to the indexes which we believe the Federal Government should produce regularly in the next decade.

i. Population and income coverages

The Consumer Price Index compiled by the BLS covers families (of two or more persons) of wage earners and lower salaried workers living in cities. The maximum income per *family* was $10,000 in 1950. The consumer price component of the Index of Prices Paid by Farmers covers the entire population of farmers. No portion of the rural nonfarm population is covered by existing indexes.

The wage escalation and farm price uses of these indexes make it inevitable that they be collected at least for a considerable period in the future. Even within this limitation, however, we believe that a movement can and should be made toward a more unified and comprehensive consumer price index program.

The residential scope of the present CPI seems too narrow: the wage and salary earners in rural nonfarm areas should be included. The exclusion of the single-person families who otherwise meet the definition of the index population should be removed, even though their inclusion will widen somewhat the range of prices to be collected. An income limitation on salaried persons must be retained if the group is to have any separate identity, although of course the $10,000 maximum of 1950 is obsolete. The appropriate population for the farm indexes is discussed in section VI.

But these are essentially minor revisions designed to make the Consumer Price Index more comprehensive in coverage of the designated occupational group. From the viewpoint of general public policy and scientific study, our basic need is for a comprehensive Consumer Price Index covering the entire population. This is the index that is appropriate to the measurement of the changes in welfare of the Nation and to the measurement of inflation (and hence the guidance of monetary and fiscal policy). The index for the wage earner and lower salaried workers' families can be continued, although we conjecture that it will parallel that of the comprehensive index sufficiently close so it will eventually be deemed more useful to provide

other special group indexes (e.g., by income level), on which Staff Paper No. 7 should be consulted.

The comprehensive United States Consumer Price Index is not only the most important index but also its construction will lay the groundwork for all the other special purpose indexes which will be required from time to time, as well as for the accurate deflation of the national income accounts.

On the one hand, the comprehensive survey of budgets of families and single individuals will provide the weights necessary to construct indexes for special subclasses of the population, whether classified by income, occupation, special welfare status, or some other characteristic. The 1950 and the prospective family expenditure surveys (in 1961 and 1962) are already designed to be comprehensive (except for possible limitations with respect to rural nonfarm and farm areas, which should be included). The main additional information which would be essential is detail on the types and qualities of goods consumed by classes not intended for inclusion in the present CPI.

On the other hand, the price-collecting system would have to be broadened, and this is indeed the main implication of our recommendation.

Only a comprehensive collection of data on prices and price changes can provide the empirical base for studying general price movements and for analyzing the differences in price movements associated with the type of commodity or service, with the geographic location, and with economic subgroups of the population. Only price statistics that represent the entire country can provide the details on price changes suited to the estimation of the aggregate volume of consumer expenditures in constant dollars.

Price indexes designed to represent the purchases of particular population groups reflect the price movements of selected types and qualities of goods and services. Our present knowledge of the behavior of consumer prices is confined to only a portion of the total market because of limitations on types of stores and commodities priced. Not only would a comprehensive program of consumer price statistics allow the calculation of a large variety of special group indexes, but also this program would permit a variety of analytical studies of the structure and behavior of markets.

The survey design for the collection of completely representative price statistics will require a thorough examination of the available information on developments in the retail markets. Classifications will be needed of marketing areas and of types of outlets within marketing areas, and both the significance for price behavior and the stability of the classifications must be explored. Just as the assumption of variation in price behavior between new and old products is warranted by common observation and fragmentary statistical evidence, so the assumption of fundamental differences in the trends of prices charged by new and old types of outlets is founded on ordinary experience and fairly evident economic reasons. The importance of the new outlet may considerably outweigh the importance of new products because the marketing changes have affected virtually all commodities and a considerable number of services.

We therefore recommend the preparation of a sampling frame, showing the distribution of consumer expenditures for particular

goods and services by market area and type of retail establishment, as the means for determining the location of the current data within the universe and for determining the feasibility and cost of the collection of price statistics representative of the entire Nation.

We also recommend a study of the practical means for determining the changes in the relative importance of the various types of outlets in various marketing areas at frequent intervals. The chain store and the supermarket were introduced into CPI outlet samples only after they had become overwhelmingly important. Some types of retail establishments and some outlets of growing importance for particular commodities are not adequately represented in any present price collection program—the variety store, the hardware store, the departments in drug stores that stock commodities other than drugs, cosmetics and tobacco products, the mail order outlet, and various kinds of discount houses.

A representative system of price indexes for specific commodities and services classified by market area and type of establishment would provide the basic data not only for a general Consumer Price Index and for the deflators of aggregate consumer expenditures but also for various kinds of special indexes. To the extent that particular population groups are concentrated geographically where certain types of establishments predominate, the price changes affecting such groups may be more accurately estimated through the general indexes than by attempts to make direct observations. Differences in price changes among various localities may be explained partly by lags and leads in the introduction of new types of retail establishments.

We hope that the interest in price behavior awakened in recent years will call forth some analytic studies focused on underlying economic trends. The geographic differences in absolute prices and in price changes over time studied simply in terms of changes in the market structure could contribute substantially to our knowledge of sectors of stability and change. The interaction of changes in production and in marketing on the relative price movements of particular commodities could be made the subject of a number of valuable studies.

ii. CITY INDEXES

The Committee recognizes that there is a continuing demand for published city indexes from labor unions and employers and from economists interested in regional studies, among others. While this demand continues, the Committee recommends the continued publication of separate indexes for large cities. However, we do not believe that the publication of accurate city indexes requires that every item in the CPI be priced in every city, nor that city indexes necessarily be used as the basic building blocks of almost all of the components of the national CPI. On the contrary, we believe that on items for which the dispersion of price changes from city to city is small, fewer cities need be priced than at present. This might be true, for example, for some nationally advertised branded manufactured goods, such as men's dress shirts. On the other hand, on items for which the dispersion of price changes among cities is very large and the costs of data collection are low, the optimum use of resources for the national index suggests that the number of cities priced be substantially in-

creased. This would be true, for example, of transit fares and utility rates.

Under the scheme contemplated here, when an item is not priced in a city for which a separate city index is published, its price movement would be imputed to that city from the national index or from some combination of priced cities. Given the thinness of city outlet samples and the further attrition that occurs in them when some of the outlets priced do not have any varieties of an item that meet specifications, this procedure does not imply any lowering of quality of the published city indexes. In fact, these considerations suggest that for some items the quality of the city indexes could be improved by imputing price movements from the national index or from a group of cities to a particular city even where the prices for the particular city are collected. This might be the case where there was no long-run divergence between the item indexes among cities, but the thinness of the outlet sample produced random or erratic movement in the item indexes for particular cities. In imputing price changes to a city from the national index or from other cities, care would have to be taken to adjust for any relevant changes in taxes that had a differential effect.

The Committee recommends that in order to test the feasibility of these suggestions BLS undertake experiments in the retroactive recomputation of city indexes, using imputed prices for certain items where data collection costs are high and the dispersion of price changes among cities is low.