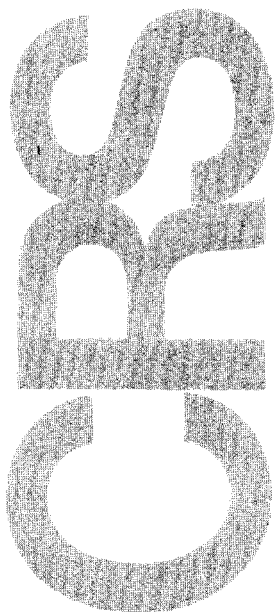# THE CONSUMER PRICE INDEX: AN OVERVIEW

by

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ABSTRACT

The consumer price index is probably the most widely used measure of inflation. Changes in the index affect the incomes of a substantial portion of the U.S. population. This report provides background information on the history and concepts of the index. In addition, several factors which may produce a bias in the index are analyzed. The objective is to provide an introduction to the CPI for the policy maker who wishes to ac-quire a working knowledge of the concept as an aid in examining economic policy alternatives.

CONTENTS

THE CONSUMER PRICE INDEX: AN OVERVIEW

I. HISTORY OF THE CONSUMER PRICE INDEX

Perhaps the most widely known indicator of price changes is the

Consumer Price Index (CPI), which has been tabulated by the Bureau of

Labor Statistics (BLS) since 1919. The original purpose of the CPI was

to provide a yardstick for adjusting wages in the shipbuilding industry.

Initially the index was prepared on a semi-annual basis; in the 1930s

the index was put on a quarterly frequency, and since the 1940s the CPI

has been published monthly. 1/

The Consumer Price Index measures the change in prices of a fixed

basket of goods and services over time. Prices of the approximately 400

individual items included in the basket are recorded monthly in 85 cities

from 24,000 establishments, 18,000 tenants, and 18,000 homeowners and

then are compared with prices during a base period. Currently, the year

1967 is used as the base period. In October 1979 the Consumer Price Index

was reported to be 225.4. This means that if in 1967 the items which make

up the market basket cost $100.00, then in October 1979 these same items

could be purchased for $225.40.

1/ U.S. Department of Labor. Bureau of Labor Statistics.
The Consumer Price Index: Concepts and Content Over the Years.
Report 517, May 1978, p. 3; hereafter referred to as BLS Report.

By measuring prices of the same group of items every month, the Consumer Price Index can be used as an indicator of inflation. The rate of inflation can be gauged by calculating the percentage change in the index level between two points in time. For example, between October 1978 and October 1979 the index rose from 200.8 to 225.4, a percentage difference of 12.2 percent. Thus, the rate of inflation over that 12-month period was 12.2 percent.

Over the past 60 years, there have been five revisions of the CPI. The most recent revision was made in 1978. As a result of the 1978 revision, BLS now publishes two consumer price indexes. The difference between the two indexes lies in their population coverage; the type of people whose purchasing habits the CPI is intended to represent.

Up until 1978, the CPI's population coverage was restricted to urban wage earners and clerical workers who represented between 40 and 45 percent of the U.S. population. With the 1978 revision, BLS intended to substantially broaden the CPI's population coverage. The revised index was intended to represent all persons living in urban areas, who constitute some 80 percent of the Nation's population.

To reassure users of the CPI that the change in population coverage would not affect the reported rate of inflation, BLS began publishing two indexes in January 1978. The CPI for urban wage earners and clerical workers, referred to as CPI-W, is a continuation of the old index with new weights. The price index for all urban consumers is called CPI-U.

A comparison of CPI-W and CPI-U indicates that there is no appreciable difference between the two. This can be seen in the following

chart which presents the index level for each CPI for the first 10 months of 1979. Features of the CPI-U and CPI-W are shown in Appendix Table 1, and are compared with the pre-1978 index.

In addition to the national CPI, indexes are available for 28 metropolitan areas and four regions. Indexes for particular population groups, such as the elderly, are not available.

COMPARISON OF CPI—U AND CPI—W

INDEX, 1967=100

CPI—U   CPI—W

JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEP.	OCT.

1979
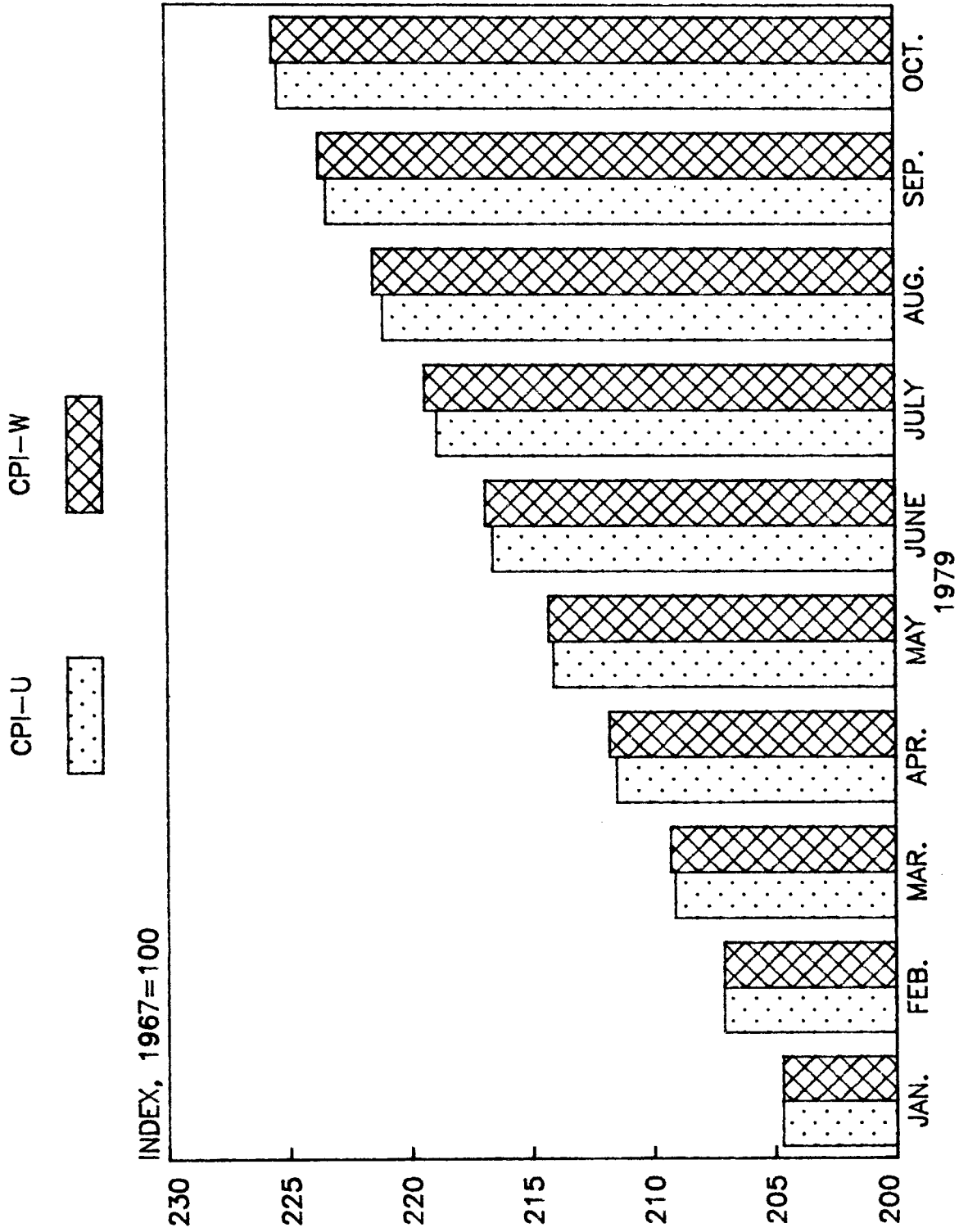
Prepared by the Congressional Research Service.

II. <u>SOURCES OF BIAS IN THE CPI</u>

There are several factors which may affect the accuracy of the CPI. These factors include: the fixed-weight construction of the index; the treatment of homeownership costs; and adjustments for changes in the quality of the items included in the CPI. Each of these factors is discussed below.

A. <u>Market Basket Approach</u>

Although it is often referred to as such, the CPI is not a true cost-of-living index. The reason it is not has to do with the index's market basket concept. In tabulating the CPI, prices of the same goods and services are collected each month. The items to be priced are determined by an extensive survey of consumer purchasing patterns called the Consumer Expenditure Survey (CES). These surveys are conducted about once every 10 years; the last one was taken during the 1972-74 period. The CES is also used to determine the relative importance, or weight, each item has in the overall index. These weights are adjusted each month to reflect relative price changes (see page 25). Essentially, the CPI assumes that each month identical goods and services are purchased in identical quantities. In the real world, however, consumers behave differently.

Individuals tend to adjust their purchasing habits in response to changes in relative prices. That is, they substitute products whose prices have increased relatively little for items whose prices have risen relatively greatly. A common example of this type of behavior would be consumers buying more chicken when beef prices go up. The market basket approach also ignores the introduction of new products and services as well as changes in consumer tastes.

Because of these factors, when a new CES is conducted and the CPI is revised, there are likely to be drastic changes in the relative importance of the various components. The following graph shows the weights assigned to four major CPI components--food, housing, apparel, and transportation. As can be seen, the weight assigned to food has been cut in half, while there has been a substantial rise in the housing and transportation weights.
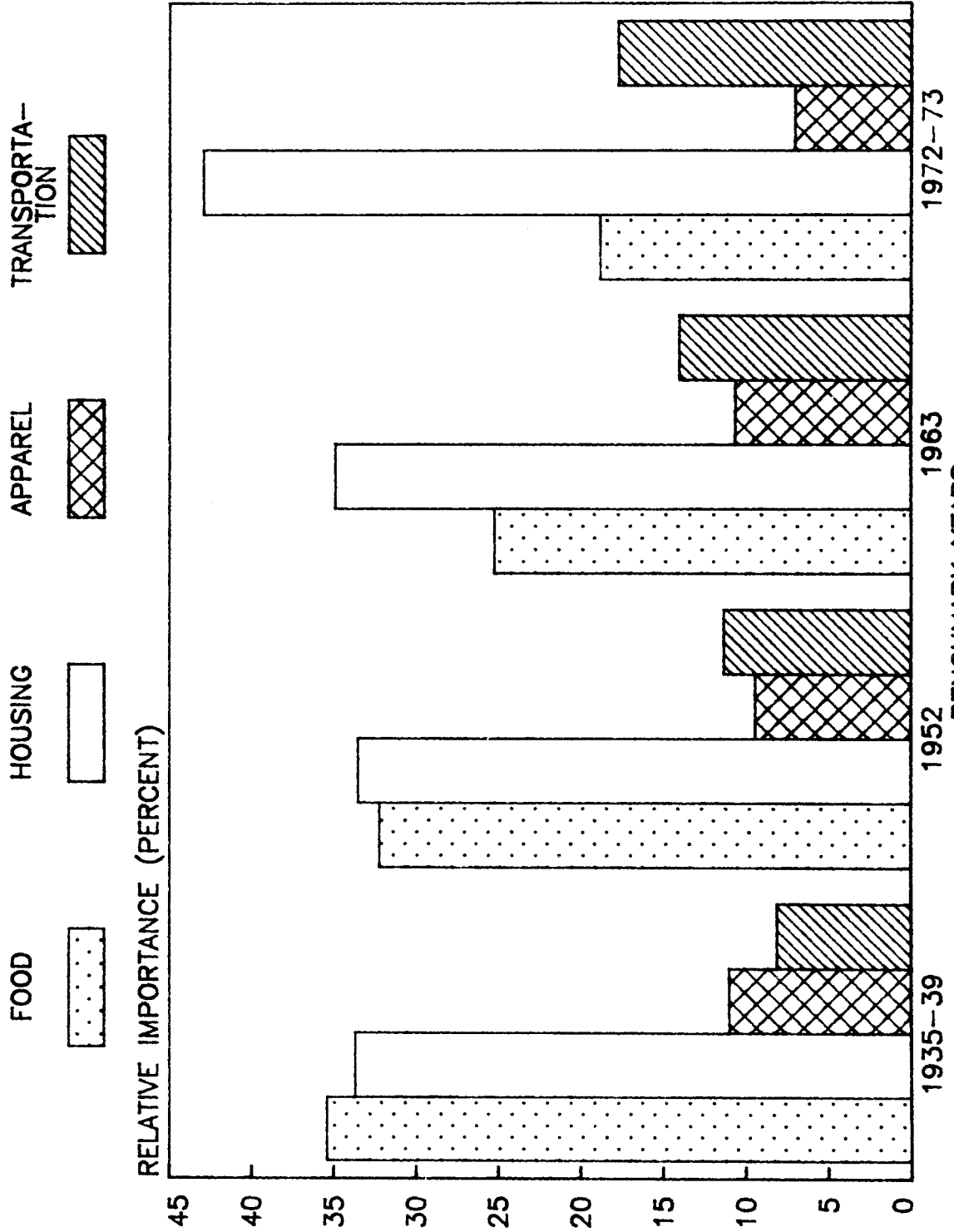
Particular problems may result from the use of the 1972-74 CES to establish component weights. It was during 1974 that there were substantial increases in the price of energy commodities. The CES findings may not have fully reflected the adjustments made by consumers to cope with those price hikes.

In sum, the weights used in constructing the CPI reflect purchasing patterns at a given point in time. The weights do not change in response to consumer efforts to economize by shifting to alternative commodities whose prices have increased at a slower rate. It is therefore likely that to some extent the CPI overstates the rate of inflation actually experienced by consumers.

B. Quality Change

As noted earlier, the CPI seeks to measure the price of a constant market basket of goods and services over time. Not only must the individual items in that market basket remain the same, but they must be of constant quality as well. Changes in the quality of an item can significantly affect the CPI, particularly if those changes are responsible for changes in the item's price.

CONSUMER PRICE INDEX WEIGHTS: MAJOR COMPONENTS

FOOD   HOUSING   APPAREL   TRANSPORTA-TION

RELATIVE IMPORTANCE (PERCENT)

1935-39   1952   1963   1972-73

BENCHMARK YEARS

Prepared by the Congressional Research Service.

At present, the only quality adjustment made in the CPI is for new automobiles.

> Adjustments for quality change in the CPI "new car" index include structural and engineering changes that affect safety, environment, reliability, performance, durability, economy, carrying capacity, maneuverability, comfort, and convenience. Although anti-pollution equipment on automobiles originally did not increase quality because the utility to the purchaser is difficult to determine, these devices do improve quality for consumers in general, and therefore an increase in physical quality for the individual consumer. Consequently, quality adjustments are made for pollution controls to automobiles.

> Quality adjustments exclude changes in style or appearance, such as chrome trim, unless these features have been offered as options and purchased by a large proportion of customers. Also, new technology sometimes results in better quality at the same or reduced cost. When no satisfactory value has been developed for such a change, it is ignored, and prices are compared directly. 1/

Several studies have attempted to examine the extent to which quality changes result in any bias in the CPI. As the table below indicates, most of those studies found that quality changes produced an upward bias in the CPI. That is, if adjustments were made for changes in quality, the CPI would be rising at a slower rate than reported. However, the results of two studies of hospital costs were contradictory. One indicated that there was an upward bias, but the other found that quality changes introduced a downward bias in the CPI.

1/ BLS Report, p. 12.

Summary of conclusions of several studies of price
indexes and quality change, various periods 1947-66

Author	Product or service	Period	Conclusion
Gavett	Washing machines	1963-66	Slight upward bias.
Gavett	Men's suits	1958-66	Slight upward bias.
Gavett	Carpets	1959-66	Upward bias.
Martin	Hospital costs	1954-61	Upward bias.
Scitovsky	Hospital costs	1951-65	Downward bias.
Barzel	Medical Services	1945-64	Upward bias
Lamson	Theater admissions	1947-64	Upward bias.

NOTE: "Upward bias" means the quality-adjusted price index computed in the
study rose less than the relevant CPI component if prices were rising, or fell more than
the CPI component, if prices were falling. "Downward bias" indicates the opposite
finding.

Source: Triplett, Jack E. Determining the Effects of Quality Change
on the CPI. Monthly Labor Review, May 1971, p. 30.

C. Homeownership Costs

Since 1953, the CPI has included a measure of homeownership costs,

which include home purchase price, mortgage interest, insurance, property

taxes, and maintenance and repair goods and services. In recent months

there has been considerable discussion over the method used by BLS to

compute the homeownership component of the CPI. 1/ This discussion has

focused on (1) BLS's treating homeownership in the same manner as it treats

other goods and services, and (2) the home purchase price data used in

computing the CPI.

Unlike most of the other items included in the CPI, a home provides

benefits to its owner over an extended period of time. Yet BLS treats

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1/ See: Debunking the Myth of 13% Inflation. Citibank Monthly
Economic Letter, Oct. 1974, pp. 69; Labor Month in Review. Monthly
Labor Review, Sept. 1979, p. 3; Saperstein, Saundra. Price Index Mis-
leading, Experts Say, Washington Post, June 27, 1979, p. A8; and, Which
Price Indicator Do You Believe? Business Week, May 14, 1979, pp. 120,
122.

dwelling exactly like every other item in the CPI. As Business Week stated, ". . . the CPI treats real estate no differently than ravioli. . . ." This treatment implies that home purchasers consume the total value of the house in the year it is purchased. This is, of course, at variance with actual behavior. The purchase price of a new home is usually amortized over a 20 to 30 year period. Moreover, the CPI does not reflect the appreciation in the value of a home which is likely to occur over time. Finally, the CPI makes no allowance for the Federal tax benefits which effectively reduce a homeowner's mortgage interest and property tax payments. All of these factors may contribute to an upward bias in the CPI.

Another flaw in the homeownership component is the home purchase price data BLS uses. BLS relies on data from the Federal Housing Administration (FHA) on prices of new and existing homes purchased under FHA commitment. According to BLS, "these data have serious limitations for use in the Consumer Price Index because FHA-insured housing constitutes a small and unrepresentative segment of the market." 1/ FHA-insured housing accounts for only 6 percent of the housing market. But these are the only nationwide data readily available in a timely fashion.

BLS has proposed that changes be made in the tabulation of homeownership costs. But, according to press reports, these changes were opposed by users of the CPI, principally organized labor, and were scrapped. 2/

1/ BLS Report, p. 13.

2/ Saperstein, op. cit.

The effect of homeownership costs on the CPI can be seen in the table below. The table compares the all items CPI with two special indexes prepared by BLS, all items less shelter and all items less mortgage interest. Comparing the all items index with one of the special indexes indicates whether the price of the expenditure group excluded from the all items index rose more or less rapidly than prices of the other goods and services included in the CPI. For example, in 1978, the all items index was 195.4, while the all items less shelter index stood at 191.3. This means that since 1967 the price of shelter has increased somewhat more rapidly than the other goods and services in the CPI.

Consumer price index--selected components

Year	1967=100			Percent change		
	All items	All items less shelter	All items less mortgage interest	All items	All items less shelter	All items less mortgage interest
1970	116.3	114.4	115.1	5.5	5.0	5.4
1971	121.3	119.3	120.3	3.4	4.3	4.5
1972	125.3	122.9	124.4	3.4	3.0	3.4
1973	133.1	131.1	132.1	8.8	6.7	6.2
1974	147.7	146.1	146.1	12.2	11.4	10.6
1975	161.2	159.1	159.1	7.0	8.9	8.9
1976	170.5	168.3	168.4	4.8	5.8	5.8
1977	181.5	179.1	179.3	6.8	6.4	6.5
1978	195.4	191.3	192.2	7.7	6.8	7.2
1979 1/	215.2	208.1	209.6	10.1	8.8	9.1

1/ Average of the first 10 months of 1979.

Source: U.S. Department of Labor. Bureau of Labor Statistics.

III. AN ALTERNATIVE PRICE MEASURE

An indication of how misleading the CPI may be can be gained by comparing that index with the implicit price deflator for personal consumption expenditures prepared by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA).

The consumption deflator is produced by a fairly complicated procedure. First, estimates of consumer purchases of goods and services are obtained. These estimates are then deflated using the appropriate component of the CPI or some other price index. For example, consumer spending for shoes is deflated using the shoe component of the CPI to obtain constant dollar spending for shoes. The individual items are then summed to produce total personal consumption expenditures in both current and constant dollars. Dividing the current dollar figure by the constant dollar figure yields the consumption deflator. Essentially, the deflator is a consumer price index in which the weight of each component is revised every quarter to reflect actual consumer purchasing patterns during that period.

Homeownership costs are also treated differently in the consumption deflator than in the CPI. The deflator does not explicitly include home purchase prices or mortgage interest payments. Instead, BEA estimates the rental value of owner-occupied dwellings and includes that estimate as a consumer expenditure.

While the deflator corrects for the CPI's fixed weights and treats homeownership costs in a more realistic manner, the deflator has the same problems with quality changes as does the CPI.

The graph on page 15 compares the CPI with the consumption deflator over the 1960-1978 period. 1/ Until the late 1960s, the two price measures were virtually identical. During the 1960s the rate of inflation was relatively low and stable; in such an environment consumer purchasing habits were probably stable as well. Since the late 1960s, however, there has been a material difference in the rate of growth of the two indexes. The CPI has advanced much more rapidly than the consumption deflator. Between 1968 and 1978 the CPI rose at an annual rate of 6.5 percent versus a 5.8 percent annual rate of gain in the consumption deflator. In 1978 the CPI level was 6 percent higher than the deflator. The discrepancy between the CPI and the deflator has continued into 1979. While the CPI has been rising at about a 13 percent annual rate, the consumption deflator has been advancing at a more moderate, although still disturbing, 10 percent pace.

The preceding discussion suggests that the consumption deflator is a superior measure of inflation than the CPI. Yet the CPI remains the more widely used indicator. Citibank recently offered three reasons for the apparent anomaly:

-- It's available monthly, while the implicit deflators are published quarterly.

-- The CPI was originally designed to measure price increases affecting a specific constituency--"urban wage earners and clerical workers"--

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1/ The Bureau of Economic Analysis publishes the implicit price deflator for personal consumption expenditures on a 1972=100 base. To compare the deflator with the CPI, the deflator was converted to a 1967=100 base.

PRICE INDICATORS

CONSUMER
PRICE INDEX

CONSUMPTION
DEFLATOR

INDEX, 1967=100
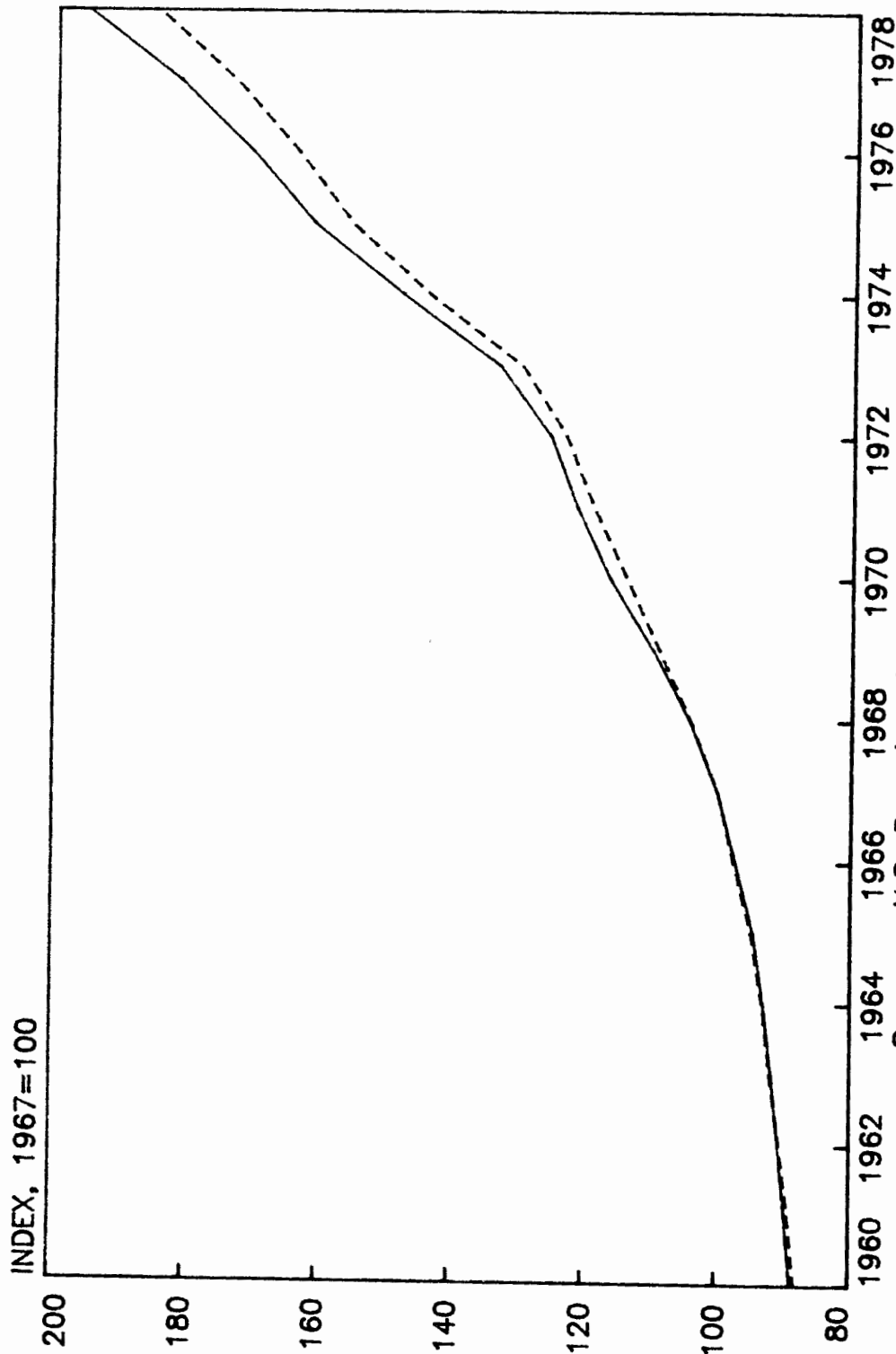
Sources: U.S. Departments of Commerce and Labor.

Prepared by the Congressional Research Service.

and forms the basis for cost-of-living increases written into labor union contracts. Labor unions were suspicious when the Bureau of Labor Statistics expanded the index to include "All urban workers" last year. Shifting to an entirely different index would not be politically "do-able" at this time.

-- Finally, in the past, while the average spread between the CPI and PCE deflator inflation rates has been positive, the deviations have not been so large as they have recently. 1/

A further consideration is that the consumption deflator is continually revised as more complete information on consumer spending becomes available; no figure is ever truly final. By contrast, the CPI is never revised. The following table shows the revisions made to date of the fourth quarter 1978 consumption deflator since that figure was first reported in January 1979. Further revisions will be made in July 1980 and July 1981.

Implicit price deflator for personal consumption
expenditures fourth quarter 1978

Date published	1972=100	Annual rate of change from previous quarter
January 1979	154.1	6.8
February 1979	154.0	6.5
July 1979	153.8	6.9

Source: U.S. Department of Commerce, Bureau of Economic Analysis.

The constant revision of the consumption deflator makes that index particularly unsuitable for adjusting incomes to compensate for inflation.

1/ Debunking the Myth of 13% Inflation, op. cit., pp. 8-9.

IV. INDEXATION

A major use of the CPI is to adjust incomes in order to maintain constant purchasing power. BLS estimates that one-half the population, including dependents, may be directly affected by changes in the CPI. 1/ Roughly 10 percent of the labor force, or 9 million workers, are covered by collective bargaining agreements providing for wage increases based on CPI changes. 2/

In addition, benefits provided by many Government transfer programs, particularly retirement programs, are adjusted for changes in the CPI. For example, since 1975 benefits paid under the old-age, survivors, and disability insurance system, commonly called social security, have been automatically adjusted for inflation using the CPI. When the CPI increases by more than 3 percent during the computation year, then social security benefit payments are increased by the CPI percentage rise. Prior to 1975 changes in benefit levels required legislative action. Delays in enacting benefit increases in response to rising prices sometimes imposed hardships on beneficiaries. However, when benefit payments were increased, Congress tended to boost benefits by an amount greater than the rate of inflation. 3/ Other Federal Government programs which are indexed include food stamps, railroad retirement, civil service retirement, and the school lunch program.

1/ BLS Report, p. 2.

2/ Sheifer, Victor J. Cost-of-living Adjustment: Keeping Up With Inflation? Monthly Labor Review, June 1979, p. 14.

3/ Kaplan, Robert S. Indexing Social Security; An Analysis of the Issues. Washington, American Enterprise Institute, 1977, pp. 9-10.

The purpose of automatically adjusting incomes for inflation, or

indexing, is to mitigate the redistribution of income and wealth which

occur during periods of rapid price advance. Advocates of indexation

have also contended that indexation would enhance the Government's

ability to pursue anti-inflationay policies since no one group would bear

a disproportionate burden due to those policies. According to a recent

Business Week article,

> This type of argument has considerable intellectual appeal. But
> it unfortunately does not apply to the kind of world that has
> existed in most countries for most of the 1970s--a world in which
> governments did not have the guts to take the monetary and fiscal
> steps needed to reduce inflation and in which rising oil prices
> exerted constant upward pressure on the price structure. In that
> kind of a world, indexing has made inflation more difficult to
> control. 1/

The indexation of Federal Government expenditures is potentially

destabilizing. Government economic policy is intended to be counter-

cyclical. That is, during periods of economic contraction the Federal

Government increases spending and/or reduces taxes in order to boost aggre-

gate demand for goods and services. Conversely, when the economy is

expanding rapidly the Federal Government pursues restrictive policies,

such as raising taxes. Associated with a rapidly expanding economy

is an accelerating rate of inflation. Automatically adjusting Federal

spending for inflation may therefore result in higher outlays at a

time when spending restraint might be more prudent. In this case

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1/ How Indexation Builds in Inflation. Business Week, Nov. 12,
1979, p. 114.

the Government would be reinforcing the business cycle rather than running

counter to the cycle. 1/

1/ For a more detailed discussion on indexing Federal Government
outlays, see: U.S. General Accounting Office. An Analysis of the
Effects of Indexing for Inflation on Federal Expenditures. PAD-79-22,
August 15, 1979.

V. DATA ADJUSTMENT

The following sections provide an overview of various procedures that can be employed to extract useful information from the Consumer Price Index. Although the examples concentrate on the CPI-U all items index, those operations involving percentage changes and purchasing power of the dollar could be legitimately performed using any of the regional indexes or any sub-category of the all items index. Calculations involving changes in base years and the development of special indexes can also be applied to any of the various regional consumer price indexes.

A. Measuring Price Changes

As previously discussed, the CPI-U is presented in the form of an index number with the index in the base year equal to 100 (the current base year is 1967, hence the 1967 CPI-U=100). It is therefore quite simple to determine the percentage price change between the base year and any given date. The percentage price change is merely the difference between the index at a given date and 100. For example, the CPI-U in October 1979 was 225.4, which represents an increase in the general price level of 125.4 percent since 1967.

Price changes between two time periods, not including the base year, can be calculated in several different ways. The most basic method is

to calculate the simple percent change from one period to another. 1/

For example, the CPI-U in September 1978 was 199.3 and in October 1979

the CPI-U was 225.4. This indicates that there was a 13.1 percent in-

crease in the general price level between these two periods.

A more useful method of using the CPI-U to determine price changes

between two time periods is to calculate a compound annual rate of change. 2/

When working with annual index numbers, separated by at least one inter-

vening year, calculating a compound annual rate of change produces the

annual rate of change which, had it occured in each of the intervening

years, would have resulted in the overall percentage change that actually

occurred during the time span under consideration. For example, the

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1/ The general equation for percentage change is:

$$\left(\frac{X_n - X_1}{X_1} \right) * 100 = \% \text{ change}$$

Where:

X_1 = the original index value

X_n = the final index value.

2/ The general equation for compound annual rates of change is:

$$\left[\left(\frac{X_n}{X_1} \right)^{1/n} - 1 \right] * 100 = \text{compound annual rate of change}$$

Where:

X_n = the final index value

X_1 = the original index value

n = the interval between X and X

(For months: n = number of months/12)

CPI-U in 1971 was 121.3 and in 1977 181.5; calculating a compound annual rate of change between these two periods yields 6.95 percent. This rate was calculated by dividing 181.5 (the final index value) by 121.3 (the original index value) and raising the quotient (1.496) to the .1666 power (1 divided by the number of intervening time periods; 1/6) and subtracting one. This (6.95 percent) is the average annual rate of change in the price level that accounts for the overall or simple percentage change in prices between 1971 and 1977, which was 49.63 percent. 1/

Calculating a compound annual rate of change between two months produces the annual rate of change that would occur if the trend in price changes between these two months were to continue per a twelve-month period. For example, the CPI-U in January 1979 was 204.7 and 211.5 in April 1979. Calculating a compound annual rate between these two months yields 13.96 percent. This indicates that if the trend in price changes between January and April were to continue throughout the year, the annual rate of inflation in 1979 would be 13.96 percent. The most commonly accepted method of measuring inflation during a given month is to calculate the percentage change from 3 or 6 months earlier at a compound annual rate.

B. Changing the Base Year

Although the current base year is 1967, the CPI-U can be adjusted so that any period can be used as the base. Changing the base period

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1/ Compounding the CPI-U index value for 1971 by 6.95 percent over 6 periods (1972, 1973, 1974, 1975, 1976 and 1977) yields:

$$121.3 * 1.0695^6 = 181.5$$

which is the CPI-U for 1977.

can be accomplished by simply dividing all the index numbers in the time periods of interest by the index value of the period chosen for the new base. For instance: to re-calculate the CPI-U from 1974 to 1977 using 1974 as the base year, you would divide all the annual index numbers from 1974 to 1977 by 147.7 (the average CPI-U for 1974).

	CPI-U (1967=100)		CPI-U (1974=100)
1974	147.7	(147.7/147.7)*100	100
1975	161.2	(161.2/147.7)*100	109.1
1976	170.5	(170.5/147.7)*100	115.4
1977	181.5	(181.5/147.7)*100	122.8

Changing the base period of the CPI-U provides a convenient method of measuring price changes between that period chosen as the base and all other time periods.

C. Purchasing Power of the Dollar

A commonly used measure derived from the CPI-U is the purchasing power of the consumer's dollar. The purchasing power of a dollar can be calculated for any period of time in terms of any other period in time by dividing the index in the period to be used as the base (that period in which a dollar is assumed to equal a dollar), by the index value in the period to be compared. The result is expressed in dollars and cents. For example: The CPI-U in 1972 was 125.3 and 181.5 in 1977. Therefore in terms of the CPI-U the purchasing power of a 1972 dollar was (125.3/181.5) $.69 in 1977. This indicates that due to inflation, a 1972 dollar would be worth only $.69 in purchasing power in 1977. Conversely, the purchasing power of a 1977 dollar would be (181.5/125.3) $1.45 in 1972.

It should be noted that the measure of purchasing power of the dollar

is subject to the same limitations as the index from which it is derived.

The change from $1 in 1972 to $.69 in 1977 is a valid and graphic method

of describing the fate of a dollar hidden away in 1972 only to be spent

on part of a specific market basket of goods and services in 1977: but

it provides no more information than its equivalent statement that it

took $1.45 in 1977 to purchase the same quantity of CPI-U measured goods

and services that $1.00 would buy in 1972. In other words, both state-

ments are corollaries to the fact that the general price level as

measured by the CPI-U increased by 45 percent between 1972 and 1977.

D. Construction of Special Indexes

Although several special indexes are currently calculated by BLS,

it is possible to construct special indexes of one's own design based

on the measure of relative importance of the categories of the CPI-U.

The measure of relative importance of the various categories of the CPI-U

indicates the percentage of the total index value attributable to the

particular category in question. For instance, with December 1978 as a

starting point, the relative importance of the housing component of the

CPI-U was 44.258, which indicates that the housing component was respon-

sible for approximately 44 percent of the total value of the all items

CPI-U in December 1978. 1/

1/ It should be noted that BLS publishes relative importance
figures only in December of each year. However, the relative impotance
of each component of the CPI changes every month. If the special index
under construction is to start in time period other than December and
to determine the index values in the time period used as the end point,
it becomes necessary to compute new relative importance data to maintain
(1/ Continued)

Construction of a special index based on the measures of relative importance is an involved process requiring several steps. To construct a special index composed of all items less the housing category, for example, would first involve determining what percentage of the all items index is not explained by the housing component, in this case the value would be 55.742 (100-44.258). This value (55.742) would then become the total relative importance contained in the special index under construction. In other words, 55.742 is now taken to represent 100 percent and is used as a base in all further calculations of relative importance.

All remaining major categories (and sub-categories as needed) must then be re-computed to determine their relative importance in the special index. This is accomplished by determining the percentage of 55.742 that is explained by each remaining major category. For example, in the original index the relative importance of food and beverages was 19.242 in December 1978; however, in the special index under construction the relative importance of this component would become 34.52 (19.242/55.742 * 100).

The next step involves multiplying the re-computed relative importance of each category by its index value in December 1978 to arrive at

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(1/ Continued) internal consistency. This can be done by determining the percentage change occurring in each major category, and sub-categories as needed, between December and the date at which the special index is to be constructed. The December relative importance of each category is then increased or decreased by the percentage change that occurred in that category. For example: The relative importance of the food component was 18.161 in Dec. 1978; however, by July 1979 its relative importance had increased to 19.610 (18.161 * 236.9/219.4)

its new index value. For example, the new index value for the food and

beverage category would become 75.693 (.345 * 219.4). The new index value

for all the major categories are then summed to provide the all items

less housing index value for December 1978.

Having determined the total index value for the starting point, the

same steps are repeated to determine the total index value for the end

period (see footnote 1/ on p. 25). Taking the percentage change between

the special index value in December 1978 and the special index value in

the end period reveals the price change that occurred during this period

when housing costs are omitted.

APPENDIX TABLE 1: Comparison of old and new
Consumer Price Indexes

Item	Old index	New indexes
Title	Consumer Price Index for Urban Wage Earners and Clerical Workers (old series).	1. Consumer Price Index for All Urban Consumers (CPI-U). 2. Consumer Price Index for Urban Wage Earners and Clerical Workers (Revised series) (CPI-W).
Population covered	Urban wage and clerical worker families and single individuals living alone. At least one family member must have been employed for 37 weeks or more during the survey year in wage or clerical worker occupations. More than half of the total family income had to be earned from wage earner or clerical worker occupations. Excludes farm families, military personnel, and persons in institutions.	CPI-U—All urban residents, including salaried workers, self-employed workers, retirees, and unemployed persons, as well as urban wage earners and clerical workers. No length of employment required and no criteria as to family income. CPI-W—Same as old index. Same for CPI-U and CPI-W.
Formula (modified Laspeyres)	$I_i = I_{i-1} \left[\dfrac{\Sigma (p_{i-1} q_a)(p_i / p_{i-1})}{\Sigma (p_{i-1} q_a)} \right]$	Same.
Standard reference base	1967=100. Selected series are also published on the 1957-59=100 base.	1967=100, for both the CPI-U and CPI-W.
Duration	Introduced Jan. 1964, replaced with revised CPI series after Dec. 1977. Available for 6-month overlap period.	CPI-U and CPI-W introduced as official indexes with the publication of the Jan. 1978 index. Available indefinitely until next revision.
Expenditure weights reference period	Average annual expenditures of urban wage earner and clerical worker families and single persons, derived from the *1960-61* Consumer Expenditure Survey in 66 areas, adjusted for price change between the survey dates and *Dec. 1963,* except for six cities added in 1966.	CPI-U—Average annual expenditures for all urban residents derived from the *1972-73* Consumer Expenditure Survey in 216 areas, adjusted for price change between the survey date and *Dec. 1977.* CPI-W—Average annual expenditures for urban wage earners and clerical worker families and single persons from 1972-73 Consumer Expenditure Survey in 216 areas, adjusted for price change between the survey date and Dec. 1977 (See BLS Reports 448-1, 2, 3; 445-1, 3.)
City coverage		
Geographic coverage	*56* urban areas; 50 metropolitan areas and cities selected to represent all urban places in the United States, with 2,500 inhabitants or more in 1960, Alaska, and Hawaii; six additional areas were added in 1966.	*85* urban areas selected to represent all urban places in the United States, with 2,500 inhabitants or more in 1970, including Alaska and Hawaii. (See table 3).
Pricing cycle	Prices of food, fuels, and a few other items collected every month in all cities. Prices of most other commodities and services collected monthly in the five largest cities and every *3 months* in the remaining cities. Pricing of foods done early in each month on 3 consecutive days.	Prices of food, fuels, and a few other items collected monthly in all cities. Prices of most other commodities and services collected monthly in the five largest cities and *bimonthly* in the remaining cities. Pricing of foods done throughout the month.
Published indexes	U.S. index and 5 largest metropolitan areas published monthly; 18 other large metropolitan areas published *quarterly.* Regional and city-size class indexes also published *quarterly* since 1967.	U.S. index and 5 largest metropolitan areas published monthly; 23 other large metropolitan areas published *bimonthly.* Regional and city-size class indexes published *bimonthly.* Regional indexes cross-classified by population size will be published *bimonthly.*

Item	Old index	New indexes
Item sample		
Item coverage............	All goods and services purchased for consumption, including both necessities and luxuries. Excludes personal life insurance, income and personal property taxes, but includes real estate taxes and sales and excise taxes.	Same.
Sample of items priced	Consumer Expenditure Survey (1960-61) data classified into 52 expenditure classes. About 400 items represented in U.S. index and in published city indexes. Certainty items priced in all published cities, other items in one or two sub-samples of other unpublished cities.	Consumer Expenditure Survey (1972-73) data classified into 68 expenditure classes. Expenditure classes contain approximately 265 classes or sets of items, called item strata, represented in the U.S. index and in published city indexes. Item strata further divided into a total of 382 lower level categories called entry-level items. Two samples of item strata priced in each published area except New York which has six samples; each unpublished area has one sample of item strata priced.
Basis of item selection	Probability proportionate to importance in family spending of group covered.	Same.
Reporter samples		
Outlet selection	Selected proportionate to type of ownership, type of outlet, geographic location within area, and in a few instances, sales volume.	A full probability sample of retail stores and other outlets was selected from the results of the Point-of-Purchase Survey. About 23,000 families across the country provided information on the specific retail stores in which they shopped. Data provided from the point-of-purchase survey were used to develop, for the first time, a consistent, objective, and probability-based sample of retail stores and service establishments for the CPI. A number of auxiliary sources used to construct an outlet sampling frame for categories not included in the Point-of-Purchase Survey.
Location	In central cities and urbanized places of 56 metropolitan areas (50 areas in 1964 and 1965).	In 85 primary sampling units which include central cities, suburbs, and urbanized places within 25 miles of a selected county or selected group of contiguous counties. Prices also collected outside of the primary sampling units to represent out-of-town purchases.
Number of reporters	About 1,775 food stores. About 40,000 rental units. About 16,000 other reporters of all kinds. About 13,000 housing units for property taxes.	About 2,300 food store outlets. About 18,000 rental units. About 19,300 other reporters as determined from the Point of Purchase Survey. About 18,000 housing units for property taxes. About 3,000 reporters selected from a number of auxiliary sources.
Number of price quotations obtained	About 1,300,000 food prices per year. About 80,000 rent charges per year. About 462,000 quotations per year for items other than food and rent. About 13,000 property tax quotations per year.	About 700,000 food prices per year. Over 70,000 rent charges per year. About 675,000 quotations per year for items other than food, rent, and property taxes. About 28,000 property tax quotations per year.
Pricing technique	Personal visit or telephone call by BLS data collector, except for some items collected by mail or from some secondary source.	Same.

Item	Old index	New indexes
Reporter Samples—Continued		
	Specification pricing, but agent is permitted to price deviations from specification under prescribed conditions.	Store-specific pricing. The data collector enters a store with exhaustive definition of a fairly broad category of goods and services called an entry level item and then proceeds systematically through successive stages to select items for pricing on the basis of sales information provided by the respondent at each stage. A specific-in-detail item is thus selected for pricing over time in the retail outlet.

Data collector continues to collect price quotations for specific item or similar substitute item until it is no longer available. |
Uses	Formulation and evaluation of economic policy measures.	Same.
	Escalator of income payments.	Same.
	Deflator of earnings to provide measures of real earnings.	Same.
	Measure of purchasing power of consumer dollar.	Same.

APPENDIX TABLE 2: Components of the Consumer Price Index