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Chapter 18

Inflation and Statistics

Inflation is having serious effects on our statistical intelligence system. The wide disparity in the rates of increase in different prices makes price indexes less reliable and more controversial. To illustrate the phenomenon, this study analyzes the respective merits of the consumer price index (CPI) and the deflator for personal consumption expenditures (PCE), and explores the reasons for the more rapid advance in the former. A new treatment of the weights in the CPI is suggested. The insidious effects of inflation on the use of price/labor cost ratios as a proxy for profit margins, on the interpretation of inventory/sales ratios, and on the validity of measures of spendable weekly earnings are also considered. Since these are only a sample of the problems that inflation is creating, the need for a major, continuing effort to deal with the matter is stressed.

THE NATURE OF THE PROBLEM

Inflation is widely recognized as a major economic problem. Less widely recognized are the statistical problems inflation has been creating. Because of inflation we are less certain about where the economy is going and less certain even about where it has been. Because inflation not only raises the general price level but raises some prices very much faster than others, we are less certain about how much inflation there is. Because sales and incomes are in current dollars, the uncertainty attaching to our price statistics increases the uncer-

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tainty about the real level of sales and incomes. Because inventories and other assets are often measured in terms of what they originally cost rather than what they are currently worth, and since inflation makes the date to which the historical cost figures pertain very important, and since these dates are difficult to keep track of, estimates of the real value of inventories and other assets are subject to wider margins of uncertainty. Because inflation changes the incentive structure under which the economy operates—by raising interest rates, making capital gains and losses a bigger factor in decisions, making fixed incomes less desirable, increasing the profitability of tax avoidance, and opening new channels through which goods and services are bought and sold—the traditional sources of statistical information become less complete and less reliable.

Some of these problems have recently become highly visible. The consumer price index has been attacked for overstating inflation. The accounting profession has formally recognized the need to take account of inflation in measuring costs and profits. Even the index of lagging indicators, which rarely gets any attention at all, has been criticized because some of its components are inflated, whereas others are deflated. One result of this visibility is that some criticisms are ill-informed and some of the proposed remedies not well-considered. But the problems do need to be aired, and potential solutions should be explored. Even without solutions we can achieve a better understanding of the statistics and how they can be interpreted in an inflationary environment. That is the objective of this chapter. It will not solve the problem of inflation, but it may illuminate some of its unfortunate consequences.

PROBLEMS WITH THE PRICE INDEXES

Rapid inflation usually brings with it greater disparity in the rates of advance of different prices. During periods of rough stability in the general price level, some prices go up and some come down but the divergence as a rule is not very large. Double-digit inflation, on the other hand, is characterized by enormous advances in some prices and much smaller advances in others. One of the consequences of the divergence is that the actual extent of inflation becomes more difficult to measure, and measurement becomes more affected by the decisions about how to do it. In short, measures of inflation become more controversial.

Index numbers such as the consumer price index are affected by the sample of prices that go into them, by the quantities that are assumed to be bought at those prices, and by the conceptual framework that determines what the index measures and how it is done.

Table 18-1. Changes in Consumer Prices, by Major Expenditure Classes (*percent*).

Expenditure Class and Relative Importance, December 1979[a]	*1967-1968*	*1978-1979*
Food and beverages (19)	3.6	10.8
Housing (45)	4.0	12.2
Apparel and upkeep (5)	5.4	4.4
Transportation (18)	3.2	14.3
Medical care (5)	6.1	9.3
Entertainment (4)	5.7	6.7
Other goods and services (4)	5.2	7.3
All items (100)	4.2	11.3
Smallest change	3.2	4.4
Largest change	6.1	14.3
Range	2.9	9.9
Average deviation[b]	1.1	3.1
Standard deviation[b]	1.2	3.8

[a] Figures in parentheses are percentages of the total cost of the CPI market basket at December 1979 prices.

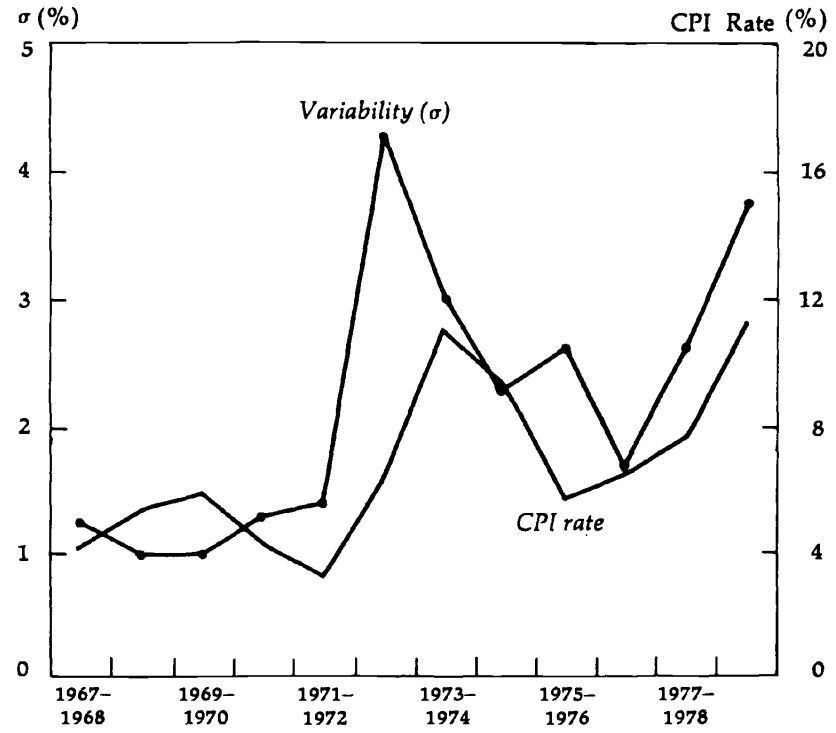
[b] Computed from the all-items figure rather than from the simple arithmetic mean of the seven group figures.

Source: U.S. Bureau of Labor Statistics.

Obviously, if all prices went up 10 percent, these things would not matter. The index would go up 10 percent. It is the variation that makes them matter, and the more variation, the more they matter. Table 18-1 makes a simple comparison between 1967-1968, when the consumer price index was going up at a 4 percent rate, and 1978-1979, when it went up at an 11 percent rate. In the first period prices in some of the major expenditure categories rose about 3 percent, whereas others rose as much as 6 percent. The overall index, which rose 4 percent, was quite representative, because there was a close consensus among the seven categories. In 1978-1979 the situation was very different. The increases were spread across a range running from 4 percent for apparel to 14 percent for transportation. The 11 percent increase in the overall index was far less representative, because there was little or no consensus among the price increases in the seven categories. Similar figures for the intervening years show that, as a rule, as the overall rate of inflation increased, the variation among the price increases in the different categories also increased (as shown in Figure 18-1).

This phenomenon opens the way for criticism of the price indexes. One of the more elementary lines of commentary that it provokes focuses upon the areas that are rising fastest and shows what the

Figure 18-1. Variability of Price Changes and the Rate of Inflation, 1967–1979.



Note: The CPI rate is the percentage change between annual averages of the all-items index. The variability measure is the root-mean-square deviation of the year-to-year percentage changes in the seven major component indexes from the CPI rate. The seven components are listed in Table 18-1.

Source: U.S. Bureau of Labor Statistics.

index would do if they were omitted. Naturally the index then rises less rapidly. The lower rate is sometimes called the basic or underlying rate of inflation. The consequence of removing prices that are at the other end of the spectrum, rising least rapidly or declining, is usually disregarded. Sometimes the argument is more sophisticated, based on the special circumstances that affect the high-rising prices or upon the reasons for believing that the measurement of the high-rising prices is defective. Yet it is curious that the special circumstances or the measurement difficulties that are stressed always pertain to the high-risers rather than the low-risers. Also, the "special circumstances" argument, usually applied to food or energy, ignores

the question of whether the behavior of those prices affects the others. If food or energy prices had not risen so fast, would other prices have risen faster, because money not spent on food or energy might then have been directed to driving up prices of other goods and services?

The measurement problems are more fundamental. Those that have surfaced in recent months mostly pertain to the differences between the consumer price index and the deflator for personal consumption expenditures. The latter is derived in the process of constructing the estimates of gross national product and represents the value of consumption expenditures in current prices divided by their value in constant (1972) prices. There are a very large number of differences between the two indexes, but perhaps the three most important are the following:

1. The CPI refers to the urban population (or, alternatively, to urban wage earners and clerical workers), whereas the PCE covers the entire population including, of course, the rural and farm population. The PCE also covers the expenditures of private nonprofit institutions, such as hospitals, universities, and churches.

2. The CPI refers to a fixed market basket of goods and services, determined by a survey of consumer expenditures in 1972–1973. Hence the movements in the CPI are determined solely by price changes, not by changes in quantities purchased. The PCE refers to a constantly changing market basket, determined by what consumers are buying currently. Hence it is influenced both by changes in prices and by changes in quantities. Some of the quantity changes may be in response to efforts by consumers to buy less of goods that are rising rapidly in price and more of goods that have become relatively cheap, but other shifts in expenditure patterns may reflect changes in tastes, in the availability of goods, in affluence, or other factors.

3. The CPI treats the cost of owner-occupied housing as an expense consisting of the net amount spent for new houses in 1972–1973 by the small fraction of the urban population that bought houses then, the amount committed to be spent on mortgage interest payments for these new houses, and the amounts spent by all homeowners for repairs and maintenance, property taxes, and property insurance. The PCE treats the cost of owner-occupied housing as an expense to be estimated by the rent that might be paid for such housing, using the rent index from the CPI for this purpose.

The difference in the population coverage of the two indexes means that the PCE is influenced by prices and expenditures that are not included in the CPI, notably prices paid by rural families and by

nonprofit institutions. For some purposes, such as deflating total personal income or disposable income, the broader coverage of the PCE is desirable. For other purposes, such as measuring real wages of urban workers, the narrower coverage of the CPI is desirable. The CPI also is available for different areas of the country, while the PCE is not.

The issue of the fixed or changing market basket is complicated. One argument is that the use in the CPI of quantity weights pertaining to 1972–1973, before the sharp increase in oil prices began, means that cost-saving shifts in fuel consumption and in types of automobiles purchased are not allowed for. The result, so the argument goes, is that the CPI exaggerates the effective increase in prices, whereas the PCE, by using current quantity weights, avoids this bias.

In measuring the change in prices between a base period, say 1972, and the current period, an index using quantity weights pertaining to the base period will usually show a larger increase than an index using quantity weights pertaining to the current period. That is, the cost of the base period's market basket will ordinarily increase faster than the cost of the current period's market basket. Neither index, however, shows the increase in cost of a market basket that is best adapted to the price situation in *each* period. The use of base period quantities generally overestimates this increase, whereas the use of current period quantities generally underestimates it.[1]

Hence this factor alone tends to give the PCE a downward bias, whereas it gives the CPI an upward bias. This tendency, however, pertains only to comparisons with the base period. Much of the time these are not the comparisons of interest. Attention is usually focused on the rate of inflation over short periods, such as a month, or six months, or a year. The base period is not involved (directly), and it becomes impossible to say, on theoretical grounds, which type of index will show higher rates of increase. All that is clear, in this case, is that the PCE does not measure price change alone, since the quantities change (in an undefined way) as well as the prices, whereas the CPI measures only the change in prices, because the market basket stays fixed in all periods.

In any case, the numerous studies that have been made of the fixed versus changing weights issue have generally shown that the matter is not of much practical consequence. The PCE provides a convenient illustration of this, because the Commerce Department computes an alternative PCE with fixed weights (as of 1972). From 1972 to 1979 the PCE deflator increased by 63.3 percent, the PCE fixed-weight index by 66.2 percent. The equivalent annual rates over the seven-year period are 7.3 percent for the deflator, 7.5 percent

for the fixed-weight index, hardly a consequential difference. This result has a bearing on the argument that the CPI is biased upward because its weights are based upon 1972–1973, before the fuel price rise made consumers use less fuel. The same argument applies to the PCE fixed-weight index, which uses 1972 weights. The foregoing comparison shows that it is an argument over two-tenths of 1 percent per year over the entire seven-year period.

In comparisons of the two indexes over shorter intervals the differences are often larger, but not always in the same direction, as Table 18-2 shows. Since 1976 the fixed-weight index has been rising faster, with a difference of eight-tenths of 1 percent during 1979. Evidently the changing quantities implicit in the PCE deflator have been causing it to show a smaller rate of increase. If this has come about because the changing market basket has deteriorated in terms of its real worth to consumers, the deflator would be understating the rise in prices. No one has demonstrated whether this is so or not.[2] The point is worth stressing because in a fixed-weight index the fact that the quantities in the market basket remain the same provides some assurance that the real worth of the market basket also has remained approximately the same.

In view of the uncertainty attaching to the propriety of using base year or current year weights, it might be well to return to a solution that was proposed years ago by Irving Fisher and others, namely calculating both indexes in a comparable manner and averaging the two indexes. This requires the development of estimates of current year weights; but since this is already being done in the PCE, it

Table 18-2. Rates of Change in Two Price Indexes Based upon Personal Consumption Expenditures, 1972–1979 (*percentage change from same quarter of preceding year*).

Year and Quarter	*PCE Deflator*	*PCE fixed-weight Index*[a]	*Difference*	*Average*
1972: 4	3.5	3.4	-0.1	3.4
1973: 4	7.5	7.8	0.3	7.6
1974: 4	11.9	12.0	0.1	12.0
1975: 4	6.1	6.5	0.4	6.3
1976: 4	4.8	4.5	-0.3	4.6
1977: 4	5.7	6.1	0.4	5.9
1978: 4	7.6	8.0	0.4	7.8
1979: 4	9.9	10.7	0.8	10.3
Average, 1971: 4–1979: 4	7.1	7.3	0.2	7.2

[a] The weights are for 1972.

Source: U.S. Department of Commerce.

would not appear to be an insuperable obstacle for the CPI. Index numbers are not very sensitive to errors in weights, and this would be especially true of an average of base-year and current-year weighted indexes. Since the Bureau of Labor Statistics (BLS) recently began a quarterly survey of consumer expenditures, some experimentation along these lines may soon prove to be practicable. The advantages of this type of index have long been recognized in making place-to-place comparisons of prices, where it is generally impossible to say whether the quantities purchased in city A are more appropriate than the quantities purchased in city B in judging whether prices are higher or lower in A than in B. If the BLS would compute both indexes currently we would know at least what difference it makes.

The measurement of housing costs has attracted more attention and probably created more misunderstanding than any of the other issues regarding the CPI and the PCE deflator. A common, but incorrect, assertion is that in computing the CPI the Bureau of Labor Statistics assumes that all homeowners buy a new home every month. The current price of houses does enter into the calculation, but not in such a ridiculous manner. New houses are treated like other purchases, such as automobiles or furniture, and the price enters the index in proportion to the amounts purchased in the base period, 1972–1973. Approximately 6 percent of homeowners bought new houses then; the other 94 percent were out of the market. The weights applied to house prices are based upon the 6 percent who purchased houses, just as the weights applied to automobile prices are based on the purchases of those who bought autos. The cost of the existing stock of houses or of autos or of anything else does not enter into the calculation of what the current price level is.

Mortgage interest payments are treated in a rather similar manner. The amount of interest the borrower commits himself to pay at the time a new mortgage contract is signed is treated as the price, and the total volume of such new commitments made during the base period is the weight. The interest payment depends upon the interest rate, the number of years the mortgage remains outstanding, and the dollar amount of the mortgage (which in turn depends upon the price of the house and the percentage that is borrowed). It is assumed that mortgages remain outstanding for about half the term written into the contract. As a result, the mortgage interest component of the CPI increases with the current level of mortgage interest rates and also with the current level of house prices (which determine the amount of the mortgage).

Other costs of homeownership, such as maintenance and repairs, property taxes, and insurance are also included in the CPI. In regard to these items all homeowners are included, since they all incurred such costs in the base period. Here is where an alternative treatment of mortgage interest costs presents itself. Since the great majority of homeowners make mortgage interest payments, why should the current payments not be treated like rents or property taxes or insurance? Only the annual interest payment would be included in the weight (not the total amount to be paid over the life of the mortgage), but all homeowners who made such payments in the base period would be included in the weights. The current interest rate would be an average of the rates on existing mortgages. It would represent a price previously contracted for but currently in effect, much like the rental on a leased apartment.

Most economists think house prices are not treated appropriately in the CPI. They regard the purchases of durable goods, such as houses and automobiles, as different from other goods and services, because the product is not consumed in a brief period. What is purchased is a continuing series of services that the durable good will render, and only the cost of what is consumed currently should be included in a consumer price index. The rest is an investment, not consumption.

This is the view taken in the PCE deflator, at least with regard to houses (not autos or other durables). The current services rendered by owner-occupied houses are measured by the rent that might be paid for them, and the index of rent that is used is the rent index in the CPI. Hence the price of new houses is not included at all in the PCE, nor are maintenance and repair costs, property taxes, insurance, or mortgage interest costs. These items are covered by the rent. The cost of newly constructed houses, however, is included in another component of the national product accounts, namely residential construction expenditure, which is a part of gross private domestic investment. If this were to be treated as an expenditure by or on behalf of consumers, the result would be more nearly comparable with the CPI (see Table 18-3).

Although the use of rental equivalents has much to be said for it conceptually, there are significant questions about the appropriateness of the CPI rent index for this purpose. It is designed to measure the rents of those who live in rented dwellings, and a large proportion of these are apartments located in the larger cities. The average apartment is smaller than the average owner-occupied house, some of them are under rent control, and many are occupied by persons with a low or fixed income seeking to minimize their housing costs.

Table 18-3. Rates of Change in Selected Price Indexes, 1972-1979 (*percentage change from same quarter of preceding year*).

Year and Quarter	CPI Rent (1)	CPI Homeownership				CPI, All Items (6)	PCE Deflator (7)	Residential Construction Expenditures Deflator (8)	PCE Plus Residential Construction Expenditures Deflator (9)
		Home Purchase (2)	Mortgage Interest Cost (3)	Taxes, Insurance, Maintenance and Repairs (4)	Total (5)				
1972: 4	3.4	3.4	2.1	6.4	4.1	3.4	3.5	6.4	3.7
1973: 4	4.8	3.0	17.8	5.6	7.3	8.3	7.5	11.3	7.7
1974: 4	5.3	9.4	20.3	9.9	12.8	12.2	11.9	10.4	11.7
1975: 4	5.2	11.1	8.2	6.8	8.5	7.3	6.1	6.8	6.1
1976: 4	5.4	4.4	1.5	6.5	4.5	5.0	4.8	8.8	5.0
1977: 4	6.4	7.9	9.1	8.8	8.5	6.7	5.7	12.7	6.3
1978: 4	7.3	11.0	21.1	7.1	12.8	9.0	7.6	14.0	8.0
1979: 4	8.1	15.5	32.5	6.2	18.3	12.7	9.9	10.1	9.7
Average 1971: 4-1979: 4	5.7	8.1	13.6	7.2	9.5	8.0	7.1	10.0	7.2

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

Owner-occupied houses are generally located in the suburbs and relatively few are offered for rent, so that few owners are aware of what rent they might pay or obtain for the premises. Hence a large element of uncertainty attaches to the assumption in the PCE deflator (and in the PCE fixed-weight index) that the CPI rent index closely approximates the equivalent rental cost of owner-occupied dwellings.

Another question about the CPI rent index pertains to its accuracy as a measure of rents. It is subject to a downward "aging" bias because rents are collected for identical apartments or houses with no allowance for the usual deterioration that occurs over time. A study of the effect of this, in which census data were used to allow for the changing quality structure of rented dwellings, showed a very much larger increase in rents than was recorded by the CPI.[3] For the decade 1950 to 1960, the adjusted rent index rose 49 percent, whereas the CPI rent index rose 30 percent. For 1960 to 1970 the adjusted rent index went up 31 percent, whereas the CPI rent index went up 20 percent. If the adjusted index is correct, the CPI rent index may understate the rate of increase in rents by as much as 1 or 1.5 percentage points per year. A more recent study covering 1974–1976 gave a similar result, with the quality-adjusted rent index rising 13.2 percent over the two years, while the CPI rent index rose 11.1 percent.[4]

In view of these considerations it is not clear whether owner-occupied housing costs are measured more accurately in the PCE deflator (or the PCE fixed-price index) or in the CPI. The latter has been rising much more rapidly, as is evident from a comparison of the CPI rent index (used in both the CPI and the PCE) with the CPI home-ownership index (Table 18–3), columns 1 and 5). The residential construction expenditures deflator has been rising more rapidly than the PCE deflator, so that including this element generally produces a faster rising index.[5] But residential construction expenditures are small relative to total personal consumption expenditures, so the effect is not great.

The rapid increase in home purchase prices and the even more rapid increase in mortgage interest costs provide a striking illustration of the fixed versus changing weight issue discussed earlier. One of the economic consequences of credit stringency and the accompanying rapid rise in mortgage interest rates is to reduce the construction and sale of new homes. Since summer 1979 new housing starts have declined from an annual rate of 1.8 million to 1.0 million as of March 1980. This has no effect on the fixed quantity weights in the CPI, of course, so the consequence is that the rising mortgage interest rates continue to boost the CPI, even though the volume of transactions

to which they pertain has sharply declined. The use of current weights would produce the opposite effect. The small volume of current transactions, when applied to the sharply lower level of mortgage interest rates in the base period, would minimize the effect of those lower rates on the CPI in that period and hence reduce the rise in the CPI from the base period to the present. The current weights would be as unrepresentative of the base period as the base period weights are of the current period. Here again the merits of the compromise solution suggested earlier—using both types of weights—might be considered.

The questions examined here of course are not the only issues that have arisen concerning the validity of our price indexes. Problems pertaining to the treatment of quality changes, servicing and repair costs, improvements in efficiency, new products, the disappearance of old products, product changes that are mandated by government regulations, and the substitution of income taxes for sales taxes are as important as ever.[6] Indeed, they are more important in view of the wider use of price indexes in escalating wages and retirement benefits. Inflation not only makes price indexes more fallible; it makes errors more costly and raises the price tag on alternative procedures.

PROBLEMS WITH OTHER STATISTICS

Price/Cost Ratio

Since price indexes are used to create other statistical measures, uncertainties regarding their validity are passed along to the other measures that they affect. Price/cost ratios are an example. The ratio of the wholesale price index for manufactured goods to the labor cost per unit of output of manufactured goods served for many years as a proxy for movements in profit margins. The figures were available monthly and more promptly than profit margin reports based upon corporate accounts. Historical studies had traced their behavior back to the 1920s and not only confirmed their close relation to directly reported profits per dollar of sales but demonstrated their value as a leading indicator in business cycles. The price and cost figures, moreover, enabled one to account for the tendency of profit margins to decline in the later stage of a cyclical expansion: Prices fail to keep up with the sharp advance in costs. In a recession, on the other hand, margins decline initially but then begin to improve as costs are cut more sharply than prices. It was also evident that over the long run, prices and labor costs moved very closely in step. Apart from business cycles, the ratio followed a horizontal trend.

But this state of affairs began to change in the mid-1960s. The price/cost ratio failed to decline as much as the profit margin figures indicated it should, and in the 1970s the ratio rose rapidly when margins fell. The proxy was not behaving as a proxy should.

It is still not clear why this happened. Inflation had somehow affected the comparability of the numerator and the denominator of the price/cost ratio. Prices appeared to be rising more rapidly than labor costs, but the boost that this would normally give to profit margins did not show up in the profits numbers. Various hypotheses were looked into to explain it, but none provided a fully satisfactory answer. Nevertheless, a way out was provided by a deflator.

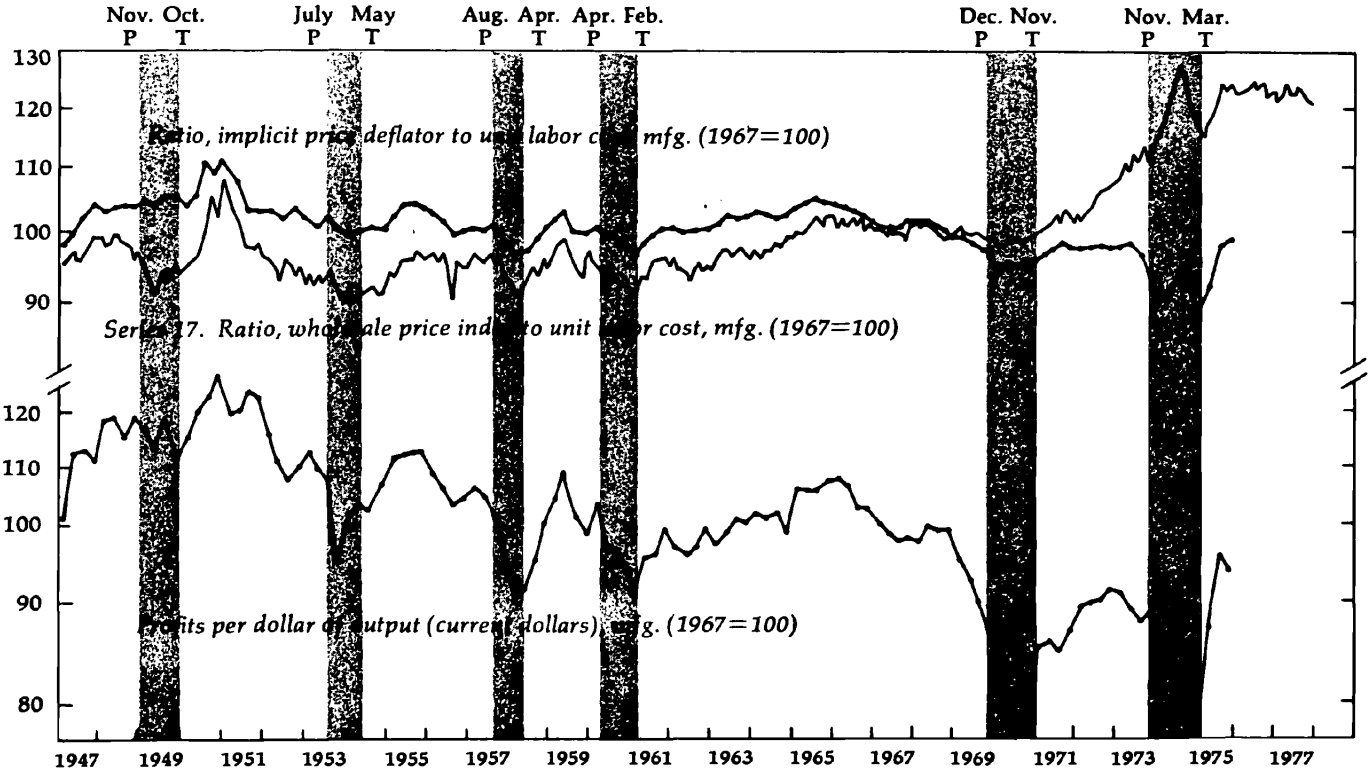
Figure 18-2 shows the monthly price/cost ratio described above (series 17) and also a quarterly price/cost ratio that, since 1965 or so, has behaved in a very different way. Both ratios pertain to manufacturing, but the numerator of the quarterly series is the implicit price deflator used to convert gross product originating in manufacturing from current to constant prices. The denominators differ also because of the different measures of output used to compute labor cost per unit of output. The upshot is that the quarterly ratio moves in a manner far more consistent with the trend and fluctuations in profits per dollar of output, also shown in the figure.

The quarterly price/cost ratio for manufacturing is not published currently, but a similar ratio for the private nonfarm sector is, and it shows a close relation to the movements in profit margins of nonfinancial corporations. It becomes available sooner than the profits figures and hence gives an advance clue to the change in profits. But the principal advantage of the monthly ratio—timeliness—has been lost, a victim of inflation.

Inventory/Sales Ratio

Another kind of ratio that has been significantly affected by inflation is the inventory/sales ratio. For many years it seemed adequate to compute this ratio by dividing the book value of inventories by the dollar value of sales. A low or declining ratio was interpreted as a favorable sign, indicating that inventories were not unduly burdensome or becoming so. But this interpretation implicitly assumed that the ratio of the two figures, both expressed in dollars, was a good approximation to a ratio computed from the physical quantity of inventories on hand and the physical volume of sales. It is the physical quantities of inventories that need to be replenished when they are low in relation to sales, or disposed of when they are high. The dollar form of ratio, which is generally the easiest to compute, can be misleading if the prices entering into the book value of inventories

Figure 18–2. Price/Cost Ratios and Profit Margins, Manufacturing.



are moving differently than the prices involved in the current value of sales.

Inflationary conditions produce such differences, or rather make them far more important. When inventories are valued at cost, the costs are incurred at an earlier date. In the meantime prices have changed, and the prices in terms of which sales are being made may be very different, due to the lapse in time, from the prices used to enter inventories on the books. The appropriate deflator for inventories will be different from the appropriate deflator for sales, and this means that the ratio of the physical volumes will move differently from the ratio of the current dollar values. The greater the rate of inflation, the greater the difference will be.

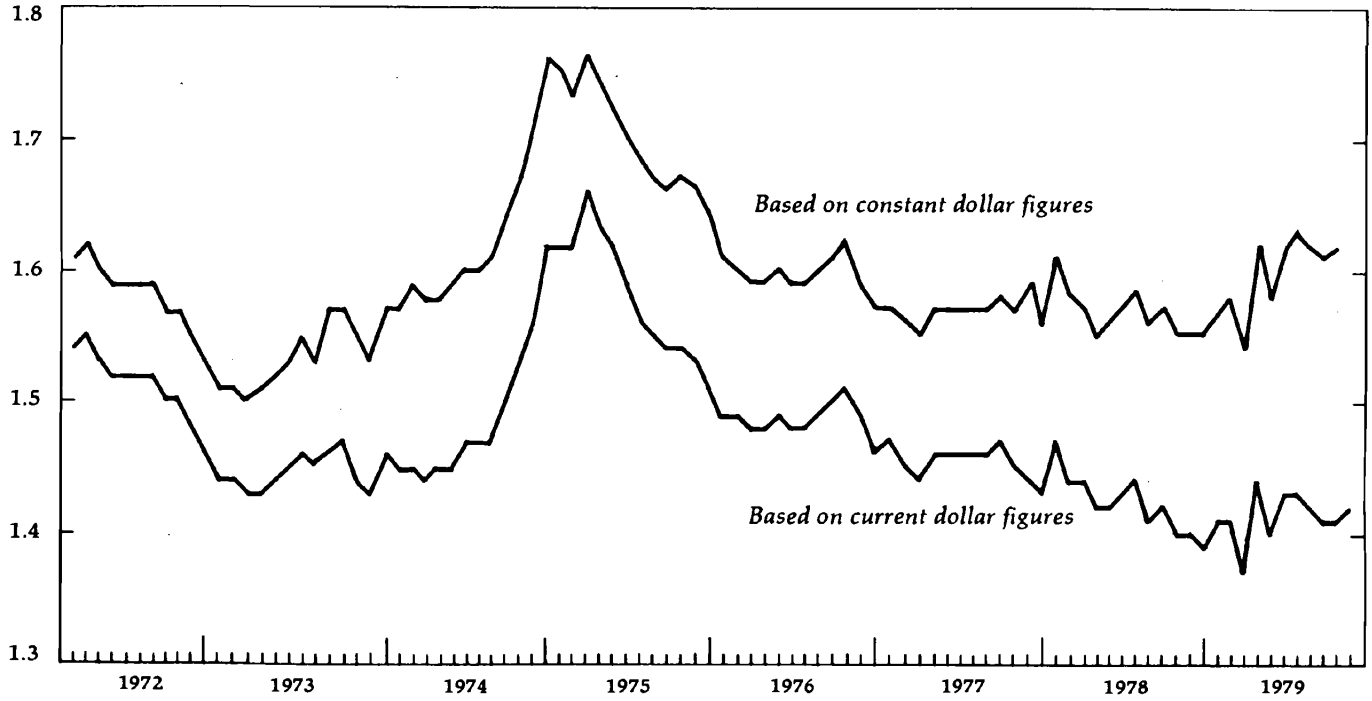
Other sorts of complications enter as well. Inflation induces companies to change their system of accounting for inventories, from first-in-first-out to last-in-first-out, for example, and this changes the price component of inventories without changing the price component of sales. The mix of goods held in inventory differs from the mix of goods sold, due to different rates of turnover. With wider differences in the rate of price change under inflation, the measurement of prices in inventories and in sales becomes more difficult and generally less accurate, so that meaningless divergences between the two price components are more likely to occur. Revisions are likely to be larger.

Hence inflation causes trouble for the user of inventory/sales ratios. An illustration is provided in Figure 18-3. Notice that during the second half of 1973 and early 1974, the ratio based on current dollar figures remained at a relatively low level, whereas the ratios based on constant dollar figures began climbing sharply. This was the beginning of recession, and there was virtually no clue in the current dollar ratio, which is the one most commonly used, that inventories were beginning to be a problem. A similar divergence began toward the end of 1978. By the end of 1979 the constant dollar ratio was higher than at any time since 1975, whereas the current dollar ratio was hovering around a very low level. Has inflation again misled those who use the current dollar ratio as a guide?

Real Spendable Earnings

Between 1947 and 1965, according to the Bureau of Labor Statistics, the spendable weekly earnings of a married worker with three dependents nearly doubled, rising from $45 to $87. At the same time, the consumer price index increased about 40 percent. Hence the married worker with three dependents kept well ahead of inflation. In dollars of 1967 purchasing power, his weekly earnings rose

Figure 18–3. Inventory/Sales Ratios, Manufacturing and Trade.



Source: U.S. Department of Commerce.

from $67 to $92, leaving him 37 percent ahead of where he was in 1947—in real terms, after taxes. That is a gain of nearly 2 percent per year during the eighteen years.

Between 1965 and 1979, according to the same statistics, the spendable weekly earnings of this worker rose from $87 to $195, more than doubling again. This time, however, the consumer price index more than doubled too. As a result, the married worker with three dependents was no better off in 1979 than he was in 1965. His weekly spendable earnings in 1979 came to $90 in 1967 dollars, not quite up to the $92 he was making in 1965. Inflation had taken away all of his gains in money income during the past fourteen years. The more he got ahead, the more he slipped behind.

If this situation were indeed typical, it would be a sorry state of affairs. But the Bureau of Labor Statistics is careful to note, in publishing the numbers, that they apply only to the worker who earns the average earnings. The hasty reader might think that this means the average worker; that is, that the average married worker with three dependents really does earn the average earnings. In fact, however, the average married worker with three dependents earns far more than this, and, moreover, his earnings have been going up faster too. Even after taxes, he is still far better off than the worker who earns the average earnings.

These statistics, in short, have become one of the most misleading series published by the federal government. Inflation is at least partly responsible for their misleading quality.

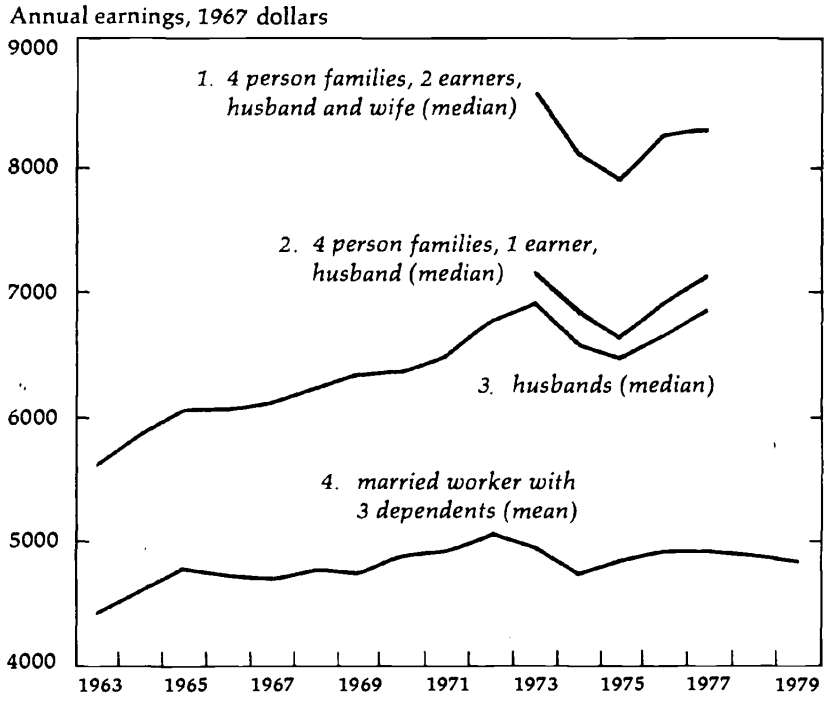
To see why this is so, consider the following hypothetical example: Joe Smith, a married worker with three dependents, earns $200 a week, working a full-time forty-hour week. Feeling the pinch of inflation, his wife decides to get a part-time job, and earns $80 for a twenty-hour week. The family income goes up to $280. But since two persons are working, the average earnings per worker goes down to $140. Furthermore, suppose Joe decides that $280 is not enough and does some moonlighting weekends with another employer, picking up $50 a week that way. The family's income is now $330, but since Joe is now listed on two payrolls and his wife on a third, the earnings of three workers are reported, and the average goes down to $110. Mr. and Mrs. Smith's attempt to beat inflation has made the average earnings per worker completely unrepresentative. I hesitate to suggest what would happen to the average if their teenager also takes on a job.

Fortunately, since this case is somewhat exceptional, and there are many married workers who are their family's sole source of support, the statistics do not behave as disastrously as in the example.

But it happens often enough to affect seriously the overall figures, and the problem has been getting worse with the rapidly rising numbers of part-time workers. Their earnings on part-time jobs significantly reduce the average earnings per worker.

Figure 18-4 gives some evidence. All the figures shown pertain to the real after-tax earnings of production and nonsupervisory workers, and all are published by the Bureau of Labor Statistics. The lowest curve (4) is the spendable earnings series described before (expressed at annual rate), which is based upon the average earnings per worker reported on private nonfarm payrolls and uses no information about the actual family status of the worker. The other figures shown in the chart come from a survey of households that provides

Figure 18-4. Four Estimates of Real After-Tax Earnings, Production and Nonsupervisory Workers.



Sources: 1 and 2: Monthly Labor Review (August 1979), table 3, p. 45. Based upon household survey conducted in March of the following year. 3: Monthly Labor Review, (August 1979), table 4. Includes only full-time, year-round workers. 4: Monthly Labor Review (October 1979), table 20, p. 98. Based upon establishment survey of weekly earnings of all workers on private nonagricultural payrolls. Weekly figures are multiplied by fifty-two to obtain annual figures.

information on the marital status of the workers as well as their earnings. Line 3 refers to the earnings of husbands and includes only full-time, year-round workers. Also, it is a median rather than an arithmetic mean. In earnings figures the median, which separates the upper half of the number of earners from the lower half, is generally lower than the mean, because the total earnings of the upper half generally exceed the total earnings of the lower half. Hence if line 3 were a mean, as line 4 is, it would be even farther above line 4 (see note 7). On the other hand, not all husbands have full-time, year-round jobs, so this tends to lift line 3 as compared with a median for all husbands.

There are other differences as well between the type of family covered by lines 3 and 4, since the husband (line 3) may not head up a family with three dependents, and the married worker (line 4) may be a wife rather than a husband. The first of these differences is taken care of by line 2, which pertains to the earnings of husbands in four-person families in which the husband is the sole earner. This increases the disparity with line 4. Finally, line 1 covers the earnings of four-person families in which both the husband and wife are wage earners. Here the figures pertain to their combined earnings, whereas the rest of the figures shown on the chart pertain to the earnings of one person.

Although the data plotted in lines 1, 2, and 3 of the figure are not precisely comparable with those in line 4, for the reasons indicated, they are sufficiently comparable to show the scale of the bias in line 4. Every one of them gives a very different picture of the level and the trend of real after-tax earnings. In 1977 the earnings reported by husbands exceeded the earnings for married workers with three dependents by 40 percent. On a weekly basis husbands earned $238 after taxes, whereas married workers with three dependents were estimated to have earned $170 (both figures in current dollars). Either husbands are massively overstating their earnings or the estimates of married workers' earnings are seriously understated. From 1965 to 1977 the real after-tax earnings of husbands rose 13 percent, whereas the real after-tax earnings of married workers with three dependents rose 3 percent. Either husbands are getting to be bigger liars or the estimates for married workers are seriously understating the growth in earnings of this type of worker.

From the nature of the estimates it is clear that the latter are subject to a large and increasing downward bias. In 1979 there were 19.7 million employed husbands whose wives were not employed, 1.4 million wives whose husbands were not employed, and 20.1 million couples where both husband and wife were employed. Two-earner

families have become the mode. In 1979, of the 97 million persons employed, 17 million or 18 percent were employed part-time. Back in 1965 only 15 percent were employed part-time. Part-timers obviously do not work as long a work-week as full-timers, and usually they earn less per hour. Average weekly earnings per worker are reduced by this factor, and its effect has been getting bigger.[7] Another factor is age. The average married worker with three dependents is older than the average of all workers, and has more experience, seniority, training, and skill. Family responsibilities usually are not undertaken until a certain level of earnings has been attained. For all these reasons the assumption that married workers with three dependents earn the average weekly wage of all job holders is ludicrous and has been becoming less and less tenable as inflation impels workers to supplement their incomes. Other factors have been at work as well.[8]

The Bureau of Labor Statistics has been aware of this situation for some years but nevertheless continued to issue the indefensible spendable weekly earnings figures every month until December 1981. The more defensible survey data on annual earnings are available only once a year and are far out of date by the time they appear. Since the household survey is in fact conducted monthly (it is the source of the unemployment figures), it is obviously practicable to obtain earnings figures from it more promptly. They could be used either to replace or at least to correct the level and trend of the existing spendable weekly earnings figures. The BLS began in 1979 to collect survey data on "usual weekly earnings" every month, but will release only quarterly figures. The first release, covering the four quarters of 1979, was issued in March 1980 but referred only to gross earnings for various types of family, not to spendable earnings. A calculation of spendable earnings from these figures (Table 18-4) shows the same enormous discrepancy that we have already seen from the annual earnings data.

The National Commission on Employment and Unemployment Statistics has recommended that the BLS develop a spendable earnings series on a quarterly basis from the survey data on usual weekly earnings and drop the monthly series.[9] An alternative, namely to benchmark the monthly series to another series that is more accurately defined, might be considered. One such benchmark is provided by the 1972-1973 survey of consumer expenditures which is currently used as the weight base for the consumer price index for urban wage earners and clerical workers. The survey covered income as well as expenditures, reported income after taxes, tabulated wage and sal-

Table 18-4. Three Estimates of Spendable Weekly Earnings, 1979.

	Gross Earnings (Current Dollars per Week)	*Spendable Earnings*		
		Current Dollars per Week	*1967 Dollars per Week*	*1967 Dollars per Year*
Estimated average weekly earnings of:				
Production or nonsupervisory workers on private nonfarm payrolls, married worker with three dependents	220	195	89	4,628
Reported median usual weekly earnings of:				
Full-time wage and salary earners (husbands)	324	273	125	6,500
Married couple, families with one earner (husband)	322	272	125	6,500

Source: U.S. Bureau of Labor Statistics, except that the spendable usual weekly earnings were calculated by the author using the BLS formula for married workers with three dependents.

ary earnings separately from other income, classified families by size and type, and calculated mean earnings rather than medians.

Table 18-5 shows the 1972-1973 survey figures for husband-and-wife families with children, from which we have derived average weekly earnings after taxes. They compare as follows with the average of the monthly series for 1972-1973:

	Urban and Rural Husband-Wife Families with Children	*Private Nonfarm Production and Nonsupervisory, Married Worker with Three Dependents*
Before taxes		
In current dollars	$239	$141
In 1967 dollars	185	109
After taxes		
In current dollars	202	125
In 1967 dollars	156	96

The monthly series in 1972-1973 was running at a level about 40 percent below the survey figures for approximately the same type of family. The coverage of course is not identical, since rural and farm

Table 18-5. Spendable Earnings from the Consumer Expenditure Survey, 1972-1973.

Urban and rural families	
Husband and wife, with children (number)	28,433,000
Other husband-and-wife families (number)	19,403,000
One-parent, single-person, and other families (number)	23,383,000
Total	71,220,000
Husband-and-wife families, with children:	
Average family size (number of persons)	4.2
Average age of family head (years)	41
Average family income	
Annually before taxes ($)	15,192
Annually after taxes ($)	12,835
Effective tax rate (%)	15.5
Average money wages and salaries, civilians	
Annually, before taxes (current $)	12,420
Weekly, before taxes (current $)	239
Annually, before taxes (1967 $)[a]	9,613
Weekly, before taxes (1967 $)[a]	185
Annually, after taxes (current $)[b]	10,495
Weekly, after taxes (current $)[b]	202
Annually, after taxes (1967 $)[a]	8,123
Weekly, after taxes (1967 $)[a]	156

[a] Calculated by dividing current dollar figure by the average consumer price index (1967 = 100) for 1972 and 1973 (129.2).

[b] Estimated by applying effective tax rate on total income to money wages and salaries.

Source: U.S. Bureau of Labor Statistics, *Consumer Expenditure Survey: Integrated Diary and Interview Survey Data, 1972-73*, Bulletin 1992, table 10.

families are included in the survey as well as families with more or fewer children, and the survey covers government employees, supervisory, and self-employed individuals. No doubt it would be possible to derive more nearly comparable tabulations from the survey data, covering urban residents only and omitting professionals and managers and the self-employed, and hence obtain a better benchmark for the monthly series. This would correct its level, which is one of its major deficiencies. To correct the trend would require additional benchmarks. Perhaps the recently started quarterly survey of consumer expenditures will provide earnings data for this purpose.

We have by no means exhausted the subject of the effect of inflation on our statistical intelligence system. Inflation has produced the anomaly of a trade balance that is in deficit when expressed in current dollars but in surplus when expressed in constant dollars. Inflation has produced confusing differences in the behavior of measures of output that are derived from physical quantity data as compared

with those derived by adjusting value data for price changes. These differences, in turn, have produced uncertainty about the accuracy of measures of productivity.[10] Inflation has made it more difficult to interpret the unemployment rate by forcing many who would not otherwise be in the labor market to seek jobs. Their actions have increased both the number employed and the number unemployed and changed the nature of unemployment, since more are seeking part-time or temporary jobs.

Inflation has made an enormous difference in the level of profits reported to stockholders and the level of profits reported in the national accounts. Inflation has increased the divergence between different measures of the money supply, because it has changed the profitability of holding various types of "money." Inflation has made it more difficult to measure the nominal level of interest rates (because of the wider spread among different rates) and more important to measure the "real" level of interest rates.

Inflation is a number one statistical problem. Now more than ever we need a watchdog commission or agency with a continuing responsibility to uncover perplexing discrepancies in economic data, explain their significance to users of statistics, recommend solutions, and follow up on their implementation.

NOTES TO CHAPTER 18

1. A hypothetical example may clarify this point. Suppose a family buys only two commodities, beef and chicken, paying two dollars a pound for beef and one dollar for chicken, and buys a ten pounds of each in period 1. In period 2 the price of beef goes to three dollars whereas the price of chicken remains the same, and the family decides that in the new circumstances it would be just as well off as before by buying somewhat less beef (say, eight pounds) and a good deal more chicken (say, fifteen pounds). The increase in the total number of pounds of meat purchased (from twenty to twenty-three) compensates for the fact that the mix is a less desirable one. The family's expenditures rise from thirty dollars in period 1 to thirty-nine dollars in period 2. How much have prices increased?

Using the CPI method, prices in period 2 are weighted by period 1 weights, in which case the bill in period 2 would come to forty dollars (thirty dollars for beef and ten dollars for chicken). The CPI index would be 40/30 or 133. Using the PCE deflator method, prices in period 1 would be weighted by period 2 weights, and the bill in period 1 would come to thirty-one dollars (sixteen dollars for beef and fifteen dollars for chicken). The PCE index would be 39/31 or 126. Since we have assumed the family in fact adjusted its purchases so as to feel equally well off in the two periods, the true cost of living index is measured by the actual change in what they spent, namely 39/30 or 130. The CPI shows a larger increase than this, the PCE a smaller increase.

Note that we have simplified the example by assuming that the family bought a market basket of equal worth in both periods. Actual expenditures can, of course, change in other ways, in which case the true cost-of-living index corresponding to the basket purchased in period 1 may differ from that corresponding to the basket purchased in period 2. If the latter index exceeds the former, the PCE might exceed the CPI.

2. In addition to the two indexes shown in Table 18-2, the Commerce Department also constructs a PCE chain-price index, which holds the quantity weights constant between adjacent quarters.

3. Rafael Rom Weston, "The Quality of Housing in the United States, 1929-1970," Ph.D. dissertation, Harvard University, 1972.

4. James R. Follain and Stephen Malpezzi, *Dissecting Housing Value and Rent: Estimates of Hedonic Indexes for Thirty-Nine Large SMSA's*, Report 249-17 (Washington, D.C.: Urban Institute, 1979), tables 20 and 21.

5. In 1979 it produced a slightly less rapidly rising index (compare columns 7 and 9 of Table 18-3). This illustrates one of the anomalies of deflators, due to the changing weights. The real volume of residential construction expenditures declined during 1979, so that despite the fact that construction costs rose more rapidly than the PCE deflator, the combined deflator rose *less* rapidly. With changing quantity weights an index can rise less rapidly (or more rapidly) than any of its components—a possibility that surely would create credibility problems.

6. For an illuminating review of these issues, see Jack E. Triplett, "The Measurement of Inflation: A Survey of Research on the Accuracy of Price Indexes," in Paul H. Earl, ed., *Analysis of Inflation* (Lexington, Mass.: D.C. Heath, 1975).

7. The effect can be shown by the following calculation based upon the "usual weekly earnings" reported in the Current Population Survey in May of each year. In May 1978 the median weekly earnings of 12,473,000 part-time workers was $61. The median for 53,775,000 full-time workers was $195. The mean earnings for each group are not reported but can be calculated approximately from the distributions by amount of earnings. They are $75 and $265 respectively. The mean for both groups combined is $229. This calculation not only shows the effect of averaging part-timers with full-timers but also the difference between means and medians. The median full-time earnings ($195) is 26 percent lower than the mean ($265). For the basic data see Janice Hedges and Earl Mellor, "Weekly and Hourly Earnings of U.S. Workers, 1967-1978," *Monthly Labor Review* (August 1979): 32-34.

8. The other factors include the entrance into the labor force of the "baby boom" generation of the late 1940s and 1950s and of women pursuing career opportunities. See Paul M. Ryscavage, "Two Divergent Measures of Purchasing Power," *Monthly Labor Review* (August 1979).

9. National Commission on Employment and Unemployment Statistics, *Counting the Labor Force* (Washington, D.C., 1979), pp. 206-208. The BLS did discontinue the monthly series after December 1981. See Paul O. Flaim, "The Spendable Earnings Series: Has It Outlived Its Usefulness?" *Monthly Labor Review* (January 1982).

10. See L. J. Fulco, "Productivity Reports," *Monthly Labor Review* (February 1979): 43; George Terborgh, "A Quizzical Look at Productivity Statistics," *Capital Goods Review of the Machinery and Allied Products Institute* (August 1979); and Joel Popkin, "A Comparison of BEA and FRB Measures of Industry Output," in National Research Council Panel to Review Productivity Statistics, *Measurement and Interpretation of Productivity* (Washington, D.C.: National Academy of Sciences, 1979).