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Escalation Measures: What is the Answer? What is the Question?

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ESCALATION MEASURES: WHAT IS THE ANSWER?

WHAT IS THE QUESTION?

BY JACK E. TRIPLETT*

Introduction and Abstract

Economists generally believe that a cost-of-living index is the appropriate measure for escalation purposes, a professional judgment that is documented in--to take examples covering a span of two plus decades--the 1961 report of the Price Statistics Review Committee (Stigler Committee) and the 1982 Price Measurement Review Program Consultations Feedback Report of Statistics Canada. Economists who are specialists in index number theory as well as economists who are primarily users of index numbers for research and policy analysis share this opinion.

This paper challenges this view. Escalation, whether in public or private sectors, seldom implies sets of circumstances that correspond to those on which the cost-of-living index has traditionally been defined.

Section I reviews the cost-of-living index concept, emphasizing the multiplicity of measures that the general concept implies. The cost-of-living index is an answer to an economic question, of the general form: "What is the minimum change in an economic variable that would be required in order to leave a specified individual consuming unit indifferent between pre- and post-inflationary states?" It has sometimes not been recognized that the literature encompasses a whole family of cost-of-living indexes, which vary with the "economic variable" on which

the index is defined (e.g., "expenditure," "pre-tax income", "wealth"). Each of these alternative definitions can be thought of as the answer to an economically meaningful question. Thus, there are many cost-of-living index answers to many cost-of-living questions. Each question can be thought of in terms of a compensation for inflation, and each cost-of-living index is an answer that provides an appropriate measurement for some purpose. Section I of the paper discusses these alternative definitions of a cost-of-living index.

Escalation of collective bargaining agreements, divorce settlements, social security payments, and so forth is also frequently interpreted as requiring a measure that will compensate for inflation, and this interpretation is sometimes correct. Section II of the paper points out, however, that even when the escalation objective is inflation compensation, the question implied by escalation seldom corresponds to the compensation question that is inherent in any of the traditional cost-of-living index formulations. That is perhaps one reason why participants in escalation arrangements seem uninterested in the economists' concept of the cost-of-living index. The paper develops one cost-of-living like price measure that is relevant to escalation, and discusses the problems of formulating and estimating an "escalation index."

The final section of the paper notes that the objective sought in some prominent escalation situations, such as the escalation of social security payments in the U.S., has not been specified clearly. To put it another way, what is the precise question for which an answer is being sought? Because price measures have been employed for escalation, the presumption has been created that the objective of these escalation arrangements is

inflation-protection; yet, much of the public discussion of (one is tempted to say "public dissatisfaction with") the outcome of escalation suggests issues involving the determination of equity in real incomes. This implies alternative economic questions and alternative economic measurements to the cost-of-living index concept on which so much of the discussion has focussed. The final section of the paper discusses the formulation of escalation objectives and the specification of measures--primarily of wages and incomes--that would meet alternative objectives in escalation arrangements.

I. Cost-of-Living Questions and Cost-of-Living Indexes.

The development of the cost-of-living index concept occurred largely because of a need to make precise the questions that a price index was to answer. Starting with the original formulation by A. Konus in the 1920's, the idea has gradually spread to become a standard part of the economists' intellectual tool kit, and a favorite artifact of textbooks in microeconomic theory.

The very universality of the COL concept, however, cloaks the fact that economists use the term "cost-of-living index" (hereafter, "COL index") in slightly different ways. Until the last decade or so, most of the literature was written as if there were but one theoretical COL index and that it provided the "true" index against which approximations such as the Consumer Price Index (CPI) were to be assessed. On this view, if the usual textbook presentation--usually cast in an indifference curve-budget constraint diagram--was conceded to be oversimplified, removing the oversimplifications was still presumed to leave one generally accepted COL index definition.

The COL index concept is usefully thought of as framing an economic question (to which the COL index itself is the answer). That question is usually phrased in a manner similar to the following (the language is adapted from Samuelson and Swamy, 1974, page 567): "What is the ratio of the (minimum) costs of a given level of living in two price situations?"

Once attention is drawn to what one might call the "COL question," it is apparent that there is a family of precisely-stated questions, not just one. As there are many appropriate COL questions, there are in consequence many appropriate formulations of a COL index, not just a single one. In a way this is not surprising, for one of the oldest adages of index numbers holds that the design of the index depends on its purpose. One can distinguish at least the following family members.

Expenditure-defined COL index. The most frequently used (and most straightforward) COL index is the formulation that answers the question: "What ratio of expenditures is required to maintain a fixed living standard in two price regimes?" This formulation may be termed the "expenditure-defined" COL index.

It is well known that the question underlying the expenditure-defined COL index can be framed from a variety of perspectives, according to which living standard is to be held fixed. What one might refer to as a "Laspeyres-perspective" expenditure-defined COL index takes as the basis for forming the expenditure ratio the base, or "reference", period living standard--that is, following Pollak, 1971, the reference-period preference function and the indifference curve attained in that period. An alternative is the "Paasche-perspective" expenditure-defined COL index that is based on the current, or "comparison," period living standard. Pollak,

1971, points out that other living standards may also be relevant--e.g., the change in the cost of the 1972 living standard between the years 1979 and 1982, or the cost of a U.S. living standard in Norway and Egypt. Because both intertemporal and interarea COL indexes are normally wanted for three or more periods or places, and not just for the two-period comparisons encountered in textbooks, this point has greater significance for price index theory than is sometimes recognized.

Much of the content of traditional price index theory concerns the effects on the measurement of what the previous paragraph has termed the "perspective." As these topics are adequately treated elsewhere in this conference, there is no need to explore them here. Two points, only, must be made, not because either is new but only because they seem so widely misunderstood.

First, various alternative perspectives all give equally valid measures. They deal with subtly different questions, and apply to subtly different uses. If one wants to compare (say) 1972 and 1982 prices, and if it were true (as often alleged) that the market basket for 1982 is far different from that of 1972, or that 1972 and 1982 correspond to different living standards, this would not automatically mean that the 1982 perspective was always preferred to the 1972 perspective--it depends on the uses and the questions asked. This point deserves emphasis because it has so frequently been misunderstood.¹

Second, the "two price regimes" mentioned in the cost-of-living question consist of the relevant market prices prevailing in the two periods being compared, and not those of some other periods. That is, a COL index for the current month (or current year) depends on market prices

prevailing this month (or this year), plus those of the reference period, and not those contracted for at some other period. The force of this part of the COL index definition applies mainly to durable goods. One often hears statements such as the "COL index for persons who own their own homes (or refrigerators or cars) would not reflect current house prices (or refrigerator prices or car prices), because current price movements do not affect that person's payments for durable goods acquired in some previous period" (for an example, see Kahn, 1980). Such statements reflect failure to recognize that it is the consumption of the services of durable goods that matters in a COL index, and not the acquisition of the durable good itself (a distinction that has prevailed in the analysis of consumer demand at least since the publication of Harberger 1960), combined with failure to understand that current opportunity cost, and not historical replacement cost, defines the consumer's opportunity set (though there are, to be sure, ambiguities for the measurement of one-period cost levels that are discussed in Muth 1974 and Pollak 1975a).

The expenditure-defined COL index is the workhorse model for empirical estimates. The U.S. Consumer Price Index is an approximation to the expenditure-defined COL index.² The expenditure-defined COL index is also the model that has been employed for all empirical COL indexes that have been based on estimated sets of consumer demand relations (see, for example, Braithwait 1980; Christensen and Manser, 1976; Manser, 1975; Goldberger and Gameletsos, 1971).

Using the expenditure-defined COL model was a natural choice for empirical COL index estimation, since nearly all research in consumer demand systems has used total expenditures, rather than "income," as the

consumer's budget constraint (see the survey by Brown and Deaton, 1972, or Philips, 1974, or Deaton and Muellbauer, 1980). In part, this research strategy reflects a decision to avoid intertemporal decisions inherent when saving is admitted into the consumer's decision-making problem, complications that are usually deemed tangential when the research focus is on the allocation among goods for current consumption; and in part it reflects the reality that available survey data on expenditures are usually considered more reliable than those on saving and income. These same considerations-- avoidance or minimization of certain technical difficulties, and the desire to erect the estimates on the firmer part of available consumption data-- lie behind the decision to employ the expenditure-based COL index model for the CPI.

This "defense" of the expenditure-defined COL index is necessary because it is plainly the most limiting of the family of COL indexes. That both economic researchers and statistical agencies have stuck with the expenditure-defined concept despite the attractiveness of the alternatives says a good deal about its homely virtues.

Income-defined COL Index. This COL index gives the answer to the question: "What ratio of (pre-tax)³ incomes would be required to maintain a fixed standard of living in two price regimes?" As with the expenditure-defined COL, there are alternative perspectives corresponding to the living standard that is used for the comparison, and different perspectives may produce different measures. The income-defined COL also uses as data market prices for the two periods under consideration, as does the expenditure-defined COL.

An income-defined COL index would differ from an expenditure-defined

COL index in a number of ways. One important difference is in the treatment of income and payroll taxes. In an expenditure-defined COL index (and in the CPI, which is its approximation) an increase in these taxes does not affect the index, though a change in excise or sales taxes does. This gives rise to anomalies if one form of tax is substituted for the other. The income-defined COL index has the advantage that it would not be affected by the mix of income and sales taxes, but only by their combined amount.

An income-defined COL index has been considered preferable to an expenditure-defined index for many purposes. It has been argued, for example (see Cagan and Moore, 1981) that an income-defined COL is more appropriate for escalation use, on the grounds that the entity being escalated is an income source, and not a measure of consumer expenditure (in section II, we examine these grounds).

However, the CPI's of most countries approximate an expenditure-defined COL index and not an income-defined one. And even research estimates of an income-based COL index concept are infrequent (see the Gillingham and Greenlees paper presented at this conference). Two attributes of the income-defined COL account for its rarity.

First, the income-based COL would rise with an increase in (say) individual Social Security payroll taxes, even if there were no change in any price in the economy. For some purposes, this would prove objectionable. Second, the concept of income, though seemingly simple at first glance, is notoriously difficult to define and measure in economic terms, and as a concept merges into lifetime wealth without a clear demarkation;⁴ thus the greater apparent usefulness of the income-based COL is offset by

formidable measurement problems in practice. Additional discussion of the income-defined COL index is in Gillingham and Greenlees (1982).

The Non-market Commodities COL index. Implicitly, the COL indexes discussed previously were defined on goods and services acquired through the market (or that could be acquired through markets--as for example, imputation in the U.S. CPI of the value of home-grown food, and beginning in 1983, of the rental value of owner-occupied housing). The standard of living may also depend on the level of services provided by the government, and on aspects of living such as pollution. Once this distinction is recognized, then the numerator of the expenditure-defined COL index discussed above should be re-phrased to answer the question: "What is the cost, at today's market prices, of a bundle of market-purchased goods and services equivalent to the bundle consumed in the base period?" Analogous re-phrasing can also be made for the income-defined COL index.

The "non-market commodities COL index" is a more comprehensive COL concept, dealing with the question: "What change in cost (alternatively, what change in income) is required to maintain the base-period's living standard, considering privately-provided goods and services, and also free government services, the effects of pollution, and so forth?" As the alternative wording of the COL question makes clear, a complete taxonomy of the family of COL indexes would include both expenditure-defined and income-defined variants of the non-market commodities COL index, and the varying perspectives that were discussed in the previous sections also arise on this definition.

Since the non-market commodities COL index encompasses on a more comprehensive set of consumption commodities than was the case for the regular expenditure-defined and income-defined COL indexes discussed earlier, each of the latter is a "sub-index" (in the sense of Pollak, 1975b) of the relevant version of the non-market commodities COL index. The theoretical discussion of sub-indexes (see also Blackorby and Russell, 1978) can be expected to apply to the relationship between the sub-indexes for market-purchased commodities and the more comprehensive index.

There can be no doubt of the relevance and usefulness of the non-market commodities COL index. The empirical barriers to estimating it, however, are formidable, because it requires consumer valuations of non-market commodities (the "value of clean air").

Some research on this topic has been carried out. Several years ago the BLS explored the possibilities in the "median-voter" literature and some alternative approaches, but we concluded that information that could be extracted from these approaches did not satisfy the requirements of a COL index (see Cobb, Barkume and Shapiro, 1978, and Shapiro and Smith, 1981). I should note also that the extensive literature using hedonic methods to estimate the "demand" for neighborhood amenities (including pollution) is defective for our purposes (indeed, for most purposes), for the methodological reasons outlined in Brown, 1983 and Triplett, 1983. So far, empirical estimation of any form of the non-market commodities COL index has proven intractable.

The narrower COL indexes (as, for example, the expenditure-defined COL index) may pick up some of the consumer costs of changes in non-market commodities. For example, if an increase in air pollution causes an

increase in medical expenditures because of respiratory illness, part of the consequences of air pollution would show up in the normal expenditure-defined COL index. But for this measure to provide a correct estimate of the value of the non-market commodities COL index would be fortuitous and unlikely. Similarly, it has sometimes been argued that the cost of putting smog control devices on automobiles (which has clearly increased the price of cars and the cost of automobile transportation, and therefore the expenditure-defined COL index) ought to be adjusted out of a COL index because the value of cleaner air provides an offset to the increased private cost of transportation. Note that this suggestion is incorrect if the expenditure-defined COL index is the subject of discussion; and if the non-market commodities COL index is the one that is wanted, then the proposal will approximate the correct movement in that index only if smog regulations are chosen so that the marginal cost of smog abatement equals the incremental valuation on clean air. That this is an appropriate principle for regulation does not mean that it has been met in practice.

The preceding was somewhat of a digression from the main line of the argument, and was intended to illustrate the formidable information requirements of the non-market commodities COL index, and clarify the relations among the various COL index concepts (on which there has been much confusion). At present, I know of no empirical estimate of a COL index including non-market commodities.

Wealth-defined COL index. A COL index based on a wealth measure has been suggested by Alchian and Klein (1971), the objective being to bring assets and changes in asset values into the COL analysis. This idea seems

appealing; for one thing, permanent income is a wealth concept, and other income concepts prove slippery or not economically relevant. Explicitly defining the COL index measurement on wealth is a way of cutting through to the essentials. In addition, the wealth concept gets away from the one-period decision-making mode that underlies other COL indexes.

An alternative approach to introducing inter-temporal decision-making into the theory of the COL index is Pollak (1975a). Pollak's approach shows that, far from making the measurement easier, moving to a multi-period setting makes it far more difficult. Discussion of these problems in the present paper takes us too far afield.

Partial-income COL index. So far, each successive member of the family of COL indexes has widened the variable on which the index is defined. One can also usefully consider going the other way. This approach is inspired by Pencavel (1977), who sought to determine the minimum change in a single price in the consumer demand system that would be sufficient to compensate for the net effect of changes in the other prices. Pencavel's objective was to make the analysis apply to an individual who was a consumer of all commodities, but a seller of one.

For present purposes, we can alter this approach a bit by supposing only that an individual has two (or more) sources of income ($I_T = I_A + I_B$). Then we may ask the question: "What change in I_A is required to achieve a total income (I_T) that maintains the base-period living standard?" The resulting "partial-income COL index," being the escalation of I_A required to hold utility constant, obviously depends on what has happened to I_B . This measure would probably not normally be properly thought of as a COL index at all, but it does provide a form of escalator, which is one use

often proposed for a COL index. The partial-income COL index is the appropriate escalator for situations in which only a portion of income is escalated and the purpose of the escalation is to maintain living standards. We return to this measurement concept in Part II.

Summary. This taxonomy of COL indexes is doubtless not complete, but that is not the intention. The variety of COL indexes that can be produced (expenditure-defined, income-defined, non-market commodities, wealth-defined, and partial-income were the names given to the five concepts discussed) correspond to different versions of the question for which the COL index is conceived as the answer. Though some of these questions are more interesting and meaningful than others, there is generally a trade-off between comprehensiveness and practicality in making a COL index measurement. The following sections consider the use of the COL index concepts discussed in this section as escalation measures.

Comment. It is often said that the CPI "is not a COL index" because the latter would account for factors such as income taxes, pollution and government services and so forth that are omitted from the CPI (see, for one such statement, Cagan and Moore, 1981, page 1). The discussion in this section specifies the precise sense that such statements are true: They are correct if the broader definitions of a COL index (the income-defined COL index or the non-market commodities COL index) are meant. However, the CPI is not deficient in these elements with respect to the expenditure-defined COL index, which provides its theoretical underpinnings. A more precise and less confusing way of putting the matter would be to say that an expenditure-defined COL index omits factors such as income taxes,

government services and so forth, whose inclusion in a COL index would be useful for many purposes. Because I believe the expenditure-defined COL index is also relevant and useful for some purposes (especially as a design for an analytic inflation measure--but that is beyond the scope of the present paper), one should avoid confusing the choice of the COL question that one wants to answer (which implies the definition of the COL index that one wants to compute) with the issue of how well the CPI approximates its own COL index concept. Both are important matters; but they are distinctly different ones.

II. Escalation or "Indexing" Issues and Escalation Measures.

In 1970, benefits of programs that accounted for roughly 3 percent of U.S. Federal government outlays were tied to the Consumer Price Index. During the following decade more and more government programs were "indexed", and by 1980 this proportion had risen to 30 percent. It should be noted that this great percentage increase reflects not so much growth in programs that are indexed (though that has occurred) but rather growth in the number of programs that make use of indexing (see appendix A of DeMilner, 1981, or Table 4 of Goldfeld-Ooms, 1981). In Canada [insert material here].

Private sector use of the Consumer Price Index as an escalator in collective bargaining agreements has fluctuated with the rate of inflation in the post-war period; in the 1970's, the number of workers covered by escalator clauses expanded as the rate of inflation increased. Few private

sector collective bargaining agreements provide for 100 percent escalation, and the data available suggest that the escalator yield as a proportion of the CPI is an inverse function of the CPI's rate of change (see Cagan and Moore, 1981, Table 2). One should note that at least one collective bargaining agreement (that of the United Auto Workers) uses an average of the U.S. and Canadian CPI's.

Outside the traditional collective bargaining use, escalation in private sector agreements has also grown greatly in recent years. Though I know of no concrete data to indicate the degree of usage, fragmentary information in the BLS (frequently, a letter of inquiry occasioned by a dispute in interpreting an often unclearly written agreement) indicates that divorce settlements, rental agreements, and so forth have increasingly been tied to the Consumer Price Index. A novel and perplexing use of the CPI was the U.S. Financial Accounting Board's decision that the index should be used for deflating data in corporate financial statements in order to get a profit measure that was not distorted by inflation.

[Insert material on private sector uses in Canada.]

What is the purpose of escalation or indexing of income payments in private contracts and government transfer programs? What is the appropriate measure for use in such arrangements?

In response to the first question, most people would answer that the objective was to protect workers and benefit recipients from inflation. And given the answer to the first question, economists invariably respond that the cost-of-living index is the appropriate measure for that purpose.

Considering particular cases of escalation leads me to challenge that "inflation protection" answer to the first question. The answers that people give to questions about the motivation of their economic behavior characteristically suggests behavior different from what is actually observed. I believe the "inflation protection" answer is, though not necessarily wrong, quite incomplete.

But let me put aside the first question until Section III, and consider for the moment only the second question ("What is the appropriate escalation measure?"), as if the answer to the first question were indeed only "inflation protection." "Protection" against inflation implies compensation. The COL question can be thought of in similar terms--i.e., What change in some economic variable is necessary to compensate for inflation? The issue, then, is whether the variable that is being escalated corresponds to the variable on which some member of the family of COL indexes is defined.

Of the list of COL indexes described in Section I, it is immediately evident that most are defined on variables that differ from the ones chosen for actual escalation situations. We have already noted Cagan and Moore's contention that the expenditure-defined COL index (or its CPI approximation) is inappropriate for escalation because no known escalator is applied to consumer expenditures: "It [the index] covers only consumption expenditures and not the part of income that is taxed or saved, whereas escalation is directed to income without regard to its disposition" (Cagan and Moore, 1981, p. 1).

But do we in many actual situations escalate income? There may be a few cases in which this is done, but the most prominent escalation cases

cannot be so interpreted. For example, the average (or "representative", to follow the conventions of price index theory) Social Security recipient has some form of income other than Social Security payments. That means we are escalating a portion of income, and not all of it. And perhaps some workers who are covered by cost-of-living escalator clauses under collective bargaining agreements have only income from wage and salary earnings under those agreements. But not all do, and a very large proportion of workers do not fall in the single-source-of-income class if we consider how conventional it is to view owner-occupied housing as producing an imputed income in kind. In all these cases total income is not the variable being escalated, and therefore the income-defined COL index is not the escalator that will leave the individual exactly compensated for inflation. That is, if the income-defined COL were applied as an escalator to a particular payment stream, the resulting total income would not in general equal the income that would keep the individual consuming unit on a fixed indifference curve.

When the particular stream of payments being escalated is only a portion of income, and the objective of escalation is to protect the real living standard, then the partial-income COL index is the appropriate escalator. This index would escalate (say) Social Security benefits by an amount just sufficient to maintain the total real income of the average recipient, after accounting for changes in the recipient's other sources of income (including imputed income from owner-occupied housing).

Yet, there is something unsatisfactory about proposing the partial-income COL index as an escalator. It seems doubtful if Congress,

employers, workers or Social Security recipients would find satisfactory an escalator that made compensation for services under collective bargaining contracts, or the level of Social Security benefits, depend on what happens to other income sources--as does the partial-income COL index. Though the partial-income COL index gives the precise answer to the relevant compensation question, perhaps this degree of precision is not what was wanted or is not understood. As Paul Samuelson and S. Swamy (1974, p. 587) remarked in a similar context, "Probably, though, one should not try to read anything so definite into people's vague notions of equity."

And one should also recognize that it is not always certain that "maintaining living standards" is precisely the meaning of "inflation protection." One frequently hears statements such as: "The purpose of escalating benefits is to maintain the purchasing power of benefit payments, or to maintain the standard of living," where it is clear from the context that the speaker is under the presumption that these are alternative expressions for the same thing. Where full income is being escalated, they of course are. But where the benefit payment is only a portion of total income, "maintaining the purchasing power of benefits" is not the same thing as "maintaining the standard of living"--they are different objectives, they imply different escalators, and a choice must be made between them.

In the case under discussion, "maintaining the standard of living" is a precisely-defined objective that implies the use of the partial-income COL index. "Maintaining the purchasing power of benefit payments" presumably implies that the benefits being escalated should command a

constant level of real goods and services--presumably consumption, but sometimes this is not entirely clear--irrespective of the command over goods and services that accrues to total income. For "maintaining purchasing power," the expenditures-defined COL index, its fixed-weight approximation, or some other measure, may be suitable. It is evident that the partial-income COL index, reflecting as it does the movement of other income sources, could hardly be interpreted as "maintaining the purchasing power of benefits."

In summary, the COL index concept, seemingly so precise and theoretically appropriate, does not in any of its several forms match the variables that are known to be escalated in actual situations, save for the one version (the partial-income COL index) whose properties (mainly, its dependence on other income sources) make it fairly clear, I think, that this is not generally what is wanted. That brings us back to the question that led off this section: What is the purpose of escalation? We turn to this matter in Section III.

Before leaving the present topic, however, it is advisable to consider briefly one or two arguments that have been raised in the context of escalators as inflation protection. [Add material on the arguments (1) that escalator measures should reflect only inflation "caused" by monetary policy and not that "caused" by relative price changes and (2) that they should measure only inflation "caused" by domestic sources and not inflation that is imported.]

III. Matching the Purpose of Escalation with the Design of an Escalator

We now consider the logically prior question: "What is the purpose of escalation?" I freely concede that I do not know the answer to this question with any degree of certainty. This section does not so much propose an answer or answers, but seeks to highlight the question. Much of the recent search for "answers" to the problems posed by "indexing" (of Social Security payments, for example) has taken place without sufficient attention to the questions for which answers are being sought.

It is clear that whatever the purpose people had in mind in entering into escalation arrangements, much dissatisfaction with the results developed during the peak inflation years of 1979-1980. Escalation and indexing arrangements were felt to cost too much, and indeed payments under escalators did rise steeply and in many cases unexpectedly. Not surprisingly, the situation led many to challenge the validity of the price measure (usually the CPI) used as an escalator--see for example, U.S. Congress, Hearings, 1980, or Statistics Canada Price Measurement Consultation Feedback Report, 1982. The accuracy of the CPI as an inflation measure, or as an approximation to a cost-of-living index, is of course a legitimate question, but one that will not be considered in the present paper, because the issues have been adequately covered elsewhere (in Triplett 1982 I reviewed three studies of the U.S. CPI that were commissioned at the height of concern over indexing).

But even though much of the dissatisfaction with the outcome of indexing has been directed toward the escalating index, many of the

issues raised suggest that the speaker has in mind an objective that does not match the purposes of the CPI or of a cost-of-living index. Examining carefully some of these complaints, even though perhaps misdirected, can tell us a good deal about what is desired in the situations for which indexing has been employed, and thereby lead to better specifications for measurement.

Lowering Contracting Costs. It has become a commonplace observation that when Congress tied U.S. Social Security benefits to the CPI, its objective was to lower the rate of increase in per person benefits. The evidence suggests that it succeeded. Goldfeld-Ooms (1981) present data indicating that the increase in Social Security benefits per recipient rose more rapidly than the CPI in the decade before "indexing" was adopted in 1975; but per recipient benefits have risen more slowly than the CPI since that time, so that real benefits per recipient dropped 5 percent between 1975 and 1981.⁵ A major objective behind the decision to use escalation in Social Security benefits was to get an emotional and politically explosive issue out of the legislative arena.

A similar point can be made about collective bargaining agreements. Are employers and unions attempting only to assure that workers' real incomes are precisely protected from inflation? Or is the foremost objective to remove from the collective bargaining table an emotionally-loaded and difficult and expensive-to-negotiate issue?⁶ Reducing the cost of bargaining may be as strong a motivation as the explicit and exact protection of the workers' standards of living. This in turns suggests

that because there are multiple objectives to be met in an escalator clause, precise definition of the cost-of-living index to be used in the contract becomes of second-order importance.

Of course, one might object that the workers would only agree to remove the inflation issue from the bargaining table if they were fully protected; but even if this were true of workers, an escalator clause puts management in the position of speculating on the course of the CPI. Putting an upper limit on losses from such speculation is one reason why collective bargaining agreements typically do not provide 100 percent pass through of the CPI rate of change. It may also be one reason why no party to a contract agreement, so far as I can determine, has ever specified that the economist's concept of a COL index is wanted, even when the distinction between a fixed-weight price index and a COL index has been described to them--and the workers, judging from positions taken by their representatives, strongly dissent from the idea that any COL index is relevant to collective bargaining (see Oswald, 1980). Unless contracting parties are not acting in their own interests (which I doubt), we should probably pay more attention to what motivates the adoption of an escalator clause in determining the statistical formulation that is appropriate.⁷

Income-Equity Issues. One characteristic of recent criticism of indexing is its focus on what has happened to the incomes of the population that receives indexed payments. As Cagan and Moore, 1981, put it, the indexed population is insulated from "price changes that reflect a change in the standard of living of the entire population" (p.3). Thus, if a price increase in imported oil leads to a fall in national income, the larger is the protected, indexed part of the population, the larger the decline in

real income that must be taken by the non-indexed population. Of course, if the entire population were indexed, the situation would be disastrous.⁸

Reaction to what many thought was "petro-inflation" in the U.S. and Canada has resulted in suggestions for a measure of "domestic inflation" as a remedy for what many people regard as the over-adjustment of recipient incomes from use of presently available price measures (see the Statistics Canada Price Measurement Consultation Feedback Report). Cagan and Moore, 1981, propose (page 3) that the CPI be adjusted by the ratio of U.S. export and import prices, so long as the rate of price change exceeds the rate wage change.

I have reservations about whether one can really distinguish "imported" and "domestic" inflation. Aside from this, however, is a more basic reservation: The problem complained of concerns equity in the distribution of real income. If distributional equity is the goal that is not being met, the solution is to assure that the incomes of the recipient population change with the incomes of the remainder of the population (e.g., for Social Security beneficiaries, to tie benefits to a measure of wages). Trying to pursue equity in the distribution of real income by devising some adjustment to the deflator for income (the CPI) is not only an exceedingly cumbersome approach, it confuses the objective of equitable growth in real income with that of inflation protection (which means constant real income)--these are two different objectives that cannot be met with the same indexing arrangements.⁹

On the other hand, linking growth in individual retired incomes to the growth in per-capita incomes of workers may well be infeasible if the proportion of beneficiaries in the population rises. This is a very real

threat to the U.S. retirement system because of the population bulge of 30-40 year old workers now moving its way through the demographic structure. This suggests a different objective: That the share of national income going to the total beneficiary population be limited at some level, lest the tax burden on the working population reduce incentives to the point that it affects productivity growth. Alternatively, if the rationale underlying a Social Security system that pays out to the average beneficiary more than the actuarial value of his payments into the fund is that such a system shares current productivity gains with the retired population, then one cannot tolerate a beneficiary scheme that threatens these productivity gains.

Either way of looking at the problem suggest an alternative scheme in place of current indexing methods--an indexing proposal that constrains payments to beneficiaries so that the share of national income to Social Security recipients be held below some ceiling, perhaps by a formula that sets payments to each beneficiary on the basis of wages, adjusted by the share of the per capita productivity dividend that is to be allocated to the total retired population (and the latter could produce a negative adjustment for individual retirees payments if the growth rate of the retired population exceeds the growth rate of productivity).

These are intended as illustrative examples, and not a thorough analysis. They do illustrate the proposition that thinking through the goals to be met by a situation in which indexing is proposed leads to a more precise definition of the question that indexing is to answer. Once the question has been refined, the development of a measure that would answer the question is a technical task. To be sure, the formulation of

objectives is by far the most difficult task, and it is not entirely an economic one. Much of the recent debate over indexing seems preoccupied with finding some narrow technical measure that would obviate the necessity for making the difficult choices that society must make. This is, of course, impossible. And the very search for a narrow technical "answer" is counterproductive and postpones work on the real task: What is the question?

Footnotes

*Office of Research and Evaluation, U.S. Bureau of Labor Statistics. The views expressed in this paper do not represent an official position of the Bureau of Labor Statistics.

The present paper is a revision and extension of an earlier paper entitled "Cost of Living Questions and Cost of Living Indexes," which received limited circulation and has been cited by that name. I appreciate helpful comments from Robert A. Pollak.

¹ This paragraph should not be construed as a reference to Fisher and Shell's (1972) argument that in the presence of taste change between two periods using the Paasche-perspective index can permit framing a meaningful question (whereas economists have conventionally disclaimed the possibility of making comparisons that bridge taste change, the COL index being defined on an unchanging preference map).

² See Gillingham 1974 for a discussion of the ways that the theory of the cost-of-living index has guided decision-making in the construction of the U.S. CPI.

³One might distinguish between pre-tax income and after-tax income in computing this member of the COL index family--that is, a complete taxonomy of the COL index family tree would do so--but the more interesting case is the index involving pre-tax income, so that is the income definition that should be understood for the present discussion.

⁴Insight into the difficulties of defining a meaningful concept of income and its measurement is contained in Friedman's Theory of the Consumption Function.

⁵This estimate is based on my own updating of Goldfeld-Ooms Table 2 (which shows a 3 per cent fall in real benefits between 1975 and 1980). Both estimates use the official CPI, so the decline would be less if real benefits were computed by use of a price index that treated housing from a flow-of-services approach (such as Gillingham, 1981).

⁶In this regard, I have observed that groups of union members generally think that their own inflationary experience exceeds that measured by the CPI. National opinion polls suggest that a large part of the public in the U.S. holds a similar belief, at least for recent periods. Thus, when inflation "catch-up" or inflation expectations become a factor at the bargaining table, differing perceptions of the facts can extend negotiations.

⁷During the past several years, statistical agencies have often been criticized for not providing guidelines for writing escalator clauses, or for their failure to tell the parties how escalator clauses should be written or what measurements should be used. Much of this criticism stemmed from the belief that the CPI was an independent contributor to inflationary pressure (an "engine of inflation," Alfred Kahn called it) and that changing the index or the way it was used could somehow moderate inflation in the private sector. This criticism is misguided. Parties to a collection bargaining agreement will determine what they believe is appropriate. No government agency, and certainly not a statistical agency, has a role in this decision. Moreover, it is naive to believe that

changing the numbers used in an escalator clause formula will have any but the most transitory and ephemeral effects on the course of money wages or inflation.

⁸It seems such a short time ago that many economists argued that the cost of inflation could be mitigated, provided all portions of the population were indexed, and some of them pointed, paradoxically, to hyper inflations such as Brazil and Israel as examples of how indexing might work!

⁹A frequently heard objection to the use of a wage measure for indexing purposes is that a wage measure would share gains in productivity with the retired population, which, it is alleged, does not contribute to productivity gain. Stepping for the moment into a normative mode, this proposal seems predicated on a false premise. The current level of productivity depends on the contributions of past generations, and some part of the current capital stock, both physical and human capital, was accumulated by current retirees. Unless retirees have already appropriated the returns from all the social investments they may have undertaken in their working lifetime, a system, such as the U.S. Social Security system, that makes the pension depend on the current social dividend as well as the pensioner's own contribution to the account has much to recommend it on equity grounds.

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