S. HRG. 104-69

CONSUMER PRICE INDEX

HEARINGS

BEFORE THE

COMMITTEE ON FINANCE
UNITED STATES SENATE

ONE HUNDRED FOURTH CONGRESS

FIRST SESSION

MARCH 13, APRIL 6, AND JUNE 6, 1995

Printed for the use of the Committee on Finance

U.S. GOVERNMENT PRINTING OFFICE
91-537—CC WASHINGTON : 1995

For sale by the U.S. Government Printing Office
Superintendent of Documents, Congressional Sales Office, Washington, DC 20402
ISBN 0-16-047415-9

COMMITTEE ON FINANCE

BOB PACKWOOD, Oregon, *Chairman*

BOB DOLE, Kansas	DANIEL PATRICK MOYNIHAN, New York
WILLIAM V. ROTH, JR., Delaware	MAX BAUCUS, Montana
JOHN H. CHAFEE, Rhode Island	BILL BRADLEY, New Jersey
CHARLES E. GRASSLEY, Iowa	DAVID PRYOR, Arkansas
ORRIN G. HATCH, Utah	JOHN D. ROCKEFELLER IV, West Virginia
ALAN K. SIMPSON, Wyoming	JOHN BREAUX, Louisiana
LARRY PRESSLER, South Dakota	KENT CONRAD, North Dakota
ALFONSE M. D'AMATO, New York	BOB GRAHAM, Florida
FRANK H. MURKOWSKI, Alaska	CAROL MOSELEY-BRAUN, Illinois
DON NICKLES, Oklahoma	

LINDY L. PAULL, *Staff Director and Chief Counsel*
LAWRENCE O'DONNELL, JR., *Minority Staff Director*

CONTENTS

MONDAY, MARCH 13, 1995

OPENING STATEMENTS

Page

Packwood, Hon. Bob, a U.S. Senator from Oregon, chairman, Committee on Finance 1

ADMINISTRATION WITNESSES

Abraham, Hon. Katharine G., Commissioner, Bureau of Labor Statistics, Department of Labor, Washington, DC 17

AGENCY WITNESSES

Greenspan, Hon. Alan, Chairman, Board of Governors of the Federal Reserve System, Washington, DC 2

CONGRESSIONAL WITNESSES

O'Neill, June, Ph.D., Director, Congressional Budget Office, Washington, DC . 24

PUBLIC WITNESSES

Gordon, Robert J., Ph.D., chairman, Department of Economics, Northwestern University, Evanston, IL 20

THURSDAY, APRIL 6, 1995

OPENING STATEMENTS

Packwood, Hon. Bob, a U.S. Senator from Oregon, chairman, Committee on Finance 35
Moynihan, Hon. Daniel Patrick, a U.S. Senator from New York 35

PUBLIC WITNESSES

Jorgenson, Dale W., Ph.D., chairman, Department of Economics and Frederic Eaton Abbe Professor of Economics, Harvard University, Cambridge, MA 36
Diewert, Walter Erwin, Ph.D., Department of Economics, University of British Columbia, Vancouver, British Columbia, Canada 41
Pakes, Ariel, Ph.D., Department of Economics, Yale University, New Haven, CT 44
Popkin, Joel, Ph.D., president, Joel Popkin and Co., Washington, DC 48

TUESDAY, JUNE 6, 1995

OPENING STATEMENTS

Packwood, Hon. Bob, a U.S. Senator from Oregon, chairman, Committee on Finance 71
Moynihan, Hon. Daniel Patrick, a U.S. Senator from New York 71
Grassley, Hon. Charles E., a U.S. Senator from Iowa 72

Page

PUBLIC WITNESSES

Boskin, Michael, Ph.D., senior fellow, Hoover Institute on War, Revolution and Peace, Stanford University, Stanford, CA 73
Dulberger, Ellen R., Ph.D., program director, Strategy and Economic Analysis, IBM Global I/T Services, White Plains, NY 83
Griliches, Zvi, Ph.D., Paul M. Warburg Professor of Economics, Department of Economics, Harvard University, Cambridge, MA 85
Norwood, Janet, Ph.D., senior fellow, The Urban Institute, Washington, DC ... 88
Pollak, Robert A., Ph.D., professor of economics, University of Washington, Seattle, WA 90

ALPHABETICAL LISTING AND APPENDIX MATERIAL SUBMITTED

Abraham, Hon. Katharine G.:
Testimony 17
Prepared statement 107
Boskin, Michael, Ph.D.:
Testimony 73
Prepared statement 109
D'Amato, Hon. Alfonse:
Prepared statement 115
Diewert, Walter Erwin, Ph.D.:
Testimony 41
Prepared statement 115
Dulberger, Ellen R., Ph.D.:
Testimony 83
Prepared statement 118
Gordon, Robert J., Ph.D.:
Testimony 20
Prepared statement 122
Grassley, Hon. Charles E.:
Opening statement 72
Greenspan, Hon. Alan:
Testimony 2
Prepared statement 126
Griliches, Zvi, Ph.D.:
Testimony 85
Prepared statement 129
Jorgenson, Dale W., Ph.D.:
Testimony 36
Prepared statement 139
Moynihan, Hon. Daniel Patrick:
Opening statement 35, 71
Norwood, Janet, Ph.D.:
Testimony 88
Prepared statement 143
O'Neill, June, Ph.D.:
Testimony 24
Prepared statement 145
Responses to questions from Senator Pryor 149
Packwood, Hon. Bob:
Opening statements 1, 35, 71
Pakes, Ariel, Ph.D.:
Testimony 44
Prepared statement 151
Pollak, Robert A.:
Testimony 90
Prepared statement 158
Popkin, Joel, Ph.D.:
Testimony 48
Prepared statement with attachment 166

COMMUNICATIONS

AFL–CIO 170
Darby, Dr. Michael R. 173
McLennan, Kenneth 176

CONSUMER PRICE INDEX

MONDAY, MARCH 13, 1995

U.S. SENATE,
COMMITTEE ON FINANCE,
Washington, DC.

The hearing was convened, pursuant to notice, at 9:30 a.m., in room SD–215, Dirksen Senate Office Building, Hon. Bob Packwood (chairman of the committee) presiding.

Also present: Senators Moynihan, Graham, Chafee, Grassley, and Simpson.

OPENING STATEMENT OF HON. BOB PACKWOOD, A U.S. SENATOR FROM OREGON, CHAIRMAN, COMMITTEE ON FINANCE

The CHAIRMAN. The committee will come to order.

We are considering today what is perhaps a more important subject fiscally than almost anything else we will consider this year. I think, in the public's mind yet, it has had relatively little notice. This is the Consumer Price Index and the effect that it can have on our policy.

To put it in perspective, just a change of one-half of one percent, if it were to be lowered one-half of one percent, is the difference in revenues to the Federal Government of about $122 billion over 7 years.

In fairness, I should say some of it is increased revenues because you are not pushed quite into higher income tax brackets and, therefore, you pay a bit more in taxes, but the bulk of it is in payments that the Federal Government makes to all programs that are indexed. As I say, that is just one-half of 1 percent. Anything larger than that compounds not arithmetically, but geometrically. The savings become even significantly greater.

So, the hearing is very, very important, and I am delighted to have Alan Greenspan today. When he came in I asked him if this was his 19th appearance in 3 weeks before Congressional committees, and he said, have you counted? I said, no. He said he thinks it is 17.

I was beginning to wonder if you had any job, Mr. Greenspan, other than as a professional witness before Congress. From time to time I do read your name in some other capacity, but I am delighted you have been very, very willing to appear whenever we have asked you. I thank you again for coming.

The Chairman of the Federal Reserve Board, Alan Greenspan.

STATEMENT OF HON. ALAN GREENSPAN, CHAIRMAN, BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM, WASHINGTON, DC

Dr. GREENSPAN. Thank you very much, Mr. Chairman. I am pleased to appear today to address some of the issues surrounding the adjustment of Federal programs for movements in the cost of living.

For the current fiscal year, roughly 30 percent of total Federal outlays are indexed to movements in consumer prices, with Social Security, SSI, veterans' pensions, military retirement, and civilian pensions counting for the bulk of this spending. On the tax side, indexation is largely confined to the individual income tax, which accounts for about 45 percent of Federal revenues.

Congress explicitly intended, in enacting the indexation of these spending and tax programs, to insulate those affected individuals from the consequences of increases in the cost of living.

The vehicle chosen for making these adjustments was the Consumer Price Index and the issue at hand is whether that price index is appropriate for the task. If it is not, there are significant implications for the budget deficit and there is the potential for considerable unintended transfers of wealth.

As I noted in testimony earlier this year, if annual inflation adjustments to indexed programs and taxes were reduced by, say, 1 percentage point—and making the admittedly strong assumption that there are no other changes in the economy—the annual level of the deficit would be lower by about $55 billion after 5 years, including the effects of lower debt levels.

The cumulative deficit reduction over this period would be nearly $150 billion, and these savings would continue to grow in subsequent years, as you, Mr. Chairman, indicated.

The CHAIRMAN. Just if I may interrupt you for a moment. The interesting difference between 1 percent and a half a percent, is that in 1 percent the savings are just immensely greater in a relatively short period of time.

Dr. GREENSPAN. Yes. They are linear in the sense that they accumulate. I think that the point that you made, Mr. Chairman, that it is a wedge which continues to grow, is a really terribly important issue with the subsequent 5 years and thereafter.

The CHAIRMAN. That is correct.

Dr. GREENSPAN. Mr. Chairman, I believe the evidence suggests that some adjustment to our indexing procedures is warranted. I am certain that many of the technical details will be elaborated in your discussions later this morning, but let me briefly outline some of the conceptual issues.

To begin, a review of the legislative history surrounding indexation does not reveal a full appreciation for the important distinction between the CPI and the true measure of the cost of living. The CPI is constructed to measure price changes for a fixed market basket of goods and services. At present, that market basket—at least at the higher levels of aggregation—is fixed to spending patterns that prevailed in 1982 to 1984.

Changes in a fixed-weight price index such as the CPI tend to form an upper bound to changes in the true cost of living, even if all of the individual prices used in the index are measured without

error. The reason is that the use of fixed weights is appropriate only if there is no possibility for consumers to offset any of the consequences of increased prices for some goods by substituting others which have not risen. While the degree of substitutability among products may be open to question, it is undeniable that such substitution does, indeed, occur.

Other technical aspects of the construction of the CPI also suggest it may overstate cost-of-living changes. Researchers at the BLS have found that an interaction between the use of fixed weights at the most disaggregated level and the manner in which new samples of retail outlets are linked into the index may be resulting in an overstatement of price increases.

In January, the Bureau of Labor Statistics implemented procedures that should alleviate the so-called "sample rotation bias" at grocery stores, but the problem likely remains for other categories. More generally, the BLS is experimenting with a geometric weighting scheme that offers broader relief from this technical problem.

Over the postwar period, there has been a marked tendency for consumers to shift purchases from high-priced full-service stores to lower-priced discount retailers. The BLS uses surveys of consumer buying patterns to keep abreast of these developments. On the basis of these surveys, a new sample of retail outlets is drawn for roughly one-fifth of U.S. cities each year. Thus with some lag, innovations in retailing are captured in the CPI. However, at the time when new outlets are rotated into the sample, if prices are found to be lower at the new establishments than at those being rotated out of the sample, the differential is, in effect, attributed to lower quality rather than to lower prices.

Even granting that the quality of service and ambience may differ between new and old outlets, presumably some of the shift in shopping patterns reflects the fact that consumers can purchase the same goods at lower prices. Consequently, some of the price declines associated with the growing importance of discount retailers may not be fully captured by our statistics.

In sum, the fixed-weight nature of the CPI and other aspects of its construction point in the direction of an overstatement of increases in the cost of living. Even if this upward bias were only a fraction of a percentage point per year, the relentless compounding of such a discrepancy ultimately would have budgetary consequences meriting serious attention.

There are, however, reasons for suspecting that weighting and construction are not the only factors leading the CPI to overstate changes in the cost of living. A more difficult, but no less important, issue concerns making adequate adjustment for the improvement in the quality of goods and services over time.

I would note that the BLS does make adjustments for quality changes in the CPI. What is at issue is whether the implemented procedures, or for that matter any practical procedures that could be established in the foreseeable future, can be expected to account fully for quality changes across the vast array of goods and services available in our economy.

In many respects, the issue of price measurement has as its mirror image the fundamental problem of defining with precision what

is a unit of output. If this conundrum could be resolved, not only would we have more accurate price measures, but we would have correspondingly better measures of output and productivity.

But defining a unit of output is an exceptionally difficult task when the characteristics of products and services are changing rapidly and along many dimensions. Under these circumstances, disentangling price change from quality improvement presents a formidable challenge.

Nowhere are these challenges more acute than in the area of medical care. What is the appropriate unit of output? Should one price procedures, treatments, or cures? Should the comfort or satisfaction of the patient be accounted for in price measurement? The past century has witnessed astonishing improvements in medical care. Cures and preventive treatments have become available for previously untreatable diseases. Medical advances have also led to new treatments that are more effective and that have increased the speed and comfort of recovery.

Technological innovations have been exceptionally rapid in the medical field. A case study of CAT scanners documented the dramatic and swift improvements in quality that occurred after their initial introduction in the early 1970s. Substantial gains were made in scan time, resolution, and the speed of image reconstruction. These characteristics, in turn, have a direct bearing on the comfort and convenience of the patient and the quality of the diagnosis provided by the doctor. Conventional price measures will almost surely miss much of this type of quality improvement because of the enormous complexity involved in defining the output that is being consumed and measuring the corresponding unit price of that output.

Although medical care is perhaps the most striking example of rapid—and difficult to measure—quality improvement, similar problems occur across a broad range of goods and services. Research has found that quality improvement may not be adequately captured for goods and services ranging from complicated capital equipment, to power tools, to consumer appliances, to the simple consumption of household lighting.

To be sure there are offsets to unmeasured increases in quality, the downward adjustment made to measured auto prices for the cost of mandated pollution control devices is one example cited in a recent CBO study. Although this equipment may provide a benefit to society, the owner of the automobile likely captures little of the direct benefits associated with his or her increase in outlays.

Other products may be made more poorly in ways that escape detection in our price statistics. But given the perpetual advance of knowledge and technology these cases are surely overwhelmed by a tendency for the quality of goods and services to rise over time in a manner that is difficult to define and measure. Those who remember with fondness the products of yesteryear are probably suffering from either fading memories or excessive sentimentality.

The difficulties confronted in price measurement are not confined to the quality advances of existing products. The continual introduction of new goods and services onto the markets of our dynamic economy creates additional challenges for price measurement.

In some cases, a new good may be similar to an improved version of an old good. In other cases, new products may deliver services to consumers that effectively were not available before, for example, personal computers, video cassette recorders, and cellular phones.

New goods and services are incorporated in our price measure, but only with a lag. This lag can create an upward bias because new products often experience their largest price declines early in the product cycle.

The more spectacular examples involve consumer electronics, such as computers and communications equipment, but the enormous entry of new products onto the markets every year makes this a more pervasive problem than is commonly understood. While any one product may not figure prominently in household budgets, the totality of new products and the often large price declines that occur before they are incorporated in our price measures suggest this problem may not be trivial.

These difficulties should not be read as a blanket indictment of our current statistical procedures. The Consumer Price Index is a fundamentally sound statistical program. The BLS has, over the years, made frequent and significant improvements in the CPI and further improvements should be, and are, on the agenda. Updated market baskets, experimentation with alternative indexing formulas, and ongoing research on the application of so-called hedonic indexes offer the possibility of better measurement in the future.

But even the implementation of improvements in the CPI can lead to distortions when this measure is used directly as a true cost-of-living escalator. For example, the BLS made a significant change in how it calculates the CPI in 1983, when it shifted from a method in which the price index for housing was constructed as if each household was paying the current home price and mortgage rate on its residence to one that is a more realistic measure of the cost of home occupancy. Because of the run-up in house prices and interest rates between the 1960s and early 1980s, the official CPI rose about 9 percent more than indicated by the newer, superior measure.

By the time the index was changed, this overstatement had added substantially to the level of outlays in the large indexed Federal programs. Once the additional interest outlays required to finance the cumulatively higher Federal debt are added in, a rough estimate suggests that, all else equal, the deficit for fiscal 1994 would have been smaller by $50 billion had the overindexing not occurred.

The fundamental problem is that we have legislated a mechanical procedure to implement cost-of-living adjustments where—given the problems inherent in any statistical measure of aggregate prices—there is a need for the application of sound judgment.If indexation had prevailed for only a short period of time, the discrepancy between the CPI and a true measure of the cost of living would not have resulted in any appreciable problem. But, left in place over long periods of time, as has now occurred and is envisioned continuing in the future, the discrepancy will compound in a manner that cumulates to a very substantial magnitude.

For this reason, I have suggested that Congress give careful consideration to the establishment of an independent national commission to set annual adjustment factors for Federal receipt and outlay programs. The members of this commission could review the available price statistics, taking into account the difference between these measures and the concept of a true measure of the cost of living. In addition, periodic review would allow the discrepancy to be adjusted for improvements in the available statistics, as well as for insights developed from outside research.

Careful consideration could be given to the establishment of a special cost-of-living adjustment for retirement benefits to reflect the buying patterns of the affected population. The replacement of a mechanical procedure by the informed judgment of experts would best ensure that the original intent of the legislation would be fulfilled—to insulate taxpayers and benefit recipients from the effects of changes in the cost of living.

The issue that we are discussing today demonstrates clearly the long-lived consequences of having allowed inflation to increase in the late 1960s and 1970s. Had the inflation environment of the 1950s and early 1960s been maintained, no widespread application of indexing would have emerged. There simply would have been no need for it.

Indexation was viewed as a way of mitigating the effects of inflation. It succeeded in many respects, but we also have seen another example of the operation of the so-called "Law of Unintended Consequences" in the enlargement of our budget deficit. I believe that if the Federal Reserve can maintain a proper direction for monetary policy we shall make this whole matter moot by eliminating the need for indexation. But, in the interim, we should at least attempt to refine our indexation procedures so as to ensure that the distortions are minimized.

Thank you very much, Mr. Chairman.

The CHAIRMAN. You will recall, Mr. Chairman, one of the dangers of being around here long enough is you remember things. When we indexed Social Security, it was intended to hold the costs down because we were voting increases greater than the cost of living, and somebody would offer an amendment for 5 percent on the floor, and amend it to 10 percent, and we had a surplus in those days.

The argument was, we can use up the surplus now. That is another unintended consequence, we had no idea at the time that we would actually probably be increasing our expenditures rather than reducing them.

I was at a meeting on Friday with Senators Dole and Domenici and Congressmen Gingrich, Livingston, and Kasich, and Congressman Kasich said, you made an extraordinary statement before the House Budget Committee.

Part of it may have related to this indexing, part of it may have related to the Balanced Budget Amendment and what we could expect with productivity and other factors, quality of life, or cost; I am not sure. Do you remember what it was you said? Was it testimony, was it answer to a question, or do I have it wrong?

Dr. GREENSPAN. No. I think he may have been referring to what I indicated that I thought would be the consequences if we could

reduce the budget deficit, eliminate it, and hopefully even in the 21st century have a small surplus.

The CHAIRMAN. What were your estimates?

Dr. GREENSPAN. Well, basically I thought that seeking a balanced budget by the year 2002 was a not unrealistic goal, and, indeed, would have very positive effects on the economy.

I also indicated, however, that the configuration of what the fiscal package would look like subsequent to the year 2002, as indicated by current law, suggested that the deficit was an extraordinary problem after the year 2002, and it was very important that we maintain a fiscal stance which keeps it roughly in balance—not exactly, but roughly.

I indicated that it was my impression of what the evidence is continuously indicating: that is, increases in productivity would occur as a consequence of the low inflation rates which would be implicit by a balanced budget, and a significantly lower rate of real and nominal interest rates in the 21st century, all of which would contribute to increased growth.

And I suggested that, under conditions such as that, a good deal of the concern that many individuals have today—that they perceive that their children will not have the same level of living, standard of living, that they have—in my judgment, would largely dissipate under a new environment of fiscal sanity, which clearly is not what one could characterize or state at the present.

The CHAIRMAN. Did you quantify productivity and quantify some other factors then?

Dr. GREENSPAN. I did not, Mr. Chairman, because the evidence here is difficult to come by and there is a significant dispute within the economics professions as to whether, when the inflation rate falls from 5 percent lower—irrespective of how one measures it—one picks up the productivity increases which are evident when you bring the inflation rate down from, say, 15 percent to 5, so that there is an element of measurement difficulty here.

But from what I have observed I suspect that when you look back at this period, say, a decade from now, the evidence that the low level of inflation that we are experiencing is having a very significant, positive effect on the rate of growth of productivity.

The CHAIRMAN. In your suggestion for an independent commission, is there any reason the Bureau of Labor Statistics could not reach the same conclusion? Is there a bureaucratic limitation or is there simply a need to have a fresh look by a group unencumbered by the past?

Dr. GREENSPAN. As I indicated in my prepared remarks, Mr. Chairman, that the BLS is actually doing an exceptionally good job. It is not the fact that they are not creating an excellent index, rather, there is something fundamentally inherent in price measurement that makes it extraordinarily difficult to avoid an index which has an upward bias in it.

One need only look at the most difficult issue to measure, which is essentially the question of quality. The one thing we are reasonably certain of is the fact that technology and knowledge are irreversible, that except for the dark ages, we have never had a decrement in the state of technology or knowledge.

It is in the nature of technology to so change the nature of products that it is increasingly difficult to capture the quality changes that are embodied in existing products. It is a continuous catch-up issue. As a consequence, if one were to have a true measure of quality-adjusted prices, they would almost surely, because of the irreversibility of technology, be running at a level below where the measured index is.

Since that gap—while it does not open every year, over time tends to widen because it becomes more difficult to capture these changes—there is a tendency to cumulatively underestimate major changes in quality.

And I do not care how hard the Bureau of Labor Statistics works, they can work 24 hours a day and they can double their staff, but the index is not going to be able to effectively capture certain types of biases in the system.

They will be able to get to certain technical issues, but not in the broader sense, and, therefore, I think, for purposes of indexation of Federal programs, the CPI should be a starting point but it should not be the end.

The CHAIRMAN. Senator Chafee, and then Senator Graham.

Senator CHAFEE. Thank you, Mr. Chairman.

Mr. Chairman, you indicated here on page 7 of your testimony that there is a need for the application of sound judgment. Do I gather from that that the BLS is restricted to a strict set of criteria in calculating the CPI? There must be some latitude granted to them now. Is there? I do not know.

Dr. GREENSPAN. No. You have the Commissioner of Labor Statistics coming shortly and I think she is far better able than I to respond to that. But there are various statistical techniques and there are also crucial questions about what it is the CPI is supposed to be measuring, or what it is measuring.

There are very major problems of what economists call substitution effects within various price indexes, and these have very critical effects on what the ultimate price number is in those indexes.

And what we are trying to do in a so-called true cost-of-living index is to create an index in such a manner which truly eliminates the so-called substitution effects. These are issues which I assume the panel subsequent to me will discuss in some detail. But the BLS does not have unlimited discretion on how it calculates the index. I mean, there are certain agreed upon fundamental issues.

And what we are talking about is not 95–98 percent of how the index is calculated. There is a vast amount of agreement on that. Where the differences lie is in the top 5, 7, 8 percent of how one makes these calculations, but those differences can have significant biases associated with them.

What I am saying is, whatever one thinks of those biases, I know of no credible analytical methodology which would say that the CPI is underestimated. The expected value or the average value of the bias, whatever it is, is almost universally believed to be positive.

The one thing we know about the inexorability of compounding interest is that even very small changes compounded over a period of years, have a very large impact on the degree of indexing of Federal programs.

Senator CHAFEE. Well, you point that out in your testimony here.

It seems to me that on the bottom of page 7 you say, "Careful consideration should be given to the establishment of special cost-of-living adjustment for retirement benefits to reflect the buying patterns of the affected population."

And I began thinking, there is a difference between a military retiree, for example, and a civil service retiree, because a military retiree, to a considerable extent, has hospital costs and prescription drug costs—not completely, but to a considerable extent—paid for them by the Federal Government.

Thus, it seems to me that an argument could be made for a differential in the index that is applied to, say, a military retiree than is applied to a postal retiree. What would you say to that?

Dr. GREENSPAN. I think that is the type of thing that the Congress should make judgments on. It is a political judgment, it is not a statistical judgment. But I would certainly agree with you that if the basic purpose is to insulate various different groups, then you have to have some separation of how it affects the tax side and how it affects the retirement side. I would caution, however, that if you go too far in that direction you will create a maze which I think would be very unfortunate, because you will then get down to subgroup upon subgroup, and there is no end to that. So, I hesitate when I even say to make a split.

I would emphasize, however, that even though there is an experimental index which the BLS has for the elderly, there is a very important question about how significant the bias in health cost pricing is, because it is that which has the major effect of what is approximately the two-tenths of a percent higher increase in a CPI for the elderly. And I have very serious questions as to how much of a bias there is in medical costs. My suspicion is, it is quite large.

Senator CHAFEE. You mean for the elderly.

Dr. GREENSPAN. No, I mean just in general. Therefore, if the medical cost index is a major player in the elderly's differential index from the overall, it is questionable whether or not that spread is as large as one might think. That is the 0.2 percent. It is not big, but 0.2 percent over the years builds up.

Senator CHAFEE. My time is up. Thank you, Mr. Chairman. Thank you.

The CHAIRMAN. Senator Graham, then Senator Grassley.

Senator GRAHAM. Mr. Chairman.

Dr. GREENSPAN. Senator.

Senator GRAHAM. Welcome back.

Dr. GREENSPAN. Thank you.

Senator GRAHAM. Mr. Chairman, is there someplace in the United States or in the world that you think could be used as a benchmark of effective efforts to calculate changes in prices as they relate to all of the variety of economic factors that you have just outlined?

Dr. GREENSPAN. Senator, I suspect that these technical problems exist in all countries and, indeed, I think one test of the measurement problem is an interesting indirect one which I am not sure is true, but it is an interesting hypothesis.

You may recall that the intelligence agencies of this government, at one point maybe a decade or so ago, calculated that the standard

of living, the real per capita income, of East Germany was not significantly different from that of West Germany. When the Berlin Wall was torn down and we took a look, it obviously had no evidence of any meaningful reality.

I suspect that why the mistake was made is that the Consumer Price Index in Eastern Germany did not have a large bias in it, there were no obvious significant improvements in quality, the old Trabey, the automobile which they made in 1950, was not terribly different from the one they produced in the 1980s.

Therefore, the price index probably truly reflected—to a greater or lesser extent, even with the types of problems I have been discussed here—more what the cost-of-living changes were in East Germany than in West Germany, where the quality factor was very significant. So, you would depress the level of income in real terms in West Germany, but you did not depress it very much in East Germany, and the numbers looked the same.

I think—but I have not looked into it closely enough to draw any firm conclusions—as a hypothesis as to why that happened, is consistent with the notion that this problem exists everywhere.

It almost has to exist everywhere if quality is a function of technology generally and the mathematical problems of substitutability are implicit in the index it will exist everywhere so long as human beings tend to substitute one product for another, depending on price. Country-by-country then these so-called substitutability problems in creating true cost-of-living indexes will exist everywhere.

Senator GRAHAM. So you are saying there is going to be no assistance or easier fix by being able to find someone else who has already done this.

Dr. GREENSPAN. Frankly, my suspicion is that we do it better than anyone else. But, the problem, basically, is that the real world out there is moving in a manner which makes even the best techniques incapable of capturing the true changes without bias.

Senator GRAHAM. Well, if that is the case, that is, that the pace of change in the real world in which we live is so fast that our statistical systems are probably inherently incapable of maintaining constancy, is there a different approach that we should be taking in terms of how to ameliorate the effects of inflation, other than what probably is the best approach, which is your suggestion that we continue our efforts to avoid inflationary pressures, and, therefore, make this moot.

Dr. GREENSPAN. Yes. Senator, I think that I am raising two very distinct questions. One is the calculation of the Consumer Price Index, which we know is biased upward but is probably proportionately biased, or I should say equally biased at high or low levels, and we can deal with it and it is very useful to get a sense of the degree of inflation in our society.

It is very useful as a broad measure of what it is that economic policy should be focused on, and it is a broad measure with some degree of inaccuracy on what standards of living are doing.

That existed before, as the Chairman mentioned, the thought of indexing Federal programs ever emerged. I think we have to distinguish between the Consumer Price Index, which should be processed as best it can be done, improved as best can be done, and continued on, and recognize that there is a separable problem here

which is the fact that if the intent of the Congress is basically to hold individual recipients of benefit programs and taxpayers harmless from the increase in the true cost of living, that is a different issue.

As far as I am concerned, the reason I raised the question of having an independent set of experts look at it is that they should not be looking at the issue of how to improve the calculation of the CPI itself. My own judgment is that the process that exists today is probably adequate.

There is a great deal of academic research, there is a great deal of processing within the BLS. I do not view that as where the problem lies. I view it essentially as the inherent upward bias in any price index of this nature, and I am raising the question as to the intent of the Congress in the original legislation to essentially insulate beneficiaries and taxpayers from the true cost of living which, therefore, implies that one should try to make a better estimate of that.

And it is not an issue of the CPI being biased upward or biased downward. I would say that the probability of it being biased downward approaches zero. While we may have very large disputes as to whether or not a bias is 0.3 percent a year, 0.5, or 1.0—and there are others who think it is much higher than that—nobody, I think, has credibly argued that the bias is negative. And so long as the number is positive, irrespective of what that number is, over the years it accumulates to a very large number.

The CHAIRMAN. Senator Grassley.

Senator GRASSLEY. Yes. Mr. Greenspan, I wish every senior citizen in America had a chance to hear, as we do, your testimony on this, because I think you are using your position responsibly to get us to consider an intellectually honest approach to what is the real cost of living.

But I think after your first testimony, now maybe 6 weeks ago, that the senior citizens and their advocacy groups that ought to know better than to think you are part of a Republican conspiracy to cut down on Social Security in a way that we do not have guts enough to do in the Congress. I do not think it should be done at this point.

But, at least the way you are saying it, I think that we do have a responsibility as policy makers to make sure that we have an intellectually honest basis for determining CPI.

I guess my comment would only be that every opportunity you have, as you have done here, to make it clear that what you are approaching is to have an intellectually honest basis for determining CPI, that is your motive, right? It is not because you want to find an easy way to cut costs of living for senior citizens.

Dr. GREENSPAN. Most certainly not. I have raised this issue in the past, not in terms of public policy questions, but in terms of the issue of how do we know about the degree of inflation in our society with respect to broad policy questions, which is an important issue. I raise this only in the context that there is an intent in the statute which, in my judgment, is being met inappropriately.

If the Congress wants to increase the real value of benefits, I suggest that there is a very simple means of doing that, it is called legislation. I am merely arguing the case that the essential nature

of the legislative intent, as I understand it, is to make certain that all beneficiaries—Social Security beneficiaries and others—be insulated from the cost of living. That is the purpose of it. I am merely saying, not whether that should or should not be done, but that it be done correctly.

That is essentially important because, implicit in a miscalculation is an inadvertent redistribution of wealth one way or the other, which is an unintended consequence of legislation which I do not think should be done, except quite explicitly by statute, by the Congress.

Senator GRASSLEY. I presume, to some extent, you would even be arguing that, for your own agency's work—and I assume the CPI is one of many factors that you use in determining whether interest rates go up or down—that you and your agency would benefit to the extent to which we had a more true estimation of what the cost of living was.

Dr. GREENSPAN. Well, actually, I am not arguing for a change in the process of the CPI. We at the Federal Reserve have always internally made an adjustment. Indeed, when asked what I defined as price stability, I have never stipulated a number.

I have said it is a condition where individual households and businesses do not take into consideration concerns about changes in the cost of living in the future. I have usually, in terms of Q and As, argued that that number, if you had to put a number on it, probably somewhere was in the area of 0–2 percent of the measured Consumer Price Index. So, I do not see it as a necessity for monetary policy. I think we already make that adjustment, and we have for decades.

Senator GRASSLEY. Is it even possible that, given the current way of estimating, that if unchanged it could possibly underestimate CPI for the elderly, or have you stated that when you said, "in every respect it is always positive and upward?"

Dr. GREENSPAN. No. I think that there is an argument here which says that the Consumer Price Index basically overestimates the rate of cost-of-living change for everybody. But, with the mix of the types of things—especially medical care—that the elderly have in their index, if you use the CPI and reweighted it to take a closer approximation of what the shares of various consumer goods elderly people have, that index has been increasing faster than the basic CPI, in large part, I think, because of the medical care component in it.

However, as I indicated earlier to Senator Chafee, my own concern is that there is a very large bias in estimation of medical costs, so I am not sure, if we were to make the adjustment in medical prices, to what extent that bias—which currently is about 0.2 percent, meaning that the elderly CPI tends to rise at a rate of about two-tenths of a percent more than the total—would disappear.

Senator GRASSLEY. Thank you.

The CHAIRMAN. Senator Simpson.

Senator SIMPSON. Nice to see you this morning, Alan.

Dr. GREENSPAN. Thank you, Senator.

Senator SIMPSON. The real issue is, the CPI is controlling a great part of what is happening to us in the United States, if we under-

stand that 30 percent of all Federal outlays—and I run these past you with my respect and admiration—and 45 percent of receipts in this country are indexed to movements in the CPI. Is that about right; do you concur in that?

Dr. GREENSPAN. Yes.

Senator SIMPSON. That is a crucial thing when we are talking about voting on a debt limit of $5 trillion within the next few weeks, crucial, crucial, to get the CPI right, and difficult to do, obviously, complex. And even though the BLS has made these improvements over the years, I think it is maybe time for the Congress to review whether the time has come for an overhaul in that. That would take a lot of time, be very difficult.

Senator Kerrey and I, we were on the Entitlements Commission, are going to do a series of bills. One will be to get at the heart of what we see is part of the problem, and that is the market basket issue where you have the current CPI market basket collected over the years 1982–1984, 20 percent gathered each year on type and quantity, updated every year. Twenty percent where they purchased the items, giving 80 percent of the people from urban areas, not even dealing with the 20 percent from the rural areas in that computation as I gather.

But would you support a requirement that the BLS more frequently update the market basket, in fact, every year in some way?

Dr. GREENSPAN. There is no question that the issue of having a base period which is more than 10 years behind us clearly creates a bias. Everyone agrees to that. It is a modest bias. It is 0.1 or 0.2 percent a year. I have no question that it is probably desirable to bring that up to date much more quickly.

It will, however, not eliminate the big chunk of the biases. In other words, there are significant biases which exist in the way the data are calculated and which rest upon evaluations of what are called lower level substitutability within the index, meaning the extent to which, with price changes, people will shift from a Chevrolet to a Ford. Knowing what that is creates significant insight into how to correctly make these adjustments.

And, while I certainly think it is advisable to have intervals between base periods which are much shorter than we currently have, I am not sure that that is the best use of monetary resources in the BLS because there are lots of other things which I think could be significantly improved and I would leave it to the Commissioner of Labor Statistics, who is coming up, to make a judgment of that.

I would not say that I would look at this particular issue and say that there is something terribly faulty in the process and that the whole procedure needs an overhaul, I am basically saying that there is something inherent in the very issue of price determination that, no matter how good you do it, you are still going to have this bias and everyone knows that.

I want to emphasize, I do not think there has been a deterioration in the quality of the CPI. On the contrary, I think it has improved measurably and I, frankly, think they are doing a very good job. But I am saying that that is not what the issue is.

Senator SIMPSON. Indeed, though, there are things in the list of commodities, such as in 1982–1984, typewriters, record players. We

do not even use those items. I think that something has to be done with that.

Dr. GREENSPAN. Oh, sure. But I hope, and I am pretty well convinced, that they are as aware of it as anybody. I mean, that is what they spend their time doing. I cannot imagine that that issue does not always confront them.

Senator SIMPSON. I think that is so. I have talked with Secretary Reich, and always do, and try to get his views. But it is odd to me, as we grapple with this, and you saw the Balanced Budget Amendment the other day, and everybody talking about Social Security. You almost feel like you are on the other side of the moon or something.

The thing that will kill Social Security is what the trustees have said will kill it. In the year 2029 it will be broke, and we all know it. Every one of us at this table knows it, everyone in the country knows it, because the trustees have told us, not some nut off somewhere. The trustees have told us this will happen. I must say, it just puzzles me to hear us talk about protection of Social Security recipients when we give them a COLA, regardless of their net worth or their income, and it just goes out to them.

We are looking at a $5 trillion debt which we will vote on very soon, and $200 billion plus deficits out to the edge of the universe, and here we go. We cannot touch it though, because we are going to help those poor souls.

The worst thing that can happen is the markets crumbling and Mexico revisited. They lose 20–30 percent of the pension values and the little people, like union members and the elderly, will be the ones most affected. It is most frustrating to this fellow sitting here, as you can tell, a touch of it.

Anyway, you do not have any comment on that, and I do not want to hear it. Unless, of course, you do, except to say I have lost my mind.

Thank you, Mr. Chairman.

The CHAIRMAN. Senator Moynihan.

Senator MOYNIHAN. Mr. Chairman, I would only want to express and join everyone else in expressing our appreciation to the Chairman, Dr. Greenspan, for raising this subject in the manner he has done, which is thoughtful and measured.

I was once the Assistant Secretary of Labor responsible for the Bureau of Labor Statistics in the early 1960s, and the people around the BLS were wonderful public servants and there was nothing you could know about them, inadequacies of their work, that they did not know first and did not talk about continuously, particularly with respect to the large price increases that followed the end of price controls of World War II. How do you measure those things?

I would say to Senator Simpson, I think what Dr. Greenspan is talking about is the need for a cost-of-living index or some measure, if what we are concerned with is maintaining the purchasing power of different forms of income, that is what you need, is not the CPI.

The BLS puts out a little pamphlet which details the CPI, and there is a question, "Is the CPI a cost-of-living index? No, although

it frequently and mistakenly is called a cost-of-living index." There is no difficulty whatever with the BLS in this regard.

I think a commission to inquire is a very thoughtful idea. Would you have in mind an adjustment to deal with payments and changes in the tax code that are now pegged to the CPI; an adjustment that would reflect the change in the cost-of-living?

Dr. GREENSPAN. Yes, Senator. What I am trying to focus on is not how to revise the Consumer Price Index. I do not think that is on the table, I do not think it should be on the table, except as an ongoing process.

Senator MOYNIHAN. It is continuously being done.

Dr. GREENSPAN. I am raising the separate question as to whether the intent of the Congress is appropriately met in its endeavor to hold harmless from changes in the cost of living, whether or not that procedure is ultimately biased by using the CPI, and whether an informed judgment of a group of professionals knowledgeable in the issue of how indexes are created, could give a far better estimate to the Congress of what the appropriate adjustment factor should be.

Senator MOYNIHAN. Well, not to disparage this much-disparaged institution, but it is probably within the range of possibility that when we indexed the income tax rates, for example, using the CPI we thought we had a cost-of-living index when, in fact, we had a Consumer Price Index. It is an easy mistake, understandable, and fixable.

I thank you very much. I do not know what the Chairman thinks, but I am disposed to say that it is a good idea whose time has come.

The CHAIRMAN. I have no other questions.

Senator Chafee?

Senator CHAFEE. No, thank you. Thank you, Dr. Greenspan.

The CHAIRMAN. Senator Graham.

Senator GRAHAM. I would just like to ask one question if I could, Mr. Chairman, to follow up on a comment that the Chairman made at the end of his response to my last question. That is, you stated that the Federal Reserve system has for some time taken these biases into account in making its monetary judgments.

What are those internal adjustments based upon, and could they be the intellectual structure around which the commission that you have suggested could do its work?

Dr. GREENSPAN. Well, Senator, when I say we make the adjustments, I do not mean that we have literally gone through an analytical procedure and have made a judgment that the bias in 1994 is .X or something like that.

I am merely saying that we have a general notion of the fact that there is a bias in the CPI, and that when we think of the nature of inflation and what its order of magnitude is, we do not take the CPI literally.

Various different members of the Federal Open Market Committee would probably have varying views of where they think that is, and that is embodied in their judgments. But, as best I can judge, no one has got a negative adjustment, everyone has got a positive adjustment, and it is only a matter of degree of what that adjustment basically is.

Senator GRAHAM. Thank you.

Senator SIMPSON. Mr. Chairman, may I ask a question, please?

The CHAIRMAN. Absolutely.

Senator SIMPSON. What if we were to—since the difficulties are obvious doing something—set the CPI, for adjustment purposes, at CPI minus 0.5 or 1.0 and just do it that way?

Dr. GREENSPAN. That is certainly one means of coming at this question. The issue, however, of putting it to a commission is that you will have a set of professional judgments which essentially is different from merely saying, CPI minus one, or CPI minus a half. The latter seems to appear as though you are making less than full indexation of the programs, and you may wish to do that. I mean, that is a perfectly appropriate policy of the Congress.

I am raising a different issue. I am saying, assume full indexing of the cost of living. What does that require that Congress do to achieve that?

Senator SIMPSON. Well, I think we went awry, as Senator Moynihan said, when we confused CPI and cost-of-living allowance and all that. There is a confusion there with the general public.

Dr. GREENSPAN. That is very true.

Senator SIMPSON. I thank you very much. Very helpful.

Dr. GREENSPAN. Thank you.

Senator CHAFEE. Can I just ask one quick question?

The CHAIRMAN. Go ahead.

Senator CHAFEE. Dr. Greenspan, on the bottom of page 6 where you talk about the run-up in house prices and interest rates between the 1960s and the 1980s, the official CPI rose about 9 percent more than indicated by the newer. Were you talking about the fact that the elderly are not buying new houses in most instances? Is that what you were referring to, that they are in a house, many of them are, presumably the mortgage has been paid off, so they are not affected by new home prices. Was that the point?

Dr. GREENSPAN. Well, it is basically all house owners. In other words, it is not only the elderly. It is essentially that the old index, because it measured the cost of home ownership as some combination of interest rates and house prices, implied that every household, to a certain proportion or extent, was buying a house and taking out a mortgage at that time. The argument was, basically, if you keep the weight low enough it averages out over time.

That turned out to be a very faulty premise of what the true meaningful cost of home ownership was, and, as a consequence, in 1983 the BLS shifted its index of home ownership to a so-called implicit cost of home ownership, which essentially tried to measure effectively the implied rent, if one had to rent, of what ownership would have been. It was sort of the owner-occupied rental equivalent of what a person's home was.

That, as I indicated before, making the shift when the shift occurred has permanently put the Consumer Price Index 9 percent higher than it would have been if we had gotten it right in the first place. So, the question at the moment is, the levels of all indexed programs are 9 percent higher than they would otherwise be. We have not retraced that, it is still there, to a large extent.

It is a little different for the so-called CPIW, which did not get indexed until 1985, but the problem is one which confronts not only

the elderly, but all home owners, and has a very large effect because the home ownership index, as I recall, was 19 percent of the total CPI.

Senator CHAFEE. Well, I join with Senator Moynihan and the Chairman in thanking you for raising this point for us. Thank you.

The CHAIRMAN. Mr. Chairman, thank you very much for coming.

Dr. GREENSPAN. Thank you.

The CHAIRMAN. We now have a very distinguished panel of Hon. Katherine Abraham, the Commissioner of the Bureau of Labor Statistics; Dr. Robert Gordon, the chairman of the Department of Economics at Northwestern; and June O'Neill, the new Director of the Congressional Budget Office.

Good morning. I might want to say to Dr. Abraham, this hearing is not any criticism of the Bureau of Labor Statistics. We have a high regard for the BLS. Every time that Janet Norwood would come and testify, we paid great attention to what she said. And I think even Chairman Greenspan is not being critical, he is just saying maybe there is an additional way to factor in some circumstances.

So, we will start with Dr. Abraham.

STATEMENT OF HON. KATHARINE G. ABRAHAM, COMMISSIONER, BUREAU OF LABOR STATISTICS, DEPARTMENT OF LABOR, WASHINGTON, DC

Dr. ABRAHAM. Thank you very much, Mr. Chairman, members of the committee. I certainly appreciate the opportunity to be here this morning to discuss the Consumer Price Index which, as you well know, the Bureau of Labor Statistics is responsible for producing.

I have submitted a prepared statement for the record. The initial part of that statement provides some background information on the way that the Consumer Price Index is constructed that, in the interest of the committee's time, I will skip over, since much of that Chairman Greenspan has already discussed.

I will turn directly to a discussion of some of the various issues that have been raised concerning the Consumer Price Index on page three of my formal statement.

I guess perhaps the best starting point for a discussion of CPI measurement issues is to emphasize, as has already been noted, that what many people mean when they talk about inflation is the change in the cost of living.

Despite what I would say are the best efforts of the Bureau of Labor Statistics, not everyone has seen the little pamphlet that Senator Moynihan quoted from, which points out that the CPI is not a cost-of-living measure.

One reason for that is that the CPI is based on a fixed market basket of goods and services. We do not allow in the construction of the index for changes in buying or consumption patterns that consumers would be expected to make as they adjust to relative price changes, buying more of goods whose relative prices have fallen and less of goods whose relative prices have risen. By making these changes in how they spend their income, consumers may be able to maintain their level of well-being at a lower cost than that indicated by the CPI.

BLS research suggests that not accounting for these substitutions in response to relative price changes raises the annual change in the CPI by 0.1 to 0.2 percent per year.

A true cost-of-living measure also would take into account changes in the external environment that might impact consumers' out-of-pocket expenditures. It is important, I think, to emphasize that the CPI is a measure of the change in the cost of purchasing a market basket of goods and services that people buy out of pocket.

Environmental changes might include such things as, for example, a deterioration in air or water quality, or an improvement in the quality of publicly-provided services, such as education.

I also would quickly add that, were we able to produce a true cost of living measure, we would do so. Unfortunately, the state of the art in the area of price index construction has not advanced to the point where anyone knows how to construct true cost of living measures.

In fact, although there are alternative price index formulations that provide a better approximation to cost of living measures than the current CPI, none of these alternatives is now feasible to produce on a real-time basis.

Given that the CPI is not, and is not represented to be, a measure of changes in living costs, it is, nevertheless, appropriate to ask how well the CPI measures what it is designed to measure.

In this connection, two broad areas of concern have been identified. The first, brought to light by BLS researchers, has to do with the construction of the most disaggregated components of the index, and, in particular, with the way in which new items enter the index as part of routine sample replenishment, and the way in which the treatment of new types of retailers, such as discount stores, impacts the index's measured rate of inflation.

The second, and I think less well understood issue, is the question of how well the index accounts for changes in the quality of the goods and services that consumers purchase.

The sample rotation effect arises because procedures for systematically introducing new outlets and items into the CPI inadvertently tend to give higher weight than is justified to prices that are temporarily low in the month the new samples are introduced, and lower weight than is justified to prices that are temporarily high. Thus, as was alluded to by Mr. Greenspan, these procedures can cause an overstatement of price change in the period immediately following sample replenishment.

The BLS has taken steps to address this problem, effective with the data for January of 1995, the data that we released on February 15th of this year. If further corrective measures can be identified, they will be incorporated as expeditiously as possible in the context of the ongoing CPI revision with which we have just gotten started this year.

The outlet substitution effect can arise because consumers are free to substitute where they buy goods and services, as well as what they buy. For example, if consumers do not consider the possibly lower level of customer service provided by a discount store to be of any consequence, they may shift to such stores and experience no loss of well-being.

Current CPI procedures would not capture any price decline associated with such a shift. Although it is unclear that there is, in fact, any bias associated with the CPI's treatment of discount outlets, further research on this issue would be valuable.

Perhaps I should elaborate just a bit on what I mean by that last statement. Through a series of papers done by BLS researchers that looked at the so-called "sample rotation effect," there was some work done on looking at outlet substitution effects. There has also been some related work looking at the functional form used to calculate price change at the lowest level of disaggregation of the index. Those research studies were proceeding, more or less, separately.

What we have recently recognized is that, in fact, the problems identified in those separate studies are really very closely related and may be arising from the same source, which means, I think, that it would be a mistake to take estimates of those individual problems and add them up, which is why I say that it is not clear that there is, in fact, any bias associated with the CPI's treatment of discount outlets, though that is a researchable question.

It is axiomatic, of course, that a measure that purports to estimate changes in prices must take account of the fact that the quality of goods and services purchased in our economy can and does change, in some cases for the better, and in some cases for the worst.

Today's cars, for example, are substantially more expensive than the cars sold in the 1970's. Today's cars, I think it would be widely agreed also, are substantially better than were the cars of the 1970's, in the important sense that they embody more of the features, such as durability, safety, lesser maintenance requirements, that consumers value.

In measuring the price change for cars over this period, the challenge is to isolate that part of the price increase associated with improvements in quality as distinct from that that is truly a price change.

In the case of new automobiles, for example, adjustments made in the CPI to factor out quality changes have had a very substantial impact. We estimate that the change in the new automobiles component of the CPI over the years from 1967 to 1994 would have been more than 80 percent greater than we actually reported had no adjustments been made for changes in quality.

In terms of the impact on the overall index, the CPI today would be roughly 3 percent higher than it would have been had we made no adjustments for quality in the new car component alone.

The more general point, I guess, is that efforts are routinely made in every index component to try to ensure that changes in quality are not reported as price changes. These efforts range from the prosaic case of adjusting for the fact that a one-ounce candy bar is worth more than a 0.75 ounce candy bar, to consideration of more difficult questions of, what is the value to the consumer of a new non-invasive diagnostic medical test that replaces an earlier, more taxing and riskier test for the same condition.

The emergence in the market of entirely new goods and services presents perhaps the most difficult quality adjustment problem. These new goods are so radically different from anything pre-

viously on the market that they have no obvious earlier counterparts with which their costs can be compared. Electronic calculators, video cassette recorders, personal computers, are often cited as examples of new goods.

Current CPI procedures lead to these new goods being included in the index in a comparatively timely fashion compared to the procedures that were in place 10 or 20 years ago.

The CHAIRMAN. I have to ask you to abbreviate, if you would, Doctor.

Dr. ABRAHAM. All right. We are introducing new procedures in the CPI to bring these new goods into the index more quickly. What I think remains to be developed are methods that enable direct comparison of a new goods price with that of its antecedent.

Now, there are some estimates out there of overstatement in the CPI as large as 1.5 percent per year. These estimates require, I think, that you be convinced that there is a large quality adjustment bias. The only point that I would make here is that I think, although there are people who hold strong views about this, the underlying evidence is relatively sparse.

There are some things that we could do to try to address this. Given additional resources, it would be possible for us to do more to directly take into account changes in the quality of goods and services. Doing that would require that we collect additional information that we do not currently collect and do not have a budget to collect.

One last point that I would make, is that, again, there are a variety of assessments out there of total bias in the CPI. I think everyone who has looked at this has agreed—although they may disagree with respect to the specific numbers—that there is quite a lot of uncertainty out there, that the problems are very difficult to address.

From the point of view of the Bureau of Labor Statistics, we are, of course, intensely aware of the importance of the data that we produce, and are doing all that we can to improve the quality of those data.

The CHAIRMAN. Thank you.

[The prepared statement of Dr. Abraham appears in the appendix.]

The CHAIRMAN. Dr. Gordon, who has appeared before us a number of times before.

STATEMENT OF ROBERT J. GORDON, Ph.D., CHAIRMAN, DEPARTMENT OF ECONOMICS, NORTHWESTERN UNIVERSITY, EVANSTON, IL

Dr. GORDON. Mr. Chairman and members of the committee, I am very grateful for the invitation to be here.

I will give an abbreviated version of this testimony, emphasizing the academic background for Chairman Greenspan's position, and also trying to provide some information that will help to convince you that the bias in the CPI is very large.

I agree with Chairman Greenspan that the right way to fix this is not to go for some dream cost-of-living index which is, I think, infeasible, but rather to bring together some people and come up

with a reasonable number to take the CPI and index Federal programs as some percentage rate less than its rate of increase.

Everybody knows by know that the CPI, along with the unemployment rate, is one of the two most essential economic statistics produced by the Federal Government. It, of course, measures the rate of inflation, the primary target of monetary policy.

Maybe we do not understand how essential the CPI is for other things that the Federal Government tells us about. For instance, the underlying components of the CPI are used by the Commerce Department to measure real consumption, which is two-thirds of real GDP. In turn, that tells us how rapidly our standard of living is growing and total output per hour tells us whether we are enjoying improvements in productivity.

If changes in the CPI overstate inflation, then the growth in real consumption, real GDP, our standard of living, and our productivity, are all understated. Instead of stagnating over the last two decades, real wages have been growing. I will give you a number to suggest how much we have been understating the growth of our real wages. The enormous implications for the budget and monetary policy——

The CHAIRMAN. Say that again, the real wages.

Dr. GORDON. Real wages are the growth of dollar wages minus the growth in the CPI, so obviously if the CPI growth is overstated, then the growth of real wages is understated.

The CHAIRMAN. Oh, I see.

Dr. GORDON. I will come up with a number for that in a minute, too.

We have a lot of media attention on this issue; it is of vast importance. But, in the academic community it a very old topic, it is not a new topic. There was a famous report in 1961 shared by the late George Stigler, which brought together some of the Nation's most prominent academics, that studied numerous aspects of government price indexes. But I re-read the Stigler report the other day and I was amazed that there was no statement in the introduction or the conclusion about an overall bias in the CPI.

For a long time it was thought it could go either way. Now, what turned the tide? Why do we now have what Chairman Greenspan argued very persuasively, it is just almost a zero chance that it is biased in the direction of understating inflation, almost surely overstates inflation.

Appropriately, the new evidence that has turned the tide came from both the academic community and from within the BLS itself. My 1990 book, "The Measurement of Durable Goods Prices," provided compelling evidence of upward bias that was larger than previously suspected in both the CPI and the producer price index.

Two new types of bias that have already been discussed earlier today were identified and quantified by talented economists at the BLS itself. Replacing the old adversarial battle of academic offense and BLS defense, the last decade has witnessed a new era of cooperation.

I am going to divide this up into four problems with the CPI. The first two are old stories, the second two are newer. Putting them all together leaves no doubt, there is a huge problem.

The first and the oldest type of bias with the CPI is what I will call traditional substitution bias. The price of beef goes up more than the price of chicken, and so consumers switch from beef to chicken. We have heard already that the base year for the CPI that determines the expenditure weights on beef and chicken are now more than 10 years out of date.

That first initial substitution bias, we have heard already, the BLS estimates to be at 0.1 to 0.2 percent a year. I am call that at 0.25 percent a year, because I think if you went down to the very finest level of disaggregation you would come up with a number like that.

Most important, the second problem with the CPI has been widely recognized for many decades, and that is the problem of quality change. Now, to set this problem in context, students of business history draw attention to what is called the product cycle.

New products, whether autos, air conditioners, or VCRs, are initially made in small volumes and sold at high prices. Soon firms figure out how to increase volumes and reduce prices. Eventually products mature, sales fall off, and prices go up more rapidly than the average product. Think of it is a U-shaped curve.

Now, if these products are introduced into the CPI too late, we miss the whole first part of the product cycle when the prices are going down rapidly. Between 1978 and 1982, the price of a VCR went down from $1,000 to $250. We got electronic, programmable capabilities that were not there in 1978, but the VCR was not in the CPI during those 4 years of rapid price decline. In my book, I emphasize the air conditioner. It was sold in mass quantities as early as 1952 and was not in the CPI until 1964.

Now, there is another aspect of quality change bias that results from a narrow definition of a commodity. We have already heard the example of the calculator. Before 1970, if you wanted to get a precise answer in multiplication or division you had to have a big, noisy, clanky thing that made a lot of noise and took a long time to figure out the answer.

Now we have pocket calculators that cost $10 that are in the pocket of every college student, and we can do exponents, logarithms, and lots of things that the old machine could not do. But that price decline was completely ignored in all the government price indexes, which treated the old and new calculators as separate products.

The third aspect of quality change results from a narrow definition of quality. New, improved models are often introduced with new features that are missed by the CPI. I am going to read just a part of this list of the kinds of things the CPI misses and that I said in the introduction of my book, I missed. I do not think we can ever get the quantification of some of these items.

For instance, over the postwar, the improved ability of freezers to hold a zero temperature; the reduced electricity consumption of all appliances, particularly refrigerators and TV sets; reduced repair costs on TV sets. The average TV set in the 1960's used to break down twice a year. Reduced vibration, noise, and discomfort in air travel. Enormous improvements in the audio quality of home stereo equipment. Compare the color TV set that you look at today

compared to 20–30 years ago; vastly different quality of picture, less energy consumption, and very much fewer repair problems.

How much does this quality change bias amount to? For some products it is huge. For TV and radio equipment, in my book I came up with the number of 6 percent per year bias over 37 years, studied in this book. For other products, of course, it is much less.

I estimated that, for consumer durables—I created about half of them—that for that half it was about 1.5 percent a year for the postwar period. I assumed that that other half that did not measure were measured perfectly by the CPI and, of course, that cannot be true. If you just took the durables I measured in my book you would get 0.3 for the whole CPI. Clearly, I can double that and feel very confident that I am way understating the problem.

By the way, I have some new unpublished research going back before World War II, taking the Sears Roebuck catalog and just doing something ordinary, like men and women's apparel, of the types sold to the typical working person. The bias I came up with there is 2.0 percent per year.

The CHAIRMAN. I have to ask you to abbreviate, if you would, Doctor.

Dr. GORDON. All right. The other two sources of CPI bias have already been discussed, and the best research on them has been done within the BLS. First, the outlet substitution bias, the fact that if consumers shift from 69 cent bananas at a traditional supermarket to 49 cent bananas at an ultra-discount supermarket, that is treated as a different product by the CPI and that price decline is missed.

Finally, there is the logarithm bias, this remarkable phenomenon. An item goes on sale from $100 to $75. That is a price decline of 25 percent. It goes back after the sale is over to $100. That is a price increase, according to the CPI, of 33 percent. 33 minus 25, the price has gone up by 8 percent, even though the thing is back to its original price of $100. That alone leads to a bias in the CPI of 0.33 percent a year, according to BLS research itself.

Now, what are the implications, taking account of compound arithmetic? If a total bias, adding up all the things I mentioned in the testimony, which I say comes out at 1.7 percent a year, even omitting a lot of different types of quality change bias, compound that over 25 years. Instead of stagnating, real wages have gone up by 53 percent. Federal expenditures on Social Security in 1994 would have been reduced by $100 billion in a single year. The true inflation rate in 1994 would have been closer to one percent than 3 percent.

Well, can you believe this kind of radical high estimate of the bias in the CPI? Whatever invention you take—and I will skip over this part of the testimony—technology has improved human life in ways that go far beyond the simple comparison of one product with another.

In a stunning paper, William Nordhaus at Yale has measured the change in the price of lights per lumen, going all the way back to the cave man, and the price of light has been going down 7-10 percent a year. That does not even take account of the value to ordinary human beings of extending day into night, of actually being

able to do productive things when it becomes dark, particularly in the winter.

The problems are many; some solutions are simple. The BLS knows about all of these problems. You can fix the logarithm bias by reprogramming the computer, you can fix outlet substitution bias by actually keeping track of the prices that consumers actually pay.

I do not think it is necessary to increase the budget of the BLS. This ivory tower academic and a few underpaid graduate students made a substantial dent in this problem at a total research cost of just a few hundred thousand dollars, thanks to the NSF for supporting it. It is a mere flyspeck.

The CHAIRMAN. Doctor, I have to ask you to conclude.

Dr. GORDON. That is a mere flyspeck compared to the budget of the BLS. The CPI is severely biased upward. Fixing it will take time. We cannot wait for that. I agree with Dr. Greenspan, that it is not possible to fix every part of this, even in principle. Every year that we wait Social Security beneficiaries and taxpayers are being compensated for inflation that has not occurred.

Thank you.

The CHAIRMAN. Thank you.

[The prepared statement of Dr. Gordon appears in the appendix.]

The CHAIRMAN. Dr. O'Neill.

STATEMENT OF JUNE O'NEILL, Ph.D., DIRECTOR, CONGRESSIONAL BUDGET OFFICE, WASHINGTON, DC

Dr. O'NEILL. Mr. Chairman, members of the committee, I am very pleased to be with you this morning to comment on the Consumer Price Index. I will summarize my testimony and I would like to submit my prepared statement for the record.

Last October, the Congressional Budget Office issued a report titled "Is the Growth of the CPI a Biased Measure of Changes in the Cost of Living?"

CBO's review of the available research, which is contained in that report, indicates that the CPI does, in fact, overstate the increase in the cost of living for the overall population. The extent of the bias is not known with certainty, but the firm empirical evidence suggests that the CPI probably overstates the rise in the cost of living by between 0.2 and 0.8 percentage points a year.

The lower boundary, the 0.2, appears to us to be quite firm. The upper boundary of 0.8 is less firm, and there is some research suggesting that it could be higher, although there might be some people who think it could be lower than the 0.8 percentage point.

First, why is it so important to measure inflation correctly? Measuring changes in the cost of living has important effects on the Federal budget and, as you are well aware, it is particularly important for those portions of the Federal budget over which this committee has jurisdiction.

By statute, the rate of increase of the CPI determines the size of the cost-of-living adjustment for Social Security as well as for other Federal transfer programs. It is also used to adjust income tax brackets and personal exemptions.

For example, a 0.5 percentage point reduction in the growth of the CPI from 1996 through the year 2000, holding all other aspects

of the economic forecast unchanged, would increase tax collections in the year 2000 by close to $10 billion and reduce spending by $13 billion below the level that CBO is currently projecting.

If the effects of the savings in debt service are included, the deficit in a single year, 2000, would be about $26 billion lower. These estimates are shown in Table 1, which is on page three of my prepared statement.

The CPI obviously has a huge effect on the Federal budget. But even if the budget were not directly affected, we should all be concerned about the accuracy of available measures of the cost of living.

As Dr. Gordon mentioned, measuring changes in prices has important effects on the way we view the performance of the U.S. economy, including growth of real output, productivity, wages, and the standard of living in general. For example, CPI price series, as Dr. Gordon mentioned, are used to deflate about 60 percent of the expenditures that make up the GDP.

If the growth in these prices is overstated, real GDP growth will be understated, as will growth in productivity. Thus, the operation of government policy, which depends on such measures as real GDP growth, can be seriously misled if the CPI is faulty.

Now let me address, very briefly, the causes of overstatement in the CPI. You may have already heard enough about them, but we have also identified the same three problem areas as contributing to the upward bias in the CPI.

First, because the CPI is a fixed-weight index, it does not fully capture the changes in buying patterns that consumers actually make to offset price increases. That is what has been referred to as substitution bias.

Second, there is a technical problem relating to the rotation of store outlets in and out of the sample, which the BLS has partially corrected. Third, adjustments in the quality of goods and services appear to be inadequate. That may be, in fact, the largest component of the problem.

The most extensive theoretical, empirical research on measurement bias relates to the first problem area, substitution bias. Our review suggests that there is a strong consensus that the CPI overstates the change in the cost of living by about 0.2 percentage points because of substitution bias.

With respect to the bias stemming from sample rotation, we conclude that it might still contribute 0.1 percentage point toward overstating the cost of living.

The third major reason for the overstatement reflects the imperfect way that changes in the quality of goods and services have been taken into account, including as an extreme aspect of the quality problem the introduction of entirely new goods or services.

Accounting for changes in quality involves extremely difficult conceptual and empirical issues, and research in these areas is not that abundant. Not surprisingly, there is a wide range in the estimates of bias that might stem from problems of quality adjustment. Some analysts believe that the quality bias is small, on the order of 0.2 percentage points, whereas others feel that it may be as much as 1 percentage point.

Well, what can be done? There is no simple way to measure changes in the cost of living accurately. Over the years the Bureau of Labor Statistics has tried to make the CPI a better measure of price change. In fact, much of the best research on the CPI has been produced by the BLS. But many difficulties remain.

The problem the government faces is that the CPI has been used to index benefits and income tax brackets as though it were a true cost-of-living measure. Consequently, the upward bias in the CPI has had the unintended consequence of increasing the deficit. In dealing with that problem, however, policy makers need to be cautious in advocating changes to the CPI. The credibility of the CPI has to be maintained.

We have identified three, not necessarily exclusive, options that this committee could pursue in response to the CPI problem. One is to maintain the status quo, awaiting scheduled changes in the CPI and supporting the efforts of the Bureau of Labor Statistics to improve the CPI as a measure of inflation. The second option is to determine, with the assistance of a panel of experts, an adjustment factor that could be applied to the CPI in the short run to bring it closer to a true cost-of-living index. The third, is to establish a larger commission to examine how indexes are used to adjust benefit levels and tax brackets.

The down side of the first option, maintaining the status quo, is that flaws in the cost-of-living adjustments will continue to put upward pressure on deficits.

The second option, which would call for legislative action on the part of this committee—namely, to adjust indexing formulas—recognizes that some consensus exists to the apparent magnitude of bias in the CPI, particularly concerning the lower bound. For example, many studies over the years have found that the substitution bias alone is on the order of 0.2 percentage points a year.

There is clearly a broad consensus on the magnitude of the substitution bias. Other potential biases have not been researched sufficiently to provide the basis for a consensus. However, a panel of experts could weigh the available evidence and advise the Congress on the approximate degree to which the CPI may overstate increases in the cost of living.

That undertaking would not entail changing the calculation of the CPI itself. If an adjustment factor could be agreed on, the statutory formulas for indexing could be changed to reflect that adjustment.

The third option—establishing a commission to undertake a broad review of indexation—recognizes that the appropriateness of the indexes now used may also require a comprehensive review. For example, the CPI for urban wage earners is used to index Social Security payments, but there is no reason to believe that the spending patterns of urban wage and clerical workers are representative of the spending of Social Security recipients.

In conclusion, the CPI has considerable effects on the Federal budget, both on spending and on revenues. Our perceptions of the economy and the soundness of economic policies depend on the quality and the appropriateness of the CPI.

The current debate about using the CPI as a cost-of-living index, I think, should yield positive results. Although many of the ques-

tions raised about the index cannot be easily answered, the effort to improve the CPI will set the basis for more informed policy in the future.

Thank you.

[The prepared statement of Dr. C'Neill and answers to questions submitted by Senator Pryor appear in the appendix.]

The CHAIRMAN. Let me ask, if we are talking about apples and apples, when Alan Greenspan, 6 weeks ago, said the Federal Reserve estimated the CPI was overstated by someplace between 0.5 and 1.5. Dr. Gordon, is that the same as your 1.7 figure?

Dr. GORDON. Yes.

The CHAIRMAN. All right.

Dr. GORDON. I am taking a number of things, putting them together, adding a bit that is conceptual, provided by the examples that I gave of things that nobody has come close to measuring, but which consumers care about. And I think the 1.7 is too low, but I do not want to get into a wild man's position here.

The CHAIRMAN. Well, nor do we. And if we were to adopt Dr. O'Neill's suggestion of, do something legislatively for some period of time, and at the same time appoint a commission, I do not want to take the most extreme estimate that God could put on this earth and say, we are going to lower the Consumer Price Index by 4 percent because somebody in Nirvana said that is what it is. But I wanted to make sure that your 1.7 roughly comports with his estimate of 0.5 to 1.5.

Dr. GORDON. It is the same concept, it is apples and apples. And I think he framed it very well by saying 0.5 to 1.5, split the different, let us do 1.0. In my prepared testimony I agreed that that is what we should do.

The CHAIRMAN. I saw that in your testimony.

Dr. O'Neill, your 0.2 is just substitution, right?

Dr. O'NEILL. Substitution alone.

The CHAIRMAN. Right.

Dr. O'NEILL. Which we thought was really the very lower boundary.

The CHAIRMAN. Now, is your 0.2 to 0.8 the apples comparison with Alan Greenspan's 0.5 to 1.5, and Dr. Gordon's 1.7?

Dr. O'NEILL. Well, what we did with the 0.8 was confine it to areas for which there were fairly firm estimates. That excludes, in the quality area particularly, sources of bias about which research has not been done.

For example, in the huge medical area there is a known bias. There are a lot of problems with the medical CPI. I do not think that enough research has been done to say exactly what that particular bias is. Including the overstatement of prices in the medical area could push the upper boundary well above the 0.8, but it would be a guess to say exactly how far.

The CHAIRMAN. Would it be fair to say, if we were to take Dr. Gordon's suggestion of 1.0, which is the midpoint on Alan Greenspan's we would not be far off.

Dr. O'NEILL. It is hard to say. That is why I think some panel of experts would be needed so that you would have an array of analysts to give you some idea.

Now, more research may be available than has been published. There is always that issue when one does a review. We did not assemble a commission or have a commission at our disposal to review every crumb of evidence that exists.

The CHAIRMAN. But you say, you are comfortable at 0.8, but beyond that you are not quite sure because the evidence is not solid.

Dr. O'NEILL. Yes. It does not mean that it is not there.

The CHAIRMAN. No, I understand that. When I said, therefore, 1.0, we are not far off of 0.8. If 0.8 is factually sustainable and you are not sure, you think the bias is beyond that but you do not have the evidence, we are not far off at 1.0, are we?

Dr. O'NEILL. That would be the upper end of the range. But the whole range is between 0.2 and, maybe you could even say, 1.5, somewhere in there.

The CHAIRMAN. Now, Dr. Abraham, tell me where you are on 0.5 to 1.5, and 1.7, and 0.2 to 0.8.

Dr. ABRAHAM. Well, I guess I am very loathe to subscribe to a particular range, although I am happy to talk about the pieces. I think we are all in agreement that there is a substitution effect associated with the fact that the CPI is based on a fixed-market basket that is on the order of 0.2 percent.

I guess in terms of Dr. Gordon's estimate that there were two areas, I think you referred to them as an outlet substitution bias and a logarithm bias, that together add up to 0.85, I could not subscribe to that for the reason that I indicated earlier. I do not think that you can add those effects up.

I think they are really the same thing, and I would be comfortable for those two things together accounting for something on the order of 0.1 to 0.3 percent per year overstatement in the CPI, which brings us to this whole quality adjustment area which, as everyone has indicated, I think is a very difficult area.

I would make a couple of points, I guess. One, is that the extremely interesting and important work that Dr. Gordon, in particular, has done on this issue, is now somewhat dated and there have been changes in the——

The CHAIRMAN. Is somewhat dated?

Dr. ABRAHAM. Is somewhat dated in the sense that the period that it referred to was what, Bob?

Dr. GORDON. 1947 to 1983.

Dr. ABRAHAM. 1983. And there have been some changes in CPI procedures since that time, so it would be valuable to update that work.

The other point that I would make is that the areas in the CPI where people have been particularly concerned about quality changes are home electronics and appliances, which together are about 1 percent of the market basket, and medical care, where I would agree there is a lot of uncertainty, which is about 7 percent of the market basket.

There is an awful lot in the rest of the index where I think our evidence is much sparser, and that leads me to be reluctant, given that I would like to be able to say what the basis for any number I came up with was in other than a judgmental way to give you a bottom line.

The CHAIRMAN. Senator Graham.

Senator GRAHAM. Thank you, Mr. Chairman. It seems to me we start with a fundamental problem that we are trying to use the Consumer Price Index as if it were an index of cost of living, and everyone is in agreement that it is not.

Are there any other statistical indices which are developed for purposes that surround the issue of cost of living which might be looked at or melded into or with the CPI in order to come closer to an index of cost of living?

Dr. GORDON. I think the problem is that you can do things with historical, retrospective research and go back and redo it and come up with a new estimate of what the true cost of living change was over, say, the decade of the 1980's. That would be a very useful thing to do.

But, as the commissioner said, you cannot put it into effect in real time. They have got to come up with a number every month and you cannot do that kind of retrospective research in the same way.

My position, however, is that you can learn from the historical research, from the comparison of what your best estimate is if you go back and do it over a long period of time, and use that number to adjust, just as Alan Greenspan suggests.

There is a lot of wonderful evidence out there. "Consumer Reports" goes out and gets the actual market price of a whole bunch of consumer durable goods the consumers care about. That has been published since 1937. I got almost everything I could out of it in the process of doing this book, but you could update quite easily the kinds of things I did and get a new estimate of quality change bias for at least the kinds of products that are reported by consumer testing agencies. You cannot do it every month in real time, but you can certainly learn from that kind of research.

Senator GRAHAM. Doctor, I was intrigued with your statement that the corollary of an upward bias in the CPI is a downward bias in some of our reports as to actual wage rates and incomes.

Dr. GORDON. All of our reports.

Senator GRAHAM. Could you elaborate on that, and what do you think the degree of that downward bias is?

Dr. GORDON. Well, for real wages it is very simple because real wages are defined as the change in dollar earnings relative to some price index, and it should be the measure of the cost of living that we are all looking for to find out if the worker is actually better off now than he or she was 20 years ago. I came up with the estimate that if you cumulated by 1.7 over the last 25 years, that is 53 percent.

We have a number of estimates that average hourly earnings, if anything, a little lower than they were in the early 1970's. I think that is hogwash. I think that average hourly earnings and output per hour, that is, productivity, are all substantially higher than they were 20, 25 years ago for precisely the reason that we are here today to discuss, that real GDP is based on a bunch of prices, and 67 percent of GDP is consumption. So, whatever way the CPI is biased up, all those other things are biased down.

Senator GRAHAM. Dr. O'Neill, Dr. Abraham, do you agree with that?

Dr. O'NEILL. Yes. Even if you take a modest overstatement, if you said that the overstatement was half a percentage point, over 20 years that cumulates to a 10 percent overstatement of inflation, and therefore understatement of real wage growth.

There has been a lot of hand wringing over how living standards have been declining and people are not doing as well as their parents did, but a lot of that could be misinformed because of failure to use a proper inflation measure to deflate earnings.

Dr. ABRAHAM. I am less willing, as I have already indicated, to subscribe to a particular amount by which the CPI overstates changes in the cost of living, but it clearly is the case that whatever overstatement there it is going to translate directly into understating the rate of growth of real wages.

Senator GRAHAM. Thank you, Mr. Chairman.

The CHAIRMAN. Senator Simpson.

Senator SIMPSON. Mr. Chairman, according to the Federal Reserve, 0.5 overstatement of the CPI costs the Federal Government about $150 billion over 5 years. I mean, we are a big, heavy country here, talking and trying to learn about something which is surely more than all of us can comprehend, and certainly more than an academic exercise, because by this instrument of the CPI, we are using it to provide COLAs for Social Security beneficiaries, regardless of their net worth or their income, military and Federal retirees, regardless of their income. I fully understand the import of that statement. We are not trying to say they should contribute. They do not, they should not. We disrupted their lives.

Food stamp recipients, including students, colleges, private sector to increase wages, to adjust the Federal income tax brackets to limit bracket creep. We are locked in to something which I will bet has not had a hearing around here in any depth for 30 years.

I commend the Chairman and Ranking Member for this, but this one is big time with what we have ahead of us, none of us, again, wanting to deal with anything politically hot, not one thing politically hot.

So, I want to ask you in a terribly provincial way, as you compute all this on the 80 percent with regard to the urban population, what calculation is based here, if all of the CPI with its numbers and the 20,000, and the 24,000 living in the chosen urban area, 29,000 across the country surveyed on what goods and services they purchased, and no separate CPI is calculated for truly rural persons. Does this mean that the CPI is then inaccurate for rural areas in the United States, which are many in the United States? If it is inaccurate, how inaccurate?

Dr. GORDON. I would think that, if anything, the cost of living may have gone up less in rural areas because those areas have been the primary early beneficiaries of Wal-Mart as it spread around the country. Of course, it destroyed the lives of a lot of small merchants, and there is that issue.

In terms of the price actually paid by consumers, the fact that consumers flooded into Wal-Mart and abandoned Main Street in many, many rural communities suggests that their cost of living may have gone down even more, or gone up less, I think is the proper way to put it.

Senator SIMPSON. Well, that is a disturbing enough statement in itself, but that did not solve much right there.

Senator MOYNIHAN. There goes Wyoming.

Senator SIMPSON. Yes.

Dr. ABRAHAM. Perhaps I could take a stab at a perspective on your question. One point I would make—I think you are probably all aware of this—that the CPI you mentioned, the so-called CPI–U is the one that covers 80 percent of the population of the United States.

The index that is used for Social Security is actually the CPI–W, which covers about 32 percent of the population. It applies to urban wage earners and clerical workers. But I guess Bob may be a little more willing to speculate than I, but given——

Dr. GORDON. That is because I am in a university and you are in the government.

Dr. ABRAHAM. Right. And I no longer am at a university. Given that we do not collect price data in rural areas, my own view is that it is very hard to say how price changes there may have compared. I think we would actually have to go out and collect the data before we could answer your question.

Senator SIMPSON. Well, on this logarithm bias that Dr. Gordon spoke of that seemed to trigger some rather intensive scribbling as you listened to his remarks, and he put it rather clearly and bluntly, about something going from 100 to 75, and that represents a price decline of 25 percent, if it went on sale and it goes back to its regular price, that is a price increase, according to your agency, of 33 percent. Now, what are we to deal with there if you say that is not so?

Dr. ABRAHAM. I am afraid I have to take issue with that description. That is just not an accurate description of a general problem that exists with the CPI. It is not the case that if we are pricing an item its price goes down and comes back up that we err. In that case the index would come back to the same value that it started at.

What may have led to his understanding of what was done and his interpretation in coming to this conclusion was some work that was done by a researcher at the BLS. There is an issue.

The issue, though, really has to do with the way that new items are handled when they are introduced into the index. I could try to explain that in more detail if you would like, but that is the so-called sample rotation effect that I referred to earlier that we think we, partially at least, fixed with the changes we made in January. So, I am not agreeing with his description of that problem.

Senator SIMPSON. I think maybe in your area and in the area of the financial markets we need to get some new computations of things like the Consumer Price Index and even the Dow Jones Average. It does not affect anything really as to some limited number of stocks, all of whom have been dropped in or dropped out over the years, many stocks doing quite well, but the Dow Jones going up because of some extraordinary event 80,000 square meters from here.

But this is very, very difficult for us. If we are going to do anything, you know we are not going to do the political hot stuff. You know that we are totally chicken. There is not a soul in here that

is going to touch military retirement, Social Security, anything and all. So, when they are doing that, watch out, because they will play in this area. They will play here. You can be a player here and fool a lot of people and really hit and distort.

Dr. O'NEILL. I believe that Chairman Greenspan recommended something like our option three, which would call for a commission that could make recommendations on an annual basis to the Bureau of Labor Statistics or to Congress. The Bureau of Labor Statistics would then be asked to publish a measure, to be used for indexing purposes, that would be the CPI minus X, and there could be different variants of that. I believe that some countries have developed indexes for different purposes that are based on their version of the CPI minus X.

Senator SIMPSON. That does not startle you if we were to do something like CPI minus 0.5 or CPI minus 1.0. I mean, does that send a rigor through you, as a formula?

Dr. O'NEILL. As a formula, it would be something like that; I just do not know exactly what it would be. I think it would be very important that the people on this commission truly be experts on the matter, people who could be considered impartial with respect to the political outcome of what they were doing.

There is some precedent because BLS does publish different kinds of unemployment rates. There are different variants—I think there were 11 at one point—of the unemployment rate, plus or minus, calculated in different ways. The same thing could be done with the CPI.

Senator SIMPSON. Thank you, Mr. Chairman. Thank you for always very important hearings that make us all learn a little more.

The CHAIRMAN. Senator Moynihan.

Senator MOYNIHAN. Yes. If I could say to Senator Simpson, there is a tradition of civil dialogue between the academic economists and the BLS that goes back three-quarters of a century.

Some indices were once fiercely disputed, such as the unemployment rate. I can tell you, when I was Secretary of Labor for Policy Planning and Research the unemployment rate would come out and instantly the AFL–CIO would say, too low, and the Chamber of Commerce would say, too high. Then we would have a panel meet and we hit it around.

But that does not happen. The general accuracy of that index is now accepted. I guess our first monthly unemployment rate with new survey data was 1948, is that not right? That is rather recent. The sampling techniques are new to us, post World War II.

I would like to make two points here if I can. One, is that, at minimum, Mr. Chairman, we face the anomalous situation that the Social Security benefits are indexed by CPI–W, which is the only CPI that existed in 1972, and the income tax rates are CPI–U, and they are not the same. We are using two quite different indices.

I do not want to alarm anybody, but the CPI–U, which is used to adjust Social Security benefits, has been growing at the rate of 3.5 percent as against 3.7 for the CPI–U. So, at this level we have been underindexing Social Security. I think there is an experimental index for the elderly that increased about 4 percent per year between 1982 and 1993. Is that not right, Dr. O'Neill?

Dr. ABRAHAM. It is actually a BLS experimental index.

Senator MOYNIHAN. That is a BLS experiment. Yes. And BLS is always right on the edge of finding out the problem it has. I think we obviously have to work at this. The time has come. We obviously are going to have an agreement.

The poverty levels. I mean, I was around in those early 1960's when we put together the poverty index. Molly Orshansky had to come up with something. She was over at the Social Security Administration was she not? And she said, why do you not say three times the city worker's family food basket. And, all right, why not?

Three times the Department of Agriculture's estimate of what it costs to feed a family of four. Now we index it and we have indexed it with CPI since. But if the CPI–U has been too high, then our poverty statistics are too high. This thing rattles and falls around, does it not?

If I could ask Dr. Abraham, first of all, you do understand logarithms, do you not?

Dr. ABRAHAM. Yes.

Senator MOYNIHAN. There we are. I wanted to get that on the record. A commission could serve the purpose. This subject has matured enough in the academy. We would run a commission which would have some BLS members on it, would we not?

Dr. ABRAHAM. I think there are different kinds of commissions that have been talked about, some of which I think it would be appropriate for the BLS to participate in, and some of which I think it would not be.

Senator MOYNIHAN. Yes.

Dr. ABRAHAM. If you were talking about a commission that was serving the Congress or a Presidentally-appointed sort of commission that Mr. Greenspan was talking about that was intended to come up with an estimate of what the cost-of-living adjustment for various purposes should be, that, I would say, is not a commission in which the BLS should participate.

Senator MOYNIHAN. Yes.

Dr. ABRAHAM. That is really getting into policy and, as you know, that is something we stay out of. I would be very eager to have formed, and obviously to work closely with, a second sort of commission which would be one charged with evaluating the BLS methods for producing the CPI and advising us on how those might be improved, and that is something that we, independently and internally, had begun talking about wanting to pursue.

Senator MOYNIHAN. Yes. Yes.

Dr. GORDON. I think you want something broader though, because there is this issue that keeps coming up. Should you really be indexing Social Security by a general price index or one that applies particularly to people over the age of 65, which is clearly more relevant, where you would have a bigger weight for medical care and you would factor in things like the shift to HMOs and other ways in which medical economies are made.

Senator MOYNIHAN. You might find you had an index that was higher than the Consumer Price Index.

Dr. GORDON. That is quite possible, but that is exactly what the commission should be thinking about.

Senator MOYNIHAN. Mr. Chairman, I would like to say, that I think you see before you that the capacity for civil inquiry into the subject of this kind is very much in place. I hope we would proceed.

The CHAIRMAN. Well, as I said at the start, what these people are talking about, together with Alan Greenspan, probably has a greater effect on our budget than anything else this committee may do this year.

Senator Simpson?

Senator SIMPSON. No. I thank you very much for your hearing.

The CHAIRMAN. Do you have any more?

Senator MOYNIHAN. I just want to make one comment. The United States has a precious tradition of good government data. We built social science into the constitution when we called for the decennial Census. Nothing is more precious than a tradition like that, and we must not politicize it.

Senator SIMPSON. Mr. Chairman, just one other thing. As you talked about, really, the senior citizens, the durable goods, the things that are acquired, medical care, I think it would be very important that somewhere we begin to do something just in that area because what is happening—I think my statistics are fairly close—is that in the year 2025, unless we do something with these programs, that 65 percent of the entire Federal budget will be going to people over 65.

Well, if that is the case, then should we not sit down now and look at durable goods, home health care? These things are just going to overwhelm all other things and they do not fit in there.

I mean, these issues with seniors and health care and home health care, hospice care, the fact that a huge percentage of all Medicare goes to people over a certain age, and in the last 6 months of their life.

I say, as one who just as enjoyed the company of a 95-year-old father and a 94-year-old mother, and my brother and I were paying for it ourselves, nobody else could do that. Yet people now want that from their government. Break the country. Break the country.

Dr. GORDON. Let me add that we have excellent research going on at the NBER in Cambridge on drug prices, and detailed comparisons that take account of the shift to generics and all sorts of things, compared with the BLS price indexes. There is material around there that should be brought together and evaluated.

The CHAIRMAN. Go ahead.

Dr. ABRAHAM. If I just might add, we are actively considering and working on incorporating as appropriate improvements in the procedures for constructing the index, so I think that an expert group to advise us would be helpful.

Dr. GORDON. That is right. And whatever number I suggested, any commission would want to take account of what the BLS is doing now, not what they did 10 years ago.And if they fix the logarithms, or whatever, we can forget that, as I am sure they will, probably, tomorrow.

The CHAIRMAN. Thank you very, very much. We are adjourned.

[Whereupon, at 11:38 a.m., the hearing was concluded.]

CONSUMER PRICE INDEX

THURSDAY, APRIL 6, 1995

U.S. SENATE,
COMMITTEE ON FINANCE,
Washington, DC.

The hearing was convened, pursuant to notice at 9:30 a.m., in room SD–215, Dirksen Senate Office Building, Hon. Bob Packwood (chairman of the committee) presiding.

Also present: Senators Chafee, Grassley, Simpson, Moynihan, Conrad, Graham, and Moseley-Braun.

OPENING STATEMENT OF HON. BOB PACKWOOD, A U.S. SENATOR FROM OREGON, CHAIRMAN, COMMITTEE ON FINANCE

The Chairman. Good morning folks. Thank you very much for coming.

Both Senator Moynihan and I regard this as one of our most significant hearings because this whole issue of the consumer price index, is it right, or is it wrong, or is it overstated or understated, is very critical to everything we do in Government.

It is kind of like those bar code readers at the supermarket. If they are miscalibrated, everything costs too much and, by and large, the average person has no idea if they are undercalibrated or overcalibrated.

Or maybe you would want to compare it to a tire. If you overinflate it, you blow out; you underinflate it, and you have a flat. And we would like to have it inflated at just the right amount.

So what you may tell us today may have more effect on the budget than anything else that is done by anybody else this year.

OPENING STATEMENT OF HON. DANIEL PATRICK MOYNIHAN, A U.S. SENATOR FROM NEW YORK

Senator MOYNIHAN. Yes sir, Mr. Chairman, may I suggest that, in your next campaign, when you get to that supermarket checkout, you do not look at that thing and ask how it works.

This is so profoundly important, and so politically neutral. We are trying to deal with what we have always been very good at in our country, which is statistics.

If I could say to Dr. Diewert, it is our pleasure to have a Canadian scholar join us.

The United States sort of built social statistics into its system when the Constitution required us to have the decennial census, and acquiring data very early.

In the mid-19th century, as Dr. Popkin will record, one of the American labor movement's manifestation was to ask Government

to start establishing prices, a city worker's family budget, things like that, so that they could bargain for wages against what had been determined to be the cost of a basket of goods necessary to maintain a family.

And it is that tradition which BLS began, which enabled it to go forward in World War I with what was to become the consumer price index. And we have since used that index for all manner of purposes, for none of which it was devised.

Did I get that right? It was not devised for the purpose we have been using it, and so we are thinking about what is a responsible correction?

And I thank the Chairman for leading us on this issue.

The CHAIRMAN. Senator Grassley.

Senator GRASSLEY. I have no opening statement, Mr. Chairman.

The CHAIRMAN. If you would not mind, we will take Dr. Jorgenson first today. He has to catch a 12:00 o'clock plane.

I hope we will finish everybody on questions before he has to go. But, if anything goes wrong, we would at least like to have him on. So we will start with Dr. Jorgenson.

STATEMENT OF DALE W. JORGENSON, Ph.D., CHAIRMAN, DEPARTMENT OF ECONOMICS AND FREDERIC EATON ABBE PROFESSOR OF ECONOMICS, HARVARD UNIVERSITY, CAMBRIDGE, MA

Dr. JORGENSON. Thank you very much.

I would like to apologize to everybody here for scheduling this departure a little early. I have a class.

This is a topic that I think is accurately described by the opening remarks you have just heard; it is an extremely important one.

In a way, it is a little bit embarrassing for economists like ourselves to be discussing the issue of measuring the cost of living, because it is something we think we know how to do.

What we are here to discuss is whether in fact it has been done in a way that is appropriate for the purposes that have just been identified by the Chairman and by Senator Moynihan.

I would like to begin with a brief summary of my prepared testimony, which begins on page 2 of the handout you will find at your desks.

The consumer price index, referred to as the CPI, is published by the Bureau of Labor Statistics. And that is the price index that is used to adjust 30 percent of Federal outlays for changes in the cost of living.

In 1983, the Bureau of Labor Statistics made two significant decisions on the treatment of housing costs. The first was to shift costs for homeowners to a rental equivalent basis, beginning in January 1983.

I am not going to discuss that in detail; that is a technical matter. There are many people here on this panel that are better qualified than to describe the rationale and the details. Suffice it to say, that was an entirely appropriate decision, and it has improved the index.

However, the second decision is something which has drawn a good deal less attention. And this was not—I repeat, not—to revise the treatment of housing costs for 1982 and earlier years.

As a consequence of these decisions, I show in my prepared testimony that the CPI has a permanent upward bias of 11 percent, a permanent upward bias.

Indexing of Federal programs to the CPI has had the effect of transferring responsibility for Federal fiscal policy from the Congress and the President to technicians who are ill equipped, in my view, to perform this policymaking function.

The two decisions taken by BLS in 1983 have contributed very substantially to the Federal deficit, and to the growth of the Federal debt.

In addition, these decisions have resulted in a massive transfer of resources from the general taxpayer, present and future, to beneficiaries of Government programs indexed to the CPI.

And what I want to emphasize in my testimony is that we should recognize that this transfer cannot be justified as an adjustment for changes in the cost of living, the 11 percent transfer that took place.

In testimony before the Committee on Finance very recently, Dr. Alan Greenspan, Chairman of the Federal Reserve Board, has proposed the establishment of a commission to recommend annual cost of living adjustments to the Congress and the President.

This is motivated by the possibility of systematic biases in the rate of inflation, estimated from changes in the CPI.

The permanent bias in the level of the CPI, resulting from the BLS decisions of 1983, requires a different approach. In this testimony, I propose that this bias be rectified as part—and, I emphasize, only a part—of a comprehensive program of deficit reduction.

I would now like to turn to my detailed testimony, beginning on page 3. Obviously, I am not going to cover all of the points that are made in the written version, but I do want to draw your attention to the two charts at the end of the version that was distributed this morning, Unlike the ones I sent in a couple of days ago, these are in color.

The first chart compares the CPI, with an alternative measure of the cost of living that treats housing on a consistent basis. This alternative measure is the implicit deflator for personal consumption expenditures, labeled PCE in the U.S. National Income and Product Accounts.

In the first chart, you can see that both price indices cover the same period, from 1947 to 1991. And, in fact, we could easily bring those up to date. They are both expressed in terms of 1973 as a base year. They are equal to 100 in that year.

And, if we proceed then to the second chart, you can see that between 1968 and 1982, the CPI grew by more than 11 percent, relative to the PCE deflator.

If you return to the first chart for a moment, you can see that, before 1968 and after 1982, the CPI and the PCE grew at essentially similar rates.

Senator CHAFEE. Now do not go too fast, because I am trying to follow this. Could you repeat that again please?

Dr. JORGENSON. Sure. Let us go back to the first chart. The CPI you see there is in red.

Senator CHAFEE. Right.

Dr. JORGENSON. Mr. Chairman, should I pay attention to this?

The CHAIRMAN. No. Go right ahead.
Dr. JORGENSON. All right.
Senator CHAFEE. This red you can ignore.
Dr. JORGENSON. All right, Fine.
Senator CHAFEE. We pay attention to your red here.
Dr. JORGENSON. All right. The PCE, which I referred to as the implicit deflator for personal consumption expenditures, is in blue.

If you follow the chart, between 1947 and 1968, you can see that these move in parallel. They really do not diverge. But, beginning in 1968, the red bars begin to climb, relative to the blue bars. Those are the biases that were built in by the BLS decisions in 1983.

However, by 1982, recalling now that the decisions were taken in 1983, the relationship between the two stabilized and, since that time, the two price indices have been growing at essentially similar rates.

So, if we now go over to the second chart, we can express the CPI relative to the CPE These are just two different measures of the cost of living.

Starting in 1968, we can see that the CPI was 97.9 percent of the PCE in 1968. However, by 1982, after this growth had taken place, the CPI had become 109 percent of the PCE. And that is a relative growth of 11.4 percent. That is the bias that was built into the CPI as a result of the BLS decisions.

Senator MOYNIHAN. Dr. Jorgenson, you are referring to the rates of increase?

Dr. JORGENSON. What I am referring to here is just a comparison between 1968 and 1982. So I took the ratio of the CPI——

Senator MOYNIHAN. Oh, going back to 1973, it is 100?
Dr. JORGENSON. That is right.
Senator MOYNIHAN. I see.

Dr. JORGENSON. Exactly. So, if I take the ratio of the CPI to the PCE in 1968, they were approximately the same, as you can see, 97.8 percent. But, by 1982. as a result of the inconsistent treatment of housing in the CPI, not shifting to a rental equivalent basis until 1983, the CPI has acquired a bias, relative to the PCE, that amounted to 11.4 percent. And that is the number that I really want to focus on because I think that is the number we need to ponder.

Senator CHAFEE. Could I just see if I got this right?
Dr. JORGENSON. Please.
Senator CHAFEE. Of course, I do not even have 1982 on my chart.
The CHAIRMAN. Yes, you do.

Dr. JORGENSON. Well, you have bars for each year. In the legend there, you can see that we had room only for the numbers for the odd years. But there is a bar in between each one of those, corresponding respectively to 1968 and to 1982.

Senator CHAFEE. I see.

Dr. JORGENSON. Now I took the ratio of the CPI to the PCE, the red to the blue, in 1968, and I plotted that in the second chart. Then I did the same thing for 1982, and plotted that in the second chart.

That gives us an idea of how well these price indices were tracking each other over the period between 1968 and 1982. And, as you

can see, they diverge substantially by 11.4 percent between those two periods.

Senator CHAFEE. All right.

Dr. JORGENSON. Now I ask the question. What accounts for the difference between the behavior of the CPI and the PCE deflator between these two periods, 1968 and 1982?

Let me first say that other of these indices are based on the same primary data, namely the information on consumer prices collected by BLS for constructing the CPI.

However, there is an important difference. And that is that the PCE deflator employs a rental equivalent treatment of housing throughout the period, all the way back to 1947, all the way forward to 1991, whereas the CPI uses this approach only after 1983. So you can say that, after 1983, the CPI and the PCE are measuring the same thing.

Before 1983, as a consequence of the BLS decision not to revise backward, the PCE measures housing costs on a rental equivalent basis, and the CPI does not. The difference between the two of 11.4 percent is due to this logical inconsistency in the treatment of housing costs in the CPI before and after January, 1983.

Maybe I should stop at this point and see if there are any questions.

The CHAIRMAN. I just want to ask one question. On your 11.4 percent——

Dr. JORGENSON. Right.

The CHAIRMAN. Is that comparable to allow Greenspan's statement that the CPI is overestimated by .5 to 1.5 percent? When Alan Greenspan says .5 to 1.5, you do not mean 11?

Dr. JORGENSON. No. I certainly do not. This is a level difference——

The CHAIRMAN. All right.

Dr. JORGENSON. A permanent difference in the level. Whereas, what Chairman Greenspan was referring to was a difference in the rate of inflation. And he says that there is a bias in the rate of inflation, which is the change from year to year of between one-half and 1½ percent. That is annual figure, representing a bias in the inflation rate.

This has nothing to do with that. This is a level difference, due to a decision by BLS not to revise the CPI backward to make it consistent with the procedures adopted in 1983.

The CHAIRMAN. Let me ask you just one question then, and then we will go on with Dr. Diewert.

Alan Greenspan says that the CPI is overestimated by .5 to 1.5 percent.

Dr. JORGENSON. Right.

The CHAIRMAN. The new Budget Director says .2 to .8 percent. Dr. Gordon at Northwestern says a minimum of 1.7 percent, and he thinks it is higher than that.

Can you put your imprint on their figures, roughly? Where would you judge in those types of figures the overstatement of the consumer price index to be?

Dr. JORGENSON. My view is that this is going to require a great deal of systematic study. It is something that BLS has been trying to resolve in its own best light for years. And I would say that the

error bands of, say, 95 percent confidence would easily encompass the range that the Chairman suggested, .5 to 1.5. We cannot narrow it down. If you had to ask me for the best point estimate, I would say my best point estimate would be around 1 percent, about in the middle of the range.

I would also like to draw the implications of this for fiscal policy if I may, Mr. Chairman, realizing that my time has run out, but I have tried to respond to questions.

This issue posed for fiscal policy makers, like Members of this Committee, by the inconsistent treatment of housing costs in the CPI before and after January, 1983 has been stated with admirable clarity by the Congressional Budget Office. And I quote, "If the CPI has an upward bias, some Federal programs would overcompensate for the effect of price changes on living standards, and wealth would be transferred from younger and future generations to current recipients of indexed Federal programs—an effect that legislators may not have intended."

How important are the budgetary consequences of this overindexing? Obviously, a precise answer to this question would require substantial and extended study, taking into account the timing of the growth of the bias between 1968 and 1982, the parallel development of indexing provisions for specific Federal outlays and interest on the accumulation of the debt that resulted.

However, a rough calculation, excluding interest on the accumulated debt, suggests that the bias produced an increase of 3.42 percent in Federal outlays.

To translate that into dollars, the estimate that is current for Federal outlays by the Congressional Budget Office for fiscal 1995 is, of course, $1.5 trillion. So that the overindexing amounts to about $50 billion. Now that is not including interest and the accumulated debt. This is more than 28 percent of the Federal deficit of $176 billion. In other words, it is a very large and substantial figure.

We have already discussed the issue that I wanted to point to next, which is that correcting the level of the CPI is a different matter from correcting the rate of change, the estimated rate of inflation, which was the subject of Chairman Greenspan's testimony.

The bias of more than 11 percent in the level of the CPI was created by a growing discrepancy between the CPI and a cost of living index. such as the implicit deflator for the CPE, during the period from 1968 to 1982.

After the two BLS decisions of 1983, this bias stopped growing and contributed nothing to the rate of inflation. The increases in Federal outlays resulting from this bias are the consequence of a inappropriate treatment of housing before 1983. And, I want to emphasize, these cannot be justified as cost of living adjustments.

These increases have resulted in massive transfers to beneficiaries of indexed programs that are totally devoid of any economic rationale.

I think any member of the public, like myself, who has been reading and listening to the media, is now entering a debate over the elimination of the Federal deficit.

A successful deficit reduction program must balance the interests of a very large number of Federal constituencies, all of whom could

benefit from deficit reduction. However, equalizing the relative gains from deficit reduction will require the use of a wide array of policy instruments. There is no silver bullet. It is going to require a great deal of careful consideration.

Elimination of the transfers resulting from the upward bias in the level of the CPI is an important policy instrument for deficit reduction.

How important could that be? Let us take our objective as balancing the Federal budget between now and the year 2002, say over the next 7 years. If we take as our baseline figure $50 billion a year, we are talking about a total contribution to deficit reduction, by elimination of these transfers, of $350 billion.

Obviously, this is not something that needs to be regarded as the key to this problem. It is only one of many policy instruments. But I think it is important to understand the magnitude of the effects of the two BLS decisions that wee taken in 1983, which has resulted in this substantial overindexing of 30 percent of the Federal budget.

Thank you very much. I appreciate your patience.

The CHAIRMAN. Doctor, thank you very much.

[The prepared statement of Dr. Jorgenson appears in the appendix.]

The CHAIRMAN. And we are delighted to have Dr. Walter Erwin Diewert with us from the University of British Columbia, who has also taught at Harvard.

Doctor, I think you come from one of the prettiest towns in North America, maybe in the world.

Dr. DIEWERT. That is why I continue to live there.

STATEMENT OF WALTER ERWIN DIEWERT, Ph.D., DEPARTMENT OF ECONOMICS, UNIVERSITY OF BRITISH COLUMBIA, VANCOUVER, BRITISH COLUMBIA, CANADA

Dr. DIEWERT. I have been asked to present testimony on the following three questions:

Question one, why is the consumer price index overstated?

Number two, what is your aggregate estimate of this overstatement?

Number three, what steps could be taken to rectify the overstatement in the CPI?

I am going to stick fairly narrowly to my terms of reference. Here is my answer to question one. I will interpret question one to mean, what are possible reasons to believe that the U.S. consumer price index may be overstating the degree of price inflation in recent years?

I distinguish five sources of overstatement or upward bias and I would like to note that every source is controversial. That is why, when you ask economists for their best point estimate of the aggregate upward bias, you get different answers because different economists include different aspects of this measurement problem.

The five sources that I distinguish are: substitution bias; elementary index bias; outlet substitution bias; quality adjustment bias; and new goods bias.

I will just briefly indicate what I think these five sources of bias are. Substitution bias is the difference between a cost of living

index, which allows the basket to change as prices change. The current CPI, of course, fixes the basket and, if prices go up, there is no allowance taken for the fact the consumers will purchase less of the higher priced goods. This is a well recognized source of bias. Some people think a fixed basket is good, and we should not worry about substitution bias. I do not agree with this position.

The second source of bias is elementary index bias. This arises from the use of an inappropriate method for aggregating price quotations at the very lowest level of aggregation. This is too technical to go into here but, if you want me to try to explain more about this, I would be glad to.

Senator MOYNIHAN. But there is an upward bias, and you cite two references to the upward bias.

Dr. DIEWERT. Yes. In the U.S. CPI, I believe there is.

Outlet substitution bias is the third source of bias, which I distinguish. This is fairly easy to explain. It is the bias that occurs when consumers shift their purchases from high-cost outlets to low-cost outlets. It turns out that the current methodology does not take into account that consumers are paying a lower average price when this happens.

Now, in the old days, this was not such a big source of bias. Work in the BLS in the 1960's, compared to the 1980's confirms this. But, in recent years, with the growth of discount stores and so on, it is a significant source of bias. Again, some people would say, well no, this is not a legitimate source of bias. But, again, I would disagree with this negative point of view.

The fourth source of bias I distinguish is quality adjustment bias, or linking bias. This is the bias which can occur when a variety or a model of a good is replaced by a new variety. Again, it is a little bit technical to get into the details of why this bias occurs. And, again, it is a bit controversial because some people maintain that there is not an upward bias at all from this quality adjustment factor. I think Joel Popkin will fall into this latter camp.

The final source of bias I would like distinguish is new goods bias. This is somewhat similar to the quality adjustment bias, but it is a little bit different. Substituting one model for another keeps the total number of commodities constant. But what we observe in today's world, with the growth of international trade, with the growth of specialized production, is that there is a vast proliferation of commodities out there that consumers can buy.

I see my light has gone on.

The CHAIRMAN. Go right ahead.

Dr. DIEWERT. It turns out that existing index number methodology simply does not take into account the benefits of an increased choice set. This is very difficult to do, but I believe this is an important source of bias.

So what is my answer to question two, what is the aggregate overstatement? Well, we can just go through and sum up the various empirical estimates for the five sources of bias. On page 3 of my testimony, it is summarized.

I believe that substitution bias in the United States probably adds about .2 percent a year to the U.S. CPI. The elementary index bias added approximately half a percent a year to the U.S. consumer price index for the years 1987 to 1994. This coincided

with a new methodology introduced, but it just had this unintended consequence of adding a built in upward bias of about half a percent.

Outlet substitution bias adds something on the order of a quarter percent to 0.4 percent a year in recent years. Again, the evidence on this is a bit thin, but that would be my best guess.

With respect to the last two sources of bias, the quality adjustment and the new goods bias, the expansion in consumers' choice sets, this is quite speculative because people do individual studies of bias in particular commodities and they find large biases.

But my friend, Jack Triplett, would say that people are fishing where the fish are biting. In other words, they are finding these large biases because they have picked priority commodities where they expect it is. There is some validity to this comment.

My guess for the combined magnitude of the last two sources of bias, would be 0.35 percent to 0.6 percent a year.

Adding up these five sources of bias leads me to believe that the U.S. CPI is overstated by approximately 1.3 to 1.7 percent a year, which seems big, but I have actually tried to be conservative.

Finally, my answer to question three, solutions to rectify the overstatement. The one source of bias which I believe would be fairly easy to correct is this elementary index bias. BLS could rework its methodology and computer programs, and I believe this could be corrected within a year.

The overstatement due to substitution bias is more problematic. It would require increased resources to BLS. Basically, they would have to get more information on quantities purchased, as well as prices paid. Under the current BLS methodology, one does not have to worry about quantities consumed so much. The BLS has its base basket, and it just collects price information.

But to attack the substitution bias, one actually has to know what consumers are purchasing. And, hence, one has to allocate funds for consumer finance surveys to find out what consumers are buying. This would involve extra resources for BLS.

The outlet substitution bias could be corrected, I think, within a time span of a year if the BLS decided that they wanted to correct for it, although, it could be more involved than that.

The final two sources of bias are really resource-intensive, and would have to the product of a long-term program. And, again, increased resources would be required to correct those biases.

A final comment. As an outside observer from Canada, all our National fiscal functions are done by Statistics Canada. You have a checks and balances system here in the United States, where prices are collected by one division and values by another division. Often there is a bit of bureaucratic infighting and reluctance to allocate resources where the needs are the most pressing.

The CHAIRMAN. Bureaucratic infighting? [Laughter.]

It does not happen in academic circles though.

Dr. DIEWERT. It certainly does. So I think you might want to think about trying to combine many of these separate statistical agencies into one nice big Statistics USA.

Thank you.

The CHAIRMAN. Doctor, thank you.

[The prepared statement of Dr. Diewert appears in the appendix.]

The CHAIRMAN. Next we will hear Dr. Ariel Pakes, who currently teaches at Yale, but he has taught at both University of Wisconsin and the Hebrew University.

Doctor, thank you for being with us.

STATEMENT OF ARIEL PAKES, Ph.D., DEPARTMENT OF ECONOMICS, YALE UNIVERSITY, NEW HAVEN, CT

Dr. PAKES. Thank you.

I am going to take my role here as providing a brief explanation of what the issues are, and how one might correct them.

So let me start with what economists think the CPI is supposed to do. The CPI is supposed to calculate the increase in expenditures that would leave the consumer just as well off today as he was yesterday.

The easiest way to do that is to take yesterday's basket of goods, reevaluate it at today's prices, and find out the expenditure change that would be needed to buy those goods today. That is essentially what the BLS is doing. The question is, what are the biases in this way of doing things?

Now I say essentially because there are two differences. One is that they hold the basket fixed for a longish period of time, about 10 years. And the second is that they are doing it for a representative consumer whereas, in economics, we do it separately for consumers with different characteristics.

I say this because one might well think of doing the CPI separately for difference age, family size and income groups.

In particular, the biases that Erwin has talked about, and I am going to talk about, are likely to be different for different baskets of goods. So they are likely to be different for different age groups, different family sizes and different income groups. And, if you do not correct it in this way, changes in the CPI—and the changes in the way you do the calculation—will favor some groups over the others.

Let me start with substitution bias. Erwin mentioned this. It is really a very simple thing. You have ensured that the consumer can purchase this year what he purchased last year. But relative prices have changed, so the consumer might well do better by substituting out of goods that have become relatively dear and into goods that have become relatively cheaper.

People have estimated substitution bias, and I think the numbers given by Erwin are pretty much agreed upon. It is the one source of bias where people tend to agree on the number, and it is about .2 percent per year.

The next source of bias that I am going to talk about is called new goods bias. This includes all three of Erwin's biases, so let me explain a little bit where it comes from.

"New goods" is a term used in a very broad sense. A slight change in quality of an old good, or an old good sold at a new outlet, like a mail order outlet or a discount house, is a new good for the CPI.

The problematic issue is that when new goods are included in the index, they are not included in a way that reflects the contribution of the new goods to increased consumer welfare.

Currently, except in very special cases, the value per dollar of the new good is not compared to the value per dollar of any previously existing good.

To an economist, the fact that people switched from old goods to the new good, is a priori evidence that the new good was worth more per dollar expenditure than the old good. And that is the source of the intuition that the new good bias is positive.

Let me take a simple example to drive the point home. Say that a new good appeared which has exactly the same services as an old good, but sells for one-half the price. I will give some examples where that has actually happened.

What happens to the CPI, the way it is currently constructed? I have explained the reasons in my handout. The year that the new good is introduced in the CPI, there is absolutely no change. There is no adjustment for the fact that a new good has entered, even though it costs one-half of what the old good cost.

What you want to happen to the CPI is that, at least for the people who purchased the new good, is very clear. There is perfect substitution between the new good and the old good, so their price index has gone down by one-half times the prices of the old good times the weight of the old good in its basket.

So what you would like to happen to the CPI is to multiply the fraction of the people who purchased the new good by this change in the price index, and include the result as a downward movement in the price index.

That does not happen. Moreover, what happens in subsequent years is that the new good is now treated just like a different old good. So there are two goods and what the price index will do is take a weighted average of the two goods.

The fact that consumers change from the old good to the cheaper new good is never registered in the price index. Even if in the simplest case where, after the introduction of the good, both the new good and the old good's prices go up at the same rate, and everybody eventually shifts to the new good because it is cheaper, the CPI will not register a fall in the price of the good, just because of the way the CPI is constructed.

Now that is an extreme example, but it is not as extreme as you would think. For example, patented drugs and generic drugs. When patented drugs go off patent, a generic appears. Until January, the generic was treated——

You should tell me when you want me to stop.

The CHAIRMAN. Go ahead.

Dr. PAKES. The generic was treated as a totally new good. So there was no price decline as a result of people moving from the patented drug to the generic.

This is independent of the fact that the chemical compounds of these drugs are FDA certified to be equivalent. And, for the vast majority of people, they do exactly the same thing.

A similar thing is what Erwin called the outlet substitution bias. An old good that is sold in a new outlet is a new good, and it never gets compared to the old good in the old outlet.

So the fall in price to the consumer that is a result of goods now being marketed by mail order or at discount houses, is never captured in the CPI.

What has happened in society is that there has been a series of marketing innovations which has decreased the cost of these goods to society. And the way the CPI is constructed, it is just not in there. It just does not capture it.

Now the question is, what is the magnitude of the outlet substitution bias, which is one of the new goods biases? I have reviewed the literature a little bit in the last few days. It is very hard to say, basically, because the studies have not been done systematically over different classes of goods. And the techniques that have been used have not been the same techniques over the commodities that have been used.

But a lower bound, I think from my reading—and this is a lower bound with some variance on it—would have to be at least as big as the substitution bias, which was .2 percent.

Now I want to say one thing about this. It is true that there has been a big shift over the last several years to mail order and discount houses. So there is some bias because of this at least as long as you believe the adjustment needed because you might enjoy shopping at the old places more than the new places is small.

But it is not necessarily true that the same change will occur in future years. Eventually we are going to get to 100 percent of the people shopping at mail order houses, and .2 percent just cannot keep being the right adjustment. So you cannot take the numbers from the past and immediately apply them to the future. I want to be careful about that.

So that is the outlet substitution bias, which Erwin talked about. My numbers are a little lower than his. I am also trying to be a little conservative.

The basic problem with new goods you can take from these examples is that there no established method of comparing the new good to old goods. The reason that I can give you such a clear answer in the two examples I gave you is because I am assuming the new and the old good are essentially perfect substitutes. So the difference in value to the consumer of having the new good available is just the difference in price because they do exactly the same things.

That is not generally the case. New goods sometimes come in which do not do the same things as old goods do. There is currently a methodology for the substitution case, called "hedonic analysis." It more generally does the correction when there is a lot of substitution between the new good and old goods that were in the same commodity group before.

Hedonic analysis is really a very simple thing, and it is easy to explain and understand. All you do is take the prices and characteristics of goods in the base period, and estimate a surface telling you what the price of different characteristic bundles are in that base year.

You then take the goods in the given year and use the hedonic surface estimated in the base year to calculate what their prices would have been in the base year.

Then you take the difference between what their prices actually are and what the prices would have been in the base year as your hedonic index of what the rise in prices are.

The good does not have to be available in both periods. You are imputing what its price would have been in the base period, had it been there. That is what hedonics does. There are many different technical details that can be used here, but that is essentially what is going on.

To the extent that new goods bias has been investigated, it has been investigated either by hands-on techniques—like the generics I mentioned before that just compares things—or by this hedonic technique.

And the numbers that you get out of it, again, vary widely. I hesitate to give you an actual number here.

The CHAIRMAN. Do not hesitate.

Dr. PAKES. I know you do not want me to. But I have to go back to my academic colleagues later and defend it.

The CHAIRMAN. But, as Dr. Jorgenson would say, you can surely estimate well, between Alan's .5 and 1.5, and he said maybe 1. And Dr. Diewert says——

Dr. PAKES. Oh, all right, I will do that. I know you want it.

The CHAIRMAN. All right.

Dr. PAKES. The numbers, by the way, vary greatly. In some cases, this hedonic analysis actually gives you negative numbers, but not many. Most of them are positive, and some of them are quite positive. Again, this is with a lot of variance. I could not see how that kind of new goods bias could be less than .2 percent. I could be wrong. But that puts you up to .6 percent now.

I did mention that these techniques do not capture a certain kind of new good, in particular goods that provide services which you could not have substituted to from the goods that were there in the previous basket. So let me give you an example, and make it clear.

Consider what happened with laptop computers came in. Well, if you were going to use hedonic analysis, which is the most sophisticated analysis used, to evaluate that, you would have taken the hedonic surface estimated for PC's, desk-size machines. The price of a desk-size machine is really related to the speed of the machine and the memory of the machine, and had very little to do with the size or the weight of the machine.

If you actually estimated what a laptop would be worth from the hedonic surface, it would tell you that the laptop price should be much lower than it actually is. And the reason it would do that is because the hedonic surface for PC's would not care very much about size and weight.

So, for a comparably powered PC, a laptop is more expensive. The reason the laptop is valuable is because it can do things that the other goods we are calling substitutes cannot do. It can go on airplanes with us. It can come to hotel rooms. There are a whole set of new goods that look like that. That bias is essentially not picked up in any of the techniques I have told you yet.

The CHAIRMAN. Now doctor, I am going to have to ask you to conclude, because we do have some questions, and I do not want to let Dr. Jorgenson get away to his plane before we have a chance.

Dr. PAKES. All right. There is one more bias that Erwin mentioned, that I would like to get back to. It is what I call the variety bias. And it is a bias as a result of there just being an increase in the variety of goods available for people to buy.

Senator MOYNIHAN. New goods bias, as Dr. Diewert said.

Dr. PAKES. Well, it is a special kind of new goods bias. Again, these two sources of bias are the sources of bias that really require much more intensive use of data, and much more intensive use of techniques than have been used to date. And it is almost a guess what the contribution of those two biases to the CPI would be. My guess, again, is that they have to at least the size of the substitution bias, but I could be wrong. That would put me up to a number like .8.

Let me say there is a different way of doing all this, and I will conclude with this.

There is a different way of doing all this, called an ideal price index, which would calculate all the biases at once. It has not really been applied yet because it requires so many new techniques.

It has been applied only in one case—autos—and then only as a example. And you have a number like a 1 percent bias. This is one case, and it is a case of an industry where we think variety has changed a fair amount, and which is reasonably technologically progressive.

Could I just conclude with some suggestions before I leave?

The CHAIRMAN. You are like the man at the Academy Awards with the envelope. [Laughter.]

Dr. PAKES. Do you want me to, or do you want me to stop?

The CHAIRMAN. I would prefer if you would stop, but give us that number.

Senator CHAFEE. It is the wholesale price of admission.

The CHAIRMAN. Point 8. All right.

Dr. PAKES. Yes. It has got a large standard error.

The CHAIRMAN. I understand that. So we can be at 1.3 or 0.3?

Senator MOYNIHAN. If I may say, Mr. Chairman, Dr. Popkin is going to be a very important witness because our estimates are 0.8, 1.0, and a high of 1.7. That is the range.

[The prepared statement of Dr. Pakes appears in the appendix.]

The CHAIRMAN. Dr. Popkin.

STATEMENT OF JOEL POPKIN, Ph.D., PRESIDENT, JOEL POPKIN AND CO., WASHINGTON, DC

Dr. POPKIN. Thank you very much, Mr. Chairman.

My prepared testimony asks and answers five questions. I am going to summarize those, and try to stay within the allotted time.

The first question I raise is, is the quality adjustment controversy a recent controversy? The answer is no.

This issue was raised in 1961, in hearings before the Joint Economic Committee. In those hearings, a committee member asked, "Let's assume for a moment you have succeeded in all the research, and you have a perfect measure of quality. Can you give us any judgment at the moment as to whether that would mean, say, that the CPI or the WPI, either one or both, would have moved less rapidly than they have in fact done with present techniques?"

Mr. Ruggles, Professor Emeritus from Yale, was a member of the committee that studied this issue, and he gave the following answer: "As long as we are being arbitrary, I would say 1 to 2 percent a year." That is not too different from what we heard today.

But this would of course exceed the amount of price increase, so I guess we have negative inflation.

Mr. Stigler, the late Nobel Laureate in economics, who was the chairman of the committee presenting this report to the Congress, said:

"The trouble with this area is that there is no extensive body of data to which one can point. This is a common impression held by, let us say, 99 percent of the economists in the country, that there has been a steady upward drift on average in quality.

"But if you corner one of these people and say, 'Give me the references where I can find these numbers on which your judgment is based,' it is a very thin collection of numbers."

I think that some members of the panel have admitted to that today.

So nothing has changed. And the important thing about that, as I see it, is that in 1972, when Congress first tied Social Security to the CPI, all this information was in the public domain. So nothing has really changed.

Second question. Is quality bias in one direction, and is it in the same direction year after year? Someone made the comment that people who study quality bias fish where the fish are. And I have been fishing where the fish are not. Let me give you something I came up with.

What price index has gone up more than any other in the CPI, given its weight in the CPI? The answer is college tuition. The index for college tuition stands at 260 percent of what it was in 1982 to 1984. That is higher than medical care, which is only at 218, and the overall CPI, which is about 150.

Now when you think about it, in the last 4 years alone, there has been a 10 percent rise in the student/teacher ratio in colleges. There are fewer teachers to teach the same number of students. Also, we are finding that our college educated students are not doing as well as college educated students in other countries.

I suspect that, if we did an intensive quality adjustment study in the area of education, we might find that, instead of going up 160 percent in the last 15 years, college tuition may in fact have gone up 300 percent in the last 15 years.

So my point is——

Senator MOYNIHAN. Because the quality has declined.

Dr. POPKIN. The quality has declined, but nobody reports that.

Senator MOYNIHAN. Oh, a lot of professors report that. [Laughter.]

Dr. POPKIN. That has not surfaced in this hearing.

Another point I would like to make is that, as has been fairly reported, the BLS has done a lot of work on quality over the years. And, in some cases, it has been accused of overkill. For example, there are studies that show that the BLS overadjusted for quality in automobiles. This is another example where quality change is not in the same direction.

Now a third question that comes to mind relates to Erwin Diewert's list of five reasons for bias. I can think of more. And, in fact, some of them go in the other direction. I think that the handling of the environment in the CPI is a source of downward bias in the CPI.

For example, when the new winter blend of gasoline came onto the market at about 5 cents more a gallon, the BLS said, oh no, that is a quality change. We are not going to let the CPI go up. People were coughing; their cars were not running as well and this is true disequality change—freely, I might add, because we do not have air in the CPI market basket, which is really what is affected by the blend. It has nothing to do with gasoline. So that is an area where I think we can find downward bias in the CPI.

Another thing is the way we handle taxes. You know sales taxes, but not State income taxes, are in the CPI. So the CPI is not neutral with respect to the way it handles taxes. Because, if a State finances one way or another way, it affects the CPI.

And nobody bothers to correct the CPI for changes in the quality of services State and local governments are providing. It seems to me, from everything I have read, that the quality of service is declining. There is just no money out there for it.

So I think, if you looked at that, you would find that the CPI is understated, not overstated.

The fourth question: If you had a commission, would what that commission says affect just the CPI, or would it permeate the entire statistical system? Unfortunately, I think the latter. The reason is this.

Let us assume that inflation is 3 percent, GDP growth is 3 percent. The commission meets, and the commission says 1 percent overstatement in the CPI. We will make the CPI 2 percent. Then the other shoe drops, the people are going to say, well, that means the GDP must be going up at 4 percent. And what about productivity? And what about all our other measures?

My concern is, if you have a judgmental overlay to objective statistics, the subjective overlay is going to win the day, and people will no longer base judgment on the underlying basic statistics.

By now you have probably gathered that I am not going to give you a number. Frankly, I have been in this business for 30 years, and I am an agnostic. I think the only way you study is bit by bit. I believe what George Stigler said, that you do not guess about numbers. That is not scientific economics.

So let me leave you with one perhaps positive note. If you do go in this direction, I would advise you to invite every American Nobel Laureate in economics to serve on this commission. Whoever accepts, accepts. And you will at least have set up an objective framework in which no one can accuse you of biasing your sample toward those people who have done research on prices because, as has been remarked, they fish where there are a lot of fish.

Thank you, Mr. Chairman.

The CHAIRMAN. Dr. Popkin, let me ask you this. No matter how you appoint a commission, there is going to be some degree of subjectivity in it. If this was perfect mathematics, we would not even need a commission. We would just plug the numbers into your PC, and out would come the exact figure that we want.

But my bigger question is that. Senator Moynihan and I were discussing this a day or two ago. Is there any need for any more studies on this? Is there information that has not yet been plumbed by somebody?

Dr. POPKIN. I am not suggesting that there is a need for more study. I am suggesting that a price index is something that evolves. A lot of the things that the panel has commented on about BLS methodology have already, in fact, been corrected and incorporated in the CPI. The issue of the calculation of geometric means and outlet issues have already been done.

Improvement also evolves; it takes place. I do not think we should stop and have a huge study of all these issues. I think, rather, the BLS should do what it has been doing for 20 years. Perhaps it could do it more quickly, in terms of implementation. It knows what it should do. The problem is implementation, and that is a management issue.

But I think the BLS has improved the CPI a lot. I think it can improve it a lot more. And I would like to see it be given the chance before you let bad statistics drive out good ones.

The CHAIRMAN. I am not so sure it is a question of bad and good statistics. Again, I think there is some subjective estimation in this, even from our other three panelists. I do not think any one of them would say, here are the exact statistics.

This is not a question of good and bad, is it, in that there is only one set of good statistics?

Dr. POPKIN. Mr. Chairman, who has the responsibility to the American people to deliver an objective set of statistics? The agencies that Congress has set up to do that, or a commission of researchers who have studied the issue?

The CHAIRMAN. Well, those are two different things. What you are saying is that we need to make sure that the public will accept whatever conclusion is reached as a fair conclusion.

Dr. POPKIN. That is right.

The CHAIRMAN. Those statistics may be totally inaccurate though. They may be totally inaccurate but, if the public accepts them as fair, that is what you are saying the conclusion need be so that they will accept them.

Dr. POPKIN. I think that is very important, if we are not to undermine the statistics.

The CHAIRMAN. I would like to ask the other three panelists, if they would, to comment on Dr. Popkin because he comes to a different conclusion than the other three of you.

And I will start with Dr. Pakes.

Dr. PAKES. Just two things—the issue of subjective evaluation is undoubtedly true. What you are going to have to do for the new goods bias, is to compare the old good to the new good. So for outlet substitution bias you will have to decide what is the benefits of shopping one way or the other.

But their is a subjective evaluation being made now. By not doing anything, you make the statement that there has been no increase in value as a result of this new marketing innovation. I think that is just wrong.

I think, as in the generic case, most economists would think it is wrong.

As far as further study of the BLS, I could not differ more from Dr. Popkin. I actually think what you need is a systematic study. He is right. There is no question that the first studies of every kind of bias go out to the one commodity group where the bias is likely to be greatest. Generalizing these results to be representative, is like saying that every aspiring young actor should expect to earn the wage of Tom Hanks. That is a little bit absurd.

So the only way you are ever going to find out what the bias is, is to do a systematic study, using agreed upon techniques. It is not going to be totally agreed upon, but you have to come to some decision. Do it systematically, across commodity groups. Without that, I do not think you will ever know the answer.

The CHAIRMAN. Dr. Jorgenson.

Dr. JORGENSON. I would like to agree with Popkin. I think the issues we are discussing here, with respect to the rate of inflation—I emphasize the rate of inflation—are important and interesting. But I think that what has come out of the testimony that you have heard is pretty unambiguous. These are not—I repeat, not—subject to resolution by a professional consensus.

BLS is aware, in the sense that staff members are aware, of all of the issues that we have discussed. In fact, BLS has made some of the most important contributions to the resolution of all of them. They know what the objective ought to be, and implementation, as Dr. Popkin has suggested, is a management issue.

I would like you to focus on one central fact. In the matter of implementation, there was a serious management error made in January, 1983. That was the subject of my testimony.

Contrary to what Professor Diewert has told you, one of the great strengths of our statistical system is that we do have checks and balances. The personal consumption expenditure deflator is made up of the same raw material as the BLS CPI, but it is produced by a competing statistical agency, namely the Bureau of Economic Analysis.

It provides an objective standard by which we can judge the magnitude of the consequences of that management error in January of 1983. Those consequences have led to $50 billion of overindexing every year.

Senator MOYNIHAN. The bureau in the Department of Commerce and the Department of Labor.

Dr. JORGENSON. Yes. That is exactly right. Same raw material, two different statistical agencies, one in one Cabinet department, one in another. Right.

The CHAIRMAN. Dr. Diewert.

Dr. DIEWERT. I am a little bit reluctant to jump in here, as an outsider but I will make a couple of comments.

I think I agree with Joel that having a commission with a judgmental overlay might not be such a good idea because it will undermine the statistical agencies eventually. Thus I would prefer to see the statistical agencies do the best job they can.

With respect to Dale's comments that they are aware of all these sources of bias, and can easily fix them up, that is certainly true, as least with respect to the awareness comment.

The question is whether they would want. In other words, the substitution bias has been around for a very long time, and BLS

has not been willing to take it on. Maybe it is for budgetary reasons, or whatever, but I do not know quite how to solve that problem. You give the statistical agency the independence to do the best job that you think it can, but yet when you see something which should be done differently, how do you go about encouraging them to do it? I do not have a resolution.

The CHAIRMAN. Senator Moynihan.

Senator MOYNIHAN. I should first of all declare my interest. Dr. Popkin and I were in the Department of Labor together in those years, and I remember Dr. Stigler's testimony. It was very much around the corridors. But when you say nothing has changed, I think the important thing is that in those years there was an abstract interest in the CPI, but it did not have any budgetary consequences whatever. Nothing was indexed.

And I would also like to say to my colleagues that it is a wonderful idea to have a commission headed by Nobel Laureates, and Dr. Podoff has just listed those that come to mind. They are Tobin, Samuelson, Solow, Modigliani, Friedman, Klein and Arrow. I do not know Lawrence Klein very well, but I know of him. And that gives you 6 Democrats to one Republican. [Laughter.]

I think you ought to know that before you sit down with them.

Mr. Chairman, the point that is powerful here is that we have four eminent economists, of whom three gave us an estimate of the range of overestimate that they think is in the CPI. And it ranges from Dr. Pake's eight-tenths of 1 percent to Dr. Jorgenson's 1 percent to Dr. Diewert's 1.3 to 1.7 percent. That suggests that last year the increase in the CPI may have been twice the real increase in prices. Is that not right, doctor?

Dr. DIEWERT. Yes.

Senator MOYNIHAN. We are not talking about small proportions. One percent is a third. 1.7 percent is half. These are big numbers.

I would like to ask one question. If we were to go back to Dr. Jorgenson's table, when the big inflation of the 1970's hit, let us just use your figure of 1.0 percent overstatement, which is about one-third. That is when inflation was about 3½ percent.

Dr. JORGENSON. Yes. During the period——

Senator MOYNIHAN. Say inflation is 15 percent——

Dr. JORGENSON. Right.

Senator MOYNIHAN. It would have to be more than 1.0, would it not?

Dr. JORGENSON. No. The point that I wanted to make, using this chart that you see is that there is a very important source of bias that was removed in January, 1983, which was the treatment of housing costs.

Senator MOYNIHAN. Yes.

Dr. JORGENSON. During the period between 1968 and 1982, the housing costs contained a price index associated with mortgage interest rates on new mortgages. That was totally inappropriate, and that was removed and replaced by this rental equivalent approach.

BLS could have revised backward. They could have started in 1983 and said, now we are going to go back and redo the CPI to make it right. The PCE deflator, using the same raw material, did make that change, so it is internally consistent.

The CPI deflator is not. Therefore, the CPI overindexes. But that is just one component. What has been discussed here has nothing to do with that.

Senator MOYNIHAN. I want to see if I can get my question straight.

Dr. JORGENSON. All right.

Senator MOYNIHAN. When you say .8 percent, .1 percent, 0.3 percent, you are talking about the range of overestimate at a vary low level of inflation generally. What if we were up at 17 percent? Would you use a much wider range? Would your 1.3 become 4.3?

Dr. DIEWERT. It would increase, mainly because of the elementary index bias. As the degree of inflation increases, there is generally more dispersion in price quotes. This elementary index bias increases as the dispersion increases. Just exactly how much, I could not give you off the top of my head. But I would like to say that Ariel's 0.8 percent upward bias is quite consistent with mine, if you take into account the fact that he did not talk about this elementary functional bias. Adding an extra 0.5 to his 0.8 puts him right up with my lower bound of 1.3.

Senator MOYNIHAN. Yes. I find this striking, Mr. Chairman.

The CHAIRMAN. It is uniformity.

Dr. JORGENSON. No, no. To answer your question, Senator, I think that the important thing to focus on is that the mean does not change, the range changes. In other words, if we think about .5 to 1.5, Greenspan's range, and we think about the midpoint, the midpoint is not much affected by higher or lower inflation rates. What is affected is the range.

If we go back to the high inflation periods, the range would widen from half a percent one way or another to, say, 1 percent one way or the other. And that is something to keep in mind.

So I think that the point estimate of 1 percent is still what I would retain.

Senator MOYNIHAN. But, if we do anything at all, it has to be more subtle that CPI minus 1?

Dr. JORGENSON. No. I think that, if you are going to deal with the issue of the transfers that I have identified, what you are going to have to do is to treat that over time, let us say a 7-year period where you are engaging in a deficit reduction exercise, you are going to have to treat the cost of living adjustment as something that is going to be reduced from year to year, in order to eliminate this transfer element altogether by the end of the period.

The total potential that I have identified is $350 billion. That is a large number, as far as deficit reduction.

The CHAIRMAN. But let me ask you, because I think Pat is asking it slightly differently, let us say that the collective evidence seems to be 1.0 percent. And we say, all right, we think that is honest evidence. It is overstated. So we are going to suggest a 1 percent reduction in the indexing. But if the inflation was 20 percent, a 19 percent adjustment would not be an accurate adjustment?

Dr. JORGENSON. No, no, of course not.

The CHAIRMAN. All right.

Dr. PAKES. Could I say one thing? I think there is a real danger in doing what you are doing. In the outlet substitution bias, what

happened yesterday is not necessarily what happens tomorrow. If you take one number, it is going to be out of date very quickly.

I think the major issue though is most of the sources of bias are not indexed by inflation. I think you will agree with this. This one particular one is, but the rest are not.

The CHAIRMAN. Senator Grassley.

Senator GRASSLEY. First, Mr. Chairman, I have a commentary on your discussion with Dr. Popkin about the perception of fairness.

I think the major problem we have in changing all this is that outside the Beltway, the present situation is perceived to be very fair. There is going to be some assumption of political manipulation, whatever we do to change the situation. The present system is seen as fair, even though all of our discussions here show how it can be off a large degree or a small degree.

My question to you, Dr. Jorgenson, would be on this 11.4 percent that is still in the base of our CPI?

Dr. JORGENSON. Exactly. That is still built into the base. Right.

Senator GRASSLEY. I know you said that what Dr. Greenspan was talking about is an entirely different matter, but because of this bias here——

Dr. JORGENSON. Right.

Senator GRASSLEY [continuing]. That still contributes in some small way. I guess my question is to what extent.

Dr. JORGENSON. No. Let us focus on exactly what Greenspan has proposed. He has proposed a commission, which would recommend to this Committee, and to the House counterparts, and to the administration annual changes in the cost of living appropriate for the indexed programs in the Federal budget.

That commission would, therefore, adjust the rate of inflation produced by the Bureau of Labor Statistics, to reflect the kind of biases in the inflation rate.

As you have just pointed out, it is a difference in the level that has not contributed to the inflation rate since 1982. Because, in 1982, the Bureau of Labor Statistics made two decisions. It eliminated the source of bias, which is not anything we have been discussing here, but rather just a growth error, an inappropriate statistical approach which was duly corrected.

Senator GRASSLEY. But since they did not compensate for it, it is still in the base.

Dr. JORGENSON. Precisely. And they failed to compensate for it. Fortunately, the Department of Commerce, which produces a competing product from the same raw materials, which in fact tracks the CPI before 1968 and after 1982 very closely, enables us to calibrate the magnitude of this error in the base.

As Dr. Popkin just pointed out, in the early 1970's we began to index, first the Social Security system and then a wide range of Government programs. So this is built permanently into the base for indexing. And it is not something that can be regarded as an adjustment for the cost of living. It is simply a statistical error that was not corrected, and was built into the base in perpetuity.

Senator GRASSLEY. So then, even if we make the adjustments for the future, we are still going to be paying for this mistake.

Dr. JORGENSON. Forever.

Senator GRASSLEY. Forever.

Dr. JORGENSON. Exactly. And, therefore, that is something that should be regarded as an appropriate policy instrument, correcting this error, for a budget balancing exercise.

If you are going to engage in the kind of deficit reduction that this Committee has sworn that it will, has indicated that it will, this could be an important policy instrument that is unexploited so far. This could be an opportunity to achieve some of the budgetary objectives that are going to be so difficult to achieve.

Senator GRASSLEY. Doctor, I am done, but Dr. Popkin wanted to respond.

Dr. POPKIN. Could I follow up on your question and Dr. Jorgenson's answer?

Senator GRASSLEY. Yes.

Dr. POPKIN. The thing I like about Dr. Jorgenson's proposal is that he is not relying on a divining rod to figure out what a bias is. He can calculate what the impact of that failure that he mentioned brought about.

So there is no smoke and mirrors here. And it can be implemented in a systematic way. And you do not have to go through this exercise of what is quality adjustment? What is the quality adjustment bias? Who has the number? It is much more objective.

The CHAIRMAN. Senator Chafee.

Senator CHAFEE. Thank you, Mr. Chairman.

Dr. Jorgenson, what if we just went to the PCE, and used that as the basis, and said we are just switching horses we are backing here?

Dr. JORGENSON. I think that would be an appropriate thing to do. And I think that would have to be phased in, like any other change, but that could certainly be done.

But I think there is a basic issue here. And that is that you have to think of dealing with these other issues. So what I favor myself is what I think of as a two-phase approach. I think that, within the framework of your current budget balancing exercise, the deficit reduction, that one really ought to focus on the objective evidence here about the difference between these two indices and what it implies about overindexing, and work that through systematically.

I think, as Dr. Popkin suggested, that is something that would enable one to achieve professional consensus much more readily than dealing with the issue of the systematic biases in the inflation rate.

I would not suggest a committee or commission of Nobel Laureates, recalling that the median age at which the Nobel Prize is awarded in economics is 70. If you take the accumulated stock, you are talking about people who are in their late 70's or early 80's.

Senator MOYNIHAN. Would I not be correct in saying that the awards at the median age 70 are for work done at 25?

Dr. JORGENSON. Precisely. I think that is very accurate, Senator.

So my conclusion is that phase two is something in which the combination of BLS and your appointed agency, CBO, which is competent in this area, one could put those two together and come up with a phase two that would address some of these issues of systematic bias.

You have heard testimony here today from the most distinguished students of this subject to the effect that there is no profes-

sional consensus that would enable you to proceed to sort out the differences between .5 and 1.5.

My number of 1 percent is based on a study done by the Bank of Dallas in the Federal Reserve System, which I believe to be the best study in this area, in an attempt to put all these numbers together. But the fact is that I think it would be very difficult to arrive at a professional consensus.

Nonetheless, given a period of time, phase two should be to address that issue. So phase one would be to deal with this issue of essentially the error in the level.

I think given a period of 4 or 5 years, you could follow that with a phase two, in which you would use some version of Greenspan's proposal. But I very much support Joel Popkin's idea. This should be done by professional statisticians—people who work for the CBO, people who work for the BLS, people who do this for a living.

Senator CHAFEE. I would like to ask the other panelists. Dr. Jorgenson put great stock in this failure that took place in January of 1983, in connection with the changes that were made in computing the rent. Nobody else mentioned that. Is that as big a problem as Dr. Jorgenson stressed?

What do you say to that, Dr. Diewert?

Dr. DIEWERT. Dale is absolutely right in his analysis of the problem. I would like to point out that Robert Gordon, who testified in this Committee previously, pointed this out in great detail in an article in "In the Public Interest" in 1981. It is almost as if Dale has taken a leaf out of Bob's old book.

Now Dale's solution to the problem presents political difficulties. The problem is that the increased benefits are built into the system. I think you would face tremendous political resistance in trying to reduce benefits to make up for this mistake.

Dr. JORGENSON. I am not talking about reducing benefits, gentlemen. I am talking about reducing the cost of living adjustment to which these benefits are subjected. We are not talking about shrinking anybody's checks, or anything like that.

The CHAIRMAN. By any measure, the checks are going to go up.

Dr. JORGENSON. Right.

The CHAIRMAN. The question is do they go up 3½ percent, or 2½ percent? Nobody is talking about any spending going down.

Dr. JORGENSON. Exactly.

Dr. PAKES. But there is an enormous thing implicit in what Dale is saying. Let us go back to what we are trying to do, which is to maintain the standard of living, or maintain what the person can purchase.

Now you are saying that you have let what the person can purchase go to another level. And what you are doing by taking this correction is saying that the level we want to let that person purchase at is what it was before 1972, not now. That is a political decision.

Senator CHAFEE. Well, let me just finish here, if I might.

You are right. It is a political decision. Since the notch baby problem seems to be disappearing, maybe we can embark on this as a substitute for it. [Laughter.]

Dr. Popkin, what do you say about what the warning signal—not the political thing, but the error that took place in 1983? Do you agree with Dr. Jorgensen?

Dr. POPKIN. Well, I think Dr. Jorgenson has identified one of the three most significant changes in price indexes. One is the introduction of a price index for computers, so we could see how computer price declines were affecting our price indexes.

Another was the introduction of price indexes for the military defense hardware, which was a very significant thing.

And the third one was this change in the housing component of the CPI, which actually was discussed in those 1961 hearings which I mentioned earlier.

So those three things are very important. The implementation, how to make the correction for the housing thing, was never really addressed.

Before I give credit to Robert Gordon for that, I would actually give it to Senator Domenici who, in 1981, wanted to freeze entitlements. And I do not know what was in his mind, but it could have been this problem that the CPI had overindexed the entitlements.

Senator CHAFEE. Well, I will pass along to Senator Domenici your kind comments and praise. And I think he might be prepared to accept it.

Thank you.

The CHAIRMAN. Senator Simpson.

Senator SIMPSON. Thank you very much, Mr. Chairman.

This is another fascinating hearing. I am trying to attend a good many of them. Did you notice? And I enjoy the participation with this fine group of colleagues, who do really remarkable bipartisan work. And I think we will never have a greater challenge than what we have coming with regard to the entitlements, as you have heard me say before.

Our job—and I really do look at this as our task on this Committee—is to drive home with great vigor the noble hope that the citizens of our country will hear and understand what is going to happen to them in the next 30 years. And they do not understand. At least they have not understood that in my 16 years here. But I think this year, for varied reasons, they understand what is going to happen to their children. More importantly, the children know what is going to happen to the children.

And so I think I see the percolation of the phrase, "We are not cutting anything; we are slowing the growth." And I think that is a very important thing to be getting out into the consciousness of America, and I see it coming.

We are doing nothing. It is like what we recommended on the Entitlements Commission when we recommended our suggestions with regard to, if you will pardon the expression, Social Security which, to my mind, should never be left off the table. My colleague there rapped quite vividly there on the table top.

Nevertheless, what we were suggesting—and this is a key—does not affect or reduce the benefit of anybody over 50. That got lost, and now it is being heard again. In other words, everything we suggested with the phase-up and so on did not affect the benefit. It did not reduce a benefit of a Social Security recipient. It will af-

fect COLA's. It will affect Part B. It will affect a lot of things, but it does not affect the benefit.

So, if we can make them understand what the CPI is a little better, and the drama of what it does as we deal with such a small number with such a huge impact.

And there is a confusion out there in the populace as to the consumer price index and the cost of living adjustment. They have got that all garbled up. Maybe we do too. But we are going to have to uncoil that knot for them and realize that they are two things—the consumer price index, vital as we look at it, and the cost of living adjustment.

And now we have the personal consumption expenditure. I hoped that would not enter, but there it is, whatever that is. It is very interesting, whatever it is.

Now you talked about quality and you talked about education. That certainly piqued my interest. The tuition at Stanford now is $27,000 a year. What are we doing? Pell grants are $4,000 or $5,000 bucks. That will not get you there. So that is troubling.

I think Pat has suggested that, as you talk about quality, that a lot of professors report on the lessening of quality. And a lot more students report on the lack of quality than professors. Something is not right.

So how do we get the consciousness of the American people into this consumer price index? You talk about numbers, and we have to talk about numbers. But how are we going to address and make the people understand how a small little number has such a tremendous effect on them, and how could you tell them to do that in 30 seconds?

Dr. JORGENSON. Well, let me try that. I think you have to focus on the idea that there is an element in the benefits, as you just suggested, that goes beyond the size of your check, that is associated with the cost of living COLA's.

That is a term to which I think you get a response of maybe 80 percent of the American population have heard about that, and maybe 30 percent of them can explain what it is. And maybe .3 percent can explain exactly what it is in these terms we have been discussing here.

Now think what you have to say is that the cost of living adjustment is something which is intended precisely to compensate for the cost of living changes. And that is something which is going to be altered as part of an overall deficit reduction package in which, as you pointed out, are going to be feeling various kinds of unfamiliar pain from various unsuspected sources.

And this is just part of the package. How large a part of the package is something for you, your colleagues, and your colleagues in the House to determine. That is what you are elected for.

But it seems to me that we do have the raw material here to proceed to get an appropriate handle on this problem of what part that ought to play. And it seems to me that that is the way to try to address this issue.

Thank you.

The CHAIRMAN. Senator Moseley-Braun.

Senator MOSELEY-BRAUN. Thank you, Mr. Chairman. To my colleague, Senator Simpson, the BLS puts out a little pamphlet to ex-

plain it in 25 words or less, so this is at least a start for the average person who might want to have a better understanding of this.

Senator SIMPSON. I will slip over there and get a copy.

Senator MOSELEY-BRAUN. If you want it, I will pass it over.

Certainly, on the one hand, this is a classic index problem. How the index gets designated, the improvement of the data that BLS collects, and the way that data is handled, revisions perhaps in sophistication and streamlining, and focusing in on what is in the market basket, and how it gets measured, is something that I think everybody agrees is a laudable goal. It makes sense to make sure that your data is as accurate and as comprehensive as you can make it.

However, the issue here with regard to the CPI is one of its effect and the effect that the recalculation might have on the lives or ordinary Americans, in terms of Social Security or income taxes, or the like.

It has been argued that the CPI overstates inflation in a macroeconomic sense. And Senator Moynihan just advised me that this panel alone has come up with a range of numbers, in terms of how much it overstates inflation, from .8 percent to 1.7 percent.

Similarly, Chairman Greenspan stated that the range was .5 percent to 1.5 percent. Well there is a lot of money in between those numbers if you want to calculate it for a particular reason. And it has in fact been calculated as representing the difference in these numbers.

The amount to which inflation is overstated can make a difference of some $21 billion, or $21 billion in income taxes for the American people, or, alternatively, a $27 billion decrease or reduction in Social Security.

Now my question to this panel is, working through the numbers, what would your respective estimations translate to in terms of an increase in income taxes or a decrease in Social Security, given the present calculation of COLA's and the like.

Dr. JORGENSON. Senator, this panel has dealt with two issues. You just summarized one of them, which was the subject of earlier hearings involving Chairman Greenspan.

There is another issue which is illustrated by this chart, which is that there is a permanent bias built into the CPI which can be measured, as I have explained in my testimony as 11.4 percent. This has nothing to do with the rate of inflation. It is a permanent change in the index that was the result of an administrative decision, an error in implementation if you like, that was made all the way back in 1983. It has no effect on tax collections.

It results in an overindexing of 30 percent of the Federal budget that I estimate as $50 billion a year. That is on the expenditure side, the outlay side. If you accumulate that on a annual basis over a 7-year period, engaging in a deficit reduction program, that could account for $350 billion of overindexing and transfers that have resulted that are not—I repeat, not—cost of living adjustments at all.

Senator MOSELEY-BRAUN. All right. And your suggestion is that $50 billion in overstatement in terms of revenues, in terms of spending, is in what, Social Security?

Dr. JORGENSON. This is in all of the indexed programs. Thirty percent of the Government budget is indexed to the CPI, and it affects all of these programs.

Senator MOSELEY-BRAUN. So, that is mostly retirement though, not the entitlements?

Dr. JORGENSON. It certainly includes all the retirements, but it also includes Federal employee compensation. It includes the Supplemental Security Income program, the Federal Employee Retirement programs, military pension programs and so on. Yes.

Senator MOSELEY-BRAUN. I do not have a problem having an academic discussion, and I do not have a problem having a real discussion, but I think we need to be forthright and forthcoming about what it is we are really talking about here.

Dr. JORGENSON. Exactly.

Senator MOSELEY-BRAUN. And what we are really talking about here is how things like retirement get calculated.

Dr. JORGENSON. That is exactly right.

Senator MOSELEY-BRAUN. And how salaries get calculated.

Dr. JORGENSON. That is right.

Senator MOSELEY-BRAUN. And how income taxes get calculated.

Dr. JORGENSON. That is right. But focus on this issue. As we have emphasized here a couple of times, nobody is talking about reducing anybody's check. Nobody is talking about that, all right?

Senator MOSELEY-BRAUN. We are talking about how the check gets calculated.

Dr. JORGENSON. We are talking about how the cost of living adjustment is applied.

Senator MOSELEY-BRAUN. Whether it is a reduction or not?

Dr. JORGENSON. Exactly, Senator.

Thank you.

Senator MOSELEY-BRAUN. All right. I think we have an obligation to be forthcoming and forthright about what this discussion really is about.

Dr. JORGENSON. Exactly.

Senator MOSELEY-BRAUN. It is not just about measuring market baskets. It is also about the impact and the use of that measurement. What is that measurement used for?

Dr. JORGENSON. In my written testimony, Senator, I made a remark that conveys my rendition of what you just said.

I said, "Indexing of Federal programs to the CPI has had the effect of transferring responsibility for Federal fiscal policy from the Congress, the elected representatives of the people and the President, to technicians who are ill equipped to perform this policy making function."

Senator MOSELEY-BRAUN. Does somebody else have a number for me? Can I get the rest of the answer?

The CHAIRMAN. I think you may want to ask your question again.

Dr. JORGENSON. It is $50 billion, Senator.

Senator MOSELEY-BRAUN. Your number is $50 billion. Does anybody have another number?

Dr. POPKIN. I should just add that my estimate was not included in the range that Senator Moynihan gave you, for good reason. I have no estimate.

Senator MOSELEY-BRAUN. All right. Thank you, Dr. Popkin.
Thank you very much. Thank you, Mr. Chairman.
The CHAIRMAN. Senator Graham.
Senator GRAHAM. Thank you, Mr. Chairman.

I would take some exception to the last comment by Dr. Jorgenson. I think what Congress has done is make a policy decision, right or wrong, that it wishes to have a maintenance of purchasing power in a variety of programs, some of which affect expenditures, some of which affect revenues.

And it has then made a second judgment that the means by which that will be accomplished shall be the CPI.

Dr. JORGENSON. That is what I am here to question. That is exactly what I am here to question. There are two aspects of it, and it is the second that I think is questionable.

Senator GRAHAM. Right. And I think what we are now learning and, in fact, the Bureau of Labor Statistics says it as explicitly as the English language will allow it to be stated, in its brochure when it says, "Is the CPI a cost of living index? No. Although it frequently and mistakenly is called a cost of living index. The CPI is an index of price change only. It does not reflect the changes in buying or consumption patterns that consumers probably would make to adjust to relative price changes."

Dr. JORGENSON. This is exactly the point at which this Congress should absorb the message that you just read from BLS. This is a very important message. As you pointed out, this is something that has not been absorbed into the policy making process. It has led to serious consequences.

Senator GRAHAM. And the question is, how do we rectify past error? And there have been two roads that have been recommended. One road is to assign this responsibility to the Bureau of Labor Statistics to develop a methodology which will come closer to accomplishing the goal of a cost of living formula.

Or, two, to take what the Bureau of Labor Statistics is currently producing, and assign that to some third party, which could be the Congress itself. Or it could be a commission of wise persons who would have the responsibility of making that modification.

In our previous hearing, one of the concerns that was expressed about road one was that the Bureau of Labor Statistics indicated that it would be an extended period of time, talking in years, maybe even in decades, as opposed to weeks and months in order to accomplish that objective.

We could calculate what the economic consequences of continuing to use an overly generously biased CPI would be, as opposed to utilizing some form of a road two, such as I understand has been suggested, maybe a commission of Nobel Laureates in economics to do this kind of work.

If this question has been asked of the panel, I apologize. But I would be interested in your assessment of those two alternatives, factoring into your assessment the time that would be required to secure a number from the Bureau of Labor Statistics, as compared to the time that might be required through an alternative available to us.

Dr. JORGENSON. I would like to suggest that it is the same thing. A commission would require precisely the same kind of procedures

and information that the BLS itself would. And that is something that, therefore, would be figured in, I would say, 5-year intervals. That would be the appropriate thing.

What I have tried to draw the attention of the Committee to is the fact that there is a third road. And the third road is to rectify an error in implementation of the BLS CPI program that occurred in January, 1983, that resulted in an 11.4 percent permanent upward bias in the index.

That third road is something that does not require years. That is something that would require this panel. We have had a discussion of that here, and it seems to me that we all agree that is a relatively objective fact, as economic facts are, about which we now ought to turn to implications of for fiscal policy. And it seems to me that that is an appropriate starting point.

I proposed in my response to an earlier question that we have a two-phase approach. Phase one is to deal with overindexing that I have discussed as a level change.

Senator GRAHAM. I am in the yellow light, but I would like to get comments, if I could, from the other members of the panel as to which of those two roads we should take.

Dr. DIEWERT. I think I would favor having the BLS develop a cost of living index, even if it does take a year or so because, as Dale indicates, they would have the primary information, and having another agency to do it would mean more guesswork.

I do agree with Dale though that, if you wanted to have an interim measure, you could assign the responsibility to the Congressional Budget Office. They would have enough expertise there to give you some kind of ball park estimate of the bias in going from the Bureau of Labor Statistics concept to a cost of living concept.

Dr. PAKES. I guess my feeling would be that we should stick with the BLS and, perhaps, have an advisory committee that works with the BLS. The people in the BLS are quite informed on all of these biases. Many of the numbers we were actually quoting you are a result of their own studies. So they know what is going on.

I would suggest having an advisory committee that works with them, simply because there are going to have to be value judgments made in the middle of this, comparisons and things like that. The conceptual issues are more recently discussed in the academic community.

I do not think you can expect an answer to this in very short order. It is going to be 5 years before you have real changes.

Dr. POPKIN. I support Professor Jorgenson's view. If we make this correction, which can be done in an objective way, that is the way to go. I think that is where the CBO can be helpful because the CBO knows about the revenue expenditure implications of the housing component change. And technical matters should remain the province of the BLS.

The CHAIRMAN. Let me say, Dr. Jorgenson, you leave when you have to go. He has to catch a 12:00 o'clock plane. I would just like to comment before you take off. Every now and then we see stories in the press about the perks of Congress. It is normally the beaches at Waikiki. I think this panel is one of the perks of Congress. To have people like this come, on relatively short notice at our beck and call, is a perk I would not trade for anything else we have.

Senator MOYNIHAN. Can I say that one of the resources I have as a member of the board from the first issue, I have the complete works of "The Public Interest." I am looking at Robert J. Gordon's article in 1981, "The Consumer Price Index: Measuring Inflation and Causing It". He had a very careful table 1, which records the CPI, PCE inflator, and the difference. This has been looking at us for a long time, and we have not done anything about it.

Dr. JORGENSON. I am not making a claim of originality, Senator. I want to make that very clear.

Senator MOYNIHAN. No. You recommended it. Oh no. Also, you calculated it.

The CHAIRMAN. But who else in the Senate would have this in his office, and could pull it out immediately?

Senator CONRAD.

Senator CONRAD. Thank you, Mr. Chairman. I thank this panel.

Dr. Jorgenson, I would like to go back to what you were talking about earlier, the question of housing bias that is in the current figures. And, in your testimony, you indicated you believe that is a bias on the spending side of an additional $50 billion a year because 30 percent of the budget is indexed by the CPI. Fifty billion a year over 7 years would be $350 billion. As I understand it, this is in addition to the 1 percent bias you would attribute to the CPI? Is that correct?

Dr. JORGENSON. That is right. The 1 percent is a bias in the inflation rate that occurs every year, year after year. What I am talking about is a one-time change in the level that has built in a permanent level bias of 11.4 percent. So that is exactly right. Those two are in addition to each other.

Senator CONRAD. My understanding is that a half-point change in the CPI would reduce the deficit by about $140 billion over 7 years. So 1 percent would reduce the deficit some $280 billion over 7 years. That would be in addition to the $350 billion that you have identified. That would be a total of $630 billion. And, in addition to that, you would have the interest savings——

Dr. JORGENSON. Correct.

Senator CONRAD [continuing]. That would flow from those changes.

Dr. JORGENSON. Exactly.

Senator CONRAD. How certain are you of the calculation of the $350 billion over 7 years, the $50 billion a year?

Dr. JORGENSON. That is something that is subject to some recalculation. It is the kind of thing that the CBO, for reasons that Dr. Popkin has just suggested, is very well equipped to provide you with a more accurate number about.

This is strictly a back of the envelope calculation, but my feeling is that it is subject to relatively modest error, by comparison with the 1 percent. If we think about the 1 percent as an annual figure over 7 years, the error bands on that, which I think are very reasonable, are those presented by Chairman Greenspan—say from one-half to 1½.

As Senator Moseley-Braun just pointed out, there are big dollars associated with that range. And I think that is a separate issue, which I would regard as something that could be resolved over the

next 5 years or so. And that is an appropriate job for CBO and BLS to do together.

Senator CONRAD. Let me understand. In terms of the 1 percent, obviously that has an effect not only on the spending side, but on the revenue side. That would affect Social Security increases. That would affect the indexing of the income tax. So that would have an effect on both the revenue and the spending side. The housing problem that you have identified would simply be on the spending side.

Dr. JORGENSON. That is right.

Senator CONRAD. Neither of those would include the interest savings.

Let me ask you, what other effects would it have on the economy if we were to make a change in both of those areas? If we were to change the housing calculation, if we were to change the CPI? Could you, and then other witnesses as well, outline what other aspects of the economy would be affected by a CPI change?

I assume there are labor contracts that are tied to the CPI.

Dr. JORGENSON. Right.

Senator CONRAD. I assume there are all kinds of contracts between companies that involve the use of the CPI. Could you identify them?

Dr. JORGENSON. Yes. Let me mention that. I think that is a separate matter. And that is something that I think led to the error in implementation by BLS.

It is perfectly possible for private parties in this economy to agree to index cost of living adjustments in any way they choose. They can use the CPI, they can use the PCE. They can use any deflator they wish, or they can not have a COLA provision at all. And this is obviously the subject of negotiation in collective bargaining.

So I think the answer is that anything that the Congress does in this area could be regarded as essentially independent of similar problems of cost of living adjustments in the private sector.

There is no reason why you want to do something that produces a new version of the CPI.

Senator CONRAD. I assume that it is actually written in the contracts that they will use the CPI. So, if we make a change here, it is going to affect other aspects of the economy.

Dr. JORGENSON. It is. But, on the other hand, if you said something like that the cost of living adjustment was going to be the CPI minus 1 percent—that is the example that you used—that does not change the CPI. Private parties are able to make transactions involving the CPI without buying into your 1 percent, or half a percent, or 1½ percent, or whatever you think the number should be. That is up to you to determine. It does not affect their transactions at all.

So I think these could be insulated from each other, the effects on the public sector and the effects on the private economy.

Senator CONRAD. Dr. Pakes?

Dr. PAKES. I think that is essentially correct, except where you are going to have more spending or less spending in the economy. So there is going to be excess demand or less demand.

Senator CONRAD. Dr. Popkin, do you want to comment?

Dr. POPKIN. I am not so sure they can be separated. I am a small businessman. My lease with my landlord has a CPI escalator. I think I would take a look at a commission, and try to figure out which way they were going to come down, and then I would build into my lease something where I could place my bet.

So I do not think they are independent.

Senator CONRAD. I thank the Chair.

The CHAIRMAN. Do you have more?

Senator CONRAD. I think we would have a very hard time making an independent determination of CPI that applies only to the government. I think for us to say, well, for Government it is CPI minus some percent. The whole rationale for this, it seems to me, or some of the strength of it at least, is that there really is a problem, that the CPI is not appropriately reporting what is happening.

The housing change that you advocate——

Senator MOYNIHAN. But the CPI does not purport to be a cost of living index.

Senator CONRAD. Well, that is a whole other issue, is it not? It really goes to the heart of the question of why we are using CPI as the means to make these changes. Maybe we are using an inappropriate test to address revenue. That is a whole other issue. I do not know if we want to kick that off here.

But it just seems to me, if we are going to do this, make changes, we have got to have it done on an objective basis that can stand up. And, if it applies to Government, there would be no reason it would not apply elsewhere.

And I am just struggling to understand what other sectors would be affected. Does anybody know what other things are tied to the CPI? I would think retirement plans in private companies, leases. I have leases that have a CPI escalator. Any other thoughts on other elements of the economy that would be affected here?

Dr. POPKIN. Alimony.

Senator CONRAD. Alimony?

Dr. JORGENSON. I still come back to my perhaps narrowly legal perspective that it would be possible to insulate the two by identifying a specific adjustment that is due to this error in the level of the CPI. And that leaves people who are engaged in private transactions, which are primarily forward looking, to preserve whatever they have written into those transactions.

What follows from that, we hope, is going to be a better reflection of changes in the cost of living, in both the public and the private sectors.

The CHAIRMAN. Let me ask you, if I can follow up on Kent's question now. The CPI overstates the cost of living increase. And yet we have paid all of our programs to the CPI, regardless of whether they exactly reflect the cost of living or not.

All kinds of private parties have apparently paid themselves to the CPI.

If we were to pass a law and say, CPI minus one, that does not change the contract the parties are using. They are still using the CPI. They could just as well be using Standard and Poor's, or the Dow, or whatever it is they want to use as a point of reference.

Dr. JORGENSON. Exactly.

The CHAIRMAN. And the fact that we changed the percentage does not change the reference point.

Dr. JORGENSON. Right. And that is the argument that reinforces Dr. Popkin's point, which he has made on a number of occasions here. And that is that creating a judgmental overlay, as he called it, that would provide a separate CPI has enormous consequences of the sort that Senator Conrad has just brought to our attention here.

So I strongly support Dr. Popkin's view that having a commission, even one composed of Nobel prizewinners, is not a great idea. It would be better to use the CBO and the BLS.

Senator CONRAD. Mr. Chairman, might I ask a final question of Dr. Jorgenson?

The CHAIRMAN. Yes. Go ahead.

Senator CONRAD. In your testimony, on page 4, you say, "In summary, BLS made two decisions in 1983. The first decision was to change the treatment of housing costs to a rental equivalent basis. The second was not to revise the treatment of housing costs for 1982 and earlier years."

Why did they make that decision?

Dr. JORGENSON. I believe that they made that decision partly because of concern about the private sector implications. But the Department of Commerce, which faced a similar issue with the PCE, made the opposite choice.

And I think that was the appropriate choice for BLS at that time—and it was certainly debated within the agency. Dr. Popkin can perhaps inform us more fully—did not reflect the thought that this might in fact build in a permanent bias. People really had not focused on the fact that they were making fiscal policy. They thought that what they were doing was talking about a cost of living adjustment in the abstract, as technicians. In fact, they were making fiscal policy. That is what we have been discussing here.

Senator MOYNIHAN. Mr. Chairman, before Dr. Jorgenson goes, that 1981 article by Robert Gordon says, "Also, since foreigners watch the CPI closely for clues to the future course of U.S. interest rates and the exchange value of the dollar, the CPI is probably the single most quoted economic statistic in the world."

And in the end he referred to the Stigler committee, which said in the now classic words of Martin Bronfenbrenner, addressed to the Stigler committee in 1960, "It is better to be imprecisely right than precisely wrong." [Laughter.]

Dr. JORGENSON. And that is an example here. We have a case in which we decided to be precisely wrong.

The CHAIRMAN. Any more, Pat?

Senator MOYNIHAN. No, Mr. Chairman.

The CHAIRMAN. Senator Graham.

Dr. DIEWERT. I just wanted to add a quick response to your question as to why the BLS did not revise these series.

There is a tradition in the CPI literature that you never revise them, partly for legal reasons, because many contracts are indexed to the them. If you start revising the CPI, the legal situation is going to be mighty tangled indeed.

Thus Dale's strategy of having a separate special Congressional deduction, or whatever, is the way to go, rather than trying to revise the CPI.

Senator CONRAD. Well, I would like you to explain that at a town hall meeting in Fargo, North Dakota.

The CHAIRMAN. I think you can.

Senator CONRAD. We are on one schedule with CPI, and everybody else is on another.

The CHAIRMAN. No, not we, but if you say the evidence is clear that the CPI has overstated the cost of living for everybody—for taxpayers, for Social Security recipients, for Congressional pensions, for judges' pensions, for everybody else—it has been mistakenly overstated.

Senator MOYNIHAN. I have got it. Congressional pensions are overindexed. [Laughter.]

Dr. JORGENSON. I think that would be a way to make the point.

The CHAIRMAN. And I think Dr. Jorgenson and the others are saying that, if we are going to make some change, rather than attempting to fool with the index, we would be better off to say minus 1 percent for the next 2 or 3 years, and we will ask a commission to study it. But we will not attempt to change the index itself by fiat.

Do I get that right, Dr. Jorgenson?

Dr. JORGENSON. That is exactly my point, yes.

The CHAIRMAN. Senator Graham.

Senator GRAHAM. Well, let me make a comment, and then a summary statement.

The CPI is not invalid for the purpose for which it is intended. It is intended to be a market basket which evaluates the changes over time in the cost of that market basket. Now, for that purpose, the CPI is accurate. Am I correct?

Dr. JORGENSON. No. Senator, I am sorry to disagree with you. But I think when the BLS decided to change the basis of housing after 1983, and not to change the basis for housing costs before 1983, they cut that makes even that interpretation credible. And that momentous consequence is what we are here to deal with today.

So I think that, in fact, it is a case in which it does not even achieve the stated objectives.

Senator GRAHAM. Let me insert the word theoretically, prior to my last statement. Theoretically it is meant to accomplish that objective.

The CHAIRMAN. Theoretically, it is meant to accurately measure prices.

Senator GRAHAM. Right. If there was a technical, and rather expensive, error that diverted from the theory, as we would say in Spanish, calostima.

Dr. JORGENSON. Right.

Senator GRAHAM. It means what a pity. But having said that, could we take a course of action that would meet the goals of public understanding, some sense of urgency to rectify past errors, but also with deference to a high level of professionalism in this arcane statistical error?

We could, for instance, ask the Bureau of Labor Statistics, in a fairly brief period of time, let us say 120 days, to give us a recommendation of what would be required and what the consequences would be of eliminating this housing bias that occurred in the early 1980's.

Second, beyond that, in a longer period of time, let us say 24 months, ask for them to give us a recommendation of a procedure by which a more systemic and ongoing modification of the CPI could be utilized in order to make it a more accurate indicator of cost of living.

Dr. JORGENSON. Yes. I think that is a version of the two-phase approach that I suggested. I would like to draw your attention——

Senator GRAHAM. Would those time frames, in your judgment, be excessively stringent?

Dr. JORGENSON. Quite the contrary. At the bottom of page 4 in my written testimony, I have a footnote which says, "The BLS developed experimental price indices extending back to 1967, based on a rental equivalent treatment." In other words, the same treatment as after 1983.

For example, I asked this same question of BLS myself, and I got the following answer. The price index labeled CPIUX1 in BLS 1988 is available to the public. It is not published by the BLS. You might ask them why, but it is readily available. They will be happy to send this to you. It would take an hour to get this information. I have a copy I would be glad to fax to you.

So they have the information on hand. It is in the inventory of statistics. And, in fact, this version of the CPI is used by the Bureau of the Census in its routine reporting. When the Bureau of the Census reports the standard of living, the inequality and poverty numbers, they produce two versions, one with the CPIUX1, and the other with the CPIU that we are discussing as flawed.

So, in fact, BLS is able to respond instantaneously to the first of those questions.

With regard to the second phase, I think you are right. Certainly 24 months would be a minimum period. I really feel though, that if there is to be an attempt to deal with this in a comprehensive way, it would be a very good idea to do that in the context of a deficit reduction goal of a long-term character.

Therefore, I would come back to the idea the BLS and CBO ought to collaborate.

Dr. POPKIN. Could I just add something on that issue?

I was at the Bureau of Labor Statistics in 1971, not 1984. And, at that time, I recommended—it was not my unique recommendation; it was in that Stigler committee report—that we treat housing the way it finally got to be treated. All the technical work was done. There was no reason that could not have been implemented within a short period of time.

I think, Senator Graham, that the real key to this is not so much getting the technical work done. It is getting the managers to implement it. The technical work is there. The senior professional staff knows what has to be done. Most of the research has been done. It has been underway for 20 years. But we have to make our decisions more quickly.

If we had done this in 1971, there would have been no difference between the housing in the CPI and in the PCE deflator. Only later in the 1970's did it become an issue. We should have anticipated that, and been prepared for it.

So I think managerial decisions have to be speeded along. And they have not been over the last 10 or 15 years.

Senator GRAHAM. Thank you.

The CHAIRMAN. Thank you very much, Dr. Jorgenson.

Any others? Bob?

Senator GRAHAM. No, Mr. Chairman.

The CHAIRMAN. Kent?

Senator CONRAD. No, Mr. Chairman.

The CHAIRMAN. Pat?

Senator MOYNIHAN. I would just like to ask Dr. Diewert if this issue comes up in Canada?

Dr. DIEWERT. Yes. There was an article in Business Week, I think last October, that talked about measurement problems in the United States and that stimulated some discussion in Canada as well.

Fortunately, we do not make this elementary price index bias mistake that is in the U.S. CPI, so our inflation rate is .5 percent more accurate, I would say.

Senator MOYNIHAN. And would be below ours?

Dr. DIEWERT. Yes. But, other than that, the biases are similar.

Senator MOYNIHAN. Those other biases?

Dr. DIEWERT. Yes.

Senator MOYNIHAN. Well, I must say, Mr. Chairman, we have a good problem here because you can get good professional judgment. You have professional standards; you have statistical standards. You know what some of the ranges here are. And we may have the most powerful means available to us to deal with what for both of us is a protracted crisis which——

Dr. DIEWERT. It feeds into all sorts of aspects of our economic performance. For instance, the productivity slowdown. If there is a 1 percent upward bias in the price indexes, there is a 1 percent downward bias in growth rates, and the productivity puzzle disappears.

Senator MOYNIHAN. And somebody might even feel better. We would have to put that measure into the increase.

Dr. DIEWERT. And there is a certain sourness in the country about real wages not going up over the past two decades. But, if the consumer price index is biased upwards by 1 percent, then you do get a growth.

Senator MOYNIHAN. And then you get another tic in the hedonic measurement. [Laughter.]

Dr. POPKIN. If I could just say something on your point, Erwin. The measures of wages have some of the same problems as the measures of prices, so you may not find real wages rising.

The CHAIRMAN. Gentlemen, thank you very, very much.

[Whereupon, at 11:33 a.m., the hearing was concluded.]

CONSUMER PRICE INDEX

TUESDAY, JUNE 6, 1995

U.S. SENATE,
COMMITTEE ON FINANCE,
Washington, DC.

The hearing was convened, pursuant to notice, at 9:30 a.m., in room SD–215, Dirksen Senate Office Building, Hon. Bob Packwood (chairman of the committee) presiding.

Also present: Senators Chafee, Grassley, Simpson, D'Amato, Moynihan, Baucus, and Conrad.

OPENING STATEMENT OF HON. BOB PACKWOOD, A U.S. SENATOR FROM OREGON, CHAIRMAN, COMMITTEE ON FINANCE

The CHAIRMAN. The Committee will come to order please. This is the third in a series of hearings we have had on the issue of the consumer price index, or the cost-of-living index. Call it what you want. They are different indexes, as we on this Committee are now well educated on this fact. I am not sure we knew that before.

One thing we have learned is that the consumer price index is overstated. It may be a little, it may be a lot. We have had estimates all the way from .2 or .4, to Dr. Robert Gordon's 1.7, and somebody estimated 2 percent. Nobody says it is accurate. The question is, how overstated is it, and should we attempt to rectify it by law? Should we have a commission? Should we leave it to the Bureau of Labor Statistics to do it gradually? Should we consolidated all statistics in one Government agency? There have been a variety of suggestions, but I do not know of anyone who has said that it is not overstated somewhat, or overstated a great deal.

We have five witnesses today, all Ph.D.'s, many of whom are familiar with this Committee. Certainly Dr. Boskin and Dr. Norwood have been here before this Committee many times.

I am going to call on Dr. Boskin first. He is a senior fellow at the Hoover Institute for War, Revolution and Peace, and a former chairman of the Counsel of Economic Advisers. The reason I call upon him first is that he also has a commitment to testify before the Ways and Means Committee at 11:00 o'clock today. They pushed back his appearance by an hour, so he can testify and stay a bit, but then he may have to take off.

So we will start with——

Senator Moynihan?

OPENING STATEMENT OF HON. DANIEL PATRICK MOYNIHAN, A U.S. SENATOR FROM NEW YORK

Senator MOYNIHAN. Good morning, Mr. Chairman.

From what I hear of that Ways and Means hearing, I think it might be best if we delayed Dr. Boskin.

The CHAIRMAN. Is this the consumption hearing?

Senator MOYNIHAN. As in tuberculosis. That was awful. I must stop that. I will get over that. It is just that we have been on a week's legislative work period. That is funny too.

I just wanted to thank you for pursuing this subject the way you have done, and make the point that perhaps the panel could find occasion to comment on it—to say that it seems to me that what we have here is not a question of changing the law, but of following the law. It would be interesting to get a memorandum from counsel regarding this.

The Social Security benefits are meant to be indexed to account for changes in the cost of living. Income tax brackets are meant to be indexed to account for changes in the cost of living.

If in fact the indexes we are using do not accurately reflect that, then we are not faithfully enforcing the laws, faithfully executing them. And it is a legitimate question, and it gets into the breaches of statistical confidence. Dr. Norwood can tell us about that, and each of our members can. But if we are to faithfully execute the laws, we have to get the best measure of our purpose as it is structured.

I would like to ask if I could simply call attention to the fact that Dr. Rivlin, who of course is the head of the Office of Management and Budget, prepared a memorandum last October 3 called Big Choices. Such is the level of mutual confidence at the White House, that it says at the top, "For handout and retrieval in meeting". But somehow one copy did not get retrieved.

The CHAIRMAN. Were you at the meeting?

Senator MOYNIHAN. No, I don't get to those meetings, but it says "Illustrative entitlement options". The first one is CPI minus 0.5 technical reform (CPI may be overstated by 0.4 percent to 1.5 percent).

We are reaching consensus here among professional persons. And it seems to me that this Committee is properly seized of this issue, and I want to thank you.

The CHAIRMAN. Thank you.

Senator Grassley?

OPENING STATEMENT OF HON. CHARLES E. GRASSLEY, A U.S. SENATOR FROM IOWA

Senator GRASSLEY. Mr. Chairman, the present situation could not be better expressed than Senator Moynihan has expressed it. And I associate myself with his remarks.

If the choice is to make an arbitrary political decision to reduce the CPI for budget purposes, versus an intellectually defensible revision of the process that is used now so that it is accurate, or at least as accurate as human beings can make it, obviously we are better off not only politically, but from the standpoint of good public policy, to review it in an intellectually defensible way.

I think that the Chairman started down this road two or 3 months ago, and I am glad to see that the process is continuing. I hope we are able to put together a group that will come up with the correct numbers, meaning that we need to come up with num-

bers that are intellectually defensible, and not some arbitrary political decision that we make.

So I applaud the effort, and only want to see that there is follow-through to accomplish it.

The CHAIRMAN. Thank you. I might just comment on that. I think you could probably legislatively say that, at a minimum, we would legislate a .5 difference and appoint a commission. That would be intellectually defensible. One point might be intellectually defensible because all our witnesses are easily within those purviews.

Then the question is whether or not you then want to say that we will keep that for 2 years and ask the commission to report to us in 6 months.

Senator GRASSLEY. The only thing I would say, Mr. Chairman, is that people being cynical about politicians, it makes our position much weaker than if we would wait for the commission to report. Hopefully, that would not take 2 years.

The CHAIRMAN. Well, we might ask this group of panelists today how quickly they think a commission could be assembled and report.

Let us start with Michael Boskin because, as I indicated, he does have to be going, although we will have a chance to question him.

Senator D'AMATO, DO YOU HAVE A STATEMENT?

Senator D'AMATO. Yes. Mr. Chairman, I am just going to ask that I be permitted to put my statement in the record, as if it were read in its entirety.

The CHAIRMAN. Without objection.

[The prepared statement of Senator D'Amato appears in the appendix.]

STATEMENT OF MICHAEL BOSKIN, Ph.D., SENIOR FELLOW, HOOVER INSTITUTE ON WAR, REVOLUTION AND PEACE, STANFORD UNIVERSITY, STANFORD, CA

Dr. BOSKIN. Thank you, Mr. Chairman. Chairman Packwood, Ranking Member Moynihan, other distinguished Members of the Committee, I appreciate the opportunity to appear before you today to discuss what I believe is a serious problem in one of our most fundamental economic statistics, the consumer price index.

We all know that flaw has fundamental consequences for public policy, especially overindexing for the cost of living in the budget.

When I was chairman of the Council of Economic Advisers, some of you may remember that I helped—with a great deal of assistance from Janet Norwood, who was then Commissioner of Labor Statistics, and many others—develop a program to improve the quality of Federal Government economic statistics. We got that program started. Unfortunately, the momentum has not been maintained. One of the most important priorities of that general project was improving price measures, especially incorporating better measures of quality change. A related issue, the periodic 10-year revision of the CPI, has also lost some momentum budgetarily.

This is part of a broader issue, which I would just spend one second on, that we are asking a lot of our economic statistics, which are decreasingly describing our actual economy well.

While these are very tight budgetary times, and I have certainly been a leader in the call to slow the growth of spending and balance the budget over the longer term, I just would reiterate that the statistical agencies are straining to keep up, let alone develop the concepts and methodologies to improve the quality of the statistics.

Before I get into the gist of my testimony, I would also like to separate out the issue of an improved measure of the consumer price index or the cost of living, which we use for many purposes. For example, it is used to get an estimate of what real wage growth has been. If indeed the consumer price index, which is generally used to deflate nominal wages, really was substantially overstated then real wage growth on balance, not for everyone, not necessarily every year, was probably understated. And this can lead to a systematic distortion of our view of certain historical episodes.

I know I have been through with several of you the issues that arise when we get a systematically incorrect estimate of data. I remember assisting Senator Moynihan in estimates of the size of the Soviet economy at one point, which were greatly exaggerated by the intelligence agencies, at least ex post.

So these are important issues. My first point is that even if no Federal program on either the outlay or revenue side of the budget was currently indexed, it would still be desirable from the standpoint of providing our citizens a better and more accurate estimate of what is actually going on in the economy, in our lives, a way to compare ourselves to our history, to other countries, it would still be desirable to improve the quality.

The second point I want to make is that these sorts of technical adjustments, as was mentioned in the opening statements of the Committee Members, should not in my opinion be used as a back door way generally to do public policy with respect to indexing of Social Security and the Tax Code, and things of that sort.

Earlier in its history a courageous vote, which perhaps cost one or more Members a seat, was on limiting COLA's. Then the issue was really not a technical one; it was should the purpose of indexing be to provide insurance for bad episodes? Should there be sort of a deductible?

Senator D'AMATO. Michael, did you counsel them to support that ridiculous vote?

Dr. BOSKIN. No. I was not counseling anybody on that point. On the other hand, I generally support the notion that, as a society, we ought to be insuring people against the larger risks, not the smaller ones. And we ought to make greater use of deductibles, but that is a separate issue. And I think it is important, whatever one's views are about Social Security and the tax system. Senator Moynihan has taken a strong stand at an earlier time about Social Security's short-run surplus and payroll taxes, so I leave that aside.

My own view is that the CPI is probably overestimated by at least 1 percent, perhaps up to 2 percentage points. And I described in my testimony that there are a well-known set of biases involved.

The second point I would make is that it seems to me that you could get a panel together, members of this panel and others who have testified before, make it non-partisan, bipartisan, and so forth, and charge them with the following task. Given what we

know, and what we expect to happen for the next few years until we get more and better studies, what is the minimum amount by which you are virtually certain the CPI is overstating inflation?

If that is the case, you could then use that number, and substitute that for CPI, CPI(U) and CPI(W) in the indexing formula. I do not know what the legalities would be. Even though it probably would not go as far as we ultimately will, you really reduce the risk of an embarrassment later if the future studies show that the overstatement was overstated.

I think that could be done quite quickly. And my own view is that we ought to get on with it, treat it as a technical matter. I do not think it should be farmed out to some bureaucracy that is going to take years to report. I think it is of enough importance that this could be done quite easily within the course of the next several months with this particular charge, not what is the best estimate or guesstimate. Remember that these are hard conceptual issues so, to some extent, there is some guesswork here. But what is the minimum amount by which you are virtually certain? That is a stronger standard than juries use. So that is my recommendation.

The CHAIRMAN. A couple of months?

Dr. BOSKIN. I certainly think that within a couple of months you could get that. Whether that number is .4, .5, .7, .2, I would not hazard to say. Get the experts together. But I think that it is something that could and should be done, and not wait until 1999, as contemplated by the budget resolution.

The CHAIRMAN. Normally we would finish the entire panel. But if we might question you now, so that you do not escape questioning by having the other panelists testify.

Dr. BOSKIN. I understand.

The CHAIRMAN. And you have to leave before we get at you.

Dr. BOSKIN. I am delighted to answer what questions I can.

The CHAIRMAN. How do we answer the political question we are going to get—this is just a ruse to raise taxes and cut Social Security?

Dr. BOSKIN. My own view is that if the group is set up in a way that makes it clearly non-partisan, purely technical, while those charges undoubtedly will fly, you can develop widespread support among experts from a variety of political constituencies and a variety of points of view—from academic experts, people in the business community, users of the data, people who have served in administrations of either political party, or both political parties—and I think they would support this as a general notion.

I think it would be desirable to couple it with a charge to the BLS and the resources necessary to try to make serious improvements in the underlying CPI program by the 1998 revision.

The CHAIRMAN. Senator Moynihan?

Senator MOYNIHAN. I would just like to say how very welcome that suggestion is. And I would like you to elaborate just a little bit.

You are making the point that asking a group of professionals to come up with the task of deciding the minimum amount by which they are virtually certain, and you say that is a stronger condition

than the reasonable doubt used by juries—virtually certain as against reasonable doubt.

Dr. BOSKIN. Yes. I chose those words quite carefully for a number of reasons. One is that, while we have some better idea of how much the CPI has overstated inflation historically, although there is still a lot of dispute about quality change in new goods—and I leave Zvi and others to discuss that—the fact of the matter is that I think we have a pretty good idea in the shorter run, but how much technical change there will be a decade from now is hard to say.

Senator MOYNIHAN. Will there be a new equivalent of the cellular telephone?

Dr. BOSKIN. Probably, but the fact is that we will know better ex post. So if we are looking forward and trying to figure out something prospectively, let us be careful.

Senator MOYNIHAN. That is why you say virtually certain.

Dr. BOSKIN. Yes. My own rough estimate, as I said here, is 1 percent or more. But that is my own guess as to the actual overstatement. However, I would use a more cautious estimate myself. I would not be virtually certain that it is 1 percent or more. That is my best point estimate or guess. I would use a lower number.

Senator MOYNIHAN. So I make the point, Mr. Chairman, that Alice Rivlin followed almost exactly that pattern. She thinks it might be between .4 and 1.5, and she said, "What do you say we call it .5?"

Dr. BOSKIN. I think that is a judicious way to proceed.

Senator MOYNIHAN. Yes. Thank you very much.

The CHAIRMAN. Senator Grassley?

Senator GRASSLEY. I think our hearing is meant to focus entirely upon the impact of the CPI on direct payments out of the Federal Treasury, which come as a result of COLA's. I want to ask a question about something that would be a little more indirect because there is a lot of cost to the Treasury for interest that we have.

Have there ever been any studies, or do you have any thought on the subject of whether or not the relationship of inflation and inflationary expectations to the interest rates has had the same impact upon interest rates, the interest rates paid on the national debt, so that the same way you say the COLA's are 1 percent at least, and maybe 2 percent out of line because of the way we figure this?

It seems to me that the same inflationary statistics would be the basis for the bond market. Have there ever been any studies about having the same inordinate effect upon interest rates, and what that might do to the indirect cost to the Treasury of the national debt?

Dr. BOSKIN. If I understand you correctly, Senator Grassley, I think that is a very perceptive comment. One could imply from inflationary expectations in financial markets, the financial market's projections of a true increase in the cost of living that bond holders would have to be compensated for.

There have been some studies, for example, in the U.K.——

Senator GRASSLEY. In the U.K.?

Dr. BOSKIN. Yes, in Britain, which issues indexed as well as unindexed securities.

Senator GRASSLEY. Yes.

Dr. BOSKIN. Indexed and unindexed bonds, by which one could imply or infer what inflation expectations were. There are also surveys done.

So the answer is that you are quite right, those are substantial. And that would be an indirect way to get some evidence. But it is an ex-ante-expected future. I may be wrong, but as I understand it, I think the Congressional intent, especially given that we lag a couple of quarters to get the data, whether you agree with it or not, was to compensate people for the actual cost-of-living change and adjust for the actual, not the ex-ante-expected future change.

So if we were expecting 10 percent inflation in 1981, and that was what a lot of economists—not me—were expecting, and the disinflation was more successful than expected, and the actual inflation rate came down to 4 percent within a year, you would not want to be adjusting for 10 percent in that kind of an environment.

So it is a very perceptive comment, and it could be one bit of information a group like this might use, but I think it probably is not a sufficient way to get at the intent of these particular programs, to the extent I understand them.

Senator GRASSLEY. So your answer is then that it probably does not have any impact upon the cost of interest on financing our National debt?

Dr. BOSKIN. Oh, certainly it does. Expected inflation heavily impacts interest rates. The higher expected inflation is, the higher interest rates are.

Senator GRASSLEY. Then I am saying, if we have inaccurate CPI studies, do they or do they not have an impact on interest costs, the same way that they have an impact on COLA increases?

Dr. BOSKIN. In my opinion, probably not fully. In my opinion, the financial markets probably adjust to some extent for that already, and see through this.

Senator GRASSLEY. Thank you, Mr. Chairman.

Dr. BOSKIN. Although they might.

Senator GRASSLEY. All right.

The CHAIRMAN. Senator D'Amato?

Senator D'AMATO. Thank you, Mr. Chairman.

I just want to commend Michael, Dr. Boskin, for his suggestion. I think it is something that we could do to hopefully encourage our counterparts in the House and the administration to come together with a bipartisan group. It would seem to me that it is in everyone's interest.

Unless I understand the political dynamics, everything has some kind of political overtones, and it seems to me that if we could get the administration and all of our colleagues on both sides to recognize a procedure such as Dr. Boskin has outlined, which would say let us take that factor which we can all agree on, which is the minimum, if indeed the panel comes up with those findings, that it really inures to the benefit of governance, and how we operate as a Government, that we are willing to correct a mistake that does have great ramifications in terms of how we run this country and the decisions we are going to have to make.

So I think it is a prudent way. I would like to see us attempt to work to get that kind of a process established, and I thank you for your testimony.

Dr. BOSKIN. Thank you, Senator D'Amato.

The CHAIRMAN. Senator Chafee?

Senator CHAFEE. Thank you, Mr. Chairman. Has this idea been around for a while? You mentioned that you talked about it when you were chairman of the Council of Economic Advisers. I can be corrected by Members of the Committee, but it seems like this was dropped on us like a bombshell by Chairman Greenspan. Do you agree with that, Mr. Chairman? When Chairman Greenspan brought it up, I think he indicated——

The CHAIRMAN. I think it is subject that among the people on this panel, they have been aware of and kicked around for some period of time. We have had commissions in the past.

But do you mean when members of Congress first become familiar with it?

Senator CHAFEE. Well, let us take it to this elite group that constitutes the Finance Committee. I may be mistaken, but I think that it really came to our attention as a budget buster way when Chairman Greenspan talked in terms of between .5 to 1.5.

Senator MOYNIHAN. Could I just make one comment?

Senator CHAFEE. Yes.

Senator MOYNIHAN. Robert Gordon had a full length article in Public Interest in 1981, so we have had 15 years of this.

The CHAIRMAN. With which I can assure you Senator Moynihan was familiar back in 1981.

Senator MOYNIHAN. Yes.

Senator CHAFEE. I always allow the exception to any knowledge here. I go to bed with Public Interest magazine every evening. [Laughter.]

But I think to make this in a fully fair fashion, we have to also say that if it comes up the other way, we have to recognize that too. In other words, it is not all clear. I suppose there will be some economists that might say that the CPI understates inflation. Is that a possibility, Dr. Boskin?

Dr. BOSKIN. While conceptually possible, I think at the moment you would be hard pressed to find an economist who would have come to that conclusion recently.

Let me also say that, in addition to the commission that Senator Packwood mentioned a moment ago, the BLS has made a number of improvements, and continues to make improvements. For example, they made a major improvement in the way housing is treated, which apparently overstated actual inflation by 9 or 10 percent in the late 1970's and early 1980's, that high inflation period.

So the generic problem, I think, is well known. I think that the suggestion to actually make an adjustment before the statistical agencies try to catch up, because of its budgetary implications, was indeed highlighted by Chairman Greenspan.

I also testified at the same hearing. It was a joint House-Senate Budget Committee meeting in early January.

Senator CHAFEE. What about varied CPI's? In other words, what applies to Social Security when you are dealing with the elderly

might be quite different than what is used to index the tax brackets. Is there anything to that?

Dr. BOSKIN. Well, there certainly is. There are many reasons to believe that different people—and perhaps the average or central tendency within some population subgroup, defined by whether you are working or not, where you live, your age, things of that sort—might consume different market baskets, might enjoy the benefits of new technology more quickly or not at all, things of that sort.

I looked into this in great detail in the mid-1980's. A colleague of mine, Michael Herd, and I wrote an article on whether there should be a separate price index for the elderly. At that time, looking back at the very high inflation in the 1970's and early 1980's, even by 5-year age groups, the price index for the average consumption basket for the elderly was quite similar, was hardly different at all from the general population. Some things they consumed disproportionately went up more rapidly, some less rapidly, and it happened to average out.

More recently, in an experimental study, the BLS looked at this and concluded that because the elderly spend more on out-of-pocket medical care expenses, probably the overall CPI slightly overstated their cost-of-living increase, but they also had a lot of provisos that they were probably overstating the rise in medical care, and not attributing enough of that cost increase to quality change rather than inflation. That is something that such a group could consider as one of the issues in making its recommendations.

Senator CHAFEE. Well, I think that is interesting. You have given us some good ideas. Thank you very much, doctor.

Dr. BOSKIN. Thank you, Senator Chafee.

The CHAIRMAN. Let me suggest to the other Committee Members what we are doing here. Dr. Baucus has to—Dr. Baucus, Dr. Boskin—has to leave and go to Ways and Means. Excuse me, Max.

Dr. BOSKIN. An honorary degree from Stanford.

The CHAIRMAN. The other panel members have not testified yet, but I suggested we ask Dr. Boskin questions now, so we do not lose him, and then we will let the other panelists finish.

Senator Conrad?

Senator CONRAD. Thank you, Mr. Chairman. It is good to see you again, Michael.

Dr. BOSKIN. The same here, Senator Conrad.

Senator CONRAD. It is good to have you here.

Dr. BOSKIN. Thank you.

Senator CONRAD. I am really filled with questions. I got a letter from Dale Jorgensen, who is a professor of economics at Harvard, the chairman of the department there, who testified on this matter before us. He indicated in his letter that the Dallas Federal Reserve has done an analysis, and he says, "I understand the Federal Reserve Bank of Dallas has arrived at an estimate of .9 percent per year in a paper I have not yet seen." He is talking about the bias of the CPI—.9. Are you familiar with that paper?

Dr. BOSKIN. I have not seen it yet.

Senator CONRAD. Mr. Chairman, I think it might be useful to the Committee if we were able to get that. I do not know if it has been published, or if it is just a study that has been concluded. Perhaps you are aware of it.

The CHAIRMAN. I am not aware of it. We will try to get it. It is well within the range.

Dr. BOSKIN. Dr. Griliches knows something about it.

The CHAIRMAN. Are you going to refer to it?

Dr. GRILICHES. Well, no. But I can say something about it.

The CHAIRMAN. All right.

Senator CONRAD. I have it here.

Dr. GRILICHES. It is a good study, but it basically has no original work. It just has other people's things in it.

Senator CONRAD. Sometimes that is the best work.

Dr. GRILICHES. Practically everybody is talking about the same three or four pieces.

Dr. BOSKIN. So what Dr. Griliches is saying is that we are all using the same information, and their conclusion is not dissimilar to others.

The CHAIRMAN. Much of which comes from Dr. Griliches.

Dr. BOSKIN. That is correct.

Senator CONRAD. Well, I think that would be useful for us to have. Let me ask you this, if I could, Michael. I have talked to economists who differ on this question. I have seen them, they have been to my office, they are real, living, breathing people. And they have told me they believe, with respect to the elderly in our population, who would be disproportionately affected because of Social Security, that the CPI understates their cost of living. And they assert that is the case because they are more heavily dependent on medical expenditures, especially pharmaceuticals, that are very expensive.

Have you done any research on that question, or read studies on that matter?

Dr. BOSKIN. Yes, I have. As I mentioned a few minutes ago, the BLS estimates that the CPI, adjusted for the market basket of people over the age of 62, which would show a greater weight for out-of-pocket medical expenses, would have grown slightly less in the period December, 1982 to December, 1993, when there was rapid medical cost inflation.

Going forward, I would say two things about that. One is in that study they say that, using the estimates of medical cost inflation probably overstates that because some part in the rise of the cost of medical care may have been improvements in quality that get attributed to price change. So they are very cautious about drawing any strong conclusions from that.

Also, of course, medical cost inflation, relative to overall inflation, has come down. So, moving forward, I think that is one thing any group should look into, and it may be the case. But I do not think the size of any such potential overstatement for the elderly is likely to be more than a small fraction of the general current overstatement of the cost of living.

Senator CONRAD. Dr. Norwood, do you want to comment on that?

Dr. NORWOOD. Yes, I would like to comment on that. The real point is that we do not know. And we do not know because we do not have prices that are collected for items that are purchased by the elderly. All the work that has been done is using the same information that is collected for the consumer price index in the same cities, which happens not to be where the elderly live.

I would make one additional point, and that is that I am not certain that the Social Security recipients are all elderly.

Senator MOYNIHAN. About one-quarter of Social Security recipients are not over 65.

Dr. NORWOOD. And there is a difference between the old old and the near old.

Dr. GRILICHES. Both are right. And the point is to realize is people are complaining about the cost of living, and the consumer price index does not necessarily measure it in that way. The simplest example is that you now have the option of having a bypass. You did not have that before. You did not have a large number of medical procedures. That makes medical care more expensive.

In the price index, these are goods which are actually new goods. They are better goods. They will not show up as a rise in the price of goods because the index does not allow for environmental changes, but that is driving medical costs up. It is a real interpretational problem of what goes into the CPI and what does not.

Senator CONRAD. Thank you. My time is up.

Senator MOYNIHAN. Mr. Chairman, could I just say for the record that the review of the literature study done by the employees of the Federal Reserve Bank of Dallas, Mr. Wynn and Mr. Cigalla, suggests that the CPI does overstate the rate of inflation. And it probably does so by no more than 1 percent annually.

Thank you.

The CHAIRMAN. Senator Simpson?

Senator SIMPSON. Thank you, Mr. Chairman. It is good to see you, Michael.

Dr. BOSKIN. Same here, Senator Simpson.

Senator SIMPSON. I remember well. You served very ably, giving correct figures, oddly enough, but there were some in that administration that were not listening to them.

Dr. BOSKIN. Well, that is another story.

Senator SIMPSON. Yes, it certainly is. You and I have talked about that before—ghastly story. Well, enough of that.

This key little thing of CPI is a driving engine. I do not know when we began to pay attention to it, but I know we had all better pay attention to it.

It still seems puzzling to me, but I guess the information for the current market basket has been collected in the years 1982 to 1984.

Dr. BOSKIN. That is correct. At the end of this decade, that base period will be updated to the period 1993 to 1995.

Senator SIMPSON. I do not think people understand that.

Dr. BOSKIN. It usually lags behind 5 or 10 years.

Senator SIMPSON. Twenty percent of the information on type and quality is updated every year. Twenty percent of the information on where they purchased the items is updated every year. They finally get to updating products like typewriters, record players, and finally getting into word processors and CD's. It has a number of limitations. It does not reflect changes in buying patterns, substitution bias. This is what I have learned here before from other witnesses and other hearings.

The items may be outdated, as I said, by 10 years. There is a quality new product bias. The new ones come on, they are very ex-

pensive, and then with economies of scale, they swiftly reduce the price. I remember the little hand calculators. They were $120 bucks, and a year later they were $9 bucks. I bought them at $120. That is the history of my life in investing.

Senator CHAFEE. Did you stock up on them?

Senator SIMPSON. Yes. They are under my bed. There is a gross there under the bed.

Now everyone has said it is overstated, everyone who has testified. This in turn increases huge transfer payments of the Federal Government like the COLA's. We know that. It is big bucks, 30 percent of the Federal outlays are indexed to the CPI(U). Forty-five percent of Federal receipts are affected by CPI. A .5 percentage point overstatement costs $150 billion over 5 years, a huge transfer of wealth while we are trying to deal with Social Security and Medicare, which are going to go broke in 7 years.

In your written testimony, you had something I was intrigued by, the logarithm bias. You called it an asymmetric bias. But, in either case, the BLS, and I think they are good. I have heard people say that it is a wonderful group, that they are very sincere and dedicated. I do not challenge that at all.

But I think the American people can understand this, that surely the BLS is making a serious mistake. And you explained in your testimony that the price of a shirt, which was originally $50 bucks, goes on sale for $40 bucks, is calculated by the BLS as a 20 percent price reduction. That sounds reasonable. So later on the sale ends, and the price returns to $50 bucks, and the BLS calculates that to be a 25 percent increase in price. The result is at the end of the day the shirt has been calculated, and the price of the shirt has increased by 5 percent, even though it was $50 bucks when it started and $50 bucks when it ended.

Now you call this a "sophomoric" mistake by the BLS. Has this kind of thing been addressed? Will it be addressed?

Dr. BOSKIN. It is being addressed. They are aware of it, and they are fixing it. And they courageously brought it to the public's attention. I was unaware of it, even when I chaired the group that led to the suggestions to improve the quality of the statistics. And I would second your notion that the BLS people are quite professional. We are asking them to do a lot, and they are strained in doing so, but they themselves uncovered this and made it public. It is rare for people to fess up to things like that, and I would applaud them.

Senator SIMPSON. So there is some tingling sensation of bipartisanship in the body. And there is. Senator Kerrey and I have a proposal in several bills to bring the Social Security system back to life. And one of them is a CPI minus .5 percentage points until we get a group together. I was ready to go to a CPI minus 1 percentage point, but we could not quite get there. But I think this is a tremendous key when this thing makes a difference of $150 billion in 5 years, just on one-half a percentage point. But this is it. This is a key area. And if we can correct it now, the outyears can have dramatic results.

I enjoy you, and wish you well, and you do well. You are a very capable person. Thank you so much.

Dr. BOSKIN. Thank you, Senator Simpson.

The CHAIRMAN. Thank you, Alan.

Now we will go on with the rest of the panel. And we will start with Dr. Ellen Dulberger, who is the program director for IBM Global I/T Services Strategy and Economic Analysis. She is an expert in price indexes for the computer industry.

Doctor?

Senator MOYNIHAN. And Lotus.

The CHAIRMAN. Michael can go whenever he has to go.

Dr. BOSKIN. Thank you very much.

The CHAIRMAN. And Lotus is what? About to be bought by IBM?

Senator MOYNIHAN. And Lotus stock has doubled in price, you know.

The CHAIRMAN. Doctor? Go ahead.

STATEMENT OF ELLEN R. DULBERGER, Ph.D., PROGRAM DIRECTOR, STRATEGY AND ECONOMIC ANALYSIS, IBM GLOBAL I/T SERVICES, WHITE PLAINS, NY

Dr. DULBERGER. Thank you for inviting my comments on the consumer price index.

Although I am employed by IBM, I appear today in a personal capacity as a professional economist. The views and conclusions contained in this testimony are mine, and not presented or intended as IBM's. I will limit my statements to highlights from my written submission.

In my view, upward bias in the CPI, and in its rate of change, may be greater than others have stated, and are both likely to be growing. The primary reason is that innovation and technological change affect quality in the introduction of new products, the way they reach us, and the way we live. And the effects of innovation and technological change have not been adequately taken into account.

One effect is what I call geographic substitution bias. Mail order purchases are a good example. Mail order companies may be located anywhere, and their location is not what determines whether consumers can or will buy their products. The same is true for home shopping on cable TV and shopping on one-line services, such as Prodigy, America On Line and CompuServe. Particularly, as information technology advances further, it becomes possible and indeed common to shop outside the geographic limits of traditional shopping.

However, the CPI has not been changed to accommodate the decreasing importance of geographic location and the changing nature of stores. Indeed, just as it does not capture mail order prices or the effect of their growing sales, it is not equipped to capture these other innovations in retail sales either. As these new and innovative alternatives to traditional shopping grow, so does the upward bias in the CPI.

Another widespread and important phenomenon is discount devices. Store coupons, deals such as buy a pizza, get a soda free, frequent flier programs and buyers' clubs are all ways for consumers to effect lower prices for their purchases. Yet, when they produce transactions that are different from the one priced for inclusion in the CPI, they will not be captured.

This means that the narrow units of observation used to measure prices for the CPI are likely to become less representative of consumer expenditures.

Quality change in the introduction of new goods presents the most difficult problems for measurement. One problem is getting new products into the CPI in a timely way. My own work on computer memory chips demonstrated that the upward bias from introduction delay can be huge. Introducing these products when they were 3 years old, instead of new, resulted in overstating the change in the index by 7.6 percentage points per year. A 5-year delay produced an upward bias of 25.7 percentage points per year.

While the impact of introduction delay may not be as great for all products, it may well be for consumer electronics products. Failure to include products into the CPI in a timely way is contributing significantly to upward bias.

Direct quality comparisons of new products with the ones they compete against is a problem that has received some attention. For example, in my work developing price indexes for computer processors, the rate of growth in the price index was overstated by 9.3 percentage points per year when direct quality comparisons were not made.

An associated measurement problem, also resulting in upward bias, is what I call "classification substitution bias." One example is the introduction of a new drug that substitutes for a surgical procedure. The drug would enter the index in a way that compares it with other drugs, and assumes that price differences within that group of drugs are equal to quality differences. The new drug would not be compared with the surgical procedure because it is in a different "cell."

There are many other examples. First-run movies viewed on cable TV rather than in theaters is one. If products were grouped differently, such as on the basis of an outcome, then the new drug and the surgical procedure could be in the same cell. It is surprising to me that the effect of classification on price indexes has received so little research attention.

What can be done? Rectifying these problems requires new approaches, including multi-disciplinary, multi-organizational teaming, reassessment and realignment of BLS research priorities, and an aggressive schedule for research and subsequent implementation of results.

For example, joint research by BLS and business could be modeled after the IBM BEA work in developing prices indexes for computing equipment. The statistical programs, especially those on consumption, could be coordinated across statistical agencies, although legislation would be required to do so.

What can be done to properly escalate Federal programs? There is a problem using a general measure of inflation such as the CPI to represent price changes of a particular program. Sometimes we may want to allow for changes in real income, and not hold it constant, such as when a new vaccine or a new medical procedure becomes available.

Other considerations for indexing Federal programs include taking account of demographic and regional differences in the level and consumption of consumer expenditures.

For these reasons, I believe that the help of a group of independent experts is needed. They would be responsible for understanding and interpreting the policy questions. They would direct informative and useful research toward the construction of meaningful price indexes.

Thank you.

[The prepared statement of Dr. Dulberger appears in the appendix.]

The CHAIRMAN. Thank you very much.

Next we will have Dr. Zvi Griliches. He was not available when we had our hearing a month ago. He was teaching in Russia. He said he was there for a month. I asked him how Russia was doing, and I think a fair answer would be slow. He is a native Lithuanian, and I asked him how Lithuania is doing. He said, well, better than Latvia, worse than Estonia. Everything is relative, I guess.

I might say as a compliment to you, doctor, that when other witnesses talk to us or testify, they sort of talk to you as the guru of gurus that they look to in this field, and we are delighted to have you with us. Go right ahead.

STATEMENT OF ZVI GRILICHES, Ph.D., PAUL M. WARBURG PROFESSOR OF ECONOMICS, DEPARTMENT OF ECONOMICS, HARVARD UNIVERSITY, CAMBRIDGE, MA

Dr. GRILICHES. Thank you. I will skip over large sections of my testimony, including the fact that many of the basic stories about the CPI have been told by other witnesses.

I believe the CPI did indeed overstate the average price rise during the last several decades, but the scientific basis for this judgment is much weaker than the general one of the discussion seems to imply.

I will also argue that the CPI is the wrong index for escalation, and the wrong instrument for deficit reduction. If entitlements are to be cut, they should be cut on their demerits, not using the irrelevant fig leaf of problems with the CPI.

I will also complain about the current attitude of some parts of the Congress that devalues economic research, threatening to make it into a second-class activity, while at the same time expecting first-class answers from it.

How large can the overstatment in the CPI be? The various guesstimates presented to this Committee are not independent of each other. They all use small estimates of substitution and formula bias originating in the BLS, and relatively large estimates of new goods biases based primarily on the work of Gordon on durables, my treatment of generics, and the more general work on computer prices by a large number of people, including Ellen Dulberger.

It is also clear to everyone that we are not doing good job of measuring real output of the health services sector, and hence also the quality adjusted prices of medical services.

An overall guess of 1 percent per year overstatement seems about right to me. But it is a guess, based on extrapolating over large stretches of unexplored components of the CPI. I would put the range of uncertainly around such a guess quite widely, easily

at a plus or minus .6 percent. I would be surprised, however, if further research proved it to be zero or as high as 2 percent.

Now one way of thinking about this is to ask the following kind of question. If we take a sizable stretch of our recent history, say 25 years, 1969 to 1994, which are still within the memory of many of us here, the official CPI measure was rising by an average of 5.6 percent per year. The theory behind this measure would say that you should be indifferent between living on $60,000 today—or precisely 1994—or on $15,000 a year in 1969, paying 1969 prices for commodities and services available in 1969, but not being able to buy the services and products that have become available since.

My guess is that most of us would not choose to make this shift, choosing $15,000 in 1969, the commodities that were available then and other living conditions, which would include 1969 pollution levels, medical and pharmaceutical technology and fear of nuclear war.

The personal safety situation in 1969, at least in my old neighborhood of Hyde Park, was probably not really better than it is today. In any case, if you are not willing to engage in this potential bargain, then the official CPI is not the measure for you.

Even if one accepts this 1 percent per year estimate as being reasonable for the past, it is not clear how such numbers are to be extrapolated into the future. The BLS is currently fixing the formula bias and the treatment of generics. It is also likely to reduce the substitution bias by moving to more timely weighting schemes. The future rates of overstatement are likely to be lower unless technical change accelerates further.

Most of the telling criticisms of the CPI have concentrated on belated and inadequate treatment of new goods and services. But there are also new "bads" to bear.

Senator CHAFEE. What is a bad?

Dr. GRILICHES. "Bads" are things that are happening to you, which are raising the cost of living. I will give you two examples.

Senator CHAFEE. It is not an acronym, but it is bad things?

Dr. GRILICHES. Yes, we do. And I am trying to say is that it is a pun on "goods". We are talking about new goods, but there are also new "bads" that enter into the stream of things.

Two examples will suffice. New and improved anti-theft devices for cars and anti-burglar systems for homes will be treated, as far as the data allows, as quality improvements, and could show up as decreases in the CPI. But the technological know-how of car thieves and burglars may be rising at about the same rate, with no real improvement in security levels.

Similarly, recent improvements in managed medical care, which send you back home on the same day after a hernia operation, represent a decline in the quality of medical care provided at previously expected medical insurance levels. This too is unlikely to show up in the CPI as it is currently measured.

Why is the CPI not better? There are three related answers to this question. One, the economy is changing rapidly, and measuring such changes is really difficult. Two, the research base for improving measurement procedures is slim and underfunded, both inside the relevant agencies and in the academic community. Three,

hardly anyone cares. There is no clear constituency or organized lobby worrying about the quality of Federal statistics.

What can be done to improve matters, besides being more sympathetic to BLS budget requests? Congress could ask some group, such as the National Bureau of Economic Research, to mount a reasonably well-funded review effort of the CPI procedures, and to recommend reforms in it. There is a precedent for it in the operation of the Stigler Committee in the late 1950's. Alternatively, the same request could be made of the National Academy of Sciences, along the lines of the Rees Committee on Productivity statistics.

There is an entirely separate issue of how such revisions should affect, if at all, the escalation of various entitlement programs. There are several reasons why the CPI may not be the best escalator for these purposes, independent of its other drift problems. It is affected not only by general monetary inflation, which is what the escalator clauses are about, but also by real economic events, which society may not be able to evade. Nor can it really compensate large groups for it.

If energy prices were to rise again, due to the resurgence of OPEC power, that would be a real tax on the U.S. economy. There is no way in which everyone can be compensated for it. If we choose to isolate some subgroup of the population from it, we have to reduce somebody else's real income.

Now we may choose to share this burden unequally, and transfer resources to the poorest segments of our society. But the current procedures imply that the affected groups would be entirely protected from such changes, and not share in the societal burden at all.

What I am trying to say is that I favor the uncoupling of the discussion of entitlements from the revision of the CPI. A policy of escalation based on CPI minus 1 percent may not be unreasonable, though I would prefer tying it to the median wage instead. But that should be done in connection with the review of the current adequacy of absolute levels of such entitlements or social safety nets. Perhaps another separate commission is also in order here.

Are you sure that your elderly aunt can really make ends meet on her current Social Security payments? I would worry about her if she does not have access to other resources. How about your cousin's retarded son who is trying to live on his own? Can he make it on the current level of SSI payments? E Pluribus Unum meant also that we take some responsibility of each other. The perception that we are trying to evade our National responsibility of being our brother's keeper leaves me feeling sad about my adopted country.

I am also appalled by statements that are emanating from the other House, implying that economics is a lower form of life, unworthy of support, and ready to be thrown out of the NSF mandate. Surely, understanding what people are made of, how our society and economy functions, and what forces are shaping its future, is more important to assuring our survival as a nation and a functioning society than trying to improve our understanding of what matter is made of.

Moreover, almost all of the research on which today's discussion is based on, besides the in-house contribution of the BLS, has been

supported by the National Science Foundation. There is no other disinterested source of support there. If Gordon's and my work, as well as other researchers, result in your reducing the deficit by several tens of billion dollars, and lead eventually to a higher real growth rate for the economy, the benefit-cost ratio of NSF's support of all economic research will be enormous, and that does not count the other contributions. In governing, there is no such thing as a free lunch either.

The CPI is an important indicator, and deserves the attention we are giving it today. But it is not the only governmental measurement enterprise that requires attention and tender and loving care. There is also the Census, the income, employment and population statistics, and the whole national economic accounts enterprise.

The current Federal statistical effort is balkanized into separate, not well-cooperating and underfunded agencies. A serious look at the possibility of establishing a unified, high quality Statistics USA agency is long overdue.

Thank you for your attention.

The CHAIRMAN. Doctor, thank you very much.

[The prepared statement of Dr. Griliches appears in the appendix.]

Next we have Dr. Janet Norwood, who has appeared before this Committee many, many times. She is now a senior fellow at the with the Urban Institute. But, of course, we knew her best as the Commissioner of the Bureau of Labor Statistics for 12 years. She was always welcome and frank, and very honest and open with this Committee.

Doctor, it is good to have you back again.

STATEMENT OF JANET NORWOOD, Ph.D., SENIOR FELLOW, THE URBAN INSTITUTE, WASHINGTON, DC

Dr. NORWOOD. Thank you very much, Mr. Chairman. It is a great pleasure to be here.

My knowledge of the CPI goes back a long way. I served for several years as Chief of the Division at the Bureau of Labor Statistics, with direct responsibility for compiling the index, and later as deputy commissioner and commissioner, I was responsible for overseeing CPI compilation and improvement as a part of the overall labor statistics program.

The invitation to me to provide testimony this morning assumes that the CPI is overstated and needs to be fixed. The assumption is that professional economists, public policy analysts and the general public have clear knowledge that the CPI is too high, that they know the precise amount of that overstatement, and that they know exactly how to improve it. I do not agree with that view.

It is true that researchers have found examples of overstatement in individual components of the CPI, but I know of no comprehensive examination of all components, including those which may be understated.

While it may well be true that the indexation of entitlement programs has proved to be expensive, it is not at all clear that the problem with indexation is that the overall CPI overstates the rate of inflation. The CPI, like all other statistical measures, is certainly

not perfect. But it comes out rather well when compared to the index of most other industrialized countries.

Senator MOYNIHAN. Dr. Norwood, your text says "extremely well." Is that an emendation?

Dr. NORWOOD. No.

Senator MOYNIHAN. We could make that "rather well".

Dr. NORWOOD. It was just by happenstance.

Now in the past I have testified before Congressional committees—many of them—on the possibility of compiling special indexes for use in particular programs. Thus far, however, no complete program to produce additional indexes has ever been funded.

Studies of the CPI usually point to three general problems in index making. And people have already referred to them. I assume my testimony will be included in the record. Each of these is discussed in my testimony, and I would just like to point basically to one of them.

One of the most widely discussed criticisms of the consumer price index is that it does not adequately adjust for changes in the quality of the goods and services that are priced. Many economists believe that this problem of quality improvement results in CPI overstatement. But this is not a new issue, nor is there much agreement on the extent of the possible resulting bias.

More than 30 years ago, when I was in the price research division at the BLS, economists were studying this very issue of quality change. We have learned a lot since that time, and many improvements and adjustments, some suggested by economists like Zvi Griliches on this panel today, have been incorporated in the index. But the fact is that we do not know how to solve the problems caused by the changes in quality for all of the goods and services priced for the index.

The point of all this is that quality changes are made for many products when the data required are available, but we do not know how the quality improvements balance off against the quality deterioration that has also taken place.

Last week, for example, on an airplane trip to Texas, I was informed that meals, or even snacks, had been discontinued for flights of three hours or less. I am not aware of any upward adjustment for that reduction in quality. On occasion, the electric service at my vacation home in Maine shuts off, but my electric bill is not adjusted for this blackout.

The deterioration in our Nation's education system has been discussed for many years now, but the larger and larger class sizes, the increasing inadequacies of university library facilities, and the shifting of resource allocation from the teaching to the administrative staff does not result in an upward adjustment in the cost of college tuition in the CPI.

Many of the CPI's critics believe that the things that people buy are always improving, and that the change in quality can be easily recognized, that data are available for use in the index, and that the methods for adjustment are always clearly understood. But the issues are complex, and problems abound.

Take, for example, the BLS index for automobiles, where quality adjustments have been made for many years now. During the 1950's and 1960's, BLS adjusted for the improved quality that oc-

curred as automobiles became larger and more powerful. In the 1970's, however, the reverse was true. The downsizing of engines and automobile size was considered a quality improvement. As Government environmental and safety regulations have affected the manufacture of automobiles, the new car prices were adjusted downward for the improved quality, even though many consumers would not have purchased the additional equipment out of choice.

Indexation of Social Security benefits and other Government programs was initiated by the Congress in an effort to provide recipients with protection from inflation. Indexation removed Congressional discretion by making the escalation automatic through use of an objective, non-political statistical measure—the CPI.

Twenty years ago, when automatic CPI indexation was initiated, the effect was in fact to slow the rate of increases. Today we face a different situation. The problem, I submit, is not how to adjust the CPI, but whether the country can afford the amount of indexation provided by law. The question here is not one of measurement, but rather one of social and economic policy. The Congress should not attempt to solve a political problem by legislating a level of a statistical index. I can think of nothing that would be more damaging to the nation's statistical system.

Thank you.

The CHAIRMAN. Doctor, thank you.

[The prepared statement of Dr. Norwood appears in the appendix.]

The CHAIRMAN. We will conclude the testimony this morning with Dr. Robert Pollak, who currently teaches at the University of Washington in Seattle, but next month will join Washington University in St. Louis. And he has been a consultant to the Bureau of Labor Statistics, so he has worked for Dr. Norwood at one stage.

Dr. Pollak?

STATEMENT OF ROBERT A. POLLAK, Ph.D., PROFESSOR OF ECONOMICS, UNIVERSITY OF WASHINGTON, SEATTLE, WA

Dr. POLLAK. Thank you. I want to thank the Committee for inviting me to testify on the consumer price index.

I have submitted a paper for the record which I wrote for BLS on the treatment of elementary aggregates, which is one of the principal issues in recent discussions of the CPI. I want to make three points, provide some analysis, and make two recommendations.

[The prepared statement of Dr. Pollak appears in the appendix.]

Dr. POLLAK. First, BLS researchers were responsible for discovering and publicizing the issues that we are now discussing. Their work was published in the Monthly Labor Review in December, 1993. That work called attention to problems that Mike Boskin mentioned. BLS research is continuing on these issues. BLS also was responsible for research on the substitution bias issue, and basically is responsible for what we know about it.

Because BLS has supported my research on the CPI, and the theory of the cost-of-living index, I am in an awkward position to praise BLS. Nevertheless, it is important for the Committee to understand the crucial role which BLS research has played in raising these issues.

Second, concerns about whether the CPI overstates the rate of inflation focus on three clusters of issues: Substitution in response to relative price changes; quality, which I interpret broadly to include the new goods problem, as well as the narrow-construed quality problem; and the problem with elementary aggregates, which I also interpret broadly to include the problems of outlet substitution.

The substitution issue and the quality issues have been discussed at length in the literature. The elementary aggregate issue is new and relatively unexplored.

Third, the substitution, quality and elementary aggregate issues pose difficult, unsettled problems. The appropriate theoretical treatments of these issues are not obvious, and the numerical implications of alternative treatments for the CPI are not obvious. Speculation about the aggregate overstatement of the CPI, therefore, requires speculation about two levels of speculation about three distinct clusters of issues.

Other economists have speculated about the magnitude of the aggregate overstatement of the CPI. I have nothing useful to add to those speculations. I do want to emphasize that the issues are difficult and unsettled.

What should be done? Before attempting to answer that question, I want to change hats and provide some analysis. My research interests include not only the cost-of-living index, but also risk regulation. In a recent paper, I criticized recommendations for placing a greater reliance on scientific experts put forward by Justice Breyer in his book, "Breaking the Vicious Circle: Toward Effective Risk Regulation".

My analysis of risk assessment, the "scientific" component of risk regulation, emphasized the interaction of scientific uncertainty with the open, skeptical, political culture of the United States. Taken together, these two factors virtually preclude resolving contentious issues by characterizing them as scientific and delegating them to experts.

In the risk assessment context, examples include setting workplace exposure standards for hazardous substances such as benzene and formaldehyde, setting standards for cleaning up hazardous waste sites, answering the question of "how clean is clean?" under Superfund, and, in the context of nuclear energy, setting standards for power plants and selecting nuclear waste disposal sites. One of the central facts is that experts are often asked to deliver more than their science can deliver or, changing hats again, more than our science can deliver.

As a result, in index number construction as in risk assessment, difficult technical issues are often resolved by appealing to professional conventions. The technical problems of the CPI intersect the political problems of taxation, intergenerational efficiency and intergenerational equity, because the CPI is used to index tax brackets and various benefit programs, including Social Security.

Even if there were no uncertainty about the rate of inflation, the threshold question of whether to escalate benefits of Social Security recipients with prices or whether to escalate them with wages would remain. And the question is political; it requires a political answer.

The credibility of the CPI depends on the perception that it is not being manipulated as a policy instrument. In an environment in which there is little trust in Government or in experts, I urge caution in modifying the CPI. There is a risk that attempting to modify the CPI, even in directions that are desirable on scientific grounds, will weaken the credibility of the index. Credibility depends not only on what is done, but how it is done, and on who does it.

Recognizing this, and recognizing that political problems cannot be resolved by characterizing them as technical and delegating them to experts, I make two recommendations. First, I recommend separating the technical issues from the political issues to the maximum extent feasible. The technical issues related to the CPI are the province of economists and other experts. The political issues are not.

Second, I recommend a procedural rather than a substantive solution to the technical issues. Specifically, I recommend that the technical issues be addressed by convening a committee of technical experts to study CPI issues and report on them. The credibility of such a committee of technical experts would be enhanced if it were convened by an independent body, such as the National Academy of Sciences or the National Bureau of Economic Research.

On the political issues, I make no recommendation.

The CHAIRMAN. Well, we will not make any scientific ones.

I do have a statement from Professor Michael Darby, who wanted to be here today, but could not. He is a former Under Secretary of Commerce, and Assistant Treasury Secretary for Tax Policy. In his analysis, he thinks that the CPI is overstated by someplace between .5 and 2.5. He said, if he had to pick a figure, he would say 1.5. And I will submit his testimony for the record.

[The prepared statement of Dr. Darby appears in the appendix.]

The CHAIRMAN. Now I always hate to start. I do not know of anybody that has come before this Committee and said, in my judgment, based upon all the factors I have looked at, the consumer price index is overstated by 7.1 and, if I could carry it to 100, it would be 7.13, and to 1,000, it would be 7.137, which is my exact estimate. No one has said that.

But I am curious, Dr. Norwood, how do you answer the question that most people who have studied this extensively say that it seems to us it is someplace between a minimum of .4 or .5, and a maximum of 2. And they sort of hung in someplace between .5 and 1 as the overstatement, or 1.2 or something like that?

Dr. NORWOOD. I would answer it in two ways. First, I would ask them upon what they base that decision. And I am certain, having been quite familiar with these issues, that they would base them on particular studies of particular components of the index, and not on a total comprehensive review. That is the first point.

The second point is that it does not surprise me. It does not surprise me at all. I would ask you, Mr. Chairman, whether you think, for example, that it was right to change the home ownership component of the CPI. I was intimately involved in that, and lost a great deal of sleep over it. And it took 10 years. Why did it take 10 years? Because we had to preserve the credibility of the index, and because we understood that a general consensus, at least some

consensus on the part of the public was needed in order to make a change.

The CHAIRMAN. Do you mean consensus, or do you mean acceptance?

Dr. NORWOOD. Acceptance really. You are quite right. What we found was that when we went out having the right things and publishing them, after a while people would come back and quote our own writings, and say "you people must be pretty stupid, you do not understand that the current approach is wrong." And yet all of it came from the things we had written.

But when we got groups of people together, we found that yes, people agreed that there was overstatement, yes, they agreed there should be a change in concept, but there was disagreement about what it should be. Some said one thing, some said another. And furthermore, there was a great deal of disagreement. I do not think that any two people in the room would agree on the particular specification, the method of compiling the index itself. And, after all, that is BLS's problem.

So there are very serious problems here. And it does not surprise me at all that in general, when you are looking at this up here, that is the problem. As I said before, Mr. Chairman, I believe very strongly that this is an issue of policy, and not an issue of measurement.

The CHAIRMAN. Well, let me ask you this. I understand the different between public acceptance and fact. Fact is Medicare is bankrupt in 2002, the part A. It is gone. That is fact. Getting the public to accept that is another matter, and those are two different issues. But we have not had anybody testify before us—and we will have two of the secretaries this afternoon—that disputes the fact that in 2002, the money is gone in part A of Medicare.

And I understand the difference here between the Congress changing the consumer price index by 1 percent, even if that was an accurate measurement, and having the public accept that.

But, having said that, I want to ask Dr. Griliches because you say that they all sort of come back to your material. There is only a little bit of material that everybody looks at. There is only so much material in this field, and much of it is his. And Dr. Griliches says, well, there is an overstatement someplace between .6 and 1.6. But he said, if he had to pick a figure, he would pick 1. How do you get there, doctor? Based upon what Dr. Norwood said, how do you come to this conclusion, whereas she says that you really cannot come to that conclusion?

Dr. GRILICHES. In a line that I did not read in the beginning, I said that in asking questions this way, the Committee assumes that we already know that the CPI is overstated. And I said I think it is. But the scientific basis for this judgment is much weaker than the questions seem to imply. And what we have had is a relatively large number of studies that delve deep into some pieces of the CPI.

There are problems with those studies. Some of them are sort of looking for the watch under the light. There are whole large stretches where we do not have anything to dig with. But they are also problematic, so I think that large stretches for which we do not know, like medical, we really know that a big part of the infla-

tion that has occurred there has really occurred because there is more being done, not because the price of doing it has risen. The concept of what is to be done has changed, so that in that sense there is an overstatement.

Now some of it goes back to the issue of the cost of living. I do not think that the people who say there are large declines in quality have not produced parallel studies of significant amount. And I myself have just invented or produced two examples, which I thought because of the things that are happening, can go that way. But I think the important distinction is in the concept of the index itself, the concept of the index as a market basket, and that is what we are pricing.

The cost of living index says that there is a standard of living that somehow you want people to be able to maintain. Even without any of the prices changing, the cost of living can go up. In a cold winter, you will have to consume more energy to keep the house warm by the same amount. That is an increase in the cost of living. It may not drive up the price of electricity. If you have to put in burglar alarms, if you have to buy more insurance, that is an increase in the cost of living. It will not be in the price index.

So when Senator Conrad was thinking about the elderly person complaining about the problem of living on Social Security, the elderly person was not faking it. It is a real problem, but it is not in the concept of the price indexing.

That is why I was saying that the problem of the entitlements, and the problem of the price index is not exactly the same. And by focusing on just this one, you are not focusing on the other one. And that is the political problem. That is where the tension comes in. I would say that the price of the basket as defined is overstated. However, that is not the only thing there is to life. And a lot of the cost of life may have also gone up; a lot of the cost of life has gone down.

The fact that we are not living in nuclear fear has gone down. There is just a tremendous difference. On the other hand, the fact that our children have a different perception about the future, have less expectations for it, is going in the other direction.And these are major things that are happening, and they are not inside the index.

The CHAIRMAN. Thank you. Senator Moynihan?

Senator MOYNIHAN. Well, again, Mr. Chairman, thank you, and thank all involved here. We are a Committee not incapable of dealing with ambiguity. We do that all the time. And it will be 35 years ago that I became Assistant Secretary of Labor for Policy Planning and Research. And the Stigler Committee Report was on my desk, you could say, and a primer on the limits of economic data.

And I am sorry if they are treating economics as a lower form of life in the other place. It is well regarded, as you see, in the Senate Committee on Finance. But it is not a hard science. It is a social science, and we understand that. We even manage to live with the thought. It does not send us home in despair. And we have responsibilities to pursue. We take an oath to faithfully execute the laws. And the law's intent of the indexation was to reflect something perceived as changes in the cost of living, price changes, which really do need to be compensated.

We just cannot sit here and have one thoroughly respected, eminent panel after another, such as this one, come and say to the Chairman that using the CPI as a proxy for the cost of living, overstate the change in the cost of living. Nobody states that more assertively, right up front, than the BLS is its brochure. I was responsible for the BLS, and I kept my distance from them, so they allowed me to pretend I was responsible. I think I was responsible about them, and it worked.

But we just cannot sit here and say, in the face of this much judgment, that we will not do anything because we are not at liberty to do nothing.

Dr. Dulberger, we have in place a system which systematically increases outlays more than we had intended, and decreases revenues more than we had intended. Do we not have to respond to that?

Dr. GRILICHES. Yes.

Senator MOYNIHAN. Dr. Dulberger?

Dr. DULBERGER. Yes, we do. And I would like to add that the problem that you are facing with using the CPI to escalate something that does not quite match in terms of concept is something that you are not alone with. The business community deals with this all the time. And they use the CPI or the producer price index to escalate long-term contracts.

And very often, what is being contracted for is not remaining constant over time. Therefore, the whole concept of holding something constant is not done.

Senator MOYNIHAN. Well it says here in this little brochure, "Understanding the Consumer Price Index," that the CPI is not a cost-of-living index, although it is frequently and mistakenly called a cost-of-living index. The CPI is an index of price change only. That is fair. That is straightforward.

Alan Greenspan said to us that every member of the Federal Reserve Board has in his or her head an estimate of one of these numbers, 0.4 or 1.5. They have their own internal adjustment they make. This seems to be as close to a consensus as anything I have heard, or am likely to get in an area of Government data. Is that not right, Dr. Pollak?

Dr. POLLAK. I think there is an issue of how much of a subjective element you want to inject into the construction of the consumer price index, or of other Government statistics. There is clearly a problem. There are several distinct problems. and I think separating them, uncoupling them, is very important.

But the entitlement problem is really distinct from the consumer price index problem. The entitlement problem, it seems to me, is a political problem. You were suggesting that we are now locked into a system in which we are escalating benefits more rapidly than we want to.

Senator MOYNIHAN. And decreasing revenue on the other side.

Dr. POLLAK. And revenue on the other side, tax brackets on the other side, are tied. That is a political problem. There also are problems with the consumer price index. And my suggestion—and, I think, Zvi Griliches' suggestion—was that the problems with the price index, with the CPI, could best be dealt with by a technical committee and that, as a matter of institutional competence, the

Senate and the House are not well positioned to reconfigure the consumer price index. This is a technical problem, and it is probably best approached with a committee that has credibility and the trappings of independence.

Senator MOYNIHAN. Trappings of independence?

Dr. POLLAK. Of independence, perhaps appointed by the National Academy of Science or——

Senator MOYNIHAN. Would you not think independence itself would be better than the trappings thereof?

Dr. POLLAK. I believe independence itself is important, but I also think the trappings of independence are crucial. I think the appearance really does matter.

Senator MOYNIHAN. The National Bureau would be fine.

Dr. POLLAK. And I think it is not only a question of what is done, but of how it is done and who does it. And I think it is extremely important that it be done by a body that is not only independent, but is widely perceived as independent.

Senator MOYNIHAN. I thank you very much. Can I just make a comment for the record again, sir?

Dr. Diewert from the University of British Columbia was here a while ago, and spoke of a unified statistics agency. And I noted from you, sir, that it is not the worst idea. We do have quite a collection. BLS goes back to the 1870's.

Dr. NORWOOD. Eighteen eighty-four.

Senator MOYNIHAN. Well, when the nascent labor movement began to say, if the Government would decide how much it took for a city worker to raise a family, we would bargain against that number, and that is how the Bureau of Labor Statistics began.

That great man, that Civil War veteran with his right arm——

Dr. NORWOOD. Colonel Powell.

Senator MOYNIHAN [continuing]. That went down the Colorado River with one arm.

Senator CHAFEE. What was his name?

Dr. NORWOOD. John Wesley Powell.

The CHAIRMAN. What has he got to do with the BLS?

Senator MOYNIHAN. He was the first head of it.

Senator SIMPSON. He also started the Cosmos Club.

Dr. NORWOOD. That is right.

Senator SIMPSON. I am glad we have that clarified.

The CHAIRMAN. Do we have any other bits of information to add?

Senator Grassley?

Senator GRASSLEY. This has been discussed a couple of times by Dr. Boskin, and I think one other person mentioned it, but I would like to get some sort of consensus, if possible, on whether or not CPI for the elderly would be higher than for other age groups. Could I have a short answer from each one of you?

Dr. DULBERGER. Well, I agree with Dr. Boskin, in that we really need to know more in order to determine that.

Senator GRASSLEY. But we just do not know?

Dr. DULBERGER. We do not know. There is some reason to believe that the composition of expenditures of the elderly may be different from the rest of the population but, as Dr. Norwood pointed out, we do not have a way to take into account that they may live in

different areas within the country. And another point that Dr. Boskin made——

Senator GRASSLEY. But that is a point that could be raised for any age group, not just the elderly.

Dr. DULBERGER. Yes, it could. And the other point was that it may be that for areas like out-of-pocket medical expenditures, we do not have a very good measure there either. So we really do not know.

Senator GRASSLEY. Each of the rest of you? This is something of interest to those of us who serve on the Aging Committee, and to those in my State, where 15 percent of our people are over 65 years of age.

Dr. GRILICHES. I think it is a complicated question because a real detailed study has not been done.

Senator GRASSLEY. All right.

Dr. GRILICHES. But if you think about the major components, the food component has probably risen less than the CPI, which is relatively large. With regard to the housing component, more of the elderly are owners, and they are under somewhat less pressure on the rental side than the rest of the population.

On the medical side, they are more under pressure, but that would not be in the price index if it were computed correctly. And I do want to argue with Senator Moynihan just a bit about the Medicare problem, which I think is a very real problem. But the driving problem is not the CPI, and the driving problem will not be solved by the CPI. One percent or half a percent will buy a few years on this problem, but will not take it away. I mean the driving problem is medical technology. And the driving problem in the expenditures of the elderly is the good things that medicine can do for us, and some that it will do to us, whether we want it or not.

The CHAIRMAN. I think it may have been I who said that. I did not mean to give the impression that the CPI drove Medicare. I simply said that Medicare is going to be bankrupt, and that is a fact. But the public does not accept it. And there is a difference between acceptance and fact in that case. And if we act in such a way that they will not accept—and we probably will not act in a way that they will not accept.

Dr. GRILICHES. Yes. But you really ought to act on that, if you are going to act on the substance, and not on this particular margin, which is sort of small potatoes in the Medicare problem.

Senator GRASSLEY. The other two panelists? Dr. Norwood?

Dr. NORWOOD. Well, as I have already said, I do not think we really know.

Senator GRASSLEY. All right.

Dr. NORWOOD. The work I have done suggests that the elderly live in different areas. They have different shopping habits, and they buy different things. The weights of an index do not move it very much. It is the prices within the index.

Senator GRASSLEY. The same for you, Dr. Pollak?

Dr. POLLAK. Yes. I agree that the issue is not really the composition of expenditure. One of the things we know very little about is where people shop and how they search. For example, we have talked about mail order shopping and home shopping network. My guess is that the elderly are relatively slow to use mail order shop-

ping and home shopping network. They probably are not likely to shop at the newer volume discount stores. None of that is really taken account of. The notion is that people are searching for prices and for quality, and we ought to think about that in relation to constructing the index, and that different groups may have different shopping patterns.

Senator GRASSLEY. All right. My last question. It is the CPI(W) that is used to index Social Security benefits. I believe I am right on that. That index represents spending by about 30 percent of the people, I have been told. I assume that this index is afflicted with the same problems as other CPI indices.

Dr. NORWOOD. Yes.

Senator GRASSLEY. My question is whether the CPI(U)—and that is urban, is it not?

Dr. NORWOOD. Yes, all urban.

Senator GRASSLEY. Would that be a better one to use in indexing Social Security benefits, since 80 percent of the population, including retirees, is included in that. Are you able to say whether the use of that index would make any difference, and is that something we should consider?

Dr. NORWOOD. We clearly should use the CPI(U). It is a broader index. The Bureau of Labor Statistics recommended that to the Congress. The Congress did not see fit to adopt it. The differences are very small between the two. However, it would not solve your problem.

Senator GRASSLEY. All right. Thank you, Mr. Chairman.

The CHAIRMAN. I have used up some of your time.

Senator GRASSLEY. Well, I think I will stop there unless other panelists wanted to comment on that, because I think my other question has been asked.

The CHAIRMAN. Senator Chafee?

Senator CHAFEE. Thank you, Mr. Chairman. We are doing somewhat of a historic review here. Senator Moynihan said that he had been with the Department of Labor in 1960. When I first met Senator Moynihan 31 years ago, when he came to Rhode Island to get an honorary degree, I was Governor and sat next to him in the warm sunshine as the undergraduates paraded across. And he did an analysis of our State simply by looking at the graduates. It was extremely interesting.

Senator MOYNIHAN. I believe it was a statistical sample of a Benedictine college. It proved that the French population in Providence was not having as much success as the Italian one.

Senator CHAFEE. I found it extremely interesting. You heard Dr. Boskin's testimony. He came forward with some specific suggestions. Obviously, this is a matter of deep interest to all of us, and there is no question but that we are driven to some extent by the fact that the dollars represented here are significant. And I suppose many would say that this is a silver bullet. We have got tremendous budgetary problems. If we revise the CPI in some fashion—obviously everybody believes in reducing it—it would help us with these problems.

So Dr. Boskin, pursuant to the questions asked by the Chairman, said on page 5 of his testimony, "It is my view that you could and should get a bipartisan group of knowledgeable professionals in a

room and charge them with the task of coming up with a minimum amount by which they are virtually certain, a stronger condition than reasonable doubt, that changes in the CPI overstate true changes in the cost of living."

In response to the Chairman's question, I think he said that could take, did he say 3 months?

The CHAIRMAN. Three months.

Senator CHAFEE. Three months. what do you think of that. Could each of you answer that quickly? Dr. Dulberger?

Dr. DULBERGER. Yes. I also think that a group could come up with a number for you in a few months, and that that is reasonable. If you are also asking about whether this harder test than the one that juries are charged with answering, I am not sure that is quite the way I would look at it. One, I do not think it is entirely a statement about the credibility of the CPI or making an adjustment to eliminate the bias that you are looking for. I think what you are looking for is the best way to use currently available information to serve the intent, and that may not be the same question.

So in my recommendation, which was also to put together a group of experts, I would charge the experts with two questions. One is, how can information that is currently available be best used to appropriately escalate the program? But we would have to know the intent. What are you trying to accomplish in escalating the program? Then we can recommend how to use the CPI with some adjustment in order to effect that.

And I would have to say that I disagree with those who would suggest that that is a comment about the quality of the CPI itself. This is done in business all the time. We make adjustments to the CPI or the PPI for the purpose of serving the intent at hand, recognizing that that intent is different from the one that the index was devised to do.

Senator CHAFEE. Dr. Griliches?

Dr. GRILICHES. I would disagree with Mike Boskin, and maybe Ms. Ellen Dullberger, a little bit. First of all, I do not think it can be done in the time frame that you are suggesting. At least with what I know of establishing committees of this kind, at least a month or two goes into trying to investigate the various people, get agreement, and select a committee, which does not leave much time for actually getting something done.

Second, I think that a committee would find itself in the situation that you are in very quickly. There are a number of pieces, and that is about all there is, and you have more or less heard about them. Some of the pieces are history, in the sense that they will be taken care of. They will be taken care of within the next year or so. Basically, the formula problem will be fixed to some extent. The generics problem in the CPI is being fixed. Those are the two things that are being fixed.

The substitution problem will take a little bit longer, but I think it might actually get fixed if the CPI moves to a somewhat faster weight change. The new goods problem is a very difficult problem. I was joking, but there also is a new bads problem. I would say that a committee that got together would at least want to spend some time trying to go over the CPI in some systematic fashion, component by component, and sort of look at what is known, how

it is currently constructed, where it comes from, what may be the potential sources of bias, and how it could possibly be improved.

I cannot imagine that process being done on this timetable. And I do not know that you would get people who would actually be willing to sit on a committee whose charge was in the form that in two or 3 months you are going to produce a number by which you will state a minimum. I think there will be more uncertainty, and I do not think you can escape the political problem by giving it to a committee.

Senator CHAFEE. Well, except I would say this, doctor, that we have had a whole string of witnesses come through here who have given range, and they have not been reluctant to speak out and say that they give a range between .5 and 1.5, or whatever it is. So I presume that what would happen in this, is that they have arrived at this range, with a bottom figure and a top figure, and they have done some independent research, so they would say .5 is our bottom figure.

Dr. GRILICHES. Well, one of the things I want to mention is that in fact many people have not done independent research. This is all running around with a relatively limited number of studies, and people have got the same pieces of paper, and more or less formed judgments on them. And those papers, including my own papers, which are a significant piece of that body of research, cover small portions of the CPI, which are not intended to be representative. They are sort of looking at something and saying well, this a stylized fact. It is likely to be a problem over a wider area because this is an example of a wider class of problems.

Senator CHAFEE. My time is up, so I had better take it. Dr. Norwood, perhaps you could——

Dr. NORWOOD. Yes. I agree with Dr. Griliches. I think it would be a terrible mistake for the Committee to convene that kind of group. I would remind you of what happened in the United Kingdom some years ago, when the Thatcher regime had some difficulties with the price index. Because of its treatment of taxes, there was a big credibility problem. The Royal Statistical Society got involved, and I think we do not want that kind of charge of politization, even if it was not intended at all by this Committee.

It seems to me that, if there is a problem with the cost of indexation, it needs to be faced and handled in that way. Talk about changing the CPI, or what is wrong with the CPI, is a much bigger, broader issue that requires more time.

Senator CHAFEE. Thank you.

The CHAIRMAN. Dr. Pollak, do you want to comment?

Dr. POLLAK. I would agree. I think the issue of modifying the CPI, improving the CPI, has got to be separated from the immediate and very serious problem of adjusting entitlements. And it is not clear to me whether Mike Boskin's proposal is a proposal for adjusting the CPI or a proposal for adjusting entitlements. But it seems to me that these are very different issues, and that adjusting entitlements is fundamentally a political issue, and adjusting the CPI is fundamentally a technical issue.

Senator CHAFEE. Let me just say this to the panel. There are technicalities and problems, and all that. But, at some point, you

have to fish or cut bait, I think, and make decisions. And that is our duty.

And I think to put things off because we do not have all the information or, as Dr. Griliches says, we are just dealing with certain parts of it, I think we just have to move on. So often we are confronted around here with the problem of not having all the information to do anything. This happens in the Environment Committee all the time. We do not have the information to do anything about the Clean Air Act. We do not have the information to move ahead on Superfund. How many parts per billion is involved? On and on it goes. But that is what we are hired for, I think. Yes?

Dr. GRILICHES. I just want to say that I have no objection with you making the decision, on the basis of what you have heard, to change the escalation to CPI minus one-half or CPI minus 1. In fact, it is a reasonable move, from a different point of view. We may not be able to afford to actually compensate everyone for everything. But that is really rewriting the law because it is different from saying that the CPI itself has to be changed by this amount, because that implies a certainty.

We are making a contract that we are going to try to do something well for people, but we will not be able to do the whole thing for various reasons, partly that we cannot afford it, partly that it is not precise. We make a judgment in these escalation clauses. And in many countries it takes the form of the CPI minus something as the escalation formula. They do not go for the full thing. And it seems to me that that is a social decision for which you have to take the responsibility.

The CHAIRMAN. Kent is next. He is higher up on the list.

Senator CONRAD. Alan started?

The CHAIRMAN. No, I started.

Senator CONRAD. All right. Because it would have been fine with me, if he had started, for him to go ahead.

Senator SIMPSON. All right. I wandered off for a moment, and obviously lost my place.

Senator CONRAD. You are forgiven. I always enjoy listening to you.

What is at stake here, of course, is very significant. The stakes are very high with respect to this question. The stakes are high because this affects the revenue side of the Federal Government, the revenue side of the ledger through the indexing of income tax. It affects the spending side because it affects the cost-of-living adjustments for Social Security. And, of course, everyone on this panel fully understands that.

Just to put it in the context for the record, we have got to save $1.3 trillion over the next 7 years in order to move towards balance in the Federal accounts—$1.3 trillion. A 1 percent adjustment in the CPI over that period of time would make a $280 billion down payment, about 20 percent of what is needed. So that is why this question is getting the kind of focus that it is. It is a focus that it deserves, and I want to commend the Chairman for an excellent hearing today. I think it has been eminently fair. We have certainly heard a broad spectrum of opinion from a superb panel.

So that puts in context what it is we are doing here. I would ask Dr. Pollak, how long would it take to have a eminent group of ex-

perts make a recommendation with respect to this issue? How long do you think it would take?

Dr. POLLAK. I think it would depend on what the charge to the panel was, on whether the panel was intended or instructed to do original research, or whether the panel was going to confine itself to working with the existing literature. On these issues, as we have been telling you, there are a lot of opinions. A lot of people are willing to speculate on the aggregate overstatement of the CPI. But if you push hard, and ask where those speculations come from, what the underlying data are on which they are based, there are very few studies. And it is not clear, if you have four studies and 20 people willing to give you opinions, that you have a great deal more information than you had in the four studies.

I think it is going to depend very much on the charge of the committee that is convened.

Senator CONRAD. What should be the charge?

Dr. POLLAK. I would like to see a separation of the CPI issues, the review of the CPI by a committee comparable to the Stigler Committee that was set up 35 years ago, which I believe reported fairly quickly.

Senator CONRAD. Could you give me some idea? What was fairly quickly?

Dr. POLLAK. My impression was that it was a year.

Dr. GRILICHES. It was more than that.

Senator CONRAD. It was more than that?

Dr. NORWOOD. Several years, if it is done fairly well.

Senator CONRAD. They commissioned studies?

Dr. POLLAK. Yes. There were what, a dozen staff studies, including one by Professor Griliches, in the published report. That was a very influential and important document.

But my suggestion is separating those issues of CPI review, which I think are extremely important, from the issue of adjusting entitlements, which I do not think should wait 2 or 3 years. I think Senator Chafee said that we have to fish or cut bait on this issue. But I think the question is, who is we? In this case, I think "we" does not refer to the technical experts.

Senator CONRAD. You know, I try to put myself in your shoes and listen very carefully to what you suggest, because I have great respect for every person on this panel. I think about the task that we have been given. Many of us believe very strongly that we have got to balance the Federal accounts. And when you do that, you are faced with a whole set of difficult choices, very difficult choices. If we really are overstating the CPI, and that has an enormous fiscal effect—$280 billion over the next 7 years if it is a 1 percent overstatement—we have really got to address that.

We need to meet that challenge. And we need to make a change. Because, if we fail to, and we are overstating the CPI, we are going to be forced to make a lot of other changes that will affect people's lives in a way that need not occur.

Dr. POLLAK. Senator, are you not going to have to make these changes, even if you are not overstating the CPI? As Professor Griliches has been saying, perhaps we are in a situation where not everyone can be protected against everything. Even if the CPI is

not overstating the rate of inflation, perhaps there are hard choices that must be made.

Senator CONRAD. That goes without question. I laid out the dimensions of the problem—$1.3 trillion over the next 7 years. That has got to be done. Now, if CPI is overstated by 1 percent, that is $280 billion of the puzzle to be solved. If it is not, if there is zero change required, that $280 billion has to come from somewhere, and it is going to dramatically affect people's lives. Disproportionately, it is going to be cuts in programs. It is going to be veterans' programs, it is going to be senior citizens' programs. Just look at what is on the table, a $256 billion reduction in the rate of growth of Medicare, $175 billion of Medicaid, veterans' programs, education programs. And there is no free lunch here. But if CPI is overstated, that is a big piece of the puzzle.

Dr. GRILICHES. That is going to impact somebody also.

Senator CONRAD. Absolutely. It is going to affect people's lives. On Social Security, it is affecting cost of living. It also affects the revenue side of the equation. As you know, in the packages in the House and the Senate, you will not find a whole lot of revenue.

I thank the Chair.

The CHAIRMAN. Senator Simpson?

Senator SIMPSON. Thank you, Mr. Chairman. This has been fascinating because it is a critical point, and I agree totally with Senator Conrad that this will not get us there at all. Where we have to go, no one wants to go politically. Everybody talks a great game on this. I do not even vote on 62 percent of the budget. In 10 years, I will not vote on 72 percent of the budget. It just goes out to people, regardless of their net worth or their income.

If we had done everything the Entitlements Commission recommended, everything will still go up 5, 6 or 7 percent a year. And when we are all done, we will have "slowed the growth of the entitlements" and done nothing with everything else in the budget. We have not even dealt with that.

If the American people cannot begin to let this sink in, and understand these things, then really democracy did not work because they just sent us here to get them everything they wanted out of the Federal Treasury, and we succeeded magnificently. And they loved us for it, and their grandchildren will be haunted by it.

I think we are at a point where either the experts give us a number, or we will do a number. And I am ready to do that. So that is where I am coming from. I will do a number. In fact, Senator Kerrey and I have done a number, as we try to bring solvency to the Social Security system, and nobody will touch that with a stick. Or they will stir it with a stick.

So we have to do that. And we have said we are going to do it with .5, CPI minus .5 percentage points. So we are off on that one. We will see where that goes. There are those out there who are telling us that changing the CPI is a savage act of meanness against the lesser in society. I have seen that one already. That is a dandy—a savage act of meanspiritedness to alter this sacred figure. So we will have to get through that one. You can hear that debate on the floor. It rings in my ears at this moment.

I would think 3 months would be quite adequate to tell us what to do with it. Twenty-5 years of what the cowboys used to call gath-

erings are out there. Twenty-5 years of gatherings are out there. There are plenty of facts. It should not in any way be considered a reflection on those who have gone before. I know what you have done, and how you have worked, Janet, how you have performed. This is not a comment about the past or what happened, or did it work right. There is no courage to deal with entitlements in this body. We have tried that, and especially the big one, Social Security, the one that is $360 billion a year.

So you have suggested that, instead of legislating a downward adjustment, I ask Dr. Norwood or Dr. Griliches, we should instead face up to the real issue—whether we should continue to index entitlement benefits. That is a political issue, and we have flunked that test for many years. If we flunk it again this time, so what? Medicare will go broke in 7 years. The disability insurance fund will go broke in the year 2016. And Social Security will begin to go broke in the year 2013. And not one single person in this place has given us any other figures, Democrat or Republican.

But the CPI indexes more than just the entitlement programs. As Senator Conrad has said, it is used to adjust the Federal income tax brackets. It is used in the private sector to adjust wages. It is used in county governments. They say, well, the CPI went up so and so, so the road crew needs 2.3 and then the cops at the city hall need this. And they all use this. Everybody is using this. And so this is not just an entitlements issue. It does not limit itself to an entitlements issue. And I am not looking for a fig leaf on this.

So where are we going to go if we cannot make this change, and at least come to some consensus among those who I have heard now for several weeks and months that cannot give us a figure? Because if you cannot get a figure from people who know the most, then we will do a figure, which we often do. Then people will howl and shriek and pant after we have done it, but we will do it. So where do we go from here?

Dr. NORWOOD. It seems to me that that is where you go from here. And that is to decide what your indexation policy should be, how much you can afford. And if it is CPI minus something, then that is what it is.

By the way, this is not the first time I have heard this. It seems to me that 20 years ago when I was at BLS, members of Congress were discussing CPI minus some amount. Usually it was 1 percent.

I would also like to suggest that, in addition to whatever the Congress decides to do about indexation policy, it should pay some attention to the statistical system, and to nurturing the statistical system. I would remind you that it took years to get the budget for the revision of the CPI so that we could have more up-to-date weights. One of the issues that is being criticized today, that the sample size for the consumer expenditure survey, which is necessary if we are going to develop any new kind of index for a true cost-of-living index, is very small because the Bureau of Labor Statistics was not able to get any real interest in the Congress for it. And, in fact, it took the Bureau 30 years to have the expenditure survey on an ongoing basis.

The revision of the outlet sample, which is now done 20 percent a year, should clearly be done more frequently. Those are issues which have been discussed over the years with the Congress and

with various administrations. As you know, I have served with both Republican and Democratic administrations. Quite frankly, there was not any more support on one side or the other. If we are going to use statistical indicators in public policy, we have got to be sure to fund them properly.

Senator SIMPSON. Mr. Chairman, I know my time has expired. I have been careful there, but when you have people who do not even understand the difference between the cost-of-living index and the consumer price index, and interchange the terms, we are not going to get very far.

And it is different this trip. The trustees of these magnificent programs are telling us that these things are going broke. That is the difference. That is what has happened this time around. And 30 of the 32 people on the Entitlements Commission told us what was going to happen, and we all know it. That is the difference.

Thank you, Mr. Chairman.

The CHAIRMAN. Senator Conrad, do you have any more questions?

Senator CONRAD. No. Again, I thank the Chairman for this hearing. I think it has been excellent.

The CHAIRMAN. I want to thank the panel. This is our third hearing. If there are more experts to hear, I am not sure who they are. My hunch is that they all read each other's mail, and there is not much more information to be gathered.

Dr. NORWOOD. I think you are quite right.

The CHAIRMAN. I think you phrased it very well. We have both a technical decision and a political decision. And the two are not the same decision. And you should be called on to make one, and we should not be called on to make the other.

Thank you all very much for coming today.

[Whereupon, at 11:35 a.m., the hearing was concluded.]

APPENDIX

ADDITIONAL MATERIAL SUBMITTED

PREPARED STATEMENT OF KATHARINE G. ABRAHAM

Mr. Chairman and Members of the Committee: I appreciate this opportunity to appear before you to discuss the Consumer Price Index (CPI), for which, as you know, the Bureau of Labor Statistics (BLS) is responsible. I think it would be useful for me to begin by providing a brief summary description of the CPI for background purposes. Although the CPI is often referred to as a "cost-of-living" index, it is in fact a measure of the average change in the prices paid by urban consumers for a fixed market basket of goods and services. Historically, this market basket has been updated roughly every ten years. The current market basket is based on 1982-84 expenditure patterns; we are in the process of updating the index to reflect 1993-95 expenditure patterns.

Although we talk about *the* Consumer Price Index, I would note that the BLS actually produces Indexes for two different population groups each month, one including all urban consumers and a second consisting just of wage earners and clerical workers. The index typically reported in the media each month is the Consumer Price Index for All Urban Consumers, or CPI-U, which was introduced by BLS in 1978 and is representative of the buying habits of about eighty (80) percent of the population. BLS also produces the CPI-W, a continuation of the Index that was introduced about three quarters of a century ago, which covers only wage earners and clerical workers, who represent roughly 32 percent of the U.S. population.

The BLS calculates the CPI on a monthly basis and publishes it about two weeks after the end of the month to which it pertains. To calculate the CPI, BLS collects some 80,000 price quotations each month, covering all items that consumers purchase for daily living. These prices are collected in 85 areas throughout the country, in about 21,000 retail and service establishments. An additional 40,000 landlords or tenants and 20,000 owner-occupants are surveyed concerning rents and housing costs. The collection of such a large number of individual prices each month is dictated by the importance of producing a measure that meets high standards of statistical reliability. All of this information is collected and processed on an extremely tight schedule, and the Index is issued each month on a date announced in advance, to avoid any appearance that the timing of the release has been affected by nonstatistical considerations. As the data for any one month are released to policy makers and the public, the process of collecting the next month's data is already well underway. In short, the production of the CPI is an extremely complex undertaking carried out each month according to a rigorous time schedule that leads to the release of each month's data in as timely a fashion as possible.

Having provided this background, I would like now to turn to the various issues that have been raised concerning the present method of determining the CPI. Perhaps the best starting point for a discussion of CPI measurement issues is to note that what many people mean when they talk about inflation is the change in the cost of living. Despite the best efforts of BLS and of economists in academic, business, and other public and private organizations, many people refer to the CPI, mistakenly, as a "cost-of-living" index. By design, as I have already noted, the CPI is a measure of the change in the cost of purchasing a fixed market basket of goods and services. As published BLS descriptions of the CPI make clear, the fact that the CPI is based on a fixed market basket means that it will tend to rise somewhat more rapidly than would a true cost-of-living measure. The reason for this is that the CPI does not reflect changes in buying or consumption patterns that consumers would be expected to make as they adjust to relative price changes, buying more of goods whose relative prices have fallen and less of goods whose relative prices

have risen. By making these changes in how they spend their money, consumers may be able to maintain their level of well-being at a lower cost than that indicated by the CPI. BLS research suggests that not accounting for these substitutions in response to relative price change raises the annual change in the CPI by 0.1 to 0.2 percentage point.

A true cost-of-living measure also would take into account changes in the external environment that might impact consumers' out of pocket expenditures. These might include such things as, for example, a deterioration in air or water quality or an improvement in the quality of publicly provided services, such as education. I also would quickly add that, were we able, we would produce a true cost-of-living measure. Unfortunately, the "state of the art" in the area of price index construction has not advanced to the point where anyone knows how to construct true cost-of-living measures. In fact, although there are alternative price index formulations that provide a better approximation to cost-of-living measures than our current CPI, none of these alternatives is now feasible to produce on a "real time" basis.

Given that the CPI is not, and is not represented to be, a measure of changes in living costs, it is nevertheless appropriate to ask how well the CPI measures what it is designed to measure. In this connection, two broad areas of concern have been identified. The first, brought to light by researchers at BLS, has to do with the construction of the most disaggregated components of the index, and in particular with the way in which new items enter the index as part of routine sample replenishment and the way in which the treatment of new types of retailers—such as discount stores—impacts the index's measured rate of inflation. The second, and less well understood, issue is the question of how well the index accounts for changes in the quality of the goods and services that consumers purchase.

The sample rotation effect arises because procedures for systematically introducing new outlets and items into the CPI inadvertently tend to give higher weight than is justified to prices that are temporarily low in the month the new samples are introduced and lower weight than is justified to prices that are temporarily high. Thus, these procedures can cause an overstatement of price change in the period immediately following sample replacement. The BLS has taken steps to address the sample rotation problem effective with the data for January 1995. If further corrective measures can be identified, they will be incorporated as expeditiously as possible in the context of the ongoing CPI revision.

The outlet substitution effect can arise because consumers are free to substitute where they buy goods and services as well as what they buy. For example, if consumers don't consider the (possibly) lower level of customer service provided by a discount store to be of any consequence, they may shift to such stores and experience no loss of well being. Current CPI procedures would not capture any price decline associated with such a shift. Although it is unclear that there is in fact any bias associated with the CPI's treatment of discount outlets, further research on this issue would be valuable.

It is axiomatic that a measure that purports to estimate changes in prices must take account of the fact that the quality of the goods and services purchased in our economy can, and does, change, in some cases for the better and in some cases for the worse.

Today's cars, for example, are substantially more expensive than the cars sold in the 1970s. Today's cars, I think it would widely be agreed, also are substantially better than were the cars of the 1970s, in the important sense that they embody more of the features—such as durability, safety, and lesser maintenance requirements—that consumers value. In measuring the price change for cars over this period, the challenge is to isolate that part of the price increase associated with improvements in the quality of vehicles, as distinct from that part that is truly a pure price change. In the case of new automobiles, for example, adjustments made in the CPI to factor out quality change have had a very substantial impact. We estimate that the change in the new automobiles component of the CPI over the years from 1967 to 1994 would have been more than 80 percent greater than we actually reported had no adjustments been made for quality improvements. (The automobile index in the official CPI-U rose 172.1 percent from December 1967 to December 1994, while over the same period, without factoring out changes in' quality, the new car component would have risen 313.4 percent.) From a different, and perhaps more important, perspective, the overall CPI today would be nearly 3 percent higher had we not made quality adjustments for the single index component of new cars. (The CPI-U All Items rose 341.6 percent from December 1967 to December 1994, while an All Items CPI-U without factoring out the new car quality adjustments would have increased 351.1 percent.)

The more general point is that efforts are routinely made in every index component to insure that changes in quality are not recorded as price changes. These ef-

forts, range from the prosaic case of adjusting for the fact that a 1 ounce candy bar is worth more than a 0.75 ounce candy bar to consideration of the more difficult question of what is the value to the consumer of a new, non-invasive diagnostic medical test that replaces an earlier, more taxing and riskier test for the same condition.

The emergence in the market of entirely new goods or services presents perhaps the most difficult quality adjustment problem. These "new goods" are so radically different from anything previously on the market that they have no obvious earlier counterparts with which their costs can be directly compared. Electronic calculators, video cassette recorders, and personal computers are often cited as examples of "new goods." Current CPI procedures lead to these new goods being included in the index in a comparatively timely fashion, and the new procedures to be introduced as a part of the ongoing CPI revision will allow them to be included even more quickly. What remain to be developed, however, are methods that enable direct comparison of a new good's price with that of its closest antecedent.

Some have estimated that the overstatement in the CPI is as large as 1.5 percentage points per year. Estimates of this size require that there be a large quality-adjustment bias, arising as a consequence of substantial improvements in the quality of the goods and services consumers purchase that are not reflected in the construction of the index. Although many believe that the CPI is biased upward because quality improvements are not fully accounted for, there is little direct evidence to support this view. Indeed, some have suggested that quality adjustment problems may lead to a downward, not an upward, bias in the CPI, at least during certain periods. Adjusting for changes in the quality of goods and services remains one of the most challenging tasks in constructing any price index. Solutions to the problem, it is widely agreed, are not obvious.

A promising strategy for improving the CPI's accounting for changes in the quality of goods and services would be to expand the collection of information on the characteristics of items, which would allow BLS to estimate the value of particular features and explicitly adjust items' prices for changes in those features. This so-called "hedonic" approach is currently used in several components of the index but its extension to other areas would require additional resources.

Assessments of the total bias in the CPI as a cost-of-living proxy vary considerably. Federal Reserve Board research staff have concluded that the CPI may overstate the change in the cost of living by 0.4 to 1.5 percentage points per year, though they also say that "these estimates are by necessity extremely rough." Another review done recently by researchers at the Congressional Budget Office concludes that the bias in the index is probably much smaller, in the range from 0.2 to 0.8 percentage point. Researchers at the Dallas Federal Reserve Bank conclude that "a figure of less than 1 percent . . . strikes us as a plausible estimate of the overall (upward) bias" in the CPI, but add "the true figure may be a lot larger or a lot smaller; at present we simply do not know."

In closing, Mr. Chairman, we are intensely aware of the sensitive nature of the data we produce, and of the critical need for these data to be as accurate as possible. As the revised methods we introduced in the most recent published CPI (released three weeks ago) indicate, we are, within the limits of our resources, pursuing these issues and introducing improvements as quickly as we can. In addition, now that the comprehensive updating of the CPI, normally conducted at ten-year intervals, has been funded, we are moving as expeditiously as possible to complete that major undertaking, while, of course, adhering to our normal standards of care and thoroughness to assure that mistakes are not made. In the interim, Mr. Chairman, we will continue to investigate the measurement issues that we and others have identified, and I can assure you that we will address them to the full extent that it is possible for us to do so.

PREPARED STATEMENT OF DR. MICHAEL J. BOSKIN

Chairman Packwood, Ranking Member Moynihan, and other distinguished members of the Committee, I appreciate this opportunity to appear before you today to discuss a serious flaw in one of our most fundamental economic statistics: the Consumer Price Index. That flaw has dramatic consequences for public policy, especially the overindexing for the cost of living in the federal budget. When I was Chairman of the Council of Economic Advisers, I helped develop a program to improve the quality of federal economic statistics. The very top priority was improving price measures, especially incorporating better measures of quality change.

It is important to note that improving estimates of the true change in the cost of living for indexing purposes would be desirable even if the federal budget was

in surplus and/or the officially measured inflation rate was zero. This is not just a budget or inflation problem. It is fundamentally a problem of accurately implementing the Congressional intent—whatever one's views are concerning its desirability—of insulating recipients of certain government benefit payments and income taxpayers (at least via the brackets if not the definition of income) from cost of living changes. Use of the CPI has unfortunately substantially overstated the true cost of living and hence led to overindexation, especially when compounded over a span of time. This has exacerbated the federal budget deficit, both historically and prospectively. Also, contrary to some impressions, the problem does not go away if inflation is low. That is good for the long-run health of the economy, other things equal, and FED policy to achieve it should be supported. But a measured CPI-inflation rate of zero would be overstating the true change in the cost of living about as much the current CPI inflation of about 3 percent overstates it.

INTRODUCTION

You asked that I address three questions: (1) Why is the Consumer Price Index (CPI) overstated? (2) What is my aggregate estimate of this overstatement? (3) What steps could be taken to rectify the overstatement of the CPI?

In summary, the CPI is overstated for both conceptual and practical reasons. First, it is a fixed-weight index, and therefore fails to adjust to changes in behavior by households in response to changes in relative prices. This is called the *commodity substitution bias.* The textbook example is that when the relative price of beef compared to chicken goes up, some households will consume more chicken and less beef. Since the CPI uses the fixed weights from a base period, it will be overweighting the higher priced beef and underweighting the lower priced chicken, and therefore overstating the true measure of the change in the cost of living.

The CPI also fails to adjust adequately *for quality change in existing goods and in the introduction of new goods.* It also suffers from a *sample rotation bias,* which is a technical problem in the way the BLS integrates new outlets into the sample used for the calculation of the CPI. It also suffers from a sales venue bias that understates the extent of substitution of discount stores relative to traditional retail outlets, which over the last few decades has been substantial. Finally, there is a technical error, now recognized by the BLS, due to the failure to treat the percentage changes in price reductions and price increases symmetrically.

I will discuss each of these briefly in turn below, but some of the practical problems can be dealt with by changes in BLS procedures and others by adding a bias adjustment factor—a practice common in other aspects of government and private economic statistics. The most difficult problem, however, is dealing with quality change in the existing products and the introduction of new products. Quality improvements and new products have been a very large part of the gain in the true standard of living in America and other industrialized countries, and our failure to fully incorporate these improvements in price measures has led to an understatement of economic growth and an overstatement of inflation (although not its short-run fluctuation).

As detailed below, **my estimate of the overstatement induced by these factors ranges from about one to two percent per year.** Correcting the overindexation by one percentage point per annum would reduce the federal budget deficit by about $70 billion in the year 2002, and by over $200 billion cumulatively for the next seven years. That corresponds to about 20 percent of the spending reduction needed to balance the budget. It is roughly the size of the estimated "balanced budget dividend." If enough control on the growth of spending is actually implemented, it is enough to finance a serious pro-growth tax cut even under the conventional scoring system.

There are several steps that could be taken to rectify the overstatement in the CPI. Indeed, the BLS is trying to deal with some of them now, (and has made major improvements) but progress will take some time. Some can be fixed quite easily. Changes in procedures will take some time to implement, but should lead to some reduction in some of the practical problems just mentioned. The blending of academic research and BLS work can be speeded up and integrated into a program to make quality adjustments. If the ponderous procedure of trying to do this for virtually every product group and sub-product is adopted, this will go on forever and lag behind real world changes. Two or three major areas could be developed and conservative assumptions made about other areas.

Simply put, it is my view that you could and should get a bipartisan group of knowledgeable professionals in a room and charge them with the task of coming up with the minimum amount by which they are virtually certain (a stronger condition than the reasonable doubt used by juries) that

changes in the CPI overstate true changes in the cost of living. That could be used as the adjustment factor while additional studies are done and new procedures implemented at the BLS. Those new studies and new procedures may not fully adjust for all of the problems, but would at least partially reduce the overstatement of the true cost of living by the CPI, with a concomitant improvement in the quality of the cost of living adjustments in government benefit programs and the indexation of tax brackets.

I should add that since the tax brackets were indexed in the early 1980's, and many government benefit programs in the mid-1970's, the cumulative overestimate of true increases in the cost of living by the CPI has been substantial. Hundreds of billions of dollars of additional government outlays have been made, above and beyond that necessary to compensate for the true cost of living increase.

The real issue moving forward is what to do. I believe the Congress should, hopefully in cooperation with the Administration, appoint such a group quickly and give them the charge I just mentioned. This proposal is similar to the one made by Federal Reserve Chairman Greenspan. As you recall, Chairman Greenspan suggested the appointment of a national commission which would meet every year, and recommend an annual adjustment. That approach may have its advantages, but I believe the one I am making is perhaps slightly more practical. It could be implemented quickly, and provide some certainty over what the adjustment would be for the next several years while the BLS is working to improve its indices. While the annual adjustment factor is unlikely to be constant from year to year, it is also not likely to change much. That is, the average amount by which the CPI overstates inflation is likely to be well in excess of the variation in the overstatement from year to year, especially now that some of the most inaccurate features of the CPI, such as the previous overstatement of housing costs, have been much improved.

To make this suggestion more concrete, if the group of experts concluded that the minimum amount by which they were virtually certain the CPI overstated inflation was, say, 0.5 percent per year, then my recommendation would be to replace indexation by the CPI-U and CPI-W, by the corresponding figures less 0.5 percent. This probably still fails to fully adjust for the true overstatement, but it has the advantage, practical and political, of getting the process going, making a conservative sensible adjustment, and reducing to virtually zero the prospect that there would be an embarrassment a few years later when additional studies become available. Again, it is my own view that the expertise already exists, including, but certainly not limited to, members of this panel and previous testifiers before this committee, to accomplish this task in short order, given the charge from the appropriate authorities.

WHY DO CHANGES IN THE CPI OVERSTATE TRUE CHANGES IN THE COST OF LIVING?

A price index that truly accurately reflected changes in the cost of living would answer the following question: suppose a given basket of goods and services were available in some base period, say 1970, to take a year before the indexing of social security and tax brackets. Then we ask households (consumers) how much more income will it take to be just as well off with the basket of goods and services consumed at today's prices as with the base year basket of goods and services and prices. Note that two things have changed: comparing the current period with the base year, for example 1995 to 1970, prices have changed and the basket of goods and services has changed. In my view, only a small part of the misstatement of the CPI is due to technical problems in getting price changes right from the base year used, including the problem of appropriate weights due to the commodity substitution effect. The much bigger problem is the quality change and new products introduced over any span of time. Think of all the new products that have been developed in the last quarter century that are now in widespread use by American households: personal computers, cellular telephones, microwave ovens, videocassette recorders, fax machines. Add to these the remarkable advances in medical technology: MRI machines, CT scanners, arthroscopic surgery, to name a few.

In addition to either decreasing cost or increasing service, such as speed, reliability, etc., new products also **sometimes open up whole new possibilities in the organization and allocation of economic activity,** for example, the household's time. Microwave ovens, for example, greatly decrease the amount of time necessary in food preparation, something especially important for two earner couples. Cellular telephones expand the geographical dimension of communications, and open up new possibilities in the organization of travel time, etc. Indeed, the flexibility and enhanced ability to both work and to consume various leisure time activities have been enhanced greatly by new products and quality change in old products—from home lighting to telecommunications. These types of benefits (once we are all over the

frustration of programming our VCRs!) are at best only remotely captured in the Consumer Price Index.

ILLUSTRATION OF THE PROBLEMS IN THE CPI

Commodity substitution bias. The CPI is a fixed-weight price index. It measures the changes in price for many products, then aggregates, or calculates a weighted average, of these separate changes in prices using weights that apply to a given base period (a year or span of years for which expenditure data are developed) that precedes the period under measurement. Typically, the CPI weights are based on consumer expenditure surveys from five to ten or more years prior to the year in question. For example, the current CPI uses weights developed from expenditure surveys in 1982-84. At the end of this decade we will be using a new base period, 1993-95. As noted above, because households tend to substitute away from commodities and services whose relative prices have increased, the general presumption would be that the further away from the base year, the more likely it is that relative prices have changed expenditure patterns considerably, so that the base year weights are no longer appropriate. There have been numerous studies of this commodity substitution bias, and, as this Committee has heard before, the consensus estimate of the overstatement of true inflation by the CPI due to this effect is about 0.2 percent per year. It should be noted that this bias is inherent in the fixed weight index unless there is no substitution by consumers in response to relative price changes. I know of no reputable economist who would argue that case is at all plausible.

SAMPLE ROTATION BIAS

When the sample of outlets and items has changed, the CPI is also likely to create an upward bias. This results from the way price data are combined on detailed items within major categories. Research by the BLS indicates that for those categories of goods and services in which the prices of items vary widely within subcategories, the CPI likely overstates price increases significantly in the months following a change in the outlets and items sample. Prior to 1978, the BLS sampled various consumer goods and services, and outlets, specified in great detail, and did not change either the outlets or the items *except when* there were major revisions to the survey, usually about every ten years or so. In 1978,. the BLS changed its procedures, and now rotates the sample within each category; about 20 percent of the outlets surveyed are changed every year. While this innovation improves the selection of items actually being purchased by consumers, the procedure has inadvertently imported an upward bias into the CPI. The BLS indicates that the CPI overweights goods whose prices are relatively low when they are first introduced and are therefore likely to increase more rapidly in the months following the rotation. This systematic overweighting of these items that have temporarily higher rates of price change appears to overstate the overall CPI by about 0.3 percentage points. This estimate is based on a study done comparing mid-1992 to mid-1993, and the robustness of the findings needs to be evaluated. I suspect it is likely to be upheld. The BLS has dealt with this issue for grocery stores and is exploring ways to deal with it more generally.

ASYMMETRIC BIAS

The BLS, courageously, admitted to a sophomoric mistake in the way it calculates percentage price changes. The BLS methodology results in the usual paradox of the difference in percentage changes from marking up versus discounting, which results from changing the base (denominator) for calculating the percentage change. If the price of a product, say a shirt, which was originally $50 goes on sale at $40, that is calculated as a 20 percent reduction (10 divided by 50 equals 20 percent). Now the sale ends and the price goes back to its original level, $50. That's calculated as a 25 percent increase (10 divided by 40 equals 25 percent). Clearly, over the two periods there has been no price change. The shirts started at $50 and ended at $50. But the methodology of the CPI results in an estimate of a +5 percent change in price (−20 percent plus 25 percent equals +5 percent). Fortunately, as noted by Robert Gordon, it only takes a little understanding of logarithms to correct this mistake. The BLS itself has shown that this contributes a bias of an extremely large two percent per year for some commodities, such as produce and female apparel. The BLS estimate of the bias for the total CPI is about 0.3 to 0.4 per year, although additional work needs to be done on other goods and services to capture this in more detail.

SALES VENUE SUBSTITUTION BIAS

Just as the CPI uses a narrow definition of products, so it also has narrow definitions of where purchases are made. In essence, each potential venue is assumed to provide a separate set of services. Consumers have been moving rapidly to large discount stores. To provide a hypothetical example, suppose a pound of apples cost 89 cents at a traditional small family grocery, but the new large superstore sells the apples for 79 cents per pound. That results in a price decline of 11 percent, but it is ignored in the consumer price index, or alternatively, treated as a reduction in quality. This venue substitution bias is sizable as it applies to nondurable purchases such as food. Over time, this change in the form of retailing is very important. It is likely that such venue substitution bias applies to a large fraction—perhaps half or two-thirds—of all consumer purchases, and therefore is likely to contribute a substantial amount to the overall CPI upward bias.

The form of retailing changes rapidly. What once was purchased in department stores is now often purchased in specialty stores in malls and elsewhere—jeans at The Gap rather than at traditional department stores, etc. In addition to the price saving, consumer convenience was also enhanced as larger inventories reduced the probability of not finding your proper size, etc. Indeed, traditional department stores have had to adapt by making themselves into agglomerations of specialty suboutlets. And now we have electronic commerce—home shopping via cable television and phone, and even via personal computer on a wide range of commodities including financial services—we are just at the beginning of this potentially immense trend. The sales venue bias adds perhaps 0.5 percent to the CPI.

QUALITY CHANGE

There are numerous dimensions of quality change. It is my view that the difficulty of accounting for quality change is the single most important source of overstatement of changes in the cost of living by the Consumer Price Index. There are several reasons, both conceptual and practical, why this occurs. First, for CPI purposes, commodities are defined quite narrowly. New products that replace old products and provide more and better services are treated as separate products. A practical example familiar to most households is the increased availability of home video rentals providing, a close substitute for going out to a movie theater. But the decrease in price for viewing movies caused by the substitution of at-home movies versus theater movies is missed by the CPI, which closely follows the change in the price of theater tickets. The CPI misses the replacement of some products by superior products over a span of time. A good example is word processing: many of us now use personal computers with word processing software, which are a vast improvement, (especially for those of us that go through numerous drafts) over electric typewriters, which in turn were a major improvement over manual typewriters.

Just as commodities are narrowly defined, so is quality. Gradual improvements in model design to increase reliability and decrease the need for repairs and down time are one important example: compare today's televisions with those several decades ago. Remember the home TV repairman who came around with a truck full of tubes? The digital revolution is greatly enhancing the quality of everything from audio sound with compact discs at home replacing records and tapes to the quality of wireless communications.

A variety of other trends have improved quality in other dimensions: energy efficiency, speed, accuracy, down time, bulk, weight, etc. Indeed, the tremendous advances in electronics that have allowed the physical downsizing and miniaturization of so many products has freed up space for other uses and greatly expanded geographic mobility.

Perhaps the most important aspect of quality change is the failure to adjust adequately for new products. It is well-known that most new products are initially made in relatively small volumes and sold at relatively high prices; only later do firms achieve economies of scale and scope, reduce price, and achieve greater market penetration. In short, the price of a product often starts high and declines rapidly. A simple example is the early cellular telephones, which sold for hundreds of dollars. Now you can get a much better cellular telephone, with more features, greater reliability, and better audio quality, for $79.95 or less. The cellular service for which the phone is designed has improved markedly as well, as wireless companies invest billions in the technology of more and better cell sites and new digital technology, leading to fewer dropped calls and better audio quality. The Consumer Price Index tends to pick up new products well into their life cycle (and some say would track obsolete products too long). VCRs, personal computers, and microwave ovens are relatively common in homes today, but were introduced into the CPI many years after they were first sold in the marketplace. Thus, the CPI misses

much of the price decline that typically happens in the early phases of the product cycle.

There are numerous estimates of the bias due to quality change. In an important study, R.J. Gordon estimated that the quality change bias in the CPI was enormous for some products: he estimated 6 percent per year for radios and TVs over almost four decades, for example. His overall estimate for durable goods was an upward bias of about 1.5 percent per year over the post-war period, ignoring any potential bias at all for those consumer durables that he did not study. It is likely that there is upward bias—perhaps not as dramatic as Gordon estimates—in other consumer durables, and nondurables, as well. This sort of quality change bias adds at least 0.5 percent per year to the CPI.

The BLS does develop various measures of quality change—the discussion here focused on additional issues and the bias due to the lag time in incorporating such estimates.

But above and beyond these technical aspects of quality change, there is a far more important manifestation of quality change that leads to an understatement of the true bias. This occurs for the reasons mentioned at the beginning of my testimony. New products open up new opportunities, and thereby enable standards of living to rise in a manner not easily measurable by price changes for specific products.

These innovations have made many more options possible for consumers and workers in the organization and allocation of their time and activities over the typical day and week, and seasons of the years, and including medical advances, over their (much extended) lifetime; they have dramatically changed the opportunities available to consumers at different sites. We can do many things now in places and at times where we could not do them before.

Consumers can send and receive advanced telecommunications from commercial airplane flights and in their automobiles. Many of us can travel, plug our laptop into a phonejack, and receive our electronic mail. The development of, improvements in, and decreased cost of electric light has made it possible for consumers to work, enjoy enhanced leisure activities, and receive information and communications much more easily and effectively at night.

We are all enormously better off because of the tremendous opportunities open to us from an incredible series of inventions, and improvements in those inventions, in transportation, communications, etc.

Cable television and modern electric lighting enable Americans to view nighttime Senate proceedings live, and unedited by the network news. Speaking as a consumer with a strong belief in a free, open democracy, I view that as an improvement in the quality of my life (although I suspect it places new types of demands on elected officials and their families which are not always entirely welcome).

A SEPARATE PRICE INDEX FOR THE ELDERLY?

The CPI-U and CPI-W are based on market baskets of goods and services consumed on average by all urban consumers and urban wage earners and clerical workers, respectively 80 and 32 percent of all workers. Population subgroups—such as the elderly—may on average consume a different enough market basket that if the goods they consume in greater proportion experience significantly different price changes than the average, then the overall CPI might be a poor measure of the true change in their cost of living. Michael Hurd and I examined this question in the mid-1980's for the much higher inflation period of the 1970's-early 1980's. Our conclusion was that the differences were minuscule, even when the elderly were subdivided into five year age cohorts. Some items they consume disproportionately had experienced more rapid, some less rapid, price increases than the average.

More recently, the BLS has developed an experimental index for those over 62 years of age. Because the elderly spend a larger share of their income on out-of-pocket medical expenses, the measured price of which increased more rapidly than overall inflation in the study period Dec. 1982–Dec. 1993, the CPI-U understated the elderly CPI by 0.3 percent per year. However, the researchers note that health care inflation itself was probably overstated in the official estimates (unincorporated quality improvements being one cause), thereby offsetting some or all of this effect. Health care inflation has slowed considerably relative to overall inflation more recently. In any event, the "experts panel" could account for this effect in estimating the minimum overstatement of the true cost of living by the CPI.

CONCLUSION

My conclusion is simple. The power of compounding over a long span of time of even a small overstatement of the consumer price index will greatly distort every-

thing that depends on inflation adjustment. The subject of immediate concern to this committee is obviously outlays and receipts in the federal budget due to the indexation of tax brackets and the indexation of large federal government transfer programs such as social security, SSI, veterans' benefits, and government pensions. But the overstatement of the CPI also leads to other important distortions in the understanding of how our economy and standard of living is evolving. It causes us to understate growth in real incomes and real wages, for example.

The direct technical adjustments I, and for that matter, numerous others who have testified before this Committee, have identified as a rough approximation are additive. Summing up the 0.2 percent for the commodity substitution bias, 0.5 for the venue substitution bias, and the 0.3 percent for the logarithmic calculation bias adds up to 1.0 percent per year. The narrow technical issues in quality change probably add at least 0.5 percent per year. This leaves what I would call the "straight forward adjustment" total of 1.5 percent per year. In the unlikely event that academic and government research into these issues somehow down the road proves to have been mistakenly high by a factor of two, the overstatement would still be 0.75 percent.

And such an adjustment, while extremely conservative in my opinion, still would not even begin to try to account for the conceptually most difficult, and doubtless most important, source of the overstatement: the failure to adequately account for the opening up of new opportunities created by fundamental innovations from the automobile to jet airplanes to personal computers that fundamentally alter the structure of our lives, raise living standards and decrease the true cost of living.

Prepared Statement of Senator Alfonse D'Amato

Mr. Chairman, I am pleased to participate in this third hearing on the accuracy of the Consumer Price Index (CPI) as a measure of inflation.

As the most widely used measure of inflation, it is imperative that the CPI be accurate. This is especially true since a number of Federal programs, such as Social Security benefits and the personal income tax rate schedules, are tied to increases in the CPI. In fact, the net fiscal effect of each one point rise is approximately $6 billion per year.

Mr. Chairman, I welcome our distinguished panel of witnesses today and look forward to their testimony.

Prepared Statement of W. Erwin Diewert

I have been asked to present testimony on the following 3 questions:

1. Why is the Consumer Price Index (CPI) overstated?
2. What is your aggregate estimate of this overstatement?
3. What steps could be taken to rectify the overstatement in the CPI?

Answer to Question 1:

I will interpret question 1 to mean: what are possible reasons to believe that the US consumer price index may be overstating the degree of price inflation that US consumers have faced in recent years?

Before answering this question, it should be noted that the words "overstatement" or "bias" in the CPI implies that we have a concept of what the "true" or "unbiased" consumer price index is. My concept of the "true" index is what the economist Robert Pollak[1] has called the "social cost of living index." The difference between this concept of the index and the Bureau of Labor Statistics' concept of the CPI can be explained briefly as follows. In the BLS concept, a representative fixed basket of goods and services is priced out every month. The official CPI is proportional to the monthly total cost of this fixed basket of goods and services. This concept does not allow for the possibility that consumers will change their baskets in response to changes in relative prices; that is, normally consumers will purchase smaller quantities of goods whose prices have risen rapidly and they will purchase relatively greater quantities of goods whose prices have risen more slowly or have fallen. The social cost of living index allows for this consumer substitution of cheaper goods for more expensive goods while the current BLS CPI does not.

With the above proviso in mind, I believe that there are 5 possible sources of overstatement or upward bias in the US CPI:

(i) substitution bias;

---

[1] See Robert A. Pollak [1981].

(ii) elementary index bias;
(iii) outlet substitution bias;
(iv) quality adjustment bias or linking bias and
(v) new goods bias.

A brief description of each of the sources of bias follows.

Substitution bias is the difference between a social cost of living index which allows the basket to change as prices change and the existing fixed basket CPI. However, numerical estimates of the magnitude of this substitution bias have been made at relatively high levels of aggregation.[2] All fixed basket CPI's suffer from this source of bias.

Elementary index bias arises from the use of an inappropriate method for aggregating price quotations at the very lowest level of aggregation. By inappropriate, I mean that there are methods of aggregation that have an upward bias built into them. Unfortunately, Reinsdorf and Moulton [1994] and Armknecht, Moulton and Stewart [1994] have demonstrated that the US CPI suffers from this source of upward bias.

Outlet substitution bias is the bias which occurs when consumers shift their purchases from high cost outlets to lower cost outlets for the same commodity. Reinsdorf [1993] found evidence that this source of bias has become important in the US during the 1980's and 1990's although it did not appear to be important in 1960's.

Quality adjustment bias or linking bias is the bias which can occur when a variety or model of a good is replaced by a new variety. Suppose that a new model appears which is more efficient in some dimension than an existing model. After two or more periods, the Statistical Agency places a price ratio for the new good into the relevant elementary price index, but the absolute decline in price going from the old to new variety is never reflected in the relevant elementary price index. This source of bias was recognized by Griliches [1979; 97] and Gordon [1981; 130-133] [1990] [1993].

Our final source of bias is new goods bias. During the past three decades, the number of commodities that consumers can purchase has increased enormously: supermarkets have steadily increased the number of products that they offer each year; large specialty warehouse stores have sprung up that offer tremendous numbers of related commodities for sale; video rental markets have sprung up; cablevision offers increased channels; etc. However, traditional index number theory makes no allowance for this large expansion in consumers' choice sets.[3]

Of all the sources of bias listed above, I believe that the biases associated with the introduction of new goods are the most significant. In the past 15 years, we have seen a proliferation of new goods and services. Traditional economics, rooted in models which have only a fixed number of commodities, has, by and large, missed the significance of this phenomenon of an increasing dimension for the commodity space. Thus productivity improvements are no longer taking place only by production units achieving economies of scale, but also by the application of science and technology through the creation of new products and new processes. It seems likely that Statistical Agencies have simply missed the improvements in our standard of living that are due to the increased number of commodities that consumers now have in their choice sets.

Answer to Question 2:

The work of Manser and McDonald [1988], Balk [1990; 82] and Aizcorbe and Jackman [1993] suggests that *substitution bias* adds about .2% per year to the US CPI.

The work of Reinsdorf and Moulton [1994] and Armknecht, Moulton and Stewart [1994] suggests that *elementary index bias* added approximately .5% per year to the U.S. consumer price index for the years 1987-1994.

With respect to *outlet substitution bias*, the estimates of Reinsdorf [1993] and Saglio [1994] suggest that this bias might add something like .25% to .4% per year to a typical CPI in recent years.

With respect to the last two sources of bias, it is not possible to estimate their aggregate impact with any degree of precision at this stage. I believe that a conserv-

[2] The most disaggregated estimates are due to Manser and McDonald [1988] who used 101 categories of goods and services and Aizcorbe and Jackman [1993] who used 207 categories of goods and services for 44 US regions or 9108 commodities.

[3] Griliches [1979; 97], Gordon [1981; 130] and Diewert [1987; 779] [1993; 59-63], suggested that this bias could be substantially reduced (but not eliminated) by simply introducing new goods into the pricing basket in a timely fashion. Triplett [1993; 200] termed the subset of the new goods bias caused by delays in introducing new products into the index the new introduction bias.

ative range of estimates for the *linking bias* and the *new goods bias* in the US CPI in recent years is .35% to .6% per year upward bias.[4]

It is likely that the above sources of bias are approximately additive. Thus adding up the above sources of bias, I believe that the US CPI overstates inflation by approximately 1.3% to 1.7% per year in recent years.

I would like to note one qualification to the above sources of bias. If the US CPI were to be adjusted downward due to an adequate treatment of the new goods bias, the resulting index would probably not be appropriate for adjusting transfer payments to the poor. The problem is that an increasing selection of commodities may not be relevant to the poor who are forced to spend the bulk of their income on a few essentials. Thus it may be necessary to have a separate CPI for low income consumers.

Answer to Question 3:

The overstatement in the CPI due to *elementary index bias* can be corrected fairly easily. The BLS would have to rework its computer programs (and its sampling methodology to a certain extent), but this could be done within a year.

The overstatement due to *substitution bias* could be corrected by dropping the current BLS fixed basket methodology and replacing it by either (i) updating the baskets much more frequently or (ii) using an index number formula that is consistent with consumer substitution. Unfortunately, the second alternative would involve updating the baskets on an annual basis and it would be necessary to increase the BLS budget considerably to accomplish this.

The overstatement due to *outlet substitution bias* could also be corrected but again it would be necessary for the BLS to rework its procedures.

To eliminate the overstatement due to *linking bias* and *new goods bias* would require a radical reworking of current BLS procedures. I believe that it would be necessary to have the BLS either buy scanner data from private companies that generate electronic point of scale data or to have the BLS compete with private companies in this area.

The bottom line on eliminating the above sources of bias is, that with the exception of elementary index bias, it cannot be done quickly or without a considerable expenditure of resources.

Finally, I would like to suggest that the current US Statistical System seems rather inefficient to an outsider from Canada, where virtually all national statistical functions are performed by a single agency, Statistics Canada. It seems to me that considerable resources could be freed up to attack the above measurement problems (and others) simply by combining many of the present independent US Statistical Agencies: Statistics USA has a nice ring to it.

References:

Aizcorbe, A.M. and P.C. Jackman, 1993. "The Commodity Substitution Effect in CPI Data, 1982-91," *Monthly Labour Review* (December), U.S. Bureau of Labor Statistics, 25-33.

Armknecht, P.A., B.R. Moulton and K.J. Stewart, 1994. "Improvements to the Food at Home, Shelter and Prescription Drug Indexes in the U.S. Consumer Price Index," paper presented at the International Conference on Price Indices, October 31–November 2, Ottawa: Statistics Canada.

Balk, B.M., 1990. "On Calculating Cost-of-Living Index Numbers for Arbitrary Income Levels," *Econometrica* 58, 75-92.

Berndt, E.R., Z. Griliches and J.G. Rosett, 1993. "Auditing the Producer Price Index: Micro Evidence from Prescription Pharmaceutical Preparations," *Journal of Business and Economic Statistics 11, 251-264.*

Diewert, W.E., 1987. "Index Numbers." In *The New Palgrave: A Dictionary of Economics,* Volume 2, J. Eatwell, M. Milgate and P. Newman (eds.), London: The Macmillan Press, 767-780.

Diewert, W.E., 1993. "The Early History of Price Index Research." In *Essays in Index Number Theory, Volume 1,* W.E. Diewert and A.O. Nakamura (eds.), Amsterdam: North-Holland, 33-65.

Diewert, W.E., 1995a. "Axiomatic and Economic Approaches to Elementary Price Indexes," Discussion Paper No. 95-01, Department of Economics, University of British Columbia, Vancouver, Canada, 1-60.

[4] Evidence on the magnitude of these sources of bias is contained in Gordon [1990], Berndt, Griliches and Rosett [1993], Griliches and Cockburn [1994] and Hausman [1994]. For a more detailed discussion of this evidence, see Diewert [1995a] [1995b].

Diewert, W.E, 1995b. "Price and Volume Measures in the System of National Accounts," Discussion Paper No. 95-02, Department of Economics, University of British Columbia, Vancouver, Canada, 1-62.
Gordon, R.J., 1981. "The Consumer Price Index: Measuring Inflation and Causing It," *The Public Interest* 63 (Spring), 112-134.
Gordon, R.J., 1990. *The Measurement of Durable Goods Prices,* National Bureau of Economic Research, Chicago: University of Chicago Press.
Gordon, R.J., 1993. "Measuring the Aggregate Price Level: Implications for Economic Performance and Policy," *Price Stabilization in the 1990s,* K. Shigehara (ed.), London: Macmillan, 233-76.
Griliches, Z., 1979. "Issues in Assessing the Contribution of Research and Development to Productivity Growth," *The Bell Journal of Economics 10 (Spring), 92-116.*
Manser, M.E. and R.J. McDonald, 1988. "An Analysis of Substitution Bias in Measuring Inflation, 1959-85," *Econometrica* 56, 909-930.
Pollak, R.A., 1981. "The Social Cost-of-Living Index," *Journal of Public Economics 15, 311-336.*
Reinsdorf, M., 1993. "The Effect of Outlet Price Differentials in the U.S. Consumer Price Index." In *Price Measurement and Their Uses,* M.F. Foss, M.E. Manser and A.H. Young (eds.), NBER Studies in Income and Wealth, Vol. 57, 227-254.
Reinsdorf, M. and B.R. Moulton, 1994. "The Construction of Basic Components of Cost of Living Indexes," to appear in *New Goods,* T. Bresnahan and R.J. Gordon (eds.), NBER Conference on New Goods.
Saglio, A., 1994. "Comparative Changes in Average Price and a Price Index: Two Case Studies," paper presented at the International Conference on Price Indices, October 31–November 2, Ottawa: Statistics Canada.
Triplett, J.E., 1993. "Comment." In *Price Measurement and Their Uses,* M.F. Foss, M.E. Manser and A.H. Young (eds.), NBER Studies in Income and Wealth, Vol. 57, 197-206.

PREPARED STATEMENT OF ELLEN R. DULBERGER

Thank you for inviting my comments on the Consumer Price Index. Although I am employed by IBM, I appear today in a personal capacity as a professional economist. The views and conclusions contained in this testimony are mine and are not presented or intended as IBM's.

Specifically, you have asked for reasons that the CPI may be overstated, an aggregate estimate of the amount of the overstatement, and what can be done to rectify it.

The main points I will make are as follows:

1. Upward bias in the CPI may be greater than others have stated and bias in its rate of change is likely to be growing. The primary reason is that technological change affects quality and the introduction of new products, the way they reach us and the way we live. The effects of technological change have not been adequately taken into account.
2. Problems for which there are known fixes should be addressed promptly. Additional funding should not be a major inhibitor. Legislation may be required to allow BLS to share information with other statistical agencies.
3. Problems which require research should be pursued with innovative approaches. These include cooperative efforts of the BLS and the business community, joint research programs between BLS and academia, and engaging the help of outside experts.
4. There is a problem with using a general measure of inflation such as the CPI to represent price changes of a particular program. If a panel of experts is convened, it should be charged with answering the following questions:
   —how can information that is currently available be used best to escalate a particular program?
   —what can be done to devise measures that improve our ability to appropriately escalate the program in the future?

SOURCES AND MAGNITUDE OF BIAS

Innovation and technological change present many types of price measurement problems, and often at the same time. These include but may not be limited to the following:

—simple substitution bias
—outlet substitution bias
—geographic substitution bias

—quality change
—classification substitution bias

SIMPLE SUBSTITUTION BIAS

Simple substitution bias, as it has been described, refers to the failure to capture changes in the composition of purchases that result from changes in relative prices (and other factors). As has been stated by others, removing this source of bias requires updated weights used in calculating the average price change.[1]

WHAT CAN BE DONE?

Updating the weights requires data on quantities or expenditures as well as prices in each period. Such data are not currently available on a timely basis. To collect it would require additional funding, changes to existing programs (which might require legislation to effect), and sharing of information with other statistical agencies. A good remedy that does not require additional funding is to integrate consumption statistics across agencies and use data from existing programs to update the weights with a reasonably short lag.[2]

OUTLET AND GEOGRAPHIC SUBSTITUTION BIAS

Outlet substitution presents a bigger challenge. While fixes for "simple" outlet substitution have been offered, these fixes would not capture outlets outside the present local geographic limits determined by BLS CPI methodology. In other words, the CPI methodology is geographically based and has not been changed to accommodate the effects of new ways of doing business.

Mail order purchases provide a good example. Mail order companies may be located anywhere in the U.S., or even beyond our borders. The geographic location of the outlet is not what determines whether consumers can or will buy its products. The products sold by mail order are available to all of us wherever we live, and can be delivered the next day if we wish. The benefit of this innovative distribution channel is confirmed by the rapid rate of growth in its sales over the past fifteen years. Yet, the CPI doesn't capture mail order prices.

The upward bias related to the geographic based methodology which I call "geographic substitution bias" goes far beyond mail order purchases. For example, the home shopping channel on cable television provides another alternative to ordinary shopping. Advances in technology make it possible for business to be conducted in new ways. Indeed, information technology, especially as computing and communications converge, enables businesses of all sizes to extend their marketing reach and lower the costs of getting the right products to the right places at the right times. Right now, we are at the cusp of a new paradigm in shopping: electronic commerce. As a greater number of transactions take place through on-line services such as Prodigy, America-on-line and Compuserv, and as Internet access to buyers and sellers continues to grow exponentially, the bias in the CPI grows too.

WHAT CAN BE DONE?

Outlet substitution bias that can be addressed using existing data should be addressed promptly and at low cost.[3] Methodology research is required to determine what to do about the reduced importance of geographic location and how to measure prices and capture substitution to shopping environments like electronic malls.

OTHER TYPES OF SUBSTITUTION BIAS

Another type of measurement problem arises with the use of discount devices such as coupons. For example, when coupons influence buying decisions, it means that consumers are benefiting from lower prices even if it means switching to other brands and sizes, or shopping at different stores.

It is the view of some that coupon usage increases during recessions. According to the National Restaurant Association, the value of coupons redeemed as a percentage of total receipts is significant and increases during recession periods. They have expressed concern to BLS that failure to account for coupon usage results in an upward bias in the CPI especially during recessions.

Some would dismiss the significance of coupon usage, arguing that clipping coupons confers a cost on the consumer that offsets some of the benefits. However, if

[1] See Manser and McDonald, 1988.
[2] Triplett, 1993, uses consumption data as an example and provides a detailed explanation of the "statistical coordination" problem and the potential to be gained from multi agency efforts.
[3] See Reinsdorf, 1993.

the benefits didn't exceed the cost, consumers wouldn't bother. Moreover, many supermarkets are now offering their customers "clipless" coupons, whereby a swipe of an electronically coded identification card deducts the value of in-store coupons from the point-of-sale total.

Other examples of discount devices include special deals such as "buy a pizza, get a free soda," buyers' clubs with membership fees, and frequent flyer programs. All of these enable consumers to effect lower prices for their purchases. A key part of the measurement problem is that these transactions are not usually a simple quantity of one. As these discount devices become more widely used, the narrow units of observation used to capture prices for the CPI are likely to become less representative of the transactions that comprise consumer expenditures.

How important are these discount devices? We don't really know. As a consumer, I use clipless coupons every time I go to the supermarket. But for family members and friends whose means are limited and/or have low opportunity cost of their time, coupons and various other discount devices are a way of life. And, as it becomes easier to obtain the benefits, usage is likely to increase. These phenomena are widespread and therefore important, yet they are not captured in the CPI.

WHAT CAN BE DONE?

Methodological and empirical research is required to determine how to deal with discount devices most specifically when they have the effect of changing the representative transaction. The business community would be a valuable source of knowledge and data pertaining to the phenomenon. Its help should be sought.

QUALITY CHANGE

Quality change and the introduction of new goods present the most difficult problems for measurement. While it is true that research focus has been given to those areas where we expect to find the biggest measurement errors, nonetheless, the results are staggering. There are four kinds of measurement problems associated with quality change:

—timeliness of introduction of new products
—direct quality comparisons of new products with existing ones
—quality comparisons of new products with other products against which they compete
—capturing substitution effects of new products as they displace others within and across their lowest classification grouping.

INTRODUCTION DELAY

Little work has been done on the effects of timeliness of new product introduction. In my work on selected electronic components, specifically computer memory chips (DRAMs), introduction delay had a sizable impact on the price index.[4] For the period 1982-1988, using a Laspeyres formula, an introduction delay of one year had the effect of overstating the price change by 1.3 percentage points per year. A three year delay produced an overstatement of 7.6 percentage points per year.

While the impact of introduction delay may not be as great for all products, it may well be for consumer electronics products. Indeed, it is likely that failure to include new products into the CPI in a timely way is contributing significantly to upward bias.

WHAT CAN BE DONE?

BLS has responded to criticism on introduction delay by focusing on selected high technology products and shortening the cycle for updating the sample. While this is an improvement, what is needed is a way to identify new products and introduce them into the CPI early in their lives. Alternative approaches, such as active involvement of the business community should be pursued.

QUALITY COMPARISONS AND CLASSIFICATION SUBSTITUTION BIAS

More work has been done on direct quality comparisons, and the effects here are also huge. For example, in my work developing price indexes for computer processors, making direct quality comparisons had the effect of more than doubling the rate of decline in the price index, from 8.5 to 17.8 percent per year over the 12 year period ending in 1984.[5] In other words, the growth rate in the price index was over-

[4] See Dulberger, 1993. I11 A five year delay added 25.7 percentage points per year, turning what should have been a decline of 27.5 percentage points per year to a decline of only 1.8!

[5] See Dulberger, 1989.

stated by 9.3 percentage points per year when direct comparisons of quality were not made. Quality comparisons of new products with products in other groupings against which they compete present the most formidable challenge and greatest need for inventive approaches. Some examples have been cited but not recognized as contributing to this other form of bias, which I call "classification substitution bias."

One example is the introduction of a new drug that substitutes for a surgical procedure. Even if the new drug were to enter the price index in the period it is introduced, the current procedure would capture it in a way that compares it with other drugs in a narrowly defined group and assumes that price differences within that group of drugs are equal to quality differences. The new drug would not be compared with the surgical procedure because it is in a different "cell."

There are many examples of innovation and technological change which result in displacement of products in other and sometimes distant classification groupings. These include e-mail and faxes as they substitute for regular mail delivered by the U.S. Postal Service; video conferencing as it substitutes for travel; and first run movies that are viewed on cable TV rather than in theaters.

If products were grouped differently, such as on the basis of an outcome, the new drug and the surgical procedure it replaces could be in the same "cell." This would facilitate and encourage the pursuit of meaningful quality comparisons, price measurement and substitution effects. It is surprising that although classification is an important part of price index methodology, it has received little or no research attention.

WHAT CAN BE DONE?

Statistical techniques such as hedonics are required to make meaningful comparisons of the quality of new products with the ones they compete against. Since the knowledge required is likely to be outside the scope of most economic researchers' experience, it is imperative to seek advice from experts in the business community who are introducing these new products and understand what drives demand for them. Such efforts might be modeled after the joint research by IBM and BEA in developing price indexes for computing equipment used in the National Income Accounts.[6]

Dealing with classification substitution will require methodological research as well. Some useful insights could be gleaned if such research were conducted using existing data. BLS should expand the availability of microdata for research programs within and outside the agency. Academic access to microdata could be modeled after a pilot program now underway at the Bureau of the Census.[7] BLS should reprioritize its research agenda and/or work cooperatively with academia and researchers in other agencies. On an ongoing basis, priorities could be set with the help of an advisory group comprised of outside researchers in academia and other government agencies.

WHAT CAN BE DONE TO PROPERLY ESCALATE FEDERAL PROGRAMS?

There is a problem with using a general measure of inflation such as the CPI to represent price changes of a particular program. This problem is vexing, but it is neither new nor isolated to federal programs. Businesses face the same problem when they use the CPI or the PPI to escalate long-term contracts. Very often, these indexes are poorly designed for the purpose at hand, yet they are used because they are readily available and widely known. For example, long-term contracts may provide for technological change such as those which provide for "information technology refresh," that is, more powerful computers to replace the ones in current use as the new ones become available. This is a case where the two parties are contracting specifically to change quality—not hold it constant.

Analogously for federal programs, sometimes we may want to allow for changes in real income and not hold it constant. An example might be the availability of a new vaccination like the one my children just received against hepatitis. Another example would be improvements in living conditions brought about by building codes. Not too long ago, many apartments in New York City did not have bath-

[6] The study at IBM developed hedonic equations for four types of computing equipment: large computerprocessors, auxiliary storage devices, printers, and displays. The quality-adjusted price index estimated from these equations were used by the BEA in the 1986 revision of the National Income Accounts.

[7] The Census Bureau is piloting a program called the "Special Sworn Employees Program" in regional data centers. The program provides a way for academic researchers to conduct research using the Census Bureau's confidential information in a way that protects the confidentiality. The program is described in McGuckin and Reznek, 1993.

rooms. Bathtubs did not have running water and were located in the kitchen. One toilet located in the hall served many apartments. Such living conditions are no longer legal and we wouldn't want them to be. We want our citizens to experience improvements such as better sanitary conditions.

Other considerations for indexing federal programs include taking account of demographic and regional differences in the level and composition of consumer expenditures. These, too, require investigation and subsequent implementation that is meaningful and apolitical.

For these reasons, I believe that a panel or commission of independent experts is needed to guide the development of indexes to appropriately escalate federal programs. This group would be charged with answering two questions:

—how can information that is currently available be used to escalate a particular program?

—what can be done to devise measures that improve our ability to appropriately escalate the program in the future?

This group of experts would have the responsibility of understanding the policy question and interpreting it to direct informative and useful research, and directing the construction of meaningful price indexes.

SUMMARY

Some sources of upward bias in the CPI are well known and a few are easily addressed. However, there are broad measurement problems that arise with innovation and technological change. These are not adequately accounted for and result in upward bias that is large and growing.

Rectifying the problems requires new approaches including multidisciplinary, multi- organizational teams, reassessment and realignment of priorities of BLS' talented research staff, and an aggressive schedule for research and subsequent implementation of results.

In addition, a group of experts is needed to oversee the construction of indexes suited to escalating specific federal programs and to guide the research program in creating improved measures in the future.

References

Cartwright, David W., 1986. "Improved Deflation of Purchases of Computers," *Survey of Current Business* 66(3):7-9.

Cole, Rosanne, Y. C. Chen, Joan A. Barquin-Stolleman, Ellen Dulberger, Nurhan Helvacian, and James H. Hodge, 1986. "Quality-adjusted Price Indexes for Computer Processors and Selected Peripheral Equipment," *Survey of Current Business,* 66(1):41-50.

Dulberger, Ellen R., 1989. "The Application of an Hedonic Model to a Quality-adjusted Price Index for Computer Processors." In *Technology and Capital Formation,* ed. Dale W. Jorgenson and Ralph Landau. Cambridge, Mass.: MIT Press.

Dulberger, Ellen R., 1993. "Sources of Price Decline in Computer Processors: Selected Electronic Components." In *Price Measurements and Their Uses,* ed. Murray F. Foss, Marilyn E. Manser and Allan H. Young. Chicago, Ill: The University of Chicago Press.

Manser, Marilyn E. and R. J. McDonald, 1988. "An Analysis of Substitution Bias in Measuring Inflation, 1959-85," *Econometrica,* 56:909-930.

McGuckin, Robert H. and Arnold P. Reznek, 1993. "Research with Economic Microdata: The Census Bureau's Center for Economic Studies," *Business Economics,* 28(3):52-58.

Reinsdorf, Marshall, 1993. "The Effect of Outlet Price Differentials in the U. S. Consumer Price Index," *In Price Measurements and Their Uses,* ed. Murray F. Foss, Marilyn E. Manser and Allan H. Young. Chicago, Ill: The University of Chicago Press.

Triplett, Jack E., 1990. "Reviving the Federal Statistical System: A View From Within," *American Economic Review,* 80(2):341-344.

PREPARED STATEMENT OF ROBERT J. GORDON

The Consumer Price Index (CPI), along with the unemployment rate, is one of the two most essential economic statistics produced by the Federal government. The rate of increase in the CPI measures the rate of inflation, the central target of monetary policy. Components of the CPI for particular products allow the Commerce Department to translate data on dollar spending by consumers into consumption spending in constant dollars, and this comprises fully two-thirds of real GDP. In

turn, real consumption spending per capita measures how rapidly our standard of living is increasing, and real GDP per hour is our basic measure of the nation's productivity.

If changes in the CPI overstate inflation, then growth in real consumption, real GDP, our standard of living, and the nation's productivity are all understated. Instead of stagnating over the past two decades, real wages have been growing. Clearly, convincing evidence of systematic overstatement of inflation by the CPI would have revolutionary consequences for virtually every basic measure of the economy's well-being.

We are here today, of course, because Chairman Greenspan has drawn attention to the budgetary implications of CPI measurement error. If the rate of inflation used to escalate social security benefits, tax brackets, exemptions, and the standard deduction were to be reduced by 1.0 percent below the forecast growth in the official CPI, the Federal budget deficit would be reduced over the next decade by hundreds of billions of dollars. Chairman Greenspan's own decisions at the Fed would be altered as well by convincing evidence of an upward bias in the CPI. The urgency of raising interest rates to fight inflation is clearly diminished if instead of running along at 3 percent, the actual inflation ate is 2.0 or even 1.5 percent.

BACKGROUND

The enormous implications for the budget and for monetary policy have suddenly focussed the spotlight of media and political attention on the possibility of measurement errors in the CPI. But in the academic community this is a very old topic, not a new topic at all. The famous 1961 Stigler report brought together some of the nation's most prominent economists to study numerous aspects of government price indexes. Many flaws were found and described in great detail, partly but not entirely overlapping the four main flaws discussed here. But I was surprised, in rereading the Stigler report, that it did not contain any conclusion regarding systematic bias in the CPI. Indeed, as recently as ten years ago, there was an active debate regarding the direction of the bias. It was argued that the bias could be up, could be down, and that there was no conclusive evidence either way.

What turned the tide? Why is there now a widespread consensus that the CPI overstates the rate of inflation? Appropriately, the new evidence emerged both from the academic community and from within the BLS itself. My 1990 book, The *Measurement of Durable Goods Prices*, provided compelling evidence of upward bias that was larger than previously suspected in both the CPI and in the Producer Price Index. Two new types of bias discussed later were identified and quantified by talented economists at the BLS. Replacing the old adversarial battle of academic offense and BLS defense, the last decade has witnessed a new era of cooperation in research. We all want to find out the answers, we all recognize that there problems with the CPI, and everyone wants to fix it.

THE FOUR PROBLEMS

There are many problems with the CPI that were discussed in the Stigler report and are statistical and methodological; these have no necessary implications for systematic bias and will be ignored here. My remarks today are limited to four problems that all uniformly point to upward bias in the CPI. The first two are old stories, and the second two are newer. Putting them all together leaves no doubt, there's a huge problem.

1. **Traditional Substitution Bias.** The CPI is what is known as a "Laspeyres" price index. That is, it measures price changes for many different products and then aggregates these thousands of separate measures of price change using weights that apply *to a base year (or years) that is prior to the period being measured.* Over much of the postwar period, these weights in the CPI have been based on consumer expenditures *from five to fifteen years* prior to the year of price measurement. In the traditional example, even if the price of chicken rises much less than the price of beef so that consumers shift their expenditures to chicken, the relative weight of chicken and beef in the CPI is based not on current spending patterns but rather on expenditures in that long-ago base year. To use a more modern example, even if the price of cellular phones drops relative to the price of postage stamps, so that consumers make more cellular phone calls and send fewer letters, the relative weight of cellular phones and postage stamps in the CPI will be based on expenditures in some remote base year.

Economists used to study this traditional substitution bias quite a lot, until they found out that it didn't amount to much. The consensus estimate for this first source of bias is 0.25 percent per year.

2. **Quality Change.** It is widely recognized that the CPI fails to adjust adequately for the improved quality of new products and new models. To set this problem in context, students of business history have drawn attention to the "product cycle." New products—whether autos, air conditioners, or VCRs—are initially made in small volumes and sold at high prices. Soon, firms figure out how to increase volumes and reduce prices. Eventually products mature, sales fall off, and prices increase more rapidly than the average product. The sequence is easily visualized as a "U"-shaped curve—the price of any given product relative to the consumer market basket starts high, then goes down, is flat for a while, and then goes back up.

Nobody debates the reality of this product cycle, and nobody debates the fact that the CPI introduces products late, thus missing much of the price decline that typically happens in the first phase of the product cycle. This is the first aspect of quality change bias For example room air conditioners were widely sold in 1951, available in the Sears catalogue and rated by *Consumer Reports* in 1952, but not introduced into the CPI until 1964, 12 years late! More recently, the microwave oven, VCR, and personal computer were all introduced into the CPI years after they were sold in the marketplace. In short, the CPI introduces new products too late and tracks obsolete products too long.

The second aspect of quality change bias results from a narrow definition of a commodity. Before 1970 precise multiplication and division required noisy and expensive rotary electric calculators; after 1970 electronic pocket calculators became available and are now in the pocket or dormitory of every college student. The price fell quickly from $1,000 to $10, and the new product could do exponents, logarithms, and lots of things the old product could not do. But the price decline was completely ignored by the government price indexes, which treated the old and new calculators as separate products. People flock to rent videos, but the declining price of seeing a movie at home, as compared to going out to a theater, is entirely missed in the CPI. Similarly, the CPI misses the replacement of manual typewriters by electronic typewriters and then PCs with word-processing capability.

The third aspect of quality change bias results from a narrow definition of quality. New improved models are often introduced with new features that are missed by the CPI. Changes occur in energy efficiency and repair frequency, but these are rarely if ever valued in compiling the CPI. Here is a brief list of some of the quality improvements that have been "missed" by the CPI over the postwar years:

- improved ability of refrigerator-freezers to hold a zero temperature;
- reduced electricity consumption of all appliances, particularly refrigerators and TV sets;
- reduced repair costs on TV sets and indeed all appliances;
- reduced vibration, noise, and discomfort in air travel as jets replaced piston planes and as air travel became safer;
- the enormous improvements in the audio quality of home and auto stereo equipment;
- the shift from metal to plastic that reduced corrosion and increased lifetimes for so many consumer products;
- the reduced weight of home power tools;
- the reduction of noise, weight, bulk, and installation cost of room air conditioners.
- And, to bring home the point to almost everyone in this room, the immeasurable increase in picture quality of color TV sets compared to the dim, flickering images of the mid-1960s.

How much does this second source of CPI bias amount to? For some products it is *huge*—6 percent per year for the radio-TV category over the 37 years studied in my book. For other products, much less. I estimated that for consumer durables the upward bias was 1.6 percent per year for the postwar period, assuming that the half of consumer durables that I didn't study were measured perfectly. I'll bet that an inquiry into that other half would turn up additional bias. Even in such traditional products as apparel, there seems to be a substantial bias—in recent unpublished historical research I have identified a 2.1 percent per year upward bias in the CPI for apparel between 1920 and 1947. If the only quality bias was in the durables I measured I measured in my book, the implied bias for the total CPI would be 0.3 percent per year. Adding in plausible bias in nondurables and services, we could easily double that to, say, 0.6 percent per year.

3. **Outlet Substitution Bias.** Just as the CPI has a narrow definition of a product, it has a narrow definition of where a product is sold. A banana is not a banana. If a pound of bananas initially costs $0.69 at Ace supermarket, and "Ultra Discount Superstores" comes to town and starts selling bananas for $0.49 per pound, the consumer enjoys a price decline of 29 percent. But the CPI registers a price decline of zero! Why? Each outlet is assumed to provide a separate set of services. But con-

sumers have been leaving ma-and-pa drug stores in droves to shop at Wal-mart, ma-and-pa toy stores to shop at Toys 'R Us, and ma-and-pa hardware stores to shop at Home Depot. So we know that individual consumers have enjoyed a price decline that is not measured at all in the CPI.

This source of CPI bias is extremely important, since it applies to food and other nondurable purchases, as well as the durables that are most subject to quality change bias. If the typical product is now sold at a 10 percent discount compared to 10 years ago, that would represent a 1 percent per year bias in the CPI for those products. If this problem applies to half of the consumer market basket, it would contribute a bias to the overall CPI of 0.5 percent per year.

4. **The Logarithm Bias.** The most embarrassing source of bias in the CPI was brought to light by the BLS itself. To put it bluntly, the CPI doesn't understand logarithms! Using the methodology of the CPI, if a piece of apparel goes on sale from $100 to $75, that represents a price decline of 25 percent. When the item goes back to the regular price of $100, that represents a price increase of 33 percent. True change in price from beginning to end?—zero, the answer that would be obtained by using logs. The CPI measured change in price? Plus 8 percent! Unbelievable but true. Careful BLS research has shown that this contributes a bias of about 2 percent per year for produce and female apparel, and a bias for the total CPI of about 0.35 percent per year.

ADDING IT ALL UP

To put this together, I've cited a bias from traditional substitution bias of 0.25 percent per year, for quality change bias of 0.6 percent per year, for outlet substitution bias of 0.5 percent per year, and for logarithm bias of 0.35 percent per year. This sums to a bias of 1.7 percent per year.

What are the implications, taking account of compound arithmetic? If such a bias were present every year for the last 25 years, instead of stagnating—instead real wages have increased by 53 percent. Federal expenditures on social security in 1994 would have been reduced by $100 billion in a single year. The "true" inflation rate in 1994 would have been closer to one percent than three percent.

CAN WE BELIEVE THIS?

Even the radical estimate presented here is surely an understatement of the true bias, for new products raise the standard of living in ways that go far beyond simple price changes for a single product. The price of light was reduced enormously by the invention of electricity, but until recent pioneering work there was no price index that directly compared the price per lumen of a primitive 1890's electric light bulb with that for a whale-oil lamp. And even such an adventuresome price index makes no attempt to measure the value to families of extending day into night, or for firms in being able to extend the hours of production from a given set of facilities.

Whatever invention we take—whether the automobile that allowed limitless flexibility in the time and destination of rapid transportation, or the jet plane and communications satellites that tied together far-flung nations into a single international community, or the television and VCR that allowed almost any motion picture to enter the home, or the new-fangled PC with CD-ROM that promises ultimately to bring the Library of Congress into every home—these new developments have made human life better on a large scale. The ultimate test of the change in the cost of living over the last 25 years is to ask the following question. Take the market basket of goods and services available in 1970 and labelled with 1970 prices. Take the market basket available in 1995 and labelled with today's prices. Ask the consumer, how much more income would you require to be as satisfied with the 1995 basket and prices as with the 1970 basket and prices? The CPI says 4 times as much income would be necessary, because the CPI has quadrupled since 1970. But that 1970 market basket has no VCRs, microwave ovens, or computer games; its color TV sets break down all the time; and its refrigerators use a lot of electricity. Consumers forced to answer my question are going to miss all the benefits of modern life and are not going to say that four times as much income would be necessary—maybe 3 times, maybe 2 times, but not 4 times. That's the ultimate test of bias in the CPI.

SOLUTIONS

The problems are many. Some solutions are simple—the logarithm bias can be fixed by simply reprogramming the computer. Traditional substitution bias can be reduced by changing weights more frequently. Outlet substitution bias can be reduced or eliminated by keeping track of prices actually paid for narrowly defined

products, tracking the market share of 69 cent and 49 cent bananas. The tough one is quality change, but it is not an insurmountable problem. This ivory-tower academic and a few underpaid graduate students made a substantial dent in the problem at a total research cost of a few hundred thousand dollars, a mere flyspeck compared to the budget of the BLS. I have always thought that the BLS spent far too much in collecting multiple observations from many cities on simple items that are not subject to quality change, and far too little to study the quality change issue directly. If the BLS were to redirect existing resources and set up an official government Quality Measurement Bureau, a cross between a think tank and Consumer Reports testing laboratories, much of the quality change bias could be eliminated.

CONCLUSION

The CPI is severely biased upward, with enormous implications for the accuracy of national statistics on inflation and the growth in output, productivity, and the standard of living. Estimates of the size of the bias vary, but in the perspective of my estimate that the bias is on the order of 1 percent per year, I view as prudent and conservative the proposal to change the indexing formula for social security and tax revenues to escalate at 1.0 percent less than the official CPI inflation rate. Fixing the CPI will take time. Every year that we wait, social security beneficiaries and taxpayers are being compensated for inflation that has not occurred.

PREPARED STATEMENT OF ALAN GREENSPAN

I am pleased to appear here today to address some of the issues surrounding the adjustment of federal programs for movements in the cost of living. For the current fiscal year, roughly 30 percent of total federal outlays are indexed to movements in consumer prices, with social security, SSI, veterans' pensions, military retirement, and civilian pensions accounting for the bulk of this spending. On the tax side, indexation is largely confined to the individual income tax, which accounts for about 45 percent of federal receipts. Congress explicitly intended, in enacting the indexation of these spending and tax programs, to insulate those affected individuals from the consequences of increases in the cost of living. The vehicle chosen for making these adjustments was the Consumer Price Index, and the issue at hand is whether that price index is appropriate for the task.

If it is not, there are significant implications for the budget deficit, and there is the potential for considerable unintended transfers of wealth. As I noted in testimony earlier this year, if annual inflation adjustments to indexed programs and taxes were reduced by one percentage point—and making the admittedly strong assumption that there are no other changes in the economy—the annual level of the deficit would be lower by about $55 billion after five years, including the effects of lower debt levels. The cumulative deficit reduction over this period would be nearly $150 billion, and these savings would continue to grow in subsequent years.

I believe the evidence suggests that some adjustment to our indexing procedures is warranted. I am certain that many of the technical details will be elaborated in your discussions later this morning, but let me briefly outline some of the conceptual issues. To begin, a review of the legislative history surrounding indexation does not reveal a full appreciation for the important distinction between the CPI and a true measure of the cost of living. The CPI is constructed to measure price changes for a fixed market basket of goods and services. At present, that market basket—at least at the higher levels of aggregation—is fixed to spending patterns that prevailed in 1982 to 1984. Economic theory indicates that changes in a fixed-weight price index such as the CPI form an upper bound to changes in the cost of living, even if all of the individual prices used in the index are measured without error. The reason is that the use of fixed weights is appropriate only if there is no possibility for consumers to offset any of the consequences of increased prices for some goods by substituting others. While the degree of substitutability among products may be open to question, it is undeniable that such substitution does indeed occur.

Other technical aspects to the construction of the CPI also suggest it may overstate cost-of-living changes. Researchers at the BLS have found that an interaction between the use of fixed weights at the most disaggregated level and the manner in which new samples of retail outlets are linked into the index may be resulting in an overstatement of price increases. In January, the Bureau implemented procedures that should alleviate this so-called "sample rotation bias" at grocery stores, but the problem likely remains for other categories. More generally, the BLS is experimenting with a geometric weighting scheme that offers broader relief from this technical problem.

Over the postwar period, there has been a marked tendency for consumers to shift purchases from high-priced full-service stores to lower-priced discount retailers. The BLS uses surveys of consumer buying patterns to keep abreast of these developments. On the basis of these surveys, a new sample of retail outlets is drawn for roughly one-fifth of U.S. cities each year. Thus, with some lag, innovations in retailing are captured in the CPI. However, at the time when new outlets are rotated into the sample, if prices are found to be lower at the new establishments than at those being rotated out of the sample, the differential is, in effect, attributed to lower quality rather than to lower prices. Even granting that the quality of service and ambience may differ between the new and old outlets, presumably some of the shift in shopping patterns reflects the fact that consumers can purchase the same goods at lower prices. Consequently, some of the price declines associated with the growing importance of discount retailers may not be fully captured by our statistics.

In sum, the fixed-weight nature of the CPI and other aspects of its construction point in the direction of an overstatement of increases in the cost of living. Even if this upward bias were only a fraction of a percentage point per year, the relentless compounding of such a discrepancy ultimately would have budgetary consequences meriting serious attention.

There are, however, reasons for suspecting that weighting and construction are not the only factors leading the CPI to overstate changes in the cost of living. A more difficult, but to my mind no less important, issue concerns making adequate adjustment for the improvement in the quality of goods and services over time. I would note that the BLS does make adjustments for quality changes in the CPI. What is at issue is whether the implemented procedures, or for that matter any practical procedures that could be established in the foreseeable future, can be expected to account fully for quality changes across the vast array of goods and services available in our economy.

In many respects, the issue of price measurement has as its mirror image the fundamental problem of defining with precision a unit of output. If this conundrum could be resolved, not only would we have more accurate price measures, but we would have correspondingly better measures of output and productivity. But defining a unit of output is an exceptionally difficult task when the characteristics of products and services are changing rapidly and along many dimensions. Under these circumstances, disentangling price change from quality improvement presents a formidable challenge.

Nowhere are these challenges more acute than in the area of medical care. What is the appropriate unit of output? Should one price procedures, treatments, or cures? Should the comfort or satisfaction of the patient be accounted for in price measurement? The past century has witnessed astonishing improvements in medical care. Cures and preventive treatments have become available for previously untreatable diseases. Medical advances have also led to new treatments that are more effective and that have increased the speed and comfort of recovery.

Technological innovations have been exceptionally rapid in the medical field. A case study of CAT scanners documented the dramatic and swift improvements in quality that occurred after their initial introduction in the early 1970s. Substantial gains were made in scan time, resolution, and the speed of image reconstruction. These characteristics, in turn, have a direct bearing on the comfort and convenience of the patient and the quality of the diagnosis provided by the doctor. Conventional price measures will almost surely miss much of this type of quality improvement because of the enormous complexity involved in defining the output that is being consumed and measuring the corresponding unit price of that output.

Although medical care is perhaps the most striking example of rapid—and difficult to measure—quality improvement, similar problems occur across a broad range of goods and services. Research has found that quality improvement may not be adequately captured for goods and services ranging from complicated capital equipment to power tools to consumer appliances to the simple consumption of household lighting.

To be sure, there are offsets to unmeasured increases in quality. The downward adjustment made to measured auto prices for the cost of mandated pollution control devices is one example cited in a recent CBO study: Although this equipment may provide a benefit to society, the owner of the automobile likely captures little of the direct benefit associated with his or her increase in outlays. Other products may be made more poorly in ways that escape detection in our price statistics. But given the perpetual advance of knowledge and technology, these cases are surely overwhelmed by a tendency for the quality of goods and services to rise over time in a manner that is difficult to define and measure. Those who remember with fondness the products of yesteryear are probably suffering from either fading memories or excessive sentimentality. The difficulties confronted in price measurement are not

confined to the quality advances of existing products. The continual introduction of new goods and services onto the markets of our dynamic economy creates additional challenges for price measurement. In some cases, a new good may be similar to an improved version of an old good. In other cases, new products may deliver services to consumers that effectively were not available before—for example, personal computers, video cassette recorders, and cellular phones. New goods and services are incorporated in our price measures, but only with a lag. This lag can create an upward bias because new products often experience their largest price declines early in the product cycle. The more spectacular examples involve consumer electronics, such as computers and communications equipment, but the enormous entry of new products onto the markets every year makes this a more pervasive problem than is commonly understood. While any one product may not figure prominently in household budgets, the totality of new products and the often large price declines that occur before they are incorporated in our price measures suggest this problem may not be trivial.

These difficulties should not be read as a blanket indictment of our current statistical procedures. The Consumer Price Index is a fundamentally sound statistical program. The BLS has, over the years, made frequent and significant improvements in the CPI and further improvements should be, and are, on their agenda. Updated market baskets, experimentation with alternative indexing formulas, and ongoing research on the application of hedonic indexes offer the possibility of better measurement in the future.

But even the implementation of improvements in the CPI can lead to distortions when this measure is used directly as a cost-of-living escalator. For example, the BLS made a significant change in how it calculates the CPI in 1983, when it shifted from a method in which the price index for housing was constructed as if each household was paying the current home price and mortgage rate on its residence to one that is a more realistic measure of the cost of home occupancy. Because of the run-up in house prices and interest rates between the 1960s and early 1980s, the official CPI rose about 9 percent more than indicated by the newer, superior measure. By the time the index was changed, this overstatement had added substantially to the level of outlays in the large indexed federal programs. Once the additional interest outlays required to finance the cumulatively higher federal debt are added in, a rough estimate suggests that, all else equal, the deficit for FY1994 would have been smaller by $50 billion had the overindexing not occurred.

The fundamental problem is that we have legislated a mechanical procedure to implement cost-of-living adjustments where—given the problems inherent in any statistical measure of aggregate prices—there is a need for the application of sound judgment. If indexation had prevailed for only a short period of time, the discrepancy between the CPI and a true measure of the cost of living would not have resulted in any appreciable problem. But left in place over long periods of time, as has now occurred and is envisioned continuing in the future, the discrepancy will compound in a manner that cumulates to very substantial magnitudes.

For this reason, I suggest that Congress give careful consideration to the establishment of an independent national commission to set annual adjustment factors for federal receipt and outlay programs. The members of this commission could review the available price statistics, taking into account the differences between these measures and the concept of a true measure of the cost of living. In addition, periodic review would allow the discrepancy to be adjusted for improvements in the available statistics as well as for insights developed from outside research. Careful consideration could be given to the establishment of a special cost-of-living adjustment for retirement benefits to reflect the buying patterns of the affected population. The replacement of a mechanical procedure by the informed judgment of experts would best ensure that the original intent of the legislation would be fulfilled—to insulate taxpayers and benefit recipients from the effects of changes in the cost of living.

The issue that we are discussing today demonstrates clearly the long-lived consequences of having allowed inflation to increase in the late 1960s and 1970s. Had the inflation environment of the 1950s and early 1960s been maintained, no widespread application of indexation would have emerged; there simply would have been no need for it. Indexation was viewed as a way of mitigating the effects of inflation. It succeeded in many respects, but we have also seen another example of the operation of the "Law of Unintended Consequences" in the enlargement of our budget deficit. I believe that, if the Federal Reserve can maintain a proper direction for monetary policy, we shall make this whole matter moot. But in the interim, we should at least attempt to refine our indexation procedures so as to ensure that the distortions are minimized.

PREPARED STATEMENT OF ZVI GRILICHES

My name is Zvi Griliches. I am the Paul M. Warburg Professor of Economics at Harvard University and Program Director of Productivity Studies at the National Bureau of Economic Research. I have spent much of my professional life studying price and productivity measurement issues, especially issues that arise as the consequence of technological and quality change. A selected bibliography of my writings on this range of topics is attached to this testimony.

The Committee asks three questions about the "overstatement" in the CPI: 1. Why; 2. How much? And 3., what can be done about it? In asking the questions this way, the Committee assumes that we already know that the CPI is "overstated." I believe that the CPI does indeed overstate the average price rise during the last several decades, but the scientific basis for this judgment is much weaker than the questions seem to imply. I will, therefore, devote a significant portion of my testimony to the question of why we don't have better answers to your questions and how we could learn more about this topic. In addition, I will argue that the CPI, our most important and best measure of the average level of consumer prices, is the wrong index for escalation and the wrong instrument for deficit reduction. If entitlements are to be cut, they should be cut on their demerits, not using the irrelevant fig leaf of problems with the CPI. I will also complain about the current attitude of some members of Congress that devalues economic research, threatening to make it into a second class activity, while at the same time expecting first class answers from it.

The CPI is overstated because it prices a fixed basket of goods and services in a dynamic and fast changing world. The priced basket does change, but not fast enough. Moreover, the current methodology does not account adequately for the improvements to our standard of living that arise from the continuous introduction of new goods and services. But neither does it account for new "bads." Thus, without further research, one remains uncertain about the overall size of the bias in the CPI (in which period?) relative to a broader concept of an index of the "cost of living."

How large could the overstatement be, overall? I have spent much of my professional life researching in this topic. I have studied new and used cars prices, personal computer and pharmaceutical prices, and also supervised and commented on work in related areas. I have also read the testimony of many of my colleagues, especially Professors Diewert, Gordon, Jorgenson, and Pakes, and the submissions by the BLS, and CBO, and the Federal Reserve Bank of Dallas. The various "guestimates" in these sources are not independent of each other. They all use the small estimates of substitution and "formula" bias from the BLS; and relatively large estimates of "new goods" biases based largely on the work on durable prices by Gordon, on the treatment of generics by myself and Iain Cockburn, and on the more general work on computer prices by the BEA, Gordon, Berndt and Griliches, Triplett, and others. In addition, it is clear to everyone that we are not doing a good job of measuring real output and hence also quality adjusted prices in the area of medical services. An overall guess of a 1 percent per year overstatement seems about right to me, but it is a guess, based on extrapolating over large stretches of unexplored components of the CPI. The range of uncertainty around such a guess is, in my opinion, quite wide, at least plus or minus 0.6 percent. I would be surprised, however, if further research proved it to be zero or as high as two percent.

A look at what is implied by such a statement may be of some use here. If we take a sizeable stretch of our recent history, say the 25 years between 1969 and 1994, which are still within the memory of many of us here, the official CPI measure (CPI-U) was rising by an average of 5.6 percent per year (from 36.7 in 1969 to 148.2 in 1994, with 1982–4=100). The theory behind the measurement of the CPI would say that you should be indifferent between living on $100,000 a year today (or more precisely, in 1994) or on $25,000 a year in 1969, paying 1969 prices for commodities and services available in 1969 but not being able to buy the services and products that have become available since (36.7 divided by 148.2 is approximately 0.25). My guess is that most of us would not choose to forgo $100,000 today for $25,000 in 1969 prices, commodity assortments, and other living conditions, which would include 1969 pollution levels, medical and pharmaceutical technology, and fear of nuclear war. The personal safety situation in 1969, at least in my old neighborhood of Hyde Park in Chicago, was probably not really better thin it is there today. In any case, if you are not willing to engage in this potential bargain of exchanging a $100,000 in today's prices for the option of living in 1969 conditions and prices on $25,000 dollars, then the official CPI is not the measure for you.

Asserting that the upward bias in the CPI has been on the order of 1 percent per year, would imply that the "right" number for this deal is $32,000 in 1969 prices and "conditions," about 28 percent higher (that is the power of compound interest!)

but still perhaps not high enough to entice many of us into this deal. But it is surely closer to the mark and one would have to start thinking more seriously and examine other aspects of this "deal" in greater detail before rejecting it out of hand. One would also need to ask whether such answers are sensitive to the assumed income level: would it be the same if one were faced with the choice of $40,000 today versus $10,000 in 1969?

But even if one accepts the one percent per year estimate as being reasonable for the past, it is not clear how such numbers are to be extrapolated into the future. The overstatement of the price of housing services was fixed in 1983. It may have accounted for about 0.3 of the suggested 1 percent overstatement (that is the difference between the rate of growth of CPI-U and CPI-U-X1 during the 1969-94 period). The BLS is currently fixing the formula bias and the treatment of generics. It is also likely to reduce the substitution bias by moving to more timely weighting schemes. Thus, future rates of overstatement are likely to be lower, unless technical change accelerates further.

Most of the telling criticisms of the CPI have concentrated on belated and inadequate treatment of new goods and new services. But there are also new "bads" whose magnitude we have not succeeded in quantifying either. Two examples will suffice: new and improved anti-theft devices for cars and anti-burglar systems for homes will be treated, as far as the data allows, as "quality" improvements and could show up as decreases in the CPI. But the technological know-how of car thieves and burglars may be rising at about the same rate, with no real improvement in the perceived security levels. Similarly, recent "improvements" in managed medical care which send you back home on the same day after a hernia operation represent a decline in the quality of medical care provided at the previously expected medical insurance level. They too are unlikely to show up in the CPI as it is currently measured.

Why isn't the CPI better? There are three related answers to this question: 1. The economy is changing rapidly, and measuring such changes correctly is really hard. 2. The research base for improving measurement procedures is slim and underfunded, both inside the relevant agencies and in the academic community. 3. Hardly anyone cares. There is no clear constituency or organized lobby worrying about the quality of Federal statistics. (I have discussed some of these issues in my recent AEA Presidential address, excerpt attached).

The problem of measuring the "quality held constant" price of lawyer services or the "real" price of hospitalization episodes is really difficult, though not impossible. Especially as far as medical services are concerned, we are accumulating large data sets on outcomes and costs and should be able to begin to do a better measurement job on prices and outputs in this sector. Similarly, a better job of tracking the appearance of new products could be done by tapping into the newly developing commercial data sets based on check-out counter scanner technologies.

The CPI is probably still the best single measurement project in the U.S. Government, but like most agencies it operates under the pressure of current emergencies and does not allocate enough resources for more basic research which would lead towards improvements in methodology. Agency management often cuts the research components whenever a budget stringency strikes, which has been happening rather often recently. The current BLS management is quite aware of these issues and sympathetic to such endeavors, but is harnstrung by its budgetary situation. It has also had difficulty in maintaining and supporting a meaningful external scientific advisory framework or enough funds to underwrite extramural fundamental research on the problems faced by the CPI. Congress has also not been very helpful in this regard. When it wakes up to these problems, which is rather seldom, it wants quick answers, but it is not very responsive to requests by agencies for building up in-house research infrastructures. But without such a capability, "measurement" agencies can neither do much about improving the quality of their "products" nor take advantage of external methodological improvements. These are long term issues and it will take a long term effort to improve matters significantly. And the results will never be "perfect." The world will not stand still. It will present us with new measurement challenges tomorrow. Still we could and should do better.

What can be done to improve matters, besides being more sympathetic to BLS budget requests? Because of the political sensitivity of the CPI, any proposed significant revision, especially if it involves new conceptual issues, will require thorough scientific discussion and a mechanism for legitimizing and garnering public support for it. A first step in this direction would be to agree on a diagnosis about what may be wrong with its current state and on a prioritized list of suggested reforms. To evaluate seriously the proposed changes will require additional research and discussion. There are several, not mutually exclusive, modalities for achieving this goal: Congress could ask the National Bureau of Economic Research to mount a rea-

sonably well funded review effort of the CPI procedures and to recommend reforms in it. (There is a precedent for it in the operation of the Stigler Committee in the late 1950's.) Alternatively, the same request could be made of the National Academy of Sciences, along the lines of the Rees Committee on Productivity statistics. Also, the Conference on Research in Income and Wealth, which is a meeting place for government and academic researchers interested in measurement issues, could be asked to organize a conference on "Reforming the CPI." This organization actually ran a conference on the "New Goods Measurement Problem" last year, in Williamsburg.

There is an entirely separate issue of how such revisions should affect, if at all, the escalation of various entitlement programs. There are several reasons why the CPI may not be the best "escalator" for these purposes, independent of its other "drift" problems. It is affected not only by general monetary inflation, which is what the escalator clauses are about, but also by real economic events which the society may not be able to evade. Nor can it really "compensate" large groups for them. If energy prices were to rise again due to a resurgence of OPEC power, that would be a real tax on the US economy. There is no way in which everyone can be compensated for it. If we choose to insulate some sub-group of the population from it, e.g., the elderly (why?), we have to reduce somebody else's real income. Now we may choose to share this burden unequally and transfer resources to the poorer segments of our society, essentially engaging in redistributive taxation, but the current procedures imply that the affected groups would be entirely protected from such changes and not share in the societal burden at all. More generally, such escalator clauses should be based on the price movements of domestically produced goods and services, on the assumption that gainers from domestic inflation should (can?) compensate some of the non-participants in the current economic game, the retired and the disabled. But foreign political and domestic natural disasters do not create many gains which can be taxed away. We are then back to a notion of a minimal social support level which should be set according to the norms and economic possibilities of the society. The CPI would be an appropriate escalator for such an "absolute minimum" support level. But many of the current recipients of such entitlements are not all that different from the average members of the society. If average wages do not rise as fast as the CPI, it is not clear that they should be made better off at the expense of the average tax payer who is not doing as well as the CPI would imply.

I would favor, therefore, uncoupling the discussion of entitlements from the revision of the CPI. A policy of escalation based on CPI-1% may not be unreasonable, though I'd prefer tying it to the median wage instead. But that should be done in connection with a review of the current adequacy of the absolute levels of such "entitlements" or social safety nets. (Perhaps another, separate, commission is also in order here.) Are you sure that your elderly aunt can really make ends meet on her current Social Security payments? I would worry about her if she does not have access to other resources. How about your cousin's retarded son who is trying to live on his own? Can he make it on the current level of SSI payments? "E Pluribus Unum" meant also that we take some responsibility for each other. The perception that we are trying to evade our national responsibility of being our "brother's keeper" leaves me feeling sad about my adopted country.

I am also appalled by statements that are emanating from the other House implying that Economics is a lower form of life, unworthy of support, and ready to be thrown out of the NSF mandate. Surely, understanding what people are made of, how our society and economy functions, and what forces are shaping its future, is more important to assuring our survival as a nation and a functioning society than trying to improve our understanding of what matter is made of. Moreover, almost all of the research on which today's discussion is based on, besides the in-house contributions of the BLS, has been supported by the National Science Foundation. There is no other disinterested source of support for basic research on economic and social measurement issues out there. If Gordon's and my work (as well as that of other researchers) result in your reducing the deficit by several tens of billion dollars and lead eventually to a higher real growth rate for the economy, the benefit-cost ratio of NSF's support of (all) economic research will be enormous, and that does not count many other contributions of basic economic research which I will not try to enumerate here. I find it sad, therefore, that some members of Congress think that they are better off navigating the Ship of State blindly, without maps and without the desire to understand better the mechanics of propulsion or the force of the currents facing them. There is no such thing as a free lunch in governing either. If we want to improve the functioning of our economic and social system, we must also invest in improving our basic understanding of how it actually works, and one

of the most important prerequisites for that is to have accurate measurements of what is happening to it.

The CPI is an important indicator and deserves the attention we are giving it today. But it is not the only governmental measurement enterprise that requires attention and tender and loving care: the Census, the income, employment, and population statistics, the whole national economic accounts enterprise, and much more. The current Federal statistical effort is balkanized into separate, not well-cooperating, but also underfunded agencies. A serious look at the possibility of establishing a unified, high quality, Statistics USA Agency, is long overdue.

Zvi Griliches: Price Measurement Issues, Selected Publications.

"Measuring Inputs in Agriculture: A Critical Survey," *Journal of Farm Economics*, 1960, XLII(5), 1411-1433.

"Hedonic Price Indexes for Automobiles: An Econometric Analysis of Quality Change," in *The Price Statistics of the Federal Government*, General Series, no. 73, New York: National Bureau of Economic Research, 1961.

"Quality Change and Index Numbers: A Critique," *Monthly labor Review*, 1962, 542-544.

"Notes on the Measurement of Price and Quality Changes," in *Models of Income Determination*, vol. 28 of *NBER, Studies in Income and Wealth*, Princeton: Princeton University Press, 1964, 381-418.

Price Indexes and Quality Change: Studies in New Methods of Measurement, editor, Cambridge, MA: Harvard University Press, 1971.

"Automobile Prices Revisited: Extensions of the Hedonic Hypothesis," (with M.Ohta) in N. Terleckyj, ed., *Household Production and Consumption, vol. 40 of NBER, Studies in Income and Wealth*, New York: Columbia University Press, 1976, 325-390.

"Automobile Prices and Quality Change: Did the Gasoline Price Increase Change Consumer Tastes in the U.S.?" (with M.Ohta), *Journal of Business and Economic Statistics*, 1986, 4(2), 187-198.

"R&D and Productivity: Measurement Issues and Econometric Results," *Science*, 1987,237, 31-35.

"Hedonic Price Indexes and the Measurement of Capital and Productivity: Some Historical Reflections," in J. Triplett and E.Berndt eds., *Fifty Years of Economic Measurement*, vol. 54 of *NBER, Studies in Income and Wealth*, Chicago: University of Chicago Press, 1990, 185-206.

Output Measurement in the Service Sectors, editor, vol. 56 of *NBER, Studies in Income and Wealth*, Chicago: University of Chicago Press, 1992.

"Auditing the Producer Price Index: Micro Evidence from Prescription Pharmaceutical Preparations," with E.Berndt and J.Rosett, *Journal of Business and Economic Statistics*, 1993, 11(3), 251-264.

"Price Indexes for Microcomputers: An Exploratory Study," (with E.Berndt). In *Price Measurements and Their Uses*, M.F.Foss, M.E.Manser, and A. H. Young, (eds.), 1993, Studies in Income and Wealth, Vol. 57, Chicago: University of Chicago Press for NBER, 63-93.

"Productivity, R&D and the Data Constraint," *American Economic Review*, 1994, 84(1), 1-23.

"Generics and New Goods in Pharmaceutical Price Indexes" (with I.Cockburn), *American Economic Review*, 84(5), 1994, 1213-1232.

"Aggregate Price Indices, New Goods, and Generics," (with F.M.Fisher), *Quarterly Journal of Economics*, 1995.

"Econometric Estimates of Prices Indexes for Personal Computers in the 1980's and 1990's," (with E.Berndt and N.Rappaport), forthcoming in *Journal of Econometrics*, 1995.

IV. Why Is the Glass Half-Empty?

Economists have not been very successful in explaining what has happened to the economy during the last two decades, nor have they been able to agree on what should be done about it. I will argue that data and measurement difficulties may in fact be a major source of this failure. This point will be made not to provide us with an alibi, but rather to temper the pretentiousness of some of our pronouncements and to urge us toward the more mundane task of observation and measurement.

Why don't we know more after all these years? Our data have always been less than perfect. What is it about the recent situation that has made matters worse?

The brief answer is that the economy has changed and that our data-collection efforts have not kept pace with it. "Real" national income accounts were designed in an earlier era, when the economy was simpler and had a large agricultural sector and a growing manufacturing sector. Even then, a number of compromises had to be made to get measurement off the ground. In large sectors of the economy, such as construction and most of the services, government, and other public institutions, there were no real output measures or relevant price deflators. Imagine a "degrees of measurability" scale, with wheat production at one end and lawyer services at the other. One can draw a rough dividing line on this scale between what I shall call "reasonably measurable" sectors and the rest, where the situation is not much better today than it was at the beginning of the national income accounts. Table 2 shows the distribution of nominal GDP by major industrial sector. In the early post-World War II period, the situation was not all that bad: about half of the overall economy was "measurable" in this sense. By 1990, however, the fraction of the economy for which the productivity numbers are half reasonable had fallen to below one-third. Figure 6 tells the same story with employment numbers. Measurement problems have indeed become worse. Our ability to interpret changes in aggregate total factor productivity has declined, and major portions of actual technical change have eluded our measurement framework entirely.[15]

[15]An argument could be made that this story would not be so bleak if we had focused on consumption expenditures instead, since many of the offending in-

TABLE 2—THE DISTRIBUTION OF GNP BY MAJOR INDUSTRIAL SECTOR, IN CURRENT PRICES (PERCENTAGES)

Industry	1947	1959	1969	1977	1990
Agriculture	8.8	4.1	3.0	2.8	2.0
Mining	2.9	2.5	1.8	2.7	1.8
Construction	3.9	4.8	5.1	4.8	4.4
Manufacturing	28.1	28.6	26.9	23.6	18.4
Transportation and utilities	8.9	9.1	8.6	9.1	8.7
Wholesale trade	7.1	6.9	6.7	7.0	6.5
Retail trade	11.7	9.9	9.8	9.6	9.3
Finance, insurance, and real estate	10.1	13.8	14.2	14.4	17.7
Other services	8.6	9.7	11.5	13.0	18.9
Government	8.6	10.2	12.6	12.5	12.2
"Measurable" sectors[a]	48.7	44.3	40.3	38.2	30.9

Note: Numbers before 1977 are not strictly comparable, since the latest revision was carried back only to 1977.

Source: Tables 6.1 and 6.2 of the *National Income and Products Accounts* (1928–1982) and *Survey of Current Business* (May 1993).

[a]Agriculture, mining, manufacturing, and transportation and utilities.

An example of the consequences of this shift is what has come to be known as the "computer paradox." We have made major investments in computers and in other information-processing equipment. The share of "information" equipment in total producer investment in durable equipment, in current prices, has more than doubled, from about 17 percent in 1960 to 36 percent in 1992. Computers alone went up from less than 1 percent to 11 percent of the total; and that does not allow for improvements in the quality of this equipment, which has been happening at a very fast rate—on the order of 15–30 percent per year (see Jack Triplett, 1989; Berndt and Griliches, 1993). Why has this not translated itself into visible productivity gains? The major answer to this puzzle is very simple: over three-quarters of this investment has gone into our "unmeasurable" sectors (see Table 3), and thus its productivity effects, which are likely to be quite real, are largely invisible in the data.

That there were gains is not really in doubt. Just observing the changes in the way banks and airlines operate, and in the ways in which information is delivered to firms and consumers, would lead one to conclude that we are in the midst of a major technical revolution. Effective distances are declining rapidly in many parts of the world. The rise of ATM networks in banking has resulted in substantial though largely unmeasured time savings for consumers. It is less clear, however, whether the large expansion of the securities industry has been associated with a similar productivity increase or was primarily a response to a real decline in the cost of rent-seeking induced by the falling price of information-processing (see Timothy Bresnahan et al., 1992).

There is also some scattered evidence for the positive contribution of computers in manufacturing, but given the needle-in-the haystack aspect of this problem, it is not particularly strong (see e.g., Alan Krueger,

dustries produce largely intermediate products and services. But personal consumption expenditures account only for about 68 percent of GDP, while services represent 56 percent of personal consumption. Thus, it is unlikely that looking at consumption data in more detail would change the tenor of my remarks much. A cursory look at *Personal Consumption Expenditures* (Bureau of Economic Analysis, 1990) yields a rough estimate of 47 percent of total consumption expenditures not easily measurable in real terms. The two largest difficult items consist of hard-to-measure services in the medical, insurance, legal, entertainment, and education areas (23 percent) and housing-related services (21 percent).

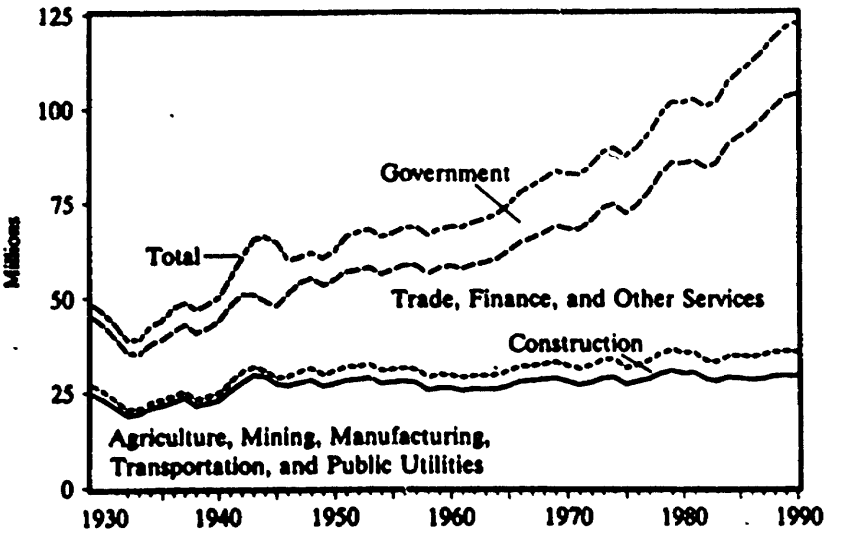


FIGURE 6. PERSONS ENGAGED IN PRODUCTION BY INDUSTRY, UNITED STATES, 1929–1980

TABLE 3—INVESTMENT IN COMPUTERS (OCAM) IN THE U.S. ECONOMY (PERCENTAGE OF TOTAL)

Industry	1979	1989	1992
Agriculture	0.1	0.1	0.1
Mining	2.4	1.1	0.9
Construction	0.1	0.3	0.2
Manufacturing	29.4	20.3	20.0
Transportation	1.3	2.0	1.0
Communication	1.5	1.4	1.5
Utilities	1.2	2.8	3.7
Trade	19.9	16.3	20.0
Finance, insurance, and real estimate (F.I.R.E.)	32.5	38.7	37.8
Other services	11.6	17.0	13.9
"Unmeasurable" sectors[a]	64.1	72.3	71.9
Plus consumer and government purchases as percentage of all computer (OCAM) purchases	67.7	77.6	77.0

Notes: OCAM = office, computing, and accounting machinery.
Source: Unpublished BEA tabulations.
[a]Construction, trade, F.I.R.E., and other services.

1991; Donald Siegel and Griliches, 1992; Erik Brynjolfson and Lorin Hitt, 1993; Igal Hendel, 1993). Some of the gains from computers have been reflected in higher wages of their operators and in the more general rise in the returns to education and "skill" (Chinhui Juhn et al., 1993). More generally, we may be just at the beginning of the computer era, early in its diffusion and learning stages, with most of the productivity contributions still to come, as we learn how to use computers more effectively and

integrate them more efficiently into the existing production structures (Paul David, 1991).

Similar arguments, can be (and have been) made about the difficulties in measuring the contribution of R&D to productivity growth (see Griliches, 1979). From one-third to over half of all industrial R&D is "sold" to the government, either in the form of research contracts and prototypes or indirectly in the form of weapons and space equipment, and its direct productivity effects do not show up in the data at all. Private R&D investment is also likely to have followed the economy and shifted its targets toward the faster-growing sectors, with more invention and technical change occurring exactly where we have more trouble in measuring them.

Not only has the economy shifted into uncharted waters, but even in the "measurable" sectors accelerating rates of change have destroyed the basis for some of the older compromises. Currently, new goods are introduced into the various official price indexes rather slowly. While attempts are being made to reduce the revision cycle in the producer price index from five to two years for some of the more high-tech goods, this may still not be fast enough. In the personal-computers market, for example, the life of a model has recently fallen to a year or less (Berndt et al., 1993).

Dealing with the quality-change problem by treating every version of a product sold to a different type of customer as a separate commodity, as is currently the predominant official practice, creates its own problems. By linking out the decline in prices experienced by consumers in their shift to supermarkets, discount stores, and mail-order purchases, it underestimates significantly not only the output of services, but also the output of some of the more "standard" manufacturing industries (Marshall Reinsdorf, 1993). A prime example of that is the treatment of generics in the pharmaceutical price indexes. The stylized facts are as follows:

(i) Generics are introduced at roughly half the price of the original brand.

(ii) The brand price, however, does not decline (it sometimes even goes up), with the ex-monopolist depreciating optimally her original position and with generics gaining between half and three-quarters of the market for the particular drug.

(iii) But because generic versions are treated as separate commodities, in spite of what the FDA says, the price index does not fall, and since the value of shipments declines as the market shifts to generics (and to hospital and HMO formularies), so does measured "output" in this industry and the associated productivity measures (Griliches and Iain Cockburn, 1993).

This might explain the rather strange fact that during the last decade pharmaceuticals, an industry with one of the highest R&D–sales ratios, had a rather dismal productivity-growth performance. This was the period with an increasing penetration of generics, which should have reduced measured prices in this industry but did not.

The measurement environment has deteriorated also in other ways. There is less willingness on the part of firms and consumers to respond to detailed questions, and our government has done little to emphasize the importance of good economic data to its own functioning or the overall understanding of our economy. The consequence of such deterioration can be illustrated by the uncertainty about the level of industrial investment in basic research, an investment which many think is crucial to our long-run economic performance (Griliches, 1986a). Because the question that asks about the allocation of total R&D expenditures by the "character of work" is not mandatory and is also not an easy one to answer, less than half of all the firms surveyed in 1988 answered it. As a result of such nonresponse, the best that can be done is to produce a "reasonable" range of estimates, based on alternative imputation algorithms, from $2.5 to $8.2 billion (and a "central" guess of $3.9 billion), which leaves us really in the dark as to what has hap-

pened to such investments recently (Eileen I. Collins, 1990).

V. Data Woes

Why are the data not better? The facts themselves are not in dispute. Every decade or so a prestigious commission or committee produces a report describing in detail various data difficulties and lacunae: the Stigler committee report on government price statistics (National Bureau of Economic Research, 1961) is still a living document, as are the related Ruggles report (Richard Ruggles, 1977), the Rees productivity report (National Academy of Sciences, 1979), the Bonnen report (J. T. Bonnen, 1981), the Creamer GNP improvement report (D. Creamer, 1977), the recent OTA report (Office of Technology Assessment, 1989), and many others. But life goes on, and change in this area is very slow. Why? I don't really have good answers to this question, and the topic itself is much larger than can be handled in this address, but at least three observations come to mind:

(i) The measurement problems are really hard.

(ii) Economists have little clout in Washington, especially as far as data-collection activities are concerned. Moreover, the governmental agencies in these areas are balkanized and underfunded.

(iii) We ourselves do not put enough emphasis on the value of data and data collection in our training of graduate students and in the reward structure of our profession. It is the preparation skill of the econometric chef that catches the professional eye, not the quality of the raw materials in the meal, or the effort that went into procuring them (Griliches, 1986b).

In many cases the desired data are unavailable because their measurement is really difficult. After decades of discussion we are not even close to a professional agreement on how to define and measure the output of banking, insurance, or the stock market (see Griliches, 1992). Similar difficulties arise in conceptualizing the output of health services, lawyers, and other consultants, or the capital stock of R&D. While the tasks are difficult, progress has been made on such topics. The work of Jorgenson and Barbara Fraumeni (1992) on the measurement of educational output is an example both of what can be done and of the difficulties that still remain. But it is not reasonable for us to expect the government to produce statistics in areas where the concepts are mushy and where there is little professional agreement on what is to be measured and how. Much more could be done, however, in an exploratory and research mode.[16] Unfortunately, the various statistical agencies have been both starved for funds and badly led, with the existing bureaucratic structure downplaying the research components of their enterprise when not being outright hostile to them, research being cut first when a budget crunch happens (Triplett, 1991).

Our current statistical structure is badly split, there is no central direction, and the funding is heavily politicized. How else can one explain that the national income accounts and the BEA as a whole receive only one-third, and health and education statistics each less than one-half of the funds allocated to agricultural statistics?[17] How does one explain the failure of the most

[16] I refrain from offering a detailed list of my own favorite data improvements; but a census of real wealth (i.e., a survey of structure, equipment, and other resources and their utilization—not just what is on the books, but what is actually out there in the field) would be high on my list. I would also like to see a survey of patent owners on the use and potential value of their property rights.

[17] I am not arguing that too much is being currently spent on agricultural statistics. That would require a substantive analysis, which has not been done. I am saying, however, that the other areas of federal statistics could use both more funding and a redirection of existing funding. We are also currently spending far more on *monthly* employment and average hourly earnings data than we spend to collect all of the other inputs and outputs *annually*. With Congressional prodding, we spend much more on local-markets data than on national-level data.

recent attempt at getting more money for economic statistics, the late "Boskin initiative"? Central economic statistics do not have a clear constituency that lobbies on their behalf. Recent governments seem not to care enough, or to have enough energy to fight for something that has a more distant horizon than the next election. One hopes for some improvement in this situation from the current administration. It has people who know better in reasonably important positions. Still, with the main focus on the daily crisis and the continuing budget battles with Congress, I am not all that optimistic. But if we want progress in this area, if we care, we need to make our opinions heard. We need to convince Congress (and ourselves) that the requests for additional funding of the statistical infrastructure are justified as investments in general knowledge and more informed policy formation; that they are not just self-serving, intended to allow us to publish more articles or run thousands more regressions; that it is indeed important to know what is happening and to understand where we might be going or drifting.[18]

We need also to make observation, data collection, and data analysis a more central component of our graduate teaching. How can we expect our community to fight for the budgets of the BEA, BLS, or Census, if the average student doesn't really know how the data that they use are manufactured or what the national accounts are made of.[19] We also need to teach them to go out and collect their own data on interesting aspects of the economy and to rely less on "given" data from distant agencies.[20] There are encouraging signs that some of this is happening, especially in the micro area. One is much more cheered by work such as that of Robert Fogel (1986) on heights and nutrition, Alan Krueger and Orley Ashenfelter (1992) on twins, Richard Levin et al. (1987) on the appropriability of technology, Rebecca Henderson and Cockburn on pharmaceutical R&D, Richard Freeman and Harry Holtzer (1986) on inner-city youths, Schankerman and Pakes (1986) on patent renewal data, Manuel Trajtenberg (1990a) on CT scanners, and Trajtenberg (1990b) and Adam Jaffe et al. (1993) on patent citations, where researchers go out, collect, and create new data sets, than by the 20,000th regression on the Robert Summers and Alan Heston (1991) data set, illuminating as it may be. But unless we transmit this message to our students, we will not be able to convince others that this is a cause worth supporting.

[18]One should probably worry also about the overall level of support for economic research. As a percentage of total academic research funding, it fell from 1.5 percent in 1979 to 1.2 percent in 1990. While the number of economists doing academic research was rising at 5.5 percent per year, funds per researcher were falling in real terms at −2.3 percent per year, and the Federal share in these funds was also dropping from 48 percent to only 27 percent (in 1989). At the same time, real funds per researcher in the academy as a whole were rising at 0.4 percent per year (National Science Board, 1991). What is it that we have been doing wrong?

[19]The recent shift toward a "three essays" Ph.D. thesis is also not conducive to a serious involvement with data creation.

[20]Unfortunately, the usage is apt. Data already means "given" rather than collected or observed.

PREPARED STATEMENT OF DALE W. JORGENSON

SUMMARY

The Consumer Price Index for All Urban Consumers (CPI-U), published by the Bureau of Labor Statistics (BLS), is the price index used to adjust thirty percent of federal outlays for changes in the cost of living. In 1983 BLS made two significant decisions on the treatment of housing costs. The first was to shift costs for homeowners to a rental equivalent basis beginning in January 1983. The second was not to revise the treatment of housing costs for 1982 and earlier years to reflect this important conceptual change. As a consequence of these decisions, the CPI has a permanent upward bias of more than eleven percent.

Indexing of federal programs to the CPI has had the effect of transferring responsibility for federal fiscal policy from the Congress and the President to technicians who are ill-equipped to perform this policy-making function. The two decisions taken by BLS in 1983 have contributed substantially to the federal deficit and the growth of federal indebtedness. In addition, these decisions have resulted in a massive transfer of resources from the general taxpayer-present and future-to the beneficiaries of government programs indexed to the CPI. It is important to recognize that this transfer cannot be justified as an adjustment for changes in the cost of living.

In testimony before the Committee on Finance Dr. Alan Greenspan, Chairman of the Federal Reserve Board, has proposed the establishment of a commission to recommend annual cost of living adjustments to the Congress and the President. This is motivated by the possibility of systematic biases in the rate of inflation estimated from changes in the CPI. The permanent bias in the level of the CPI resulting from the BLS decisions of 1983 requires a different approach. In this testimony I propose that this bias be rectified as part of a comprehensive program of deficit reduction.

On February 25, 1983, the Bureau of Labor Statistics (BLS) introduced an important technical modification in the Consumer Price Index for All Urban Consumers (CPI-U). This altered the treatment of housing costs by shifting the costs for homeowners to a rental equivalent basis. The change was first announced by Commissioner of Labor Statistics Janet Norwood in a Department of Labor Press Release issued on October 27, 1981. This announcement and subsequent documentation published by BLS [1] provide a detailed rationale for the change.

The rental equivalent measure of housing costs introduced with the CPI-U for January 1983 was a conceptual improvement and has been retained in subsequent official publications. However, housing costs in 1982 and preceding years employed a "homeownership" measure ". . . based on house prices, mortgage interest rates, property taxes and insurance, and maintenance costs." [2] The treatment of housing costs prior to 1983 was not modified in publishing the revised CPI-U, so that the new treatment of housing introduced a discrepancy in the conceptual basis for the CPI-U before and after 1983.

In the accompanying chart I compare the CPI-U with an alternative measure of the cost of living that treats housing on a consistent basis. This alternative measure is based on the implicit deflator for Personal Consumption Expenditures in the U.S. National Income and Product Accounts.[3] Both price indices cover the period 1947 to 1991 and are expressed in terms of 1973 as a base year (1973 = 100.0). Between 1968 and 1982 the CPI grew by more than eleven percent (11.4%), relative to the PCE deflator. Before 1968 and after 1982 the CPI and the PCE deflator grew at essentially similar rates.

What accounts for the difference between the behavior of the CPI and the PCE deflator during the period between 1968 and 1982? Both indices are based on the same primary data source, namely, the information on consumer prices collected by the BLS for the purpose of constructing the CPI. However, the PCE deflator employs a rental equivalent treatment of housing throughout the period, while the CPI uses this approach to housing costs only after January 1983.[4]

In summary, the BLS made two decisions in revising the treatment of housing costs in the CPI-U in 1983. The first decision was to change the treatment of housing costs to a rental equivalent basis beginning in January 1983. The second was

---

[1] Bureau of Labor Statistics (1983).

[2] Gillingham and Lane (1982), p. 9.

[3] Alternative cost of living measures have been analyzed by Jorgenson (1990) and Sleanick (1991). The conceptual basis for cost of living measures is discussed by Diewert (1993).

[4] BLS has developed "experimental" price indices extending back to 1967 based on a rental equivalent treatment of housing, for example, the price index labeled CPI-U X1 in BLS (1988). However, the official version of the CPI-U does not incorporate these data on housing costs before 1983.

not to revise the treatment of housing costs for 1982 and earlier years. As a consequence of these two decisions the level of the CPI-U is more than eleven percent above the level of the implicit deflator for PCE, a measure of the cost of living based on the same primary data sources but with a consistent treatment of housing costs.

The issue posed for fiscal policy makers by the inconsistent treatment of housing costs in the CPI-U before and after January 1983 has been stated with admirable clarity by the Congressional Budget Office (1994):

> The budgetary effect of any overestimate of changes in the cost of living highlights the possibility of a shift in the distribution of wealth. If the CPI has an upward bias, some federal programs would overcompensate for the effect of price changes on living standards, and wealth would be transferred from younger and future generations to current recipients of indexed federal programs-an effect that legislators may not have intended.[5]

The Congressional Budget Office (1994) has pointed out that Social Security is by far the most important of the federal outlays that are indexed to the CPI-U. However, Supplemental Security Income, Military Retirement, and Civil Service Retirement are significant programs that are similarly indexed. Other federal retirement programs, Railroad Retirement, veterans' compensation and pensions, and the Federal Employees' Compensation Act also contain provisions for indexing and are affected by the two decisions taken by BLS in 1983. Altogether thirty percent of federal outlays are indexed to the CPI-U. These outlays are more than eleven percent higher than can be justified on the basis of a cost of living adjustment.

Are federal revenues also affected by the BLS decisions of 1983? The Economic Recovery Tax Act of 1981 indexed individual income tax brackets and the personal exemption to the CPI-U. However, tax changes were initially based only on price changes in 1983 and 1984, so that federal revenues have not been affected by the upward bias in the CPI. Accordingly, policy measures for rectifying the effects of this bias should focus on outlays rather than revenues.

How important are the budgetary consequences of a permanent upward bias of more than eleven percent in the CPI-U? Obviously, a precise answer to this question would require extended study, taking into account the timing of the growth in the bias between 1968 and 1982, the parallel development of indexing provisions in specific federal outlays, and interest on the accumulation of debt that resulted. However, a rough calculation, excluding interest on the accumulated debt, suggests that the bias produced an increase of 3.42 percent in federal outlays of $1.5 trillion in fiscal 1995 or $50 billion. This is more than twenty-eight percent of the federal deficit of $176 billions projected by the Congressional Budget Office (1995).

Important studies by the Congressional Budget Office (1994) and the Federal Reserve Board (1994) have suggested that rates of inflation estimated from the CPI may be systematically biased. This possibility raises different issues from those related to a permanent bias in the level of the CPI. Federal Reserve Board Chairman Alan Greenspan (1995) has suggested in testimony before the Senate Finance Committee that a national commission be created to make annual recommendations for cost of living adjustments to federal revenue and outlays. The existence of a permanent bias in the level of the CPI requires a different approach.

The bias of more than eleven percent in the level of the CPI was created by a growing discrepancy between the CPI and a cost of living index such as the implicit deflator of PCE during the period 1968 to 1982. After the two BLS decisions of 1983 this bias stopped growing and contributed nothing to the rate of inflation. The increases in federal outlays resulting from this bias are the consequence of an inappropriate treatment of housing costs before 1983 and cannot be justified as cost of living adjustments. These increases have resulted in huge transfers to beneficiaries of indexed programs that are totally devoid of any economic rationale.

The Committee on Finance is now entering a debate over the elimination of the federal deficit. A successful deficit reduction program must balance the interests of a large number of federal constituencies-all of whom could benefit from deficit reduction. However, equalizing relative gains from deficit reduction will require the use of a wide array of policy instruments. Elimination of the transfers resulting from the upward bias in the level of the CPI is an important policy instrument for deficit reduction. In fact, the employment of this instrument as part of a comprehensive program could greatly facilitate the imposition of outlay reductions that might otherwise be politically infeasible.

---

[5] Congressional Budget Office (1994), p. 32.

References

Bureau of Labor Statistics (1983), "Changing the Homeownership Component of the Consumer Price Index to Rental Equivalence," Washington, U.S. Department of Labor, February 25.

——— (1988), "Experimental Measures," Washington, U.S. Department of Labor, February 16. Congressional Budget Office (1994), "Is the Growth of the CPI a Biased Measure of Changes in the Cost of Living?" CBO Papers, Washington, Congress of the United States, October.

——— (1995), "The Economic and Budget Outlook: Fiscal Years 1996-2000," Report to the Senate and House Committees on the Budget, Washington, Congress of the United States, January.

Diewert, W. Erwin (1993), "Index Numbers," in W. Erwin Diewert and Alice O. Nakamura (eds.), Essays in Index Number Theory, Amsterdam, North-Holland, pp. 71-105.

Gillingham, Robert, and Walter Lane (1982), "Changing the Treatment of Shelter Costs for Homeowners in the CPI," Monthly Labor Review, June, pp. 9-14.

Greenspan, Alan (1995), "Testimony," Committee on Finance, United States Senate, March 13.

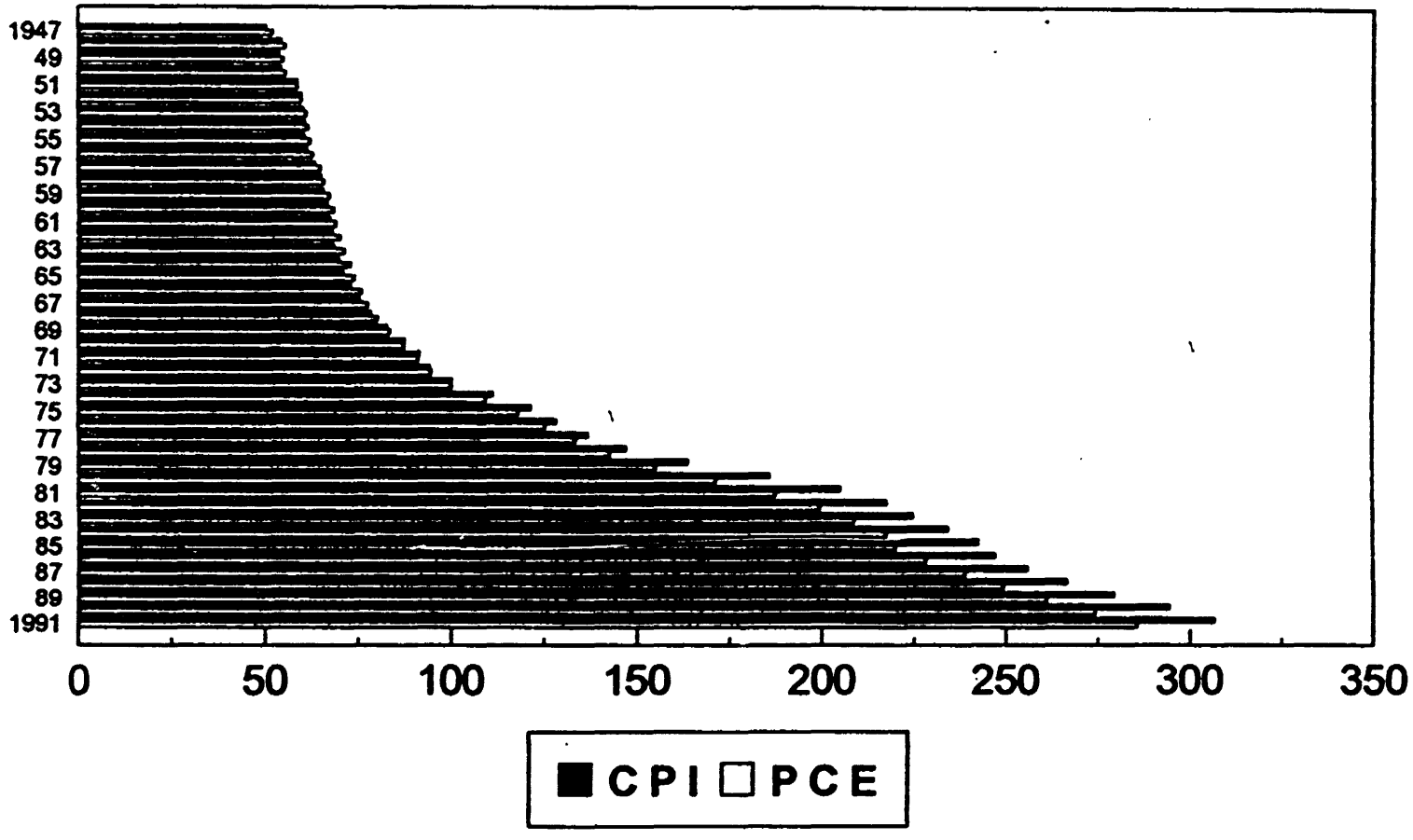
Jorgenson, Dale W. (1990), "Aggregate Consumer Behavior and the Measurement of Social Welfare," Econometrica, Vol. 58, No. 5, September, pp. 1007-1040.

Lebow, David E., John M. Roberts, and David J. Stockton (1994), "Monetary Policy and 'The Price Level'," Washington, Board of Governors of the Federal Reserve System, August.

Norwood, Janet L. (1981), "Statement Regarding Changes in the Consumer Price Index," News Release 81-506, Washington, U.S. Department of Labor, October 27.

Slesnick, Daniel T. (1991), "Normative Index Numbers," Journal of Econometrics, Vol. 50, Nos. 1/2, October/November, pp. 107-130.

Time Series 1947-1991



PREPARED STATEMENT OF JANET L. NORWOOD*

Mr. Chairman and Members of the Committee: It is a great pleasure for me to appear once more before this Committee. I am especially pleased to have the opportunity to discuss issues relating to the calculation of the Consumer Price Index (CPI). My knowledge of the CPI goes back a long way. I served for several years as Chief of the Division at the Bureau of Labor Statistics (BLS) with direct responsibility for compiling the index, and later as Deputy Commissioner and Commissioner, I was responsible for overseeing CPI compilation and improvement as a part of the overall labor statistics programs. I encouraged BLS research on the index and supported publication of the findings. I note that much of the current controversy about the CPI is based on research done at the Bureau

The invitation to provide testimony this morning assumes that the CPI is overstated and needs to be "fixed." The assumption is that professional economists, public policy analysts, and the general public have clear knowledge that the CPI is too high, that they know the precise amount of that overstatement, and that they know exactly how to improve it. I do not agree with that view. It is true that researchers have found examples of overstatement in individual components of the CPI, but I know of no comprehensive examination of all components, including those which may be understated. While it may well be true that the indexation of entitlement programs has proved to be expensive, it is not at all clear that the problem with indexation is that the overall CPI overstates the rate of inflation. The CPI, like all other statistical measures, is not perfect; but it comes out extremely well when compared to the indexes of most other industrialized countries.

The CPI is one of the most complex of all of the government's statistical indicators. It involves massive data collection and compilation, all accomplished on a very short time horizon. The CPI(U) covers the expenditure experience of the urban population of the country, whereas the CPI(W), currently used in most federal government indexation, covers a much smaller group, only about 32 percent of the population. In the past, I have testified before Congressional Committees on the possibility of compiling special indexes, e.g., to represent the expenditures of the older population. Thus far, however, no complete program of data collection relevant to the older population or any other special group has been undertaken.

Many of my colleagues in the economics profession have reviewed with the Committee their work on aspects of the CPI which conclude that, for the component or products covered, the CPI overstates the rate of price change. These studies usually point to three general problems in index making: (1) substitution in response to relative price change; (2) problems associated with the introduction of new items; new retail outlets, and (3)the manner of adjusting the price for a change in the quality of a product. Let me briefly discuss my views on each.

SUBSTITUTION IN RESPONSE TO RELATIVE PRICE CHANGE

People often change the quantities that they buy in response to changes in the prices between commodities, substituting the cheaper for the more expensive one. This is an important issue, although there is general agreement in the research community that the effect of this substitution has been an upward bias, but the amount of the bias has been quite small. This issue is, of course, associated with what is usually referred to as the "market basket" or "fixed weight" effect.

Some have suggested that changing the weights more frequently, even every year, would produce more accuracy. BLS practice has been to revise the CPI once every 10 years, but there is nothing magic about the 10-year interval. In fact, budget problems have sometimes extended the interval. I believe that the CPI should remain a base-weighted index and would, therefore, oppose an index which shifted weights each year. But, if empirical research demonstrated the desirability of more frequent updating—say at 5- or 7-year intervals instead of 10 years, that might be a useful thing to do. In the meantime, Congress should provide for automatic consideration of CPI revision plans at least once each decade. Periodic revision of the CPI should be an integral part of the CPI program, and steps should be taken to ensure that a budget for a revision be submitted for Congressional consideration in the year following the taking of the decennial Census. This could be accomplished by providing the BLS with a periodic budget in addition to its current budget, in much the same way as the periodic consideration of the Economic and Agricultural Censuses are handled.

---

*Any opinions expressed herein are solely the author's and should not be attributed to The Urban Institute, its officers, or funders.

INTRODUCTION OF NEW PRODUCTS AND OUTLETS

Some researchers have concluded that the problems associated with the introduction of new products and retail outlets result in upward bias in the index. While BLS has already taken steps to improve many of its procedures to reduce those biases, problems associated with the introduction of new products remain one of the most difficult problems in index compilation.

I believe, however, that the outlet sample revision (and the associated item sample initiation) would be improved if it were carried out over a shorter cycle than the current 5-year pace. The original plan for outlet rotation proposed in 1978 was to use a 3-year rotation cycle (one third of the CPI each year). Unfortunately, budget constraints that remain in effect today forced extension of outlet rotation to a 5-year cycle. One additional point should also be made here. The very small sample size for the continuing Consumer Expenditure Survey (CE), from which the CPI market basket is drawn, is a considerable constraint on the BLS in its work to improve the CPI. It took the BLS some 30 years to get authorization to conduct the CE on a continuing basis, rather than once every decade as a part of a CPI revision. It is time to put that program on a sounder foundation by expanding CE sample size.

QUALITY CHANGE

One of the most widely discussed criticisms of the Consumer Price Index is that it does not adequately adjust for changes in the quality of the goods and services that are priced, and many economists believe that this problem of quality improvement results in CPI overstatement. But this is not a new issue, nor is there much agreement on the extent of the possible resulting bias. More than 25 years ago, when I was in the price Research Division at the BLS, economists were studying quality change issues. We have learned a lot since that time, and many improvements in adjustment—some suggested by economists on this panel today—have been incorporated in the index. But the fact is that we do not know how to solve the problems caused by the changes in quality for all of the goods and services priced for the index. Indeed, we cannot even be sure that quality has improved for some of these items. While many improvements have occurred, especially in technologically advanced areas, we also all know of areas in which a deterioration in quality has occurred. The BLS makes a very strong effort to ensure that changes in quality are taken into account, but it is difficult, sometimes impossible, to isolate the exact effect of some quality changes.

The point of all this is that quality changes are made for many products when the data required are available, but that we do not know how the quality improvements balance off against the quality deterioration that has also taken place. Last week, for example, on an airplane trip to Texas, I was informed that meals and even snacks had been discontinued for flights of 3 hours or less. I am not aware of any upward adjustment for that reduction in quality. On occasion, the electricity service in my vacation home in Maine shuts off, but my electric bill is not adjusted for this "blackout." The deterioration in our nation's educational system has been discussed for many years now, but the larger and larger class sizes, the increasing inadequacies of university library facilities, and the shifting of resource allocation from the teaching staff to administrative staff does not result in an upward adjustment in the cost of college tuition in the CPI.

Many of the CPI's critics believe that the things that people buy are always improving and that the change in quality can be easily recognized, that data are available for use in the index, and that the methods of adjustment are always clearly understood. But the issues are complex, and problems abound. Take, for example, the BLS index for automobiles, where quality adjustments have been made for many years now. During the 1950's and 1960's, BLS adjusted for the improved quality that occurred as automobiles became larger and more powerful. In the 1970's, however, the reverse was true. The downsizing of engines and automobile size was considered a quality improvement. As government environmental and safety regulations have affected the manufacture of automobiles, the new car prices were adjusted downward for the improved quality, even though many consumers would not have purchased the additional equipment out of choice.

In short, there is much we know about price measurement, but much remains to be discovered. A great deal of progress has been made, although there is, of course, more to do. I believe that we know neither the amount of the quality change effect nor whether it causes the index to be over- or under-stated.

THE CPI AND THE POLICY OF INDEXATION

The indexation of Social Security benefits and other government programs was initiated by the Congress in an effort to provide recipients with protection from inflation. Indexation removed Congressional discretion by making the escalation automatic through use of an objective, non-political statistical measure—the CPI. Twenty years ago, when automatic CPI indexation was initiated, the effect was in fact to slow the rate of Social Security payment increases.

Today, we face a different situation. The problem, I submit, is not how to adjust the CPI, but whether the country can afford the amount of indexation provided by law. The question here is not one of measurement but rather one of social and economic policy. The Congress should not attempt to solve a political problem by legislating the level of a statistical index. I can think of nothing that would be more damaging to the nation's statistical system.

PREPARED STATEMENT OF JUNE E. O'NEILL

Mr. Chairman and Members of the Committee, I am pleased to be with you this morning to comment on the consumer price index (CPI). The CPI is widely used as an indicator of inflation and changes in the cost of living. It is of considerable importance to the federal budget because it is used to index benefits in major entitlement programs as well as to adjust income tax brackets. Yet many experts argue that the CPI consistently overstates changes in prices and, therefore, provides an inaccurate measure of changes in the cost of living. That potential upward bias in cost-of-living adjustments has spurred the recent controversy about the CPI.

The Congressional Budget Office's (CBO's) review of available evidence indicates that the CPI does in fact overstate the increase in the cost of living for the overall population. The extent of that upward bias is not known with certainty. But the empirical evidence, which addresses many but not all of the possible sources of bias, indicates that the CPI probably overstates growth in the cost of living by between 0.2 and 0.8 percentage points a year. Other potential sources of bias that have not yet been verified empirically may offset to some extent or greatly add to the measured overstatement.[1]

WHY THE CONSUMER PRICE INDEX IS IMPORTANT

Measuring changes in the cost of living has important effects on the federal budget and, as you are well aware, is particularly important for those portions of the federal budget over which this Committee has jurisdiction. The rate of increase of the CPI determines the size of the cost-of-living adjustment for Social Security and other federal transfer programs, and it is also used to adjust income tax brackets and personal exemptions. For example, if the CPI grew 0.5 percentage points slower than the CBO budget baseline assumes from 1996 through 2000, but all other aspects of the economic forecast were unchanged, by the year 2000 tax collections would be close to $10 billion higher and spending would be $13 billion lower than CBO currently projects (see Table 1).[2] If one includes the effects of the savings on debt service, the deficit in 2000 would be about $26 billion lower.

Although the CPI has a huge effect on the federal budget, everyone should be concerned about the accuracy of available measures of the cost of living even if the budget was not directly affected. Measuring changes in prices has important effects on people's perceptions of the performance of the U.S. economy, including growth of real output, productivity, wages, and the standard of living in general. If the change in the CPI overstates the actual growth in living costs, we will be misled into thinking that the growth of the U.S. standard of living is slower than is actually the case. Exaggeration in the CPI also means that the growth rates of real gross domestic product (GDP), productivity, and real wages will appear to be lower than they actually are. GDP and measures of productivity are affected because detailed CPI price series are used as price deflators for roughly 60 percent of the expenditures that make up the GDP. If the growth of those prices is overstated, the growth of real expenditures—that is, real GDP—will be understated. In turn, measures of productivity are affected because productivity is essentially real GDP divided by total hours worked.

---

[1] See Congressional Budget Office, *Is the Growth of the CPI a Biased Measure of Changes in the Cost of Living?* CBO Paper (October 1994).

[2] The Bureau of Labor Statistics currently publishes two versions of the consumer price index. One (the CPI-U) is based on the spending patterns of all urban consumers (about 80 percent of the population); the other (the CPI-W) is based on the spending patterns of only urban wage earners and clerical workers (32 percent of the population). The CPI-W is used as the cost-of-living adjustment for Social Security, whereas the CPI-U is used for the income tax.

TABLE 1.—EFFECT ON THE DEFICIT IF CPI GROWTH IS 0.5 PERCENTAGE POINTS SLOWER THAN ASSUMED IN THE CBO BASELINE

(In billions of dollars)

	1996	1997	1998	1999	2000
Change in Revenues[1]	−0.9	−2.0	−4.5	−6.7	−9.6
Change in Outlays Social Security and Railroad Retirement	−1.3	−3.1	−5.1	−7.1	−9.3
Supplemental Security Income	−0.1	−0.2	−0.4	−0.6	−1.0
Civil Service Retirement	−0.1	−0.3	−0.5	−0.8	−1.0
Military Retirement	(2)	−0.2	−0.3	−0.6	−0.8
Veterans' compensation and pensions	−0.1	−0.2	−0.3	−0.3	−0.5
Earned income tax credit[1]	(2)	−0.3	−0.5	−0.9	−1.2
Other[3]	(2)	(2)	(2)	(2)	(2)
Offsets[4]	(2)	(2)	0.1	0.2	0.4
Change in Total Outlays	−1.5	−4.3	−7.0	−10.1	−13.3
Debt Service	−0.1	−0.4	−1.0	−2.0	−3.3
Change in Deficit	−2.5	−6.7	−12.5	−18.8	−26.2

SOURCE: Congressional Budget Office.

[1] Preliminary estimates by CBO. The Joint Committee on Taxation would estimate any actual legislation. Revenue increases are shown with a negative sign because they reduce the deficit.

[2] Less than $50 million.

[3] Federal Employee Compensation Act, foreign service retirement, Public Health Service retirement, and Coast Guard retirement.

[4] Includes Medicare, Medicaid, and Food Stamp offsets to cuts in the Social Security cost-of-living adjustment.

The operation of government policy also can be misled if price measures are faulty. The uncertainty about the CPI can affect monetary policy, although the monetary authorities also consider other measures of price change as well as additional information on wages and use of capacity. The mismeasurement of price change could, however, affect other policies even more. Distortions in measures of the growth in real wages or output, or in the measure of the number of families in poverty (which is determined in part by the CPI measure), can affect both specific programs and fiscal policy in general.

The budgetary impact of overestimated changes in the cost of living also results in an unintended shift in the distribution of wealth. If the CPI had an upward bias, some federal programs would grow too fast because they overcompensate for the effect of price changes on living standards. Consequently, wealth would be transferred from younger workers and future generations to current recipients of indexed federal programs—an effect that legislators may not have intended.

CAUSES OF OVERSTATEMENT IN THE CPI

The CPI is basically a fixed-weight index of prices. The weights are determined by surveys of how urban residents spend their money, and the current CPI uses as weights the average spending patterns of more than 10 years ago—specifically, the 1982-1984 period. Collecting the prices used in constructing the CPI is a large and complex endeavor. The Bureau of Labor Statistics (BLS) surveys about 25,000 outlets each month and collects prices for about 95,000 goods and services. The task is magnified by the need to bring new items and outlets into the survey regularly.

Three problem areas have been identified as contributing to an upward bias in the measures. First, the index does not fully capture changes in consumer buying patterns that offset price increases. Second, a technical problem exists that relates to the rotation of store outlets. Third, adjustments for improvements in the quality of goods and services (including the introduction of new goods) appear to be inadequate.

SUBSTITUTION BIAS

Consumer buying patterns change in part in response to changes in relative prices. Because the CPI is a fixed-weight index with the weights based on the 1982-1984 market basket, it does not reflect how consumers substitute relatively low-priced goods for high-priced goods. To use a common example, if the price of chicken rises relative to the price of beef, consumers will buy more beef and less chicken, thereby mitigating the adverse effect of the price increase in chicken on their standard of living. A strong consensus exists that the CPI overstates the change in the cost of living by about 0.2 percentage points because it does not take into account

how consumers respond to changing prices. That source of overstatement in the cost of living by the CPI is referred to as substitution bias.

SAMPLE ROTATION BIAS

In 1978, in an effort to keep the mix of items and outlets up to date, the Bureau of Labor Statistics instituted a procedure called sample rotation, in which 20 percent of the outlets used in the CPI surveys could be updated every year. Surveys of consumer shopping patterns are conducted, and the items selected for use in the CPI come from the outlets that consumers most commonly use. That process permits new products as well as new outlets to enter the survey.

Although the procedure of sample rotation improved the quality of the CPI on balance, the BLS discovered that its benefits may have been partially offset by an upward bias inherent in the procedure. Items that increased more rapidly in price in the months following the rotation of outlets in the CPI survey tended to be given too much weight in the index, thereby creating an upward bias in measured prices.

The prices of items most subject to bias from sample rotation are those that vary a great deal, such as food and clothing prices. However, as of last January, the BLS instituted a procedure that is expected to remove the bias for food prices. Moreover, procedures the BLS introduced a few years ago may have eliminated some of the bias from sample rotation for clothing. The remaining bias stemming from sample rotation might still contribute 0.1 percentage point toward overstating the cost of living.

CHANGES IN QUALITY

The third major reason for the overstatement of changes in the cost of living reflects the difficulties in accounting for changes in quality—including, as an extreme aspect of the quality problem, the advent of entirely new goods or services. For example, if the price of a tire increases but the quality of the tire is improved, then the change in the cost of living cannot be measured as simply a change in price. If the price doubles but the tire lasts twice as long, and other important qualities of the tire (traction, ride, and the like) are also better, then the quality-adjusted price change may in fact be zero or even negative.

Accounting for changes in quality, however, is often extremely difficult. Estimating changes in quality is relatively easy for some goods and services, such as tires. But it is much more difficult to adjust for the change in the quality of banking services as a result of widespread use of automatic teller machines or the change in the quality of audio equipment. Furthermore, some goods and services may defy attempts to estimate changes in quality. How, for example, could one adjust a physician's prices for changes in the ability of the physician to make the correct diagnosis?

In fact, measuring the prices of medical care presents some of the thorniest problems in price measurement. One major problem is identifying what product to measure. Should the index track the prices of various treatments, or should it track specific procedures? Tracking specific procedures—such as a course of antibiotics, a type of surgery, or a day in the hospital—could be extremely misleading. If an appendectomy required four days in the hospital 10 years ago but currently entails only one day, then an index that measures the cost of a hospital day could seriously misrepresent the changes in the true cost of treating appendicitis. Similarly, if surgery for a specific condition was replaced by a drug treatment that was cheaper and just as effective, the cost-of-living index would be inaccurate unless it reflected that switch from surgery to drug treatment.

The CPI does not account for many types of changes in the quality of medical care. Virtually every aspect of medical care has undergone rapid technological change. The treatment of cataracts, the quality of diagnostic equipment, dental services, surgical techniques, anesthetics, and so forth have changed radically in the last 20 years. But it would be extremely difficult to place a value on such changes in quality—for example, the welfare benefit of a new type of anesthetic.

A few studies have focused on certain problems in the health area. Studies of prescription drugs indicate that current price measures grossly overstate the increase in quality-adjusted prices, primarily because of inadequate adjustments for quality but also because generic drugs are given too little weight. The amount of research in other areas of medical care is too sparse, however, to assess the extent of potential mismeasurement.

New goods and services present some of the same problems, which are compounded by the need to identify the new goods as soon as they become a significant part of consumer purchases. The introduction of videocassette recorders (VCRs) is a good example of the problems posed by new goods. VCRs were brought into the

CPI survey slowly, with a weighting that understated their importance in consumer purchases. Consequently, the initial decline in the price of VCRs was not fully reflected in the CPI. The introduction of VCRs, and other successful new products, increased the welfare of consumers (as evidenced by rapid acceptance of VCRs by consumers even at their initial high prices).

In theory, a price index should reflect the increase in welfare that accompanies the introduction of a successful product. Unfortunately, the procedures for doing so are difficult, and the procedures do not always result in conclusive estimates of the increase in welfare.

The Bureau of Labor Statistics makes adjustments for quality change for numerous components of the CPI, and indeed in some instances it may overadjust for quality change, thereby understating the price increase for that item. However, although more research is needed to determine the extent of bias, on balance the CPI is believed to understate improvements in quality. Because of the paucity of studies in this area, the range of estimates of bias that stems from the problems of quality adjustment is large. Some analysts believe that the bias may be small, on the order of 0.2 percentage points, whereas others feel that it may be as much as 1 percentage point.

WHAT CAN BE DONE?

There is no obvious, simple way to measure accurately changes in the cost of living. Over the years, the Bureau of Labor Statistics has sought to make the CPI a better measure of price change—in fact, much of the best research on the CPI has been produced by the BLS—but many difficulties remain.

The problem the government faces is that the CPI has been used to index benefits and income tax brackets as though it was a true cost-of-living measure. Consequently, the upward bias in the CPI has had the unintended consequence of increasing the deficit. In dealing with that problem, however, policymakers need to proceed cautiously in advocating changes to the CPI. The credibility of the CPI as well as the process of revising the CPI should be maintained. A major reason for the CPI's wide acceptance is its credibility. A reliable index is needed so that individuals, firms, and the government will be willing to enter into long-term contracts that are implicitly or explicitly indexed for price change.

There are three, not necessarily exclusive, options that this Committee could pursue in response to the CPI problem: 1) maintain the status quo, awaiting scheduled changes in the CPI and supporting the efforts of the Bureau of Labor Statistics to improve the CPI as a measure of inflation; 2) determine, with the assistance of a panel of experts, an adjustment factor that could be applied to the CPI in the short run to bring it closer to a true cost-of-living index; and 3) establish a commission to examine thoroughly the indexes used to adjust government programs for increases in the cost of living and recommend how best to measure the cost of living.

The downside of the first option—maintaining the status quo—is that deficits will continue to grow as a result of flaws in the cost-of-living adjustments. The bureau is continually trying to improve the CPI. In 1998, the Bureau of Labor Statistics will conduct a major revision of the index, in which the base period will be changed to 1993-1995; other modifications may be introduced at that time. Moreover, the BLS is conducting research on other issues, which may bring improvements in the long term. But those scheduled changes would still potentially leave a substantial upward bias in the CPI.

The second option, which would call for legislative action on the part of this Committee, recognizes that some consensus exists on the apparent magnitude of bias in the CPI, particularly concerning the lower bound. For example, a number of studies over the years have found that bias from commodity substitution alone is on the order of 0.2 percentage points a year. Although the bias may lessen as the BLS improves its calculation of the CPI, the evidence suggests that subtracting 0.2 percentage points from the CPI-U as it is currently calculated is warranted.

Other potential biases have not been researched sufficiently to provide the basis for a consensus. However, a panel of experts could weigh the available evidence and advise the Congress on the approximate degree to which the CPI may overstate increases in the cost of living. That undertaking would not entail changing the calculation of the CPI itself. If an adjustment factor could be agreed on, the statutory formulas for indexing could be changed to reflect that adjustment.

The third option—establishing a commission to undertake a broad review of indexation—recognizes that the appropriateness of the indexes now used may require a comprehensive review. For example, the CPI-W is used to index Social Security payments, but there is no reason to believe that the spending patterns of urban wage and clerical workers are representative of the spending of Social Security re-

cipients. In addition, it may be more appropriate to include government services in the mix of goods and services that are priced, or to use a different weight for medical care than that used by the CPI.

CONCLUSION

The CPI has considerable effects on the federal budget—both on spending and revenues. Further, people's perceptions of the economy and the soundness of economic policies depend on the quality and appropriate use of the CPI. The current debate about the degree to which the CPI can be used as a cost-of-living index should yield positive results. Although many of the questions raised about the index cannot be easily answered, the effort to improve the CPI will set the basis for more informed policy in the future.

RESPONSES TO QUESTIONS FROM SENATOR PRYOR

Question 1: Over half of the "new" drugs produced by the pharmaceutical industry over the past 12 years duplicated drugs already on the market. Those drugs which are truly innovative, or breakthrough, in nature are also largely immune to competition and other market forces, according to the Office of Technology Assessment (OTA). As a result, manufacturers have charged as much as $350,000 a year for breakthrough drugs such as Ceredase. How has CBO accounted for these factors in its analysis?

Answer: CBO concluded that the CPI overstates the rate of increase in the cost of living caused by changes in prescription drug prices and that this probably causes an upward bias in the overall CPI of 0.1 percentage point or less. That conclusion was based on a review of four studies that collectively cover a large fraction of prescription drug sales. The studies focused on the quality adjustment of prices and the degree to which the official price measures may be giving too little weight to generic drugs.

CBO's analysis did not specifically address how many of the new drugs duplicate drugs already on the market or the degree to which drug pricing is immune from competition. Failure to address those questions does not undermine the conclusion of the analysis, however, since its purpose was to investigate whether the CPI measures prices appropriately for use as a cost-of-living index, not the degree of price competition.

It should be noted, however, that even though many of the new drugs may not serve to dramatically increase medical capabilities, they can bring price competition into a therapeutic area. According to one study sponsored by the pharmaceutical industry, in therapeutic areas in which treatments already existed, new drugs introduced during 1991 and 1992 were launched with prices that averaged 14 percent below those of the market leader. New products in the most active therapeutic categories averaged 36 percent less.[1] Another recent study analyzed 148 drugs introduced into the U.S. market between 1978 and 1987. The authors found that more than half of those substances that provided the same benefits as existing drugs but offered no increase in therapeutic potential were introduced at prices below the market leaders, and the study concluded, "both the introductory price and subsequent price increases are lower when there are more substitutes in the market."[2]

In instances in which there are only one or two imitators, competitive pressures may not be substantial. In many cases, several drugs will be appropriate to treat a given condition but will be imperfect substitutes. Each drug may have its particular strengths, weaknesses, and side effects. Thus, a doctor may treat the same malady differently in different patients. Even when firms compete, they may primarily use nonprice factors to do so. A firm may, for example, increase its promotional efforts as a way of increasing market share. Price competition is more likely to occur after several rival manufacturers enter the scene. The fact that some drugs may not have close substitutes gives the pharmaceutical companies some market power.

Ceredase, although expensive, is used to treat a rare condition that affects an estimated 5,000 people worldwide. Consequently, it does not figure largely, if at all, in the buying patterns of the typical consumer and in the CPI. Furthermore, Ceredase is an extreme case that has not been replicated since its approval in 1991. There have been other expensive drugs, and other breakthrough drugs, but none that has reached this level of cost.

---

[1] Boston Consulting Group, *The Changing Environment for U.S. Pharmaceuticals* (New York: Boston Consulting Group, April 1993), pp. 8-9.

[2] John Lu and William S. Comanor, "Strategic Pricing of New Pharmaceuticals" (paper presented at the American Economics Association, Boston, Mass., January 1994), p. 26.

Breakthrough drugs do not account for the largest amount of consumer spending on prescription drugs. The drugs that dominate U.S. pharmaceutical spending, and hence are likely to affect the CPI, are to be found in therapeutic categories such as ulcer medicine or antihypertensives where they often face some (albeit imperfect) brand-name competition, which limits the ability of any single company to raise prices arbitrarily. Furthermore, in most major therapeutic categories, one or more of the major brand-name drugs has come off patent, permitting generic entry. By the end of 1995, eight of the 20 best-selling drugs in the United States will no longer enjoy patent protection. That may reduce the ability of producers of other drugs in the same therapeutic categories to sustain major price increases.

Question 2: At present, there is widespread debate over how best to objectively measure the cost-effectiveness of new prescription drugs. Reliable metrics are still being developed and have yet to be uniformly implemented or accepted. In the absence of established methods, how can price measures be modified to capture qualitative improvements attributable to new therapies?

Answer: Although it is difficult to determine quality-adjusted prices for prescription drugs, it is possible to develop better price indexes than are now used for a significant number of drugs. When a variety of drugs for treating a specific condition have been available for a fairly long time—say, 10 or 15 years—it is possible to glean some evidence about the value of drug improvements to users. Many drugs fall in that category, and studies have provided useful evidence about how to develop quality-adjusted price indexes for such drugs.[3] Although such studies do not provide conclusive results about quality adjustment and have many shortcomings (they are subject to error and are both expensive and time-consuming), they indicate that some quality adjustment is possible. It might be impossible, however, to make estimates of quality adjustments for a number of drugs, particularly those that have dramatically different attributes than existing drugs or have not been on the market long enough.

Therefore, price indexes could be developed to capture qualitative improvements attributable to new therapies for some new drugs, but developing reliable estimates of quality change may not be possible for new therapies that are dramatically different from existing drugs.

Question 3: The October 1994 CBO analysis points out that "the price of many patented drugs increases rapidly when generic drugs become available . . . some manufacturers may feel that they can maximize their profits by raising prices when their patent expires." Indeed, 60 percent of all generic drugs in the United States are sold by brandname manufacturers.

Has CBO updated its analysis to reflect the growing trend in "shadow pricing," whereby brandname manufacturers introduce generic drugs at prices which closely track those of the original, brandname products? Is CBO aware of any statistics documenting the reduction in cost savings which has resulted from this trend?

Answer: CBO is not aware of any major statistical or academic studies on pricing and market shares of generic drugs that have appeared since its October 1994 report on the CPI. At that time, the academic literature clearly suggested that competition from generic drugs reduced the average cost of treatment, although it may have increased the price charged for the brand-name drug.

Recent trade magazines are consistent with the earlier academic literature, Over the past year, evidence suggests that the brand-name companies have been more aggressive than ever in reducing the prices of their generic versions of products coming off patent, in hopes of retaining market share.[4] That move by brand-name manufacturers has slowed the growth of the companies that manufacture only generic drugs, while not slowing the growth of generic drugs or the degree of price competition.

Question 4: A recent GAO study recently found that Americans pay 32 percent more for their prescription drugs than our Canadian neighbors. Recent history has also shown how the cost of new drugs can severely strain the financial resources of families and consumers who live on fixed incomes, such as many older Americans.

---

[3] See Valerie Y. Suslow, *Are There Better Ways to Spell Relief? A Hedonic Pricing Analysis of Ulcer Drugs*, Conference Paper (Washington: D.C.: American Enterprise Institute, October 1993); Ernst R. Berndt and Stan N. Finkelstein, *Price Indexes for Anti-Hypertensive Drugs That Incorporate Quality Change: A Progress Report on a Feasibility Study*, Working Paper No. 6-92, Program on the Pharmaceutical Industry, Sloan School of Management (Cambridge, Mass.: Massachusetts Institute of Technology, 1992); and A. Afuah, *Technical Progress and Product Market Success in Pharmaceuticals: The Case of Chalesterol Ethical Drugs*, Working Paper No. 3495-92, Program on the Pharmaceutical Industry, Sloan School of Management (Cambridge, Mass.: Massachusetts Institute of Technology, 1992).

[4] For instance, see "Generic Market Invaded by Majors," *MedAd News* (November 1994), pp. 1 and 29.

Wouldn't prescription drug prices play an important role in a cost-of-living index for older Americans?

Answer: Prescription drug prices are more important for older people than for the population as a whole. As of December 1994, the relative importance, or weighting, of out-of-pocket expenditures. on prescription drugs was about 2.0 percent for households headed by someone 62 or older, compared with 0.9 percent for all urban households. Therefore, if an official cost-of-living index for the elderly was developed, prescription drugs would have a greater weight than in the current CPI-U.

PREPARED STATEMENT OF ARIEL PAKES

Economic theory tells us that the change in the index of prices facing a given consumer in a given period is the change in expenditures that are needed in order to leave that consumer just as well off in the current period as the consumer had been in the previous period. Probably the simplest way of getting an estimate of this expenditure change is to take the basket of goods bought last period, use current period prices to calculate the expenditures needed to buy that same basket this year, and then compare the calculated number to expenditures in the earlier period. This is equivalent to computing a weighted average of the price changes between the two periods, with weights equal to the share of the good in expenditures in the initial period.

This simple procedure is in fact very close to what the BLS does. The basic difference is that the BLS calculates the change for a "representative" urban consumer, and the weights it uses for different commodity groups in the basket are held fixed over a longish period (usually over a decade; as noted below there are larger conceptual differences in the way the price changes are calculated in a small number of commodity groups). The goods within the commodity group do change periodically because of their sample rotation procedures (about 20% of the products are replaced each year, so the whole sample is replaced every 5 years), and because goods disappear from the market, or rather from the market outlet that is being sampled, and when they disappear they are replaced by similar goods at the same outlet (this occurs to about 4% of the products each year).

As noted the theory produces a different CPI for each individual depending on the goods that the individual purchases, while the BLS is done for a representative urban consumer. That is the BLS uses a representative basket of goods, a representative sample of the outlets at which those goods are purchased, and representative varieties of the good in the chosen outlet. The first point to note then is that, given how the CPI is used, it would seem to be worthwhile to calculate both the index and the bias adjustments separately for average households in different age-income-family size classes. This might require some change in sampling procedures (a reorganizational cost that should be small) and if we want to get precise estimates for detailed classes we might need to expand the size of the samples being used somewhat (this might be more expensive). However, given data and an agreed upon procedure it is easy enough to do the calculations for the different groups.

I will not belabor this point below, but I want to state at the outset that there is good reason to believe that several of the bias adjustments that I (and others) are discussing here are likely to have very different implications for households with different demographic and income characteristics. Thus if we ignore the demographic and income breakdown the changes will favor some groups over others. I leave you to judge both the normative and the political implications of implementing such changes.

I now move on to likely biases in the way the index is calculated; i.e. to measures of the difference between the expenditure change that would leave the consumer's welfare unchanged between the two periods and the expenditure change implicit in the way the CPI is constructed. Even in a world where; i) all households had the same preferences and income, so that they all agree which baskets of goods are preferred to others, ii) and the goods available did not change over time, there is still a source of bias in the way the CPI is calculated. To see this note that since relative prices have changed in the second period, a consumer given an increase in expenditures equal to the CPI's price change supplement should be able to do better than buying the same basket he did last year by substituting out of those goods that have become relatively more expensive and substituting into those that have become cheaper.

What the CPI calculation does is insure that the consumer could consume the same basket as last year and hence attain the same level of welfare. Once we allow for substitution effects the expenditure change implicit in the CPI will generally allow the consumer to do better. This "substitution" bias can be computed by actu-

ally analyzing preferences directly and computing the change in expenditures that would be needed in order to leave the consumer just as well off in the current period as in the last period (allowing the consumer to substitute in the way the consumer desires to substitute). The answer depends on precisely how the analysis is carried out, which is perhaps why the substitution adjustment is not currently done at the BLS. However, this is one of the few topics I will touch on in which there is a fair amount of agreement on the relevant magnitudes. The substitution bias seems relatively small, perhaps accounting for a .2% upward annual bias in the CPI (see, e.g., Wynne and Sigalli, 1994, and the literature cited there).

I believe this is a number that you have seen before, and it is likely that it comes from a review of estimates of substitution bias. Many economists, and I am one of them, believe that substitution bias is likely to be the smallest of the sources of bias in the CPI which I will discuss here. On the other hand given currently available data and techniques it is the source of bias whose effect we can most easily quantify.

The second source of bias I want to discuss is the bias caused by the fact that "new goods" are marketed over time. Before going on here I should make it clear that I am using the term "new goods" very broadly. Thus goods that are just a slightly different "quality" (sometimes just a different labelling) of an old good, or even an old good which is marketed in a new outlet (e.g. by mail order), are considered "new goods" in the following discussion (and I hope you will soon understand why).

Clearly if the good was not available in the base period, we cannot calculate the change in its price between the base and the current period. The discussion of the treatment of new goods usually centers around two issues. One is the speed at which new goods are included in the commodity basket (are we calculating price changes for a basket of goods which is no longer representative of the average, or for that matter, of any, consumer?). The quicker the goods are included in the index, the more accurate we believe the index will be (though one can construct extreme examples where this is not necessarily the case). Though there are undoubtedly improvements that could be made in the BLS's procedures for incorporating new goods in a more timely way and some experimentation with new data sources (like scanner data) is probably worthwhile, my impression is that the BLS would link in new goods more quickly if the budget were available for them to do so.

The second issue when discussing new goods is whether the new goods, when included in the index, are included in a way that reflects the contribution of the availability of the new good to consumer welfare. This is the heart of the problem in the "new goods debate" and to understand the issues we need to know something about how new goods are currently included in the index. During the period between the major revisions in the index (which, recall, occur about every ten years) new goods are primarily introduced either through the sample rotation, or through the sample substitution, procedures. When they are introduced they are almost invariably introduced either by i) an overlap pricing procedure or by ii) a linkage procedure. In overlap pricing we find a year in which both the old and the new good are sampled and calculate price changes up to and including that year as the price change of the old good, and price changes thereafter as the price change of the new good. Note that the new good's price is never compared to the prices of goods that existed before the new good was marketed. When new goods are introduced through a linkage procedure we "link in" the new good by assuming its relative value to the consumer at the time it is linked in is equal to the ratio of the prices of the two goods in that year (in the case of substitution there may be no common year for the good, in which case the rate of change in the price of the commodity group is typically used for the price change for that good in that year). Items which form entirely new product groups (e.g. personal computers and video cameras after they were introduced) are not sampled until a major revision in the index occurs and a new commodity group is established for them. They then are given a weight and treated as any other commodity group (thus just as in overlap pricing, they are never compared to previously existing goods).

The important point here is that in overlap pricing we never compare the value per dollar from the new good to the value per dollar to the old good, and in the linkage procedure we assume, a priori, that the value per dollar of the new and old goods are the same. Common sense might lead us to believe that the reason new goods are able to penetrate the market is that their value per dollar is larger than that of the goods they replace. If this common sense is correct then the value of the commodity basket that contains the new goods is larger than what the official procedures attribute to it, and the change in the computed CPI will be larger than the change in expenditures needed to compensate a consumer for current period price changes.

An example might be useful here. The simplest case is one in which a new good is marketed which delivers precisely the same services to almost all consumers as a previously existing good, but is initially priced at, say 1/2, of the older good's price (possibly because someone has found a cheaper method of producing this good). In this case we know that, at least for the people who are aware of the properties of the new good and hence purchase it, a correct index would fall by at least 1/2 times the weight of the old good in the index (it would fall by more if consumers substitute towards this good as a result of the price change). Thus a lower bound estimate of the fall in prices due to the introduction of the new good would be the fraction of the people using the new good times 1/2 the old price times the weight of the old good in the index.

We now compare this to what is actually likely to happen to the index. Regardless of which of the above two procedures is used for adding the new good to the index, the index will show no change in prices when the new good is introduced. Overlap pricing never compares the "quality" of the two goods, while the linkage procedure assumes the "quality" of the new good is 1/2 the quality of the old good, so we have to buy 2 units in order to get the same services as we do from one unit of the older good (and the price per unit of quality is unchanged). Note that this result is independent of whether consumers flock to the new good (presumably because they think the new good gives them more for their money).

The change in the index in subsequent years will be a weighted average of the price changes of the new good and the old good in those years, with weights determined by the fraction of sales that are of the new good and the frequency of the BLS's revision procedures. In the unlikely event that both the new and the old good have prices that rise at the "general rate" of inflation, the existence of the new good not only does not have any effect on the CPI in the initial year, it never has any effect on the CPI (regardless of whether all consumers eventually shift to the new good and experience a true price decline of at least 1/2 of the price of the older alternative).

In reality we generally observe large changes in the relative prices of the new and the old goods in the periods after they are introduced. However the direction of the changes depends very much on the nature of the particular market. Thus often new goods are introduced at a relatively high price which is subsequently forced down by competition from further entrants, but sometimes new goods are introduced at a relatively low price (in order to induce consumers to try it) which trends upward thereafter (after consumers have more information). Similarly often the old goods price falls as a result of the existence of the cheaper alternative, but there are several well documented cases where its price rises (the producer prefers to lose market share and hold onto a small "loyal" group of high paying customers). As a result there are examples where the changes in the CPI resulting from the new good actually accentuates the problem caused by the lack of a comparison between the old and new goods, and examples where subsequent pricing behavior ameliorates part of the bias resulting from the lack of a comparison. However, provided competition insures that the price of the new good never rises to the initial price of the older alternative, the index will never account for the true price decline caused by the introduction of the new good.

This may seem like an extreme example, but it is not so far from the truth in a surprising number of cases. Consider what happens when a drug goes off patent and generic alternatives begin to appear. Typically a generic enters at a fraction of the price of the pioneer (or previously patented) drug, even though; i) their active chemical compounds are (FDA certified to be) the same, and ii) at least for the vast majority of the users the effects of the two different drugs are indistinguishable. As noted traditional BLS procedure for handling generics do not register a price fall for consumers who switch to the generic. To illustrate the quantitative magnitude of the resulting bias in the BLS procedures Griliches and Coburn (1994) take two drugs as examples from a larger NBER project on the construction of price indices, compute various indices that actually do compare the generic to the patented alternative and hence do generate welfare gains as a result of individuals switching to the generic, and compare them to an index constructed to mimic the BLS procedures. They find that the BLS indices have upward biases in the three years after the drug goes off patent of about 14% and 6% per annum in the two cases.

I should note that as a result of this research the BLS is in the process of revising the procedures with which the drug price index is computed. The major change, however, seems to be in increasing the rotation speed for drugs. There does not seem to be any attempt at comparing the generic to the previously patented alternative, and hence to register a price decline for individuals who switch to the generic. Of course to use a method which actually compares the old and the new good one needs to use more than just price data, one also needs an assumption on how

to do the comparison. Invariably the assumption used will be questionable, and one reason the BLS does not do the comparison may well be that it does not want to take on the role of being an arbiter between alternative arguable assumptions (of course by doing nothing they are making the implicit assumption that the two goods are not substitutable for one another).

Drugs are only a small fraction of the CPI consumption basket (about 1%), and were discussed here primarily as a relatively "clean" example of what can go wrong with current procedures. However the "outlet substitution bias" pointed out by Reinsdorf (1983) and referred to earlier in these proceedings has a very similar character and seems to be much more pervasive. That is, at least if we do not count the welfare change resulting from the change in the actual way we shop, the "new goods" sold by mail order, or at a factory outlet, are often identical to the old goods they replace, and typically have a much lower price. Our society has been able to achieve these lower prices because of a combination of marketing innovations and the force of competition, but because of the way the BLS calculations are made the price falls that these innovations deliver are never registered in the CPI.

The estimates of outlet substitution bias' impact on the CPI are quite different for different commodity groups, and the research done to date has not been systematic either in its coverage, or in the techniques used for comparisons (for example, for the way we make adjustments for the purchase of systematically different varieties at the different types of outlets). Still if you had to bet on the research to date you would probably guess that the magnitude of this bias alone is likely to have been at least as large as substitution bias. The emphasis here, however, should be on two phrases; "likely" (in contrast to certainly), and "has been" (in contrast to will continue to be). In particular, as I note below, at least without a whole new round of marketing innovations, it is hard to believe that outlet substitution bias will be as large as this in the future.

The crux of the problem in including new goods in the index is devising a method for comparing the welfare derived from consuming a basket that includes the new good to that derived from previously existing alternatives. The drug and outlet substitution examples were straightforward because there was reason to believe that, at least for a large fraction of consumers, the new and the old goods provided the same services, so for these consumers the increase in welfare from consuming the new good was just equal to the monetary savings from purchasing the new good (the price decline). Typically, however, goods have several different characteristics and are used to generate several different types of services, with different combinations of the characteristics being relatively more valuable in generating different types of services.

Thus sleeping bags differ in at least three dimensions that are relevant to consumers; warmth, weight, and water repellency. The relative value of the different bundles of these characteristics that we call "goods" to a particular consumer depends on whether the consumer intends on using it for long overnight summer hikes, in contrast to winter camping, . . . , that is on the nature of the services for which the consumer uses it. What we think we know for the general case of new good introduction is that a consumer purchasing, say a sleeping bag, will only purchase a newly introduced bag if the welfare obtained from spending the money on the new bag is at least as high as the welfare from spending the money on the best available old bag (at least provided all the old bags are still available). Thus the existence of the new bag increases the consumer's welfare. The fact that this is not captured by the current method of constructing the CPI is the reason economists think they know the direction of bias in the CPI caused by the lack of a good method for introducing new goods. However, except in simple special case like the ones discussed above, it does not give us an estimate of the magnitude of the bias.

There is an imperfect but more general procedure to measure the bias due to quality change in a world with many characteristics that dates back at least to Court (1939), was revisited by Griliches (1967), and has two important features; it has limited data requirements, and it is relatively easy to use. The problem is that in many cases it cannot be given an interpretation in terms of what we want our price index to measure. The technique is called hedonic regression analysis. It has recently been used by the BLS to adjust prices in a modest way in two expenditure classes in the CPI (apparel and an adjustment for aging in the shelter component of housing), and with care could probably be extended to allow us to do reasonable comparisons between old and new goods in an assortment (though not all) commodity groups.

There are several variants of hedonic analysis but the basic idea can be explained quite simply. It uses the data on prices and characteristics in a base period to estimate a surface which describes the relationship between prices and characteristics in that year. It then uses this surface to predict what the prices of the products

(bundles of characteristics) marketed in the current year would have been had they been marketed in the base year. The difference between the actual current prices of these products and the prices predicted from last year's surface becomes the estimate of the price change for these products.

How are we to interpret the hedonic results? I want to distinguish between two cases. First take the case of new goods which have essentially the same characteristics and provide the same services as goods which appeared before them (the generic and outlet substitution examples above). In this case the hedonic analysis actually gives us the price change for a good that was previously in existence, and it seems fairly evident that it is a reasonable measure of the price change for that good (at least modulus technical errors in getting the hedonic surface correctly, and small adjustments for slightly different characteristics of the product, like ease of shopping in the new outlet case). Of course one could get the same adjustment by comparing the prices for goods with the same bundles of characteristics directly, but the hedonic method allows us to do this in a consistent and thorough way, and to make small adjustments when goods with only slightly different characteristics appear.

The second case is the case when new products provide the consumer with an ability to enjoy a significantly different type of service than had been previously available from use of the goods in the commodity group being analyzed. In these cases the results of hedonic analysis are not interpretable, and as a result, probably should not be used. An example might be useful here. Consider the introduction of laptop computers. At one point we only had personal computers (desk sized machines). Their important characteristics were given by measures of their speed, memory, etc. If in the year we introduce laptops into the index, we compare them to previous information processing equipment by using the hedonic surface estimated for pc's we would very likely find that the laptop fell below the surface for pc's. That is since size and weight are probably not very important determinants of the relative prices of pc's, and a comparably powered pc would cost much less than a laptop, the hedonic procedure would indicate that the introduction of laptops was associated with an increase in the price of information processing equipment. This despite the fact that many of us purchased laptops (and think they have had a significant impact on our productivity). The problem is that the services that the laptop provides are different than the services the pc provides, so we cannot just compute the value of a laptop as the cost difference between it and a comparatively powered pc.

More generally there is no reason to believe that hedonic type techniques give a good measure of the appropriate price change for goods and services in which there have been major product innovations of this sort. There are several ways of actually incorporating such changes, but all of them have greater data requirements than the techniques mentioned so far, all require one to take a stand on some rather complex issues, and all are more difficult to implement. This is probably why most current estimates of the effect of the biases induced by new goods and quality change rely quite heavily on a mix of "hands on" comparisons and hedonic methodology.

Wynne and Sigalli (1994) review the results of attempts to estimate the bias due to quality change and the introduction of new goods on different components of the CPI. The numbers vary widely, even within a commodity group. Some are negative, indicating that producers use the excuse of a quality change to pass on price rises, but most are positive, and some are quite large (Gordon's, 1990, estimate for durables, which includes motor vehicles, furniture, household appliances, and radios and TV, is about 1.5% per year during the post World War II period). Once again, however, there has been no systematic attempt to obtain adjustments for quality change and new goods for the different components of the CPI, the assumptions used in the studies that have been done are neither uniform nor generally agreed upon as correct (and some have been seriously questioned), and for some commodity groups the techniques of analysis that have been used to date are just not rich enough to answer the questions we need to answer (though I do think that a careful use of hedonic techniques, at least as a check on current procedures, could get a reasonable estimate of the bias caused by most new goods in many commodity groups). As a result probably all I can say on the overall magnitude of new goods bias is what I said at the outset; the bias due to the new goods and quality change (and this is independent of any outlet substitution bias) is likely to be larger than the bias due to substitution effects (which, recall was estimated at .2); but again this is a "likely," rather than a probability one, statement.

I want to briefly come back to the possibility of measuring the gains of new products via techniques that require more data, more assumptions, and more subsequent analysis than the combination of direct comparisons and hedonic techniques discussed above. Several such techniques are available. They are based upon obtaining direct estimates of how consumers value different bundles of goods (of consumer

preferences) as a function of consumer characteristics. Given such estimates, it is easy to do the calculations needed to obtain an "ideal" price index, the measure of the price change needed to make the consumer just indifferent between the goods offered this period and those consumed the last.

It is important to note that because these techniques compute an ideal index, conditional on their assumptions, they correct for all biases simultaneously. In particular, they also make an adjustment for the benefits of increased variety. None of the techniques discussed above do this; and there are many of us who think that the variety bias in the CPI may be substantial (and variety bias is the last source of bias I will discuss).

For example the expansion in the number of models of cars after 1973 is quite amazing; we now have high roofed minivans, jeeps and trucks with "creature comforts," relatively low priced two seater sport cars (the Miata), etc. The fact that they have been purchased by consumers indicates that their value per dollar to some consumers, the consumers who purchased them, were greater than those of the alternative models.

What the increase in variety does is that it fills out the characteristic space. Even if each new variety enters at exactly the price the hedonic pricing surface would predict for it, it increase welfare by allowing consumers to get closer to their "favorite" good (or combination of goods) given that surface. I want to note that variety bias is not likely to be limited to large durable items; quite the contrary, it is likely to be quite pervasive. For example, Hausman (1994), provides estimates of variety bias in the food product, "cereals," and, as one might guess, they are substantial (he also has a more general discussion of variety bias).

Indeed even under the extreme assumption that all possible new varieties were known today (so none could be attributed to the "ingenuity" of producers) economists would still think that there will be a variety bias in future periods. The reason is quite simple. As income and population rise producers make more profits from introducing a given variety at a fixed markup. This increase in potential profits from an increase in market size will allow them to cover their sunk costs in developing and marketing new varieties. So in any growing economy we ought to expect a secular trend for increased variety. However we know next to nothing about the magnitude of the bias in the CPI that this process generates.

One way to produce an ideal price index is to estimate a model wherein consumer preferences are defined on bundles of the relevant characteristics of the product (instead of a preference for cars we have a preference for a bundle of interior size, trunk size, safety features, acceleration, etc.), and then find the income change that would make the consumer just indifferent between the goods available today, and the goods available yesterday. The consumer then evaluates the new goods (or new bundles of characteristics) themselves, and we just use the result of the consumer's evaluation (and several, sometimes questionable, assumptions). Berry, Levinsohn, and Pakes (forthcoming) show that one can do this using only aggregate data on the prices, characteristics, and quantities of the models marketed in a given commodity group (though one is likely to get better estimates if they have data which matches consumer characteristics to the products that the consumer chooses). Note that they do require data on aggregate quantities, data which is not needed for the other computations I have discussed thus far. However, at least for many products, such data is available from a variety of sources.

A variant of this technique was used by Pakes, Berry and Levinsohn (1993) to compare an ideal price index for autos to an analog of the index that would have been obtained using BLS procedures for autos between 1980 to 1990. The results indicated that the BLS price changes were about 33% too large. This is a number which, at least in principle, corrects for all the biases discussed thus far. Again, however, it is only for the autos components of the CPI, and it was originally intended only as an example of calculations that can be done. In particular we never did a thorough examination of the robustness of this number to the many assumptions that went into calculating it (a task that we are now engaged in).

We are some distance from actually using these techniques in a coherent fashion to calculate biases in the CPI. My current suggestion would be to use these techniques to do feasibility and robustness studies on particular commodity groups in which we think variety and new product biases are likely to be large.

I want to conclude with four or five more general points that did not come out in the discussion above.

First I have emphasized throughout how little we currently know about the extent of the various biases in the CPI. However, I hope that the committee also notes how much information has been provided by the little bit of low cost research that has been done thus far on price indices. That research has identified several commodity groups where we all believe there are significant biases in the indices, given your

orders of magnitude for those biases in those groups, and provided techniques for correcting them. Indeed, provided there are some small changes in institutional structure, it is likely that a small allotment of additional funds to some combination of academic and government researchers devoted to applying those techniques more generally will allow us to get much of the needed correction done, and on a current year basis (I come back to this below).

Second, I want to warn against taking the "easy way out" and using an empirical result on a particular bias analyzed on a particular commodity group in a particular time period, as, in any sense, "representative" of the more general effects of that bias on the CPI. The research that is done on particular biases usually begins by choosing a commodity group that we know is likely to have a relatively large bias of the sort being investigated. This for at least two reasons; i) if the magnitude of the bias in that commodity group turns out to be small we might think that the magnitude might be small more generally, and ii) because we are interested in the magnitude of the bias in these "dramatic" cases for substantive reasons other than for the correction of the CPI. Thus many of the hedonic studies are on autos and computers, and as you might guess the hedonic results show striking biases in both indices in the early years of the two industries (in autos, where we can investigate the bias in later years, we seem to find a subsequent rather dramatic fall in the bias, see Raff and Trajtenberg, 1995). Generalizing from the early year studies to a bias calculation for the entire CPI would have been a bit like assuming every aspiring young actor should eventually expect to have the earnings of a Tom Hanks.

Relatedly we should be aware that the bias calculations can change dramatically from period to period. Thus it is obvious that the fraction of sales that are mail order, or that accrue to factory outlets, cannot grow at the same pace in the future as they have in the past (at some point all sales would be mail order). So though, say a .2% correction might have been appropriate for the last few years such a correction is likely to become much too large in the near future, at least without another major stream of new marketing innovations.

That is, it will not do to take a "correction" from previous periods and apply it blindly to the indefinite future. Though some interim "fix" in the index might be needed, unless we institute a procedure which will allow us to calculate a bias corrected index pretty much on line we are not likely to have any more accurate a measure of price changes in the future than we have today.

Fourth, it is worth reemphasizing that most of the examples of biases noted above are likely to have very different quantitative impacts for different demographic groups (drugs are likely to be a higher fraction of the budget of the elderly, and the fraction of purchases by mail order and from warehouse outlets are very different for different income and age groups). So there is a need for setting up an apparatus to calculate the index separately for different demographic groups.

One final point. In my opinion the finance committee should set up a committee consisting of a mix of academics and individuals who work on related topics in government institutions which would be empowered to investigate and eventually decide among alternative possible improvements in the CPI. My impression is that the problems with the CPI that are currently correctable but not yet corrected, are not left in this state because of any lack of knowledge by either the BLS staff or the staff at related institutions. Quite the contrary. Much of the good research on biases that I have read was written by individuals working in various government institutions and after reading their papers and talking to them it is hard not to be impressed by their knowledge. It seems that the reasons that improvements in the BLS procedures were not as forthcoming as we might have wanted are twofold; a lack of budget, and a feeling that the BLS staff are not empowered to make such improvements (especially when all changes will, of necessity, involve some questionable assumptions, and a debate on the index is raging). Hopefully the committee would help solve at least the second problem. The committee should have a small budget which they can allocate to investigating the implications of alternative possible correction procedures, be empowered to make changes in the way the index is constructed, and, within the limits decided by the budgetary process, have the ability to determine whether and where more extensive data gathering is necessary for constructing a more appropriate CPI.

Addendum to the Statement of Ariel Pakes before the Senate Finance Committee

A portion of my prepared statement is incorrect. It states that the drug component of the CPI never registers price declines when individuals switch from a previously patented drug to its generic alternative. Since January of this year the BLS has changed their procedures to account for this price fall. I was not aware of this

change at the time I submitted my testimony. The BLS should be given credit for reacting in a timely way to relevant research findings.

References

Berry, Steven, Levinsohn, J. and A. Pakes, "Automobile Prices in Market Equilibrium: Part I and II," Forthcoming, *Econometrica.*

Gordon, Robert J. (1990), *The Measurement of Durable Goods Prices* (Chicago: University of Chicago Press).

Griliches, Zvi (1961), "Hedonic Price Indexes for Automobiles: An Econometric Analysis of Quality Change," in *The Price Statistics of the Federal Government* (New York: National Bureau of Economic Research), reprinted in Griliches 1971.

Griliches, Z. and I. Cockburn (1994) "Generics and New Goods in Pharmaceutical Price Indexes," *American Economic Review,* 84 1213-1232.

Hausman, Jerry A. (1994), "Valuation of New Goods Under Perfect and Imperfect Competition," M.I.T. Working Paper, June, 1994.

Pakes, A., S. Berry and J. Levinsohn (1993) "Applications and Limitations of Some Recent Advances in Empirical Industrial Organization: Price Indexes and the Analysis of Environmental Change," *American Economic Review, Papers and Proceedings,* 83, 240-246.

Raff, Daniel M.G., and M. Trajtenberg (1995), "Quality Adjusted Prices for the American Automobile Industry: 1906-1940," NBER Working Paper No. 5035.

Reinsdorf, M. (1993) "The Effect of Outlet Price Differentials on the U.S. Consumer Price Index," in Murray F. Foss, Marilyn E. Manser, and Allan H. Young (eds.), *Price Measurements and Their Uses, NBER Studies in Income and Wealth,* vol. 57 (Chicago: University of Chicago Press).

Wynne, Mark A. and F. Sigalla (1994), "The Consumer Price Index," *Economic Review,* Federal Reserve Bank of Dallas, Second Quarter, 1994.

PREPARED STATEMENT OF ROBERT A. POLLAK

I want to thank the committee for inviting me to testify on the Consumer Price Index (CPI).

I have submitted for the record a paper I have written for BLS on the treatment of "elementary aggregates," one of the principal issues in recent discussions of the CPI.

I want to make three points and two recommendations.

First, BLS researchers were responsible for discovering and publicizing the CPI issues we are now discussing. Their work was published in *The Monthly Labor Review,* a BLS publication, in December, 1993. Because BLS has supported my research on the CPI and the theory of the cost-of-living index, I am awkwardly positioned to praise BLS. Nevertheless, it is important for this committee to understand the critical role that BLS research has played in raising these issues.

Second, concerns about whether the CPI overstates the rate of inflation focus on three principal issues:

- Substitution—The CPI ignores the tendency of consumers to respond to changes in relative prices by switching away from goods and services whose relative prices have increased and toward goods and services whose relative prices have decreased.
- Quality—Various techniques are used to capture changes in the characteristics of goods and services and translate these changes into "equivalent" price changes. These techniques are generally thought to work better for goods (e.g., computers, prescription drugs) than for services (e.g., banking services, medical services). I interpret the quality issue broadly enough to include the closely related issue of the treatment of "new goods."
- Elementary Aggregates—Various techniques are used to select the "items" that are priced for the CPI and for combining these price observations into "basic component indexes." It has been argued that the formula used for calculating basic component indexes imparts an upward bias to the CPI. I interpret the elementary aggregate issue broadly enough to include not only the choice of an appropriate formula for combining the prices of items, but also item selection and "outlet substitution."

The substitution and quality issues have been discussed at length in the theoretical and empirical literature. The elementary aggregate issue is new and relatively unexplored.

In the paper I wrote for BLS and submitted for the record, I argue that the elementary aggregate issue cannot be satisfactorily resolved within the confines of usual assumptions of the theory of the cost-of-living index: it is misleading to cast

the problem of elementary aggregates as the familiar problem of choosing an appropriate functional form for combining items. Instead, I argue, dealing with this issue requires developing the theory of the cost-of-living index under more general assumptions. More specifically, a satisfactory resolution of the item selection/basic components index problem requires a theoretical framework that recognizes that consumers do not face a single price for each good but instead face a distribution of prices. Consumers recognize that they face a distribution of prices and their (search) behavior reflects this recognition. The appropriate procedure for constructing a cost-of-living index under these assumptions is quite different from the appropriate procedure under the assumption that the "law of one price" holds (i.e., that the price distribution facing each consumer collapses to a single point); the implications for the CPI are unclear. Finally, the CPI is not supposed to represent the prices facing a particular consumer with particular preferences, but instead is a "group" index (see Pollak [1980]) intended to reflect the experience of a heterogeneous population of consumers with different preferences who may face different prices. The group index perspective, I should add, also has implications for the treatment of quality which have not yet been fully explored.

Third, the substitution, quality, and elementary aggregates issues pose difficult, unsettled problems. The appropriate theoretical treatments of these issues are not obvious, and the numerical implications of alternative treatments for the CPI are not obvious. Speculation about the aggregate overstatement of the CPI thus involves two levels of speculation regarding at least three distinct issues. Other economists have speculated about the magnitude of the aggregate overstatement of the CPI; I have nothing useful to add to their speculations. I do want to emphasize that the issues are difficult and unsettled.

What should be done about the CPI?

Before attempting to answer this question, I want to change hats. My research interests include not only the cost-of-living index, but also environmental economics and risk regulation. In a recent paper on risk regulation (Pollak [1995]), I criticized a recommendation for placing greater reliance on scientific experts put forward by Justice Stephen Breyer in his book, Breaking the *Vicious Circle: Toward Effective Risk Regulation*. My analysis of risk assessment—the "scientific" component of risk regulation—emphasized the interaction of scientific uncertainty with the relatively open, skeptical political culture of the United States. Taken together, these two factors virtually preclude resolving contentious issues by characterizing them as scientific and delegating them to experts. Examples in the risk assessment context include:

- setting workplace exposure standards for hazardous substances (e.g., benzene, formaldehyde)
- setting standards for cleaning-up hazardous waste sites (e.g., under superfund, "how clean is clean?") and
- setting standards for nuclear power plants and nuclear waste disposal sites.

One of the central facts is that experts are often asked to deliver more than their science can deliver—or, changing hats again, more than our science can deliver.

In index number construction, as in risk assessment, difficult technical issues are often resolved by appealing to professional conventions. Professional conventions standardize index number constructions by limiting the extent to which the index can reflect the idiosyncratic judgments of the individuals involved in producing the index. Professional conventions are a bureaucratic necessity precisely because they limit the scope for individual discretion, but such conventions should not be confused with scientific truth. In the case of the CPI, economists appeal to the theory of the cost-of-living index for a principled resolution of technical issues. Yet economists know that the theory of the cost-of-living index is based on a number of assumptions that are often inappropriate. For example, the theory assumes that the "law of one price" holds and that the index is intended to represent the experience of an individual—arguably a household—rather than a heterogeneous population.

The technical problems of the CPI intersect the political problems of taxation, intergenerational efficiency, and intergenerational equity because the CPI is used to index tax brackets and various benefit programs including social security. Even if there were no uncertainty about the rate of inflation, the threshold question of whether to escalate the benefits of social security recipients with prices or with wages (e.g., of workers entering the labor force) would remain. This question is political, and it requires a political answer.

The credibility of the CPI depends on the perception that it is not being manipulated as a policy instrument. In an environment in which there is little trust in government or in experts, I urge caution in modifying the CPI. There is a risk that attempting to modify the CPI, even in directions that are desirable on scientific grounds, will weaken the credibility of the index. Credibility depends not only on

what is done to the CPI, but how it is done and who does it. Recognizing this, and recognizing that political problems cannot be resolved by characterizing them as technical and delegating them to experts, I make two recommendations:

First, I recommend separating the technical issues from the political issues to the maximum extent feasible. The technical issues related to the CPI are the province of economists and other experts; the political issues are not.

Second, I recommend a procedural rather than a substantive solution to the technical issues related to the CPI. Specifically, I recommend that the technical issues be addressed by convening a committee of technical experts to study CPI issues and report on them. The credibility of such a committee of technical experts would be enhanced if it were convened by an independent body such as the National Academy of Sciences or the National Bureau of Economic Research.

The most recent committee to examine the CPI was appointed in 1959 and reported in 1960. After thirty-five years, it is time for another committee of technical experts to reevaluate the CPI. The committee was chaired by the late George J. Stigler of the University of Chicago, who won the Nobel Prize for economics in 1982.

On the political issues, I make no recommendations.

References

Pollak, Robert A., "Group Cost of Living Indexes," *American Economic Review*, Vol. 70, No. 2 (May 1980), 273-278.

Pollak, Robert A., "Regulating Risks," *Journal of Economic Literature*, Vol. 33, No. 1, (March 1995), 179-91.

Enclosure.

Elementary Aggregates in the CPI*

Robert A. Pollak
University of Washington
Department of Economics
University of Washington
Seattle, WA 98195
(206) 543 5864

Revised: March 1995
Comments Welcome

Does the Consumer Price Index (CPI) overstate the rate of inflation? Until recently, discussions of "bias" or "measurement errors" in the CPI emphasized the treatment of "quality" and "substitution bias." Recently, however, a new concern has been added: the manner in which the 9,108 "basic components" indexes that enter the CPI are calculated from underlying sampling data on "items."

Economic theory often clarifies the practical problems that arise in constructing price indexes and sometimes provides useful guidance for resolving them. In this paper I treat the selection of items and the calculation of basic component indexes as economic rather than statistical problems. I argue that these problems cannot be satisfactorily resolved within the confines of usual assumptions of the theory of the cost-of-living index, an index which compares the minimum expenditure required to attain a particular indifference curve under two price regimes. Dealing with these problems, I argue, will require developing the theory under more general assumptions. More specifically, a satisfactory resolution of the item selection/basic components index problems requires a theoretical framework that recognizes that consumers do not face a single price for each good but instead face a distribution of prices. Furthermore, consumers recognize that they face a distribution of prices and their (search) behavior reflects this recognition. The appropriate procedure for constructing the CPI under these assumptions is quite different from the appropriate procedure under the assumption that the "law of one price" holds (i.e., that the price distribution facing each consumer collapses to a single point). If each consumer faces a single price for each good, then (apart from random measurement errors that are introduced in the process of collecting and transcribing prices), the price dispersion we observe might arise because

- different consumers face different prices

*This research was supported by the Bureau of Labor Statistics. I am grateful to BLS staff members for helpful conversations but the views expressed are my own and do not reflect those of BLS.

- the prices that are collected for each item differ because they are the prices of different "goods." In the final section, I discuss the interpretation of the Jevons geometric mean of price ratios and the Dutot ratio of arithmetic means as functional forms for basic component indexes within the confines of the usual assumptions of the theory of the cost-of-living index.

* * *

As a research strategy, it is tempting to begin by assuming that goods are well-defined, that "quality" is not at issue, and that a consumer (or a population of identical consumers) faces a known distribution of prices. The analysis is simplified by adopting the usual assumption that all search costs can be reduced to a single (monetary) dimension. A consumer seeking to maximize expected von Neumann-Morgenstern utility will search optimally over outlets where, in the simplest case, each outlet sells only one good; the analysis of the optimal search strategy is, of course, more complex when outlets sell more than one good. This orientation differs from the approach of Baye [1985], Anglin and Baye [1987], and Reinsdorf [1994] which appear to be the only papers that analyzes the issues of price dispersion and search in the context of the cost-of-living index. All of these papers avoid the use of von Neumann-Morgenstern utility functions. For example, Anglin and Baye (p. 1182) assume that consumers choose a "search strategy that minimizes expected expenditures, inclusive of search costs, of buying a given level of utility," an assumption that enables them to sidestep the use of von Neumann-Morgenstern utility functions. The alternative view that I adopt here is that the cost-of-living index should measure the compensation a consumer must receive for facing one price distribution rather than another; because the required compensation depends on the consumer's risk aversion, it requires a von Neumann-Morgenstern utility function.

For a particular consumer—a consumer is fully characterized by location, preferences (i.e., the von Neumann-Morgenstern utility function), wage rate, and nonlabor income—the analysis should yield a "price-distribution cost-of-living index" which compares a reference distribution of price vectors with a comparison distribution of price vectors. For a particular consumer it should be straightforward to develop a theory of the true cost-of-living index and a theory of bounds on the true index.

Logistical considerations—the time, effort, and money that a consumer must expend to search outlets—matter in even the simplest case. It is convenient use space and distance (i.e., the location of the consumer and the locations of outlets) as a shorthand for these more general logistical considerations. From the standpoint of formal modeling, the simplest assumption is that outlets are located on the circumference of a circle and the consumer is located at its center. To sample an outlet, the consumer incurs costs, which are, by assumption, identical for all outlets. Anglin and Baye [1987] provide a careful description of the assumptions required to keep the formal model tractable (e.g., each outlet sells only a single commodity; consumers can return to outlets they previously sampled without incurring additional costs). As long as the emphasis is on searching for the lowest price for homogeneous, well-defined commodities, the consumer could presumably use the telephone to reduce search costs; for outlets with 800 numbers, the cost of telephone search is independent of location. Yet even a casual analysis of the role of reputation in telephone and catalogue sales suggests that price dispersion reflects more than the costs of searching for low prices for homogeneous, well-defined commodities. The heterogeneity of commodities is crucial, and the price search story ignores the difficulty of specifying commodities in term of their "characteristics."

The foregoing discussion fails to recognize important dimensions of the heterogeneity of outlets. One of the concerns that Reinsdorf [1993] and others have emphasized is the emergence of "discount" outlets. There are two issues here. First, is there a parallel rise in "convenience" outlets (e.g., minimarts associated with gas stations, etc.)? Second, in the discount outlets, consumers buy in larger quantities, but there is little or no discussion of "quantity discounts" and "nonlinear pricing" in the literature on the cost-of-living index; Wilson [1993] provides an up-to-date discussion of nonlinear pricing, but makes no reference to its implications for price indexes. Yet there are wide differences in prices per unit (e.g., price per ounce) within a single outlet (e.g., candy; toothpaste; detergent; pain relievers). Discount outlets often fail to offer small sizes; Preston McAfee of Texas A & M has an unpublished paper in which he discusses "quality" in an industrial organization context. The discussion of "quality" often begins with the assumption that if the size of a package increases by 10% and the price increases by 10%, then nothing has really changed; for example, this assumption about the effect of "simple repackaging" is the starting point for Fisher and Shell [1972]. The alternative to the simple repackaging as-

sumption is to recognize that package size matters, perhaps by treating packages of different sizes as different goods. In any case, casual assumption that "discount" outlets that stock only large sizes are "low price" outlets needs to be reconsidered in the light of nonlinear pricing.

There are opportunities here for empirical work. Within outlet and across outlet variations in price per unit for particular brands could be analyzed empirically without data on what consumers actually choose to buy (i.e., by looking at the posted prices). The more difficult questions are what goods consumers in a given outlet choose to buy, and which consumers choose to shop at which outlets. Yet the heterogeneity of consumers suggests other issues.

The CPI is not supposed to represent the prices facing a particular consumer with particular preferences, but instead is a "group cost-of-living index" (Pollak [1980]) intended to reflect the experience of a heterogeneous population of consumers with different preferences who may face different prices. The group index can be viewed as an aggregate of individual indexes and requires an explicit treatment of aggregation over consumers. The price-distribution cost-of-living index is likely to be more sensitive to consumer heterogeneity than the usual cost-of-living index. For a particular consumer the price-distribution cost-of-living index depends not only on the reference and comparison price distributions, but also on such characteristics as location, preferences, wage rates, and nonlabor incomes that differ across consumers.

The role of the wage rate requires further comment. In most discussion of the cost-of-living index, as in most discussions of consumer behavior, we assume that preferences for goods are separable from preferences for leisure and other uses of time. This standard—but implausible—separability assumption enables us to define a subindex for market goods that depends on goods prices but not on the wage rate. When we drop the assumption that the consumer faces a known price for each good and assume instead that the consumer faces a price distribution, the wage rate is a crucial determinant of search costs. Thus, consumers with different wage rates will adopt different search strategies and, hence, they will evaluate alternative price distributions differently.

The foregoing discussion ignores three issues. First, the discussion of wage rates implicitly assumes that the consumer's wage rate is fixed. If the consumer faces a distribution of market wages as well as a distribution of prices, we could analyze joint search strategies in the labor market and in goods markets. The analysis above is consistent with the assumption that the labor market search must be completed before the goods market search begins. Second, the discussion of separability ignores the complications that arise in defining separability for von Neumann-Morgenstern utility functions; as Pollak [1967] shows, separability of a von Neumann-Morgenstern utility function is a considerably more restrictive assumption than separability of an ordinal utility function. Third, the entire discussion ignores the complications posed by households and families by implicitly assuming that the consumer facing a distribution of prices is an individual. The optimal search strategy of a household depends on both its demographic composition and its labor force participation decisions. The difficulty is that labor force participation decisions, demographic composition, and, indeed, the very existence of the household are endogenous. If we ignore the endogeneity, the problem reduces to one of comparing, for example, the search costs facing a two-earner couple with those of an otherwise identical one-earner couple. (The phrase "otherwise identical" conceals a portion of the endogeneity problem: because labor force participation is endogenous, we might attribute the difference in labor force participation to different realizations in labor market search.)

* * *

The heterogeneity of commodities poses two difficulties that the usual "hedonic" approach—which views commodities as bundles of "characteristics"—deals with poorly or not at all. First, the assumption that all consumers are identical provides a poor starting point for analyzing "quality." A satisfactory analysis must recognize that different consumers purchase different qualities or varieties because of differences in tastes and differences in incomes; this recognition requires a group index. Second, the usual assumption that consumers face a single price for each "quality" (i.e., for each bundle of characteristics) is not credible. A satisfactory analysis must recognize that consumers face a distribution of characteristics prices; this recognition requires an analogue of the price distribution cost-of-living index defined over characteristics prices. This, however, leads to a third difficulty: even if consumers could observe all of the relevant characteristics of goods, adding a distribution of characteristics prices to the usual hedonic model would substantially complicate the analysis by superimposing "quality search" on "price search." When we relax the

unrealistic assumption that consumers can observe all of the relevant characteristics of goods, we encounter fundamental questions about the conceptual foundation of the index.

An alternative theoretical approach recognizes that consumers are uncertain about the characteristics of goods and that they base inferences about quality not only on the observable characteristics of goods but also on their prices and on the observable characteristics of outlets in which they are sold. The "information paradigm" (see Stiglitz [1987]) suggests that consumers behave in this way and implies that price, outlet characteristics, and quality must be analyzed together. The implications of the information paradigm for index number construction need further exploration.

The foregoing discussion, like most discussions of index numbers and consumer behavior, assumes that there are well-defined goods but provides no guidance for identifying the empirical counterparts of these goods. From the standpoint of selecting a probability sample of "items" whose prices constitute the data from which the CPI is constructed, the absence of a definition of the population from which the items are drawn is distinctly awkward. The awkwardness is especially acute once the quality genie is out of the bottle. Stiglitz [1994] argues that the definition of commodities—or, more precisely, the failure of economic theory to define commodities—poses a fundamental problem for socialism: because it is impractical to specify commodities precisely in terms of their characteristics, producers have opportunities to fulfill their quotas by producing low quality products. Although Stiglitz does not discuss index numbers, the failure of economic theory to define commodities and the impracticality of specifying them in terms of observable characteristics poses fundamental problems for index number construction.

* * *

I now consider the implications of treating "items" as the empirical counterparts of "goods" within the confines of the usual assumptions of the theory of the cost-of-living index. At issue is the proper procedure for aggregating prices at the finest level of disaggregation. The background for this discussion consists of Reinsdorf [1993], Reinsdorf and Moulton [1994], five BLS papers from the *Monthly Labor Review* of December 1993 (Fixler [1993]; Moulton [1993]; Aizcorbe and Jackman [1993]; Kokoski [1993]; Schmidt [1993]) and the Ottawa survey paper by Diewert [n.d.] which provides a scrupulous survey of the literature.

Following Diewert, I now view the issue as one of choosing an appropriate functional form for combining the observed prices that are the raw material from which price indexes are constructed. Diewert focuses on three functional forms for what he terms "elementary price indexes" (p. 3):

$$(1)\quad P_{CA} = \Sigma(1/N)\,(p_i^1/p_i^0)$$

$$(2)\quad P_{JE} = \Sigma(p_i^1/p_i^0)^{1/N}$$

$$(3)\quad P_{DU} = \Sigma(1/N)\,p_i^1/\Sigma(1/N)\,p_i^0$$

where P_{CA} is Carli's arithmetic mean of price ratios, P_{JE} is Jevons's geometric mean of price ratios, and P_{DU} is Dutot's arithmetic mean of period 1 prices divided by the arithmetic mean of period 0 prices. Viewing the issue as one of choosing a functional form, I agree with Diewert that it is difficult to find any theoretical grounds that would justify Carli's arithmetic mean of prices as a procedure for constructing basic component indexes from sampling data on "items" under the usual assumptions.

Both Jevons's geometric mean and Dutot's ratio of arithmetic means have some theoretical justification. My own preference, if it were necessary to choose a functional form on the basis of what we know now, would be for Dutot's ratio of arithmetic means. In my opinion, however, it is fundamentally misleading to attempt to deal with the problem of elementary aggregates and price dispersion as one of functional form choice within the confines of the usual assumptions of the theory of the cost-of-living index.

The theory of the cost-of-living index is the dominant approach to constructing consumer price indexes in the United States. The "axiomatic" or "test" approach has received relatively little official or academic attention in the United States, although an American economist, Irving Fisher, was the leading figure in its development. The test approach begins not with an indifference map or demand system but with

a set of axioms that it seems "reasonable" to require a price index to satisfy. U. S. economists' indifference notwithstanding, the test approach (which Diewert discusses at length in his Ottawa paper) has considerable academic support in Europe. Indeed, the test approach may be better suited to European political and bureaucratic culture, where there is more deference to "experts" than in the United States and less concern with explaining official decisions to the public and its representatives; an analogous point about the role of experts in Europe and the United States is often made in the literature on comparative risk regulation.

BLS publications sometimes describe the CPI as an approximation to the cost-of-living index and sometimes as an upper bound on it. Indeed, sometimes BLS descriptions of the CPI for nontechnical audiences appeal to the approximation and the bound interpretations almost simultaneously, failing to emphasize that these two interpretations have different implications for index number construction. BLS technical publications, it should be said, often emphasize the distinction, and BLS researchers (e.g., Braithwait [1980]; Manser and McDonald [1988]) have played a leading role in investigating substitution bias—a bias that reflects the difference between a fixed weight index, such as the Laspeyres, and an index that allows for substitutions in response to changes in relative prices.

Two kinds of information are required to construct a cost-of-living index:

- the base indifference map, or, more precisely, a base indifference curve from that map and
- the price vectors corresponding to the two price regimes being compared.

If the base indifference curve and the two price vectors were known, then constructing the cost-of-living index would be straightforward. Because both the base indifference curve and the price vectors are unknown, the task is complicated.

Among economists, the discussion of price indexes generally assumes that the price vectors are known and focuses on the difficulties created by the fact that the base indifference curve is unknown. The approximation approach, as the name suggests, attempts to approximate the true index that would be obtained if the base indifference curve were known.

The approximation approach can be interpreted as involving three steps:

(a) "estimating" a base indifference map using data on consumer demand behavior,

(b) selecting a base indifference curve from that map, and

(c) constructing the cost-of-living index corresponding to that base indifference curve.

Because the effects of price changes on the cost-of-living depend on the consumer's willingness to substitute away from goods whose relative prices have risen and toward goods whose relative prices have fallen, the consumer's estimated (or assumed) willingness to make such substitutions in response to relative price changes is crucial. In terms of the indifference map, estimating the consumer's willingness to substitute requires estimating the curvature of the indifference map or the elasticity of substitution; in terms of demand functions, it requires estimating the matrix of cross-price elasticities.

The first step of the approximation approach, estimating the base indifference curve, involves two substeps:

(ai) specifying a class of functional forms for the base indifference map or, equivalently, specifying a class of functional forms for the demand system and

(aii) using data on consumer demand behavior to select a member of that class.

Thus, the approximation approach is susceptible to errors of two different types:

(ai) a specification error, introduced by using a class of functional forms for preferences that does not include the true functional form and

(aii) an estimation error, a consequence of randomness in behavior and observation that makes the member of the specified class selected a random variable.

As in any empirical investigation, the result reflects both the a priori specification of the functional form and the data used to estimate it.

The bound approach finesses the need to estimate the base indifference map by redefining the index number construction problem. Instead of attempting to approximate the true cost-of-living index, the bound approach constructs an upper bound or a best upper bound on the set of true cost-of-living indexes corresponding to all possible indifference maps. (Although the usual focus is on upper bounds and best upper bounds, there is a parallel theory of lower bounds and best lower bounds.) It is well-known that the Laspeyres index is the best upper bound on the cost-of-living index (with the appropriately specified base indifference curve). It is also well-known that the Laspeyres index is the true cost-of-living index corresponding to the Leontief (i.e., fixed-coefficient) indifference map—an indifference map corresponding to a preference ordering that permits no substitution in response to changes in rel-

ative prices. (As Moulton [1993] emphasizes in his contribution to the December 1993 Monthly Labor Review discussion of consumer price indexes, the CPI is not really a Laspeyres index because, inter alia, reference prices do not correspond to the base period quantities.)

Can using Jevons's geometric mean formula to construct basic component indexes from sampling data on "items" be justified either as an approximation or as a bound?

The approximation approach justifies the geometric mean at the finest level of disaggregation only in conjunction with highly restrictive assumptions about preferences. First, preferences must be separable across basic components. Second, at the basic component level, preferences must be given by Cobb-Douglas subutility functions with equal exponents within each basic component. Third, to justify using a fixed-weight index to combine these geometric means into a complete index, the basic components must be combined using a fixed-coefficient aggregator function. Thus, a procedure that combines the geometric mean at the finest level of disaggregation with a fixed weight index at a higher level of aggregation involves a combination of assumptions about preferences that is difficult to justify. It requires a specific degree of substitutability at the finest level of disaggregation and the complete absence of substitutability at higher levels of aggregation. The necessary assumptions, although not formally inconsistent, are an odd combination. Indeed, they are a combination of assumptions that justify a very specific approximation at the finest level of disaggregation with assumptions that justify bounds at higher levels of aggregation.

The bound approach implies a fixed weight index and, hence, offers no justification for the geometric mean.

Can using Dutot's ratio of arithmetic means formula to construct basic component indexes from sampling data on "items" be justified either as an approximation or as a bound?

The approximation approach justifies the Dutot index only in conjunction with the assumption of fixed-coefficient preferences, that is, preferences that permit no substitution in response to changes in relative prices. The assumption is implausible at higher levels of aggregation and grossly implausible at the finest level of disaggregation.

The bound approach implies a fixed weight index and, hence, provides a rationale for the Dutot index.

* * *

WHERE DOES THIS LEAVE US?

1. It is misleading to cast the problem of elementary aggregates as one of choosing an appropriate functional form for combining items. The issues are deeper and require additional research. Indeed, I should add that BLS has taken the lead in raising and researching these issues.

2. Although I have focused on a subset of technical issues that arise in constructing the CPI, a principled resolution of these and other issues (e.g., the treatment of price distributions; the choice between individual indexes and group indexes) depends on the purpose of the index (e.g., in a one good world, in which index number issues cannot arise, should social security be escalated with prices or with real wages?).

References

Aizcorbe, Ana M. and Patrick C. Jackman, "The Commodity Substitution Effect in CPI Data, 1982-91," *Monthly Labor Review,* Vol. 116, No. 12, (December 1993), 25-33.

Anglin, Paul M. and Michael R. Baye, "Information, Multiperiod Search, and Cost-of-Living Index Theory," *Journal of Political Economy,* Vol. 95, No. 6, (December, 1987), 1179-1195.

Baye, Michael R., "Price Dispersion and Functional Price Indices," *Econometrica,* Vol. 53, No. 1, (January 1985), 217-223.

Braithwait, Steven D., "The Substitution Bias of the Laspeyres Price Index," *American Economic Review,* Vol. 70, No. 2, (March 1980), 64-77.

Diewert, W. E., "Axiomatic and Economic Approaches to Elementary Price Indexes," xerox, n.d.

Fisher, Franklin M. and Karl Shell, *The Economic Theory of Price Indices,* New York: Academic Press, 1972.

Fixler, Dennis, "The Consumer Price Index: Underlying Concepts and Caveats," *Monthly Labor Review,* Vol. 116, No. 12, (December 1993), 3-12.

Kokoski, Mary F., "Quality Adjustment of Price Indexes," *Monthly Labor Review*, Vol. 116, No. 12, (December 1993), 34-46.
Manser, Marilyn, and Richard McDonald, "An Analysis of Substitution Bias in Measuring Inflation, 1959-1985," *Econometrica*, Vol. 56, No. 4, (July 1988), 909-30.
Moulton, Brent R., "Basic Components of the CPI: Estimation of Price Changes," *Monthly Labor Review*, Vol. 116, No. 12, (December 1993), 13-24.
Pollak, Robert A., "Additive von Neumann-Morgenstern Utility Functions," *Econometrica*, Vol. 35, No. 3, (July-October 1967), 485-494.
Pollak, Robert A., "Group Cost of Living Indexes," *American Economic Review*, Vol. 70, No. 2 (May 1980), 273-278. (Reprinted in Robert A. Pollak, *The Theory of the Cost of Living Index*, New York: Oxford University Press, 1989.)
Reinsdorf, Marshall, "The Effect of Outlet Price Differentials on the U.S. Consumer Price Index," in Murray F. Foss, Marilyn E. Manser, and Allan H. Young, editors, *Price Measurements and Their Uses*, NBER Studies in Income and Wealth, Vol. 57, Chicago: University of Chicago Press, 1993, 227-254.
Reinsdorf, Marshall, "The Effect of Price Dispersion on Cost of Living Indexes," *International Economic Review*, Vol. 35, No. 1 (February 1994), 137-149.
Reinsdorf, Marshall, and Brent R. Moulton, "The Construction of Basic Components of Cost of Living Indexes," paper presented at the NBER Conference on Research in Income and Wealth: The Economics of New Products, Williamsburg, Virginia, April 29-30, 1994.
Schmidt, Mary Lynn, "Effect of Updating the CPI Market Basket," *Monthly Labor Review*, Vol. 116, No. 12, (December 1993), 59-62.
Stiglitz, Joseph E., "The Causes and Consequences of the Dependence of Quality on Price," *Journal of Economic Literature*, Vol. XXV, No. 1, (March 1987), 1-48.
Stiglitz, Joseph E., *Whither Socialism?* Cambridge: MIT Press, 1994.
Wilson, Robert B., *Nonlinear Pricing*, New York: Oxford University Press, 1993.

PREPARED STATEMENT OF DR. JOEL POPKIN

The invitation to participate in these hearings contains an explicit premise that the Consumer Price Index (CPI) overstates the rate of inflation largely because it underestimates the rate at which the quality of goods and services is rising. My view is that there are quality deteriorations as well as improvements, that both kinds may be poorly measured or not be picked up in the index, and the net effect is indeterminant. Quality aside, there are other aspects of the CPI that probably cause understatements of the rate of inflation. My comments on these issues are organized into five sections, each introduced by a question.

The first section raises the question of **whether or not the quality adjustment controversy is of recent vintage?** Whether or not quality bias exists is, in my view, problematic. But if it does, it is not a bias that has suddenly been discovered. The issue was raised at least as long ago as May 1961 at hearings before the Joint Economic Committee on a report on price statistics prepared by a committee headed by the late George Stigler, a Nobel Laureate.[1] Committee Staff Director, Mr. Knowles sought a quantification of the pace of unmeasured quality change:

> *"Let's assume for a moment you have succeeded in all the research and you have a perfect measure of quality. Can you give us any judgment at the moment as to whether that would mean, say, that the CPI or the Wholesale Price Index, either one or both, would have moved upward less rapidly than they have in fact done with present techniques?"*[2]

Mr. Ruggles:[3]

> *"As long as we are being arbitrary, I would say 1 to 2 percent a year. But this would exceed, of course, the amount of price increase we have had in the index. So this would give us a falling price index over the period."*[4]

Mr. Stigler joined in:

> *"The trouble with this area is that there is no extensive body of data to which one can point. This is a common impression held by, let us say, 99 percent of the economists in the country, that there has been a steady upward drift on average in quality in peace-time, not, for example, in 1942-*

---

[1] *The Price of the Federal Government: Review, Approach and Recommendations.* General Research Series 73, New York: National Bureau of Economic Research.
[2] Government Price Statistics; Hearings before the Joint Economic Committee, Part 2, May 1, 2, 3, 4, and 5, 1961, p. 542.
[3] Member of Price Statistics Review Committee.
[4] Ibid, p. 543.

45. But if you corner one of these people and say, "Give me the references where I can find these numbers on which your judgment is based," it is a very thin collection of numbers."[4]

When Congress first tied Social Security to the CPI in 1972, it knew that 99 out of every 100 economists thought the CPI did not take adequate account of quality, yet it chose to tie benefits to the existing CPI. The reason is clear. Professor Stigler did not favor making subjective estimates from thin data, a view I agree with.

The second question is **whether the quality bias is of one direction year-after-year?** Maybe, maybe not. Let me provide two examples. The first example is of likely long-term downward bias because quality deterioration is ignored. It has to do with college education. The index for college tuition in February 1995 stood at 259.8, as compared with 150.9 for the CPI and 217.9 for medical care, all based to 1982-84=100. This CPI component is sizable, accounting for 1.5 percent of the CPI market basket, and has risen considerably. Yet many think there has been a deterioration of U.S. college education. There has been a 10 percent rise in student/teacher ratios in just the four years from 1987 to 1991, and comparative results of test scores between the U.S. and foreign countries show U.S. students are falling behind worldwide competition. This is the kind of bias that is ignored in the tabulations on which Chairman Greenspan relies, because it has not been studied.

The second example involves men's shirts. In the early 1960s, men wore cotton shirts; assume they cost $5 each. Soon wash-and-wear shirts were introduced and became popular. They cost $6. The BLS linked them in to the CPI to replace cotton shirts, but assumed the $1 higher price was due to quality factors, ease of care, etc. The CPI component for men's shirts did not rise. Subsequently, wash-and-wear shirts fell out of favor; purchasers preferred the coolness and breathability of cotton shirts even though they were more expensive. Assume their cost was $7 and linked into the men's shirt index. Thus the consumer ended up paying $7 for a cotton shirt he had paid $5 for a decade ago. Yet the CPI for men's shirts did not rise because, at this point in time, the cotton shirt was being compared with wash-and-wear, not the original cotton shirt. This example shows how a prompt attempt to adjust for quality improvement can result in the perhaps unrecognized need to make an offsetting adjustment several years later.

A related point is that when BLS targets an area for quality adjustment, the adjustments may be too large. This happened in the 1960s and 1970 in automobiles, which though rising in quality, were not improving as much as BLS numbers suggested.

The third question is—**Are there other areas of the CPI from which downward biases could emanate?** One, identified by both the Congressional Budget Office and the Federal Reserve Bank of Dallas is the treatment of the environment in the CPI. Increasingly consumers are forced to pay for improvements to the items they buy that are designed to improve the environment, not the product. Sometimes they adversely affect the utility of the product to which they are attached. The catalytic converter, instituted at fairly large cost in 1970 and improved since then, has been treated as a quality improvement in cars even though it has little to do with driving performance and may even limit it and raise maintenance costs. Most consumers would not buy a catalytic converter unless everyone else were forced to do so. After all, one driver cannot clean up the environment by himself. Thus the cost of the catalytic converter is like a tax, a tax designed to clean up air which is not in the CPI market basket. The CPI should rise, not remain unchanged as present BLS treatment dictates.

Taxes introduce ambiguities into the CPI. The CPI measures sales but not income taxes, so it is not neutral to financing methods of state and local governments. And it does not take into account what is happening to the quality of services being provided. Lately many state taxpayers are complaining they pay more taxes but get few and/or poorer local services. This is a clear case of unmeasured quality deterioration.

The fourth question is **whether a commission's findings would have an impact of the credibility of official government statistics?** Unfortunately, the answer is yes. The close relationship between prices and output assures this result. If CPI increases and GDP growth were both proceeding at 3 percent rates and a commission said the CPI was overstated by 1 percent, it would not take long to figure out that growth must be understated by 1 percent. Thus, the judgmental picture would be one of inflation at 2 percent, GDP at 4 percent. Now the focus of attention would shift from the BLS to the BEA. Some might want a commission to examine GDP and make adjustments there too. The BLS Employment Cost Index used to measure compensation costs would also be called into question; it has many of the same problems as the CPI because it is like a market basket of workers. No major national indicator would be immune from being second guessed. Objective statistics

would be replaced by subjective ones. So the outcome would very much depend on who is the umpire.

My answers to these first four questions clearly suggest I do not agree that the CPI is clearly biased in any direction in any given year. But if my view does not prevail today, I would at least like to make some constructive suggestions about the kind of panel that could best address the issue objectively and have the best chance of holding the confidence of the American people in the statistics the government produces. So my fifth point is, **if we have a commission, how should it be structured?**

I think invitations should be extended to every American Nobel Laureate in Economics. Their combined wisdom, coupled with their long-term experience as witnesses to technological change and new product and service introduction, is our best source of objective economic input into this issue, if it exists. I would not select economists who have not won Nobel Prizes, even if they have done considerable price research. The reason is that then there is no unambiguous standard for inclusion. Further, as has been pointed out, many price researchers have already reached conclusions on the topic of their research.

I appreciate the opportunity to have these remarks made part of the record and have appended a copy of a column I wrote on the subject that appeared in the Washington Post, March 10, 1995.

THE WASHINGTON POST

Joel Popkin

No Quick CPI Fix

The Consumer Price Index (CPI) was initiated by the Bureau of Labor Statistics (BLS) during World War I because it was needed to index wages during the rapid inflation of the period. It has been an American institution for most of this century. Like most institutions, it has been criticized on many occasions.

The form of criticism has varied, at times even being directed at the compilers of the data. For example, in 1970, Nixon aide Frederick Malek investigated the religious identity of the senior BLS staff, presumably to test the hypothesis that one's religion affects how one would compile national statistics. But while they varied in form, the criticisms have usually been from the same perspective—they claim the CPI goes up too fast.

As the century draws to a close, the CPI is undergoing another onslaught—this time from the Federal Reserve Board and the new House of Representatives. And the Senate Finance Committee is scheduling hearings on the subject soon, for which it has asked the BLS to provide testimony.

The Federal Reserve staff apparently thinks the CPI goes up faster than it should. Its research on the subject has not been published, but Fed Chairman Alan Greenspan has said that if those upward biases were eliminated, $150 billion could be cut from the federal deficit over the next five years. That prospect is enticing to many politicians who want to cut Social Security benefits or raise income taxes, both of which are indexed by the CPI.

The Federal Reserve criticisms emphasize biases that stem from the index formula the BLS uses and the way certain price changes are measured. Theory and evidence, much of it provided by BLS researchers, suggest these can be sources of upward bias. Another problem frequently alleged to impart bias is quality change measurement—making sure that the item priced this month has the same characteristics as last month's and, when it does not, adjusting the price to reflect the quality difference.

Many think that quality change is usually positive and not adequately measured. But there are many examples of quality deteriorating, too. Quality improvements and deterioration often march hand-in-hand. Fruits and vegetables may have a longer shelf life but seem not to deliver the same taste. Cars that get better mileage might be less crashworthy. The net bias because of the failure to account for quality change is, at this point, unknown. It needs to be determined in a comprehensive research program that considers all the problems associated with the CPI.

The problem is that the sources of bias the Federal Reserve and the House are talking about are not unambiguous in direction and not the only potential ones. And there are other problem areas in the CPI that may prove, when analyzed, to impart upward or downward bias. Two important ones relate to deciding what the consumer purchases when buying health care and education. In order to know what prices to collect, one must know the items or units that are being purchased.

We also need to decide whether and how the environment should be accounted for in the CPI. Currently, gasoline price increases due to the required use of winter blends to preserve air quality are removed from the CPI. In this case, modifications in gasoline serve as a surrogate for air quality changes. It may be that the downward adjustment in prices is too large or should not be made at all, especially if the recent complaints of some users of the winter blend are taken into account.

Finally, there is the issue of taxes in the CPI. Sales taxes are included in the index, but income taxes are not. Thus, the CPI is affected by how state and local governments choose to finance the services they provide. And what if the amount of those services is failing, as many allege, while sales tax rates are rising? Does that not suggest a downward bias in the CPI?

The CPI needs work. But the work should not be slanted to produce results that make it easier for policymakers to correct past mistakes. If we are to make changes in the CPI to correct it for bias, it should be done as an outgrowth of a balanced and timely program to improve the index, not just with the objective of providing a quick fix to the issue of indexing Social Security for inflation. The government has the obligation to accurately record the economic progress of our country. That obligation should not be subverted for political ends.

The writer was assistant commissioner for prices in the Bureau of Labor Statistics from 1969 to 1973.

FRIDAY, MARCH 10, 1995

COMMUNICATIONS

STATEMENT OF THE AFL–CIO

This statement expresses the strong opposition of the AFL-CIO to mandating reductions in the annual official inflation rate as measured by the Consumer Price Index (CPI) in order to cut Federal budget deficits.

In testimony before this Committee and in other forums, the Chairman of the Federal Reserve Board, Alan Greenspan, has proposed that this be done—either directly by the Congress or through a special Commission to be established for this purpose.

The CPI is used in indexing benefits paid under government programs, such as social security and veterans benefits, and in setting specifications for personal income tax brackets, exemptions, and deductions.

We are well aware of the high stakes involved—in terms of savings to the Federal budget, in losses to beneficiaries of indexed programs, and in higher personal income taxes to be paid.

The Chairman has urged speedy action, because the effects cumulate over time. The sooner CPI reductions can be made, the greater the savings to be realized for the budget (and the greater the loss to individual beneficiaries and taxpayers.)

Proposals have been made in the past to reduce benefit outlays by an arbitrary subtraction from the CPI rate—mainly when inflation was rising strongly. Today the CPI is running at very low rates (2.7 percent for the year ended December 1994).

Greenspan, however, makes a frontal assault on the index itself, claiming that its computation "overstates" inflation in an estimated range of.5 to 1.5 percentage points. Technical grounds are thus invoked—implying a range of certainty which does not really exist. Not only is overstatement said to be present, but its potential magnitude is suggested to be large.

The subtractions to be made, according to Greenspan, would put the index on a "true cost-of-living" basis in contrast to a measure merely reflecting price inflation.

Greenspan's estimates come from a staff paper, dated August 1994, which was supplied to us upon our request. (Our detailed comments are attached.) The staff estimates do not deal primarily with classical "cost of living" theory but with price measurement. The "state of the art" is such that at the present time it is usually impossible to tell whether price change is being overstated or understated. Errors occur in both directions, but their magnitudes are essentially *unknown* at the present time.

We believe that a credible case for "overstatement" has not been made in the Federal Reserve paper, and that the working assumption for bias in the CPI should be "zero." It is entirely possible, in fact, that on balance, CPI is actually *understating* inflation.

Thus, picking a number from .5 to 1.5 would really be an arbitrary exercise, representing a compromise or political consensus rather than a technical one. Other studies by the BLS have indicated that the CPI as applied for social security retirees actually understates the rate of inflation by .3 to .4 percentage points.

The public places a high value on the integrity of Federal statistical agencies and their ability to produce the most reliable numbers possible. Over its long history, the Bureau of Labor Statistics has earned an enviable reputation, despite periods of great controversy and turmoil over one or more of its statistical series.

Over the decades, the AFL-CIO and its predecessor unions have not always agreed with BLS technical determinations and have not hesitated to say so. But we strongly support the function of BLS as an independent source of expertise and authority on price and labor statistics.

We agree with recent observations of former Commissioner Janet Norwood that "competent statisticians and economists can produce statistical series that are reli-

able and objective, but there is no such thing as a perfect' index. The public and its representatives must *learn what is known and not known about the statistical series under discussion."* (emphasis supplied).

"Knowledge of what can be used with confidence and what needs further research and experimentation is crucial if we are to improve our statistics—and if Congress is to make wise decisions in legislating the use to which a statistical series will be put."

Today's CPI is a complex and sophisticated statistical instrument, used not only for indexed programs, but with components and subcomponents used in a multitude of other government statistics. The index is also used extensively in the private sector, and in collective bargaining negotiations between unions and management.

BLS has approached price measurement problems with assiduous research and has incorporated corrections in the index for both overstatement and understatements of price change, in an ongoing process.

At present BLS is engaged in a large-scale overhaul of the index, done approximately every 10 years. The overhaul involves an updated market basket, new population weights, new area samples and improved methodologies. The present time is a peculiarly inappropriate one to be attacking the index and demanding computation of special reduction factors.

We believe the independence and authority of the Bureau of Labor Statistics must be maintained—free of political hardball.

It is in order for the Bureau to seek whatever inputs it may need, not only from its present advisory committees, but also from such specialized technical committees as it may choose to convene on an ad hoc basis.

We do *not* believe it is in order for any kind of oversight committee to be established to second-guess the work of the BLS or to override its results.

OUR RECOMMENDATION TO THE CONGRESS: DO NOTHING!

Attachment.

AFL–CIO COMMENTS ON FEDERAL RESERVE STAFF PAPER
"Monetary Policy and the Price Level"
(August 1994)

The Federal Reserve paper builds its estimates by adding together the number of points" of overstatement it can establish at the minimum and then separately at the maximum. The minimum estimates all start at zero—finessing the possibility that negative values, representing "understatement" might also exist. The maximums are constructed as estimated "upper bounds," representing the largest conceivable degrees of overstatement that might be present.

The Minimum Estimate (.4)

The minimum estimate consists of the addition of two items—which together add up to .4 (rather than .5).

(A) "Low-level substitution" (.3) Most of the total (.3) is for an item called "low-level substitution" in the Fed paper. The number comes from a recent BLS study of computation problems associated with the rotation of new samples into the index. (Each year, samples are replaced for about 20 percent of the local areas priced for the CPI.)

Comment:

Computation glitches do not represent a systemic "upward bias." BLS has made a number of changes effective with the January 1995 index and is continuing its review. This item is a disappearing quantity.

(B) "High-level substitution" (.1) The remaining item (.1) reflects studies that estimate general "substitution bias" (called "high level substitution" in the Fed paper) in a range of .1 to .2 points.

This bias is said to occur because the CPI uses price changes for a fixed market basket of goods and services. The index does not allow for alternative, lower-priced purchases consumers may make when prices rise for particular products, so as to hold down their living costs. A "true" cost of living index would include allowance for such substitutions.

Comment:

There is no way in which "substitution bias" can actually be determined as to when and whether it is taking place or to what degree consumers may be equally satisfied with their rearranged purchases. Substitutions can only be *inferred* on the basis of retrospective studies of past index behavior.

The AFL–CIO has always viewed the theory with skepticism. What degree of satisfaction is lost for consumers who trade down from steak to hamburger? Do people readily substitute—with equal satisfaction—tea for coffee if the price of coffee rises relative to the price of tea? Is purchase of a used car really as satisfactory as a new car when new car sticker prices jump?

Consumer price indexes throughout the world use a "fixed market basket" in their calculations of price change.

The Maximum Estimate (1.5)

(A) High and low level substitution items (.6)

The maximum estimate includes the same two "substitution" items as in the minimum estimate, but with an additional .1 in each case. These items account for .6 points in the 1.5 aggregate estimate.

Comment: The same comments apply here as for the minimum estimate.

(B) Retail outlets (.1)

The retail outlet item uses results from a special BLS study of food and gasoline outlets and then extends them to a large portion of the rest of the index (more than 40 percent overall).

Comment:

The authors themselves regard this as a "crude upper bound." The effect is small and likely overstated. The net effect, if any, would thus come to less than .1.

(C) Quality adjustment (.3)

"Quality adjustment" refers to the measurement of price change, after adjusting for any changes in product quality. It can either lower or increase reported price change (or have no effect). BLS has several different ways of handling this at present, but some types of products present especially difficult problems in what to measure and how.

The Federal Reserve analysts accept the results of an authoritative study in 1988 which concluded that errors in quality adjustment cancel each other out in the index, with no net impact on overall price change. But they use this conclusion only as a "zero" estimate in the calculation of *minimum* upward bias, and disregard it in calculating *maximum* bias.

To construct an "upper bound" for quality bias, the authors rely on a single study for "consumer durables" which suggested that such prices could be overstated by as much as 1.5 points per year.

This 1.5 figure is then *extended* to a large variety of other goods and services where quality adjustment problems are thought to be "most acute. " Not only are household appliances included, but also lawn equipment and power tools, clothing, automobiles, airline fares, medical care, and entertainment commodities—altogether reaching a total of 23 percent of the index.

Comment:

If the overall effects of "quality bias" cancel each other out, then this conclusion applies at the maximum as well as at the minimum—and places the maximum estimate at zero. If the maximum is stated as larger than zero, then a like quantity needs to be subtracted from the minimum estimate, producing a negative offset. *The estimates for maximum bias should thus be disregarded.*

In any case the calculation of the "upper bound" is broad-brush and thinly buttressed. It not only covers areas where little or nothing is known, but even more remarkably, two areas where *a great deal* of work has been done: (1) *automobiles,* for which BLS does extensive quality adjustment (some would say overadjustment) and (2) *clothing* commodities—for which BLS now incorporates "hedonic" measurement techniques.

For new cars, quality adjustments have been substantial. Without such adjustment, new car prices would have come out 80 percent higher in the index over the years 1967 to 1984, according to recent BLS testimony.

Taken together, autos and clothing account for fully half of the total of the "overstatement" attributed to inadequate adjustment for quality change.

(D) New Products (.5)

There are many problems with accounting for new products in the index, such as the appropriate definition of new products and whether they are introduced into the index too long after their initial prices have fallen.

There are no studies on the magnitude of such problems with respect to consumer products.

The Fed authors therefore construct an "upper bound" by making "some rather extreme assumptions" for household appliances, lawn and power tools, and drugs. Together these categories account for 2.3 percent of the index.

Prices for the new products in these categories are weighted at the existing percentages of the index for all products. Prices are then assumed to fall at the rate of 20 percent per year causing "upward bias" to reach a total of .5 points per year.

Comment:

The estimate for "new products" is the largest single item in the overall total of 1.5 points comprising the maximum estimate. It is entirely theoretical, even conjectural. We believe that "extreme assumptions" have produced extreme and insupportable results. New goods are not ignored in present BLS procedures—and improvements are scheduled for the ongoing general index revision.

ADDENDUM

A note on the problems of estimating price change for new and improved products—an example of product improvements that may be imposed on consumers whether they want them or not.

The Wall Street Journal, March 23, 1995:

> **Time Warner,** facing a wave of consumer protest, is abandoning a plan that would have made cable customers pay extra for a new high-tech cable box whether or not they wanted new features such as an electronic program guide and pay-per-view movies.

STATEMENT OF DR. MICHAEL R. DARBY*

THE WARREN C. CORDNER PROFESSOR OF MONEY & FINANCIAL MARKETS
DIRECTOR OF THE JOHN M. OLIN CENTER FOR POLICY
THE JOHN E. ANDERSON GRADUATE SCHOOL OF MANAGEMENT AT UCLA
AND
RESEARCH ASSOCIATE OF THE NATIONAL BUREAU OF ECONOMIC RESEARCH

OVERSTATEMENT OF INFLATION IN THE CONSUMER PRICE INDEX

Mr. Chairman and Members of the Committee: Thank you for this opportunity to submit my views on the important issue of the overstatement of inflation in the Consumer Price Index (CPI) and possible steps to rectify that overstatement. My views are expressed not only on the basis of long time use of these data as an academic and business economist, but also with reference to my experience as Assistant Secretary of the Treasury (1986-1989) where my responsibilities included development of Treasury economic policy and forecasts, liaison with the Federal Reserve System, and preparation of the Social Security Trust Fund Trustee's reports and my experience as Under Secretary of Commerce for Economic Affairs (1989-1992) where my responsibilities included development of Commerce economic policy and forecasts, supervision of the Bureau of the Census and the Bureau of Economic Analysis (BEA), and liaison with other statistical agencies including the Bureau of Labor Statistics (BLS).

Why is CPI inflation overstated?

Price indices basically estimate inflation over a given period by as the ratio of the estimated cost of a standard basket of goods and services in the end year to the cost of the same basket in the base year. This sounds straightforward, but the results depend crucially on the basket which is used in the calculation, how quality changes are handled in goods and services which change over time, and how to account for new products consumed in the end year but not in the base year. In a dynamic economy like ours, where goods are continually improved, new goods are introduced which were never before available, and consumption patterns change rapidly in response to both new opportunities and changing relative costs of previously available

---

*The conclusions and opinions expressed in this statement are those of the author and do not necessarily reflect those of any organization with which he is or has been affiliated. A fuller discussion of a number of these issues is contained in Michael R. Darby, "Causes of Declining Growth," in *Policies for Long-Run Economic Growth,* proceedings of A Symposium Sponsored by The Federal Reserve Bank of Kansas City, Jackson Hole, Wyoming, August 27-29, 1992, Kansas City: Federal Reserve Bank of Kansas City, 1992.

goods and services, accurate measurement of inflation is a difficult and costly but not impossible task. In practice, however, the CPI suffers significant upward bias in measured inflation because of each of these factors.

The BLS has primary responsibility for price indices in the federal statistical system and has not done a good job at dealing with either quality improvements or new goods and services. Because of dissatisfaction with the price indices available from the BLS, over the years various administrations and Congress have shifted increasing responsibility for price indices to the BEA which reports price indices as part of the national accounts using the bureaucratic circumlocution of "implicit price deflators" to avoid direct trespass upon BLS turf. The BEA indices remove some (but not all) of the biases present in the BLS indices including particularly the CPI, and are routinely preferred by economists for empirical and policy analysis. Whether the biases in the CPI reflect inadequate funding of BLS, poor management, or political pressures to leave the upward biases in the statistics is beyond the scope of the questions which you, Mr. Chairman, have asked me to address.

Biases due to quality changes

The CPI is supposed to permit us to disentangle how much of increased consumers' expenditures are due to price increases and how much is due to increases in quantities purchased which, on a per capita basis, represent real increases in the standard of living. This division into price and output components is a relatively simple task for basic commodities like flour, potatoes, or white cotton cloth of a specified weave because the products and their prices are directly comparable in different years. As we have become wealthier, such basic commodities have become relatively insignificant in our purchases compared to more complex goods and especially services, or mixtures of goods and services.

The task of dividing sales in different years into comparable price and quantity components becomes progressively more difficult for the more high-tech goods and for services for which even the units of output are far from obvious: A pound of computers or a billion floating-point operations. A hospital day or days of healthy life saved? An hour of grocery clerk's time or pounds of potatoes sold at retail. The CPI bias arises because a particularly effective and widespread means of competition is to offer a better combination of goods and services at a smaller increment in price (if any) than the improvement is worth to consumers. Some of these improvements are entirely missed by the BLS, so a 15 minute visit to a doctor is viewed as of equal quality in 1995 and 1975, even though in 1995 the doctor may be able to cure your disease rather than merely offer comfort. Others are recognized, but only partially accounted for: Suppose the base-year model of automobile did not come with automatic transmission or air conditioning, but technological improvements have made it possible to offer those features standard at a relatively small increment in cost. Consumers seeing that the quality has improved by more than the cost switch to ordering this car with automatic and air conditioning; so it becomes standard equipment on the automobile. The BLS will recognize that there is a quality improvement but measure it by the cost differential after the technological improvement, not by what it would have cost to buy the car with automatic transmission and air conditioning in the base year. The BLS method thus minimizes the effect of these quality improvements on our standard of living.

Not all quality changes are improvements, of course, but surely most changes in the quality of goods and services unrecognized by the BLS have been improvements and the net bias from that source is upward. For BLS-recognized decreases in quality, the adjustment for quality changes results in an upward (not downward) bias in the CPI. Consider, for example, the innovation in marketing embodied in the Wal-Mart store. These stores offered consumers the opportunity to buy less retailing services with their goods than previously at a very substantial reduction in price. Consumers found this combination of goods and services so much more attractive than any of those available in the base year that the closure of previously dominant merchants after the arrival in town of the Wal-Mart has become a cliche. Rather than stop collecting price information on the goods once the prior merchants are out of business, the BLS will make an adjustment for quality differences based on the price differential before the prior stores close. But this differential overstates the quality difference as perceived by consumers which is precisely the reason that the Wal-Mart drives its competitors out of business. Thus, in the relatively rare cases in which quality changes are negative but the BLS corrects for them, using the post-innovation price differential to make the correction biases the CPI upward.

Biases due to new goods and services

New goods and services are conceptually very similar to unrecognized quality changes , except in this case all such innovations which succeed in the marketplace

are improvements in the standard of living as viewed by the consumer. They highlight, however, the difficulty in estimating the extent of the upward bias in the CPI. Consider an innovative drug which substitutes for surgery which was the previously best treatment for an illness although with a lower cure rate and significantly higher death rate. Clearly omission of this innovation understates the improvement in our standard of living, but by how much? Unlike the automobile example, we cannot look at the value if the drug in the base year when it didn't exist even as a nonstandard option. As a result, a range of uncertainty arises depending on whether we estimate the improvement based on estimates of prices which would have reduced the quantity of the drug purchased in the base year to zero or whether we look at benefits including to those just willing to purchase the drug when its use becomes widespread. I do not believe that there is a real solution to this problem, but urge the committee to use caution when considering minimal estimates of upward bias based on the latter convention since the real bias could be much larger.

Biases due to using the earlier year's basket of goods and services

Leaving aside these issues of new and improved products for a moment, technological innovations and other economic changes will alter the prices of some goods and services relative to those of others in different years. Consumers will buy more of those goods which are relatively inexpensive and less of those which are relatively dear in any given year. Since the CPI is based on a base-year basket of goods and services, using the increase in that basket to divide consumer-expenditure increases into price and quantity component overstates the increase in prices and understates the increase in the standard of living actually achieved since the base year. This source of bias can be quite significant in a dynamic economy like ours, particularly where substantial movements in foreign exchange rates have led to large movements in relative prices of different goods and services.

WHAT IS MY ESTIMATE OF THE OVERSTATEMENT?

I estimate that on average use of the CPI overstates inflation—and understates improvements in the standard of living by at least 0.5 and by as much as 2 or 2.5 percentage points per annum. If constrained to give a single number, I would say that the upward bias amounts to about 1.5 percentage points per annum.[1] This is based on examination of individual sources of bias by myself, by my former staffs, and by academic colleagues, as well as by examination of related implications for mismeasurement of such variables as GDP and labor productivity.

WHAT STEPS COULD BE TAKEN TO RECTIFY THE OVERSTATEMENT?

I believe that establishment of a nonpartisan commission of outside academic experts is the first crucial step to rectifying the overstatement in the CPI. Such a commission would be charged with examining and improving the procedures used in estimating the CPI, educating the public about the issues involved in the bias, and preparing for Congressional review an action plan to improve the accuracy and remove the bias in the CPI. Such an action plan should be submitted by a date certain which would permit Congress to review and accept or modify it prior to implementation by the following January. In my view, such an action plan would involve both adoption of specific plans for improving measurement and coverage of quality changes and new goods and services and specification of what additional data must be collected to implement those improvements. Such changes might be particularly important in rectifying our understanding of price and output changes in medicine, high-tech goods and services where the upward biases in inflation estimates appear to be most severe. The commission should also propose a correction for the estimated average effect of the remaining biases in the CPI which could be subtracted from the improved numbers to result in an unbiased Consumer Price Index.

I would urge that such a commission be given staff independent of but with access to the personnel and records of the BLS and other statistical agencies as required for the work of the commission, subject to the standard confidentiality requirements imposed by the agencies when outside academics are given access to their internal records.

---

[1] These estimates refer to the current CPI-U. Things were much worse, for example, before the 1982 corrections for gross overestimates of housing cost increase. These corrections were not made retrospectively, however, although the BLS calculated the CPI-U-X1 which is the corrected version. This error thus permanently and arbitrarily increased the official poverty definitions by a cumulative amount of some 8.7 percent with a somewhat smaller effect on Social Security benefits because of a special phase-in provision on the use of the corrected CPI-U for Social Security benefits.

In my experience, when measurement problems persist despite a professional consensus on their presence and the need to correct them, as in the case of the CPI, that persistence is often due to administration reluctance to allow statistical agencies to do the right thing even though it might be politically disadvantageous or discomfort a powerful group of supporters. It is precisely in cases such as this that Congress needs to call in outside academic expertise not subject to pressures to bend the yardstick to advantage a particular group or position.

Thank you for your consideration in permitting me to submit these views in writing given the conflict between the Committee's hearing and my teaching schedule. I would be happy to address any further questions which you might have.

STATEMENT OF KENNETH MCLENNAN

(PRESIDENT, MANUFACTURERS ALLIANCE)

The Manufacturers Alliance is pleased to submit to the Senate Finance Committee a statement of its views on the questions of the overstatement of inflation by the Consumer Price Index (CPI) and the use of any estimates of overstatement. This involves both technical and political decisions.

The Manufacturers Alliance is a policy research and professional development organization whose 500 member companies include leaders in almost every manufacturing industry. For more than 60 years, the Alliance has served as a spokesperson for policies which promote technological advancement and economic growth for the benefit of U.S. industry and the public interest.

Our member companies' interest in adjustments to the CPI is two-fold: first, through their use of price indexes to escalate long-term contracts, and, second, as employers, with respect to cost-of-living adjustments for payments to employees and Social Security payments to beneficiaries.

Few would question that the Bureau of Labor Statistics (BLS) measure of consumer prices, the CPI, is the best available index. But there also is little doubt that the CPI can, and should be, improved. The pertinent question is: to what extent, if any, does the CPI overstate inflation?

The answer to that question is important since the CPI is used to make cost-of-living adjustments to Social Security payments to beneficiaries, to certain other recipients of federal benefit programs, and to retired federal government workers; to collectively bargained wage payments where such adjustments are provided for; and to income tax exemptions, deductions, and brackets. Thus, a reduction in the CPI because of any overstatement of inflation could result in *lower* government and corporate payments in the first two instances, and *higher* tax payments in the latter. Stated more bluntly, those most affected by the adjustments would be Social Security recipients [1] and taxpayers.

Putting aside the matter of whether or not such changes are desirable, a problem arises in that there is no consensus as to the extent that the CPI overstates inflation.

In late January, Alan Greenspan, Chairman of the Federal Reserve Board of Governors, in testimony before the Senate Banking Committee, said that the CPI overstates the rate of inflation by 0.5 to 1.5 percentage points a year. Further, assuming the mid-point of Greenspan's range, eliminating this bias could result in a savings to the federal government of $150 billion over five years. That could reduce the federal budget deficit currently projected for the year 2000 by $55 billion, about one-quarter of the total.

On the other hand, a recent Congressional Budget Office study estimated that the CPI overstates the rate of inflation by only from 0.2 to 0.8 percentage point annually. And, recently, Laura D'Andrea Tyson, former Chair of the Council of Economic Advisers, said that the substitution bias probably results in a CPI overstatement of between 0.1 and 0.2 percentage point.

SOURCE OF THE BIAS

The two most important technical problems with the CPI are:

1. *Substitution.*—Since the CPI tracks price changes for a fixed market basket of goods and services, it fails to capture shifts in purchases each month as consumers substitute goods that have become relatively cheaper for goods that have become relatively more expensive; and

---

[1] Social Security represents some three-quarters of federal spending tied to the CPI.

2. *Quality changes and new products.*—In principle, a change in price that reflects a change in quality is not considered to be a change in the cost of living. However, it is difficult, if not impossible, as a practical matter to measure the extent of quality changes in the vast number of products and services that consumers purchase.

COMPLEXITY OF PROBLEMS OF MEASUREMENT

To this point in the discussion there has been an implied assumption that any bias resulting from the technical problems with the CPI is upward. As to the substitution bias, both theory and practice would seem to indicate that this is the case. Consumers *do* react to changes in price, and the fixed-market basket approach measures the change in the cost of living as if consumers *do not* alter their buying patterns when the prices of some goods and services rise faster than others. More frequent changes in the market basket could moderate the impact of this bias, but would require additional research and revenues at a time when spending restraint is being given a high priority.

With respect to changes in quality and the introduction of new products, here too the net effect is probably an upward bias because of the resulting increases in the benefits to consumers. However, there may be offsets. For example, certain changes in a car may result in better mileage, but this may be at the expense of comfort and/or safety. Similarly, a new food product may offer longer shelf life, but may sacrifice nutrition to do so. Such offsets do not change the conclusion that quality improvements and product innovations produce a net upward bias on the extent of inflation as measured by the CPI. At any rate, it seems fair to state that because of the complex methodology involved and a lack of data, to date BLS consideration of quality changes and new products has been minimal.

THE TECHNICAL ISSUE

The BLS is not unaware of the bias problem in the CPI raised by Chairman Alan Greenspan—in fact, admits to it—but contends that Greenspan overstated the overstatement. The BLS estimate of the overstatement of inflation by the CPI is around 0.5 of a percentage point a year.

Nor has the BLS been unresponsive in trying to fix the problems with the CPI. For example:

- The BLS traditionally has revised the market basket about every 10 years. Beginning in 1998, the BLS plans to use a market basket based on consumer behavior in 1993-1995.
- Earlier this year the BLS introduced changes to the food, drug, and prescription-components of the CPI which will reflect consumers' increasing use of cheaper, generic brands. This is expected to reduce the growth in consumer inflation by 0.1 percentage point per year.

Nonetheless, the BLS admits that not only would the required changes to eliminate completely the biases in the CPI be difficult to implement, but even then, most likely, problems related to adjustments for changes in quality and the introduction of new products would remain.

THE POLITICAL ISSUE

The BLS traditionally has been insulated from political pressures. However, immediately following Chairman Greenspan's comments on the overstatement of the CPI, a number of prominent members of Congress could not resist this newfound opportunity to cut the growth of federal spending and increase tax revenues.

The Republicans, led by House Speaker Newt Gingrich and Majority Leader Dick Armey, immediately endorsed the Greenspan suggestion that the federal budget deficit be reduced by adjusting federal benefits and income tax brackets, exemptions, and deductions by an inflation measure more accurate than the current CPI. In fact, at one time Gingrich threatened to cut off funding of the BLS if the necessary steps to change the CPI were not taken.

Nor were the Democrats far behind, claiming the proposed changes in the CPI were not a technical issue, but a backhanded way to cut Social Security benefits and increase taxes. To forestall any such change in the CPI, Richard Gephardt, Minority Leader, and other Democrats introduced a bill in the House (H.R. 815) to provide that the BLS may not change, during the 104th Congress, the method of calculating the CPI if it would result in higher taxes unless the change has been approved by law.

Notwithstanding these moves, Katharine Abraham, Commissioner of the Bureau of Labor Statistics, has expressed the opinion that the policymakers in the Congress and at the Federal Reserve Board are aware of the technical problems faced by the BLS in attempting to arrive at an accurate gauge of inflation and are not likely to

approve quick-fix adjustments or to shift responsibility for the CPI to some other agency.

SOLUTIONS TO THE PROBLEM

A number of alternative solutions to the problem of the overstatement of inflation in the CPI merit attention:

- First, there is the frequently-resorted-to proposal for an outside panel of experts on the subject to review the CPI and make recommendations for possible improvements. This would, in effect, be part of a balanced and timely program to improve the index. Such an approach has been suggested by Commissioner Abraham.
- Second, in line with Chairman Greenspan's suggestion, the BLS need make no changes in its methods of calculating the CPI, but Congress could set its own limit on cost-of-living adjustments (COLAs), providing, for example, that federal benefits and tax brackets be adjusted by a set amount such as 1 percentage point less than the increase in the CPI. In an earlier hearing before the Senate Finance Committee, Greenspan called for a permanent independent Commission that would set new cost-of-living adjustments for income taxes and benefit programs that are tied to the CPI.
- Third, no adjustments in the CPI should be mandated, but the BLS should be encouraged to study further the matter and accelerate its efforts toward a more accurate CPI.

CONCLUSION

Whatever approach is taken, any changes in methodology should be made in light of their contribution to a more accurate CPI, not with respect to their impact on benefit and tax payments. The Manufacturers Alliance supports the proposal that Congress establish a panel of statistical experts to review the current methodology for measuring the CPI and recommend (1) an estimate of the upward bias in the CPI measure of inflation, and (2) changes in the procedures currently used by BLS to estimate the CPI. The panel of statistical experts should be drawn from the relevant federal statistical offices, the Federal Reserve Board research staff, the Office of Management and Budget, and the Congressional Budget Office.

The panel should report its findings six months following appointment, along with recommendations to the President and the Majority and Minority leadership in the Senate and the House of Representatives. The Alliance believes that, as a matter of principle, it is inequitable for the government to continue to perpetuate an unintended benefit. Policy officials should promptly correct the bias in the CPI based on the findings of the panel of experts.

○