

to do what is within our means to do. It is a commemoration of the conciliation of capacity and conscience, of power with prudence. It is a commemoration of our awareness of the terrifying levels to which conflict, once begun, can escalate. It is a commemoration of the resolve, enshrined in the Charter of the United Nations barely 6 weeks earlier, to reaffirm faith in the dignity and worth of the human person.

You have dedicated this ceremony to peace. And, without doubt, the introspection the horror of Hiroshima compelled has made our world a safer place. Machinery has been put in place to support nuclear controls and safeguards, to carry out the destruction of nuclear weapons, to ban nuclear testing. The nuclear nonproliferation treaty has been validated in perpetuity. It has signatories whose number falls only a few short of the membership of the United Nations itself. Given tact, reason, and understanding it should be possible to aspire to a truly universally regime. Such a regime becomes all the more necessary and compelling given the clear and unambiguous assertion by the Security Council at the highest political level in January 1992 that the proliferation of weapons of mass destruction constitutes a threat to international peace and security.

In 2 years we shall commemorate the 40th anniversary of an unfulfilled mission: The question of a comprehensive nuclear test ban, which first appeared on the agenda of the General Assembly in 1957. It would be an achievement well worth striving for. The progress being made towards a comprehensive test ban treaty must be enhanced and build upon. The vast potential for the peaceful uses of nuclear energy must be addressed and given realisation unhindered by its diversion for essentially combative ends. And it is clear that non nuclear-weapon states must be provided international security assurances that are legally binding.

These are some thoughts that come to mind on an occasion such as this. In Hiroshima hope has succeeded hate, determination despair. For a half a century you have lived with an awareness at first hand of what the phrases the world uses can really mean. Please share that awareness, that sense of the possibilities that we can and we must realise. The world owes you no less, nor you the world.¹

This is the message from the Secretary-General of the United Nations.

Excellencies, citizens of Hiroshima, this expression of the Secretary-General is what we at the United Nations want to do together with you, the citizens of Hiroshima and the people of Japan.

I thank you.

PROCLAMATION HONORING THE 25TH ANNIVERSARY OF KICKAPOO HIGH SCHOOL OF SPRINGFIELD, MO

Mr. ASHCROFT. Mr. President, today I would like to salute a high school from my hometown of Springfield, MO, that defines excellence in secondary education. Kickapoo High School has been recognized by the U.S. Department of Education as one of the excellent secondary schools in America. Opened in 1971, Kickapoo will celebrate its 25th anniversary on October 25 after a rich history of academic achievement. Over 8,000 Missourians have graduated from the halls of Kickapoo High School. These students have attended some of America's finest universities including: Yale, Northwest-

ern, University of Chicago, Duke, and Washington University.

Kickapoo High School continues to be a leader in educational diversity, serving as a model, not just for southwest Missouri, but for the Nation as a whole. The needs of physically and academically challenged students have been served by the opening of a learning resource center and by establishing an orthopaedically handicapped program. In an era when test scores are emphasized for college admissions, Kickapoo High School's students exceeded the national average on the ACT by two points on each of the three sections. Students' educations are supplemented by advanced placement courses, where 80 percent of Kickapoo students earned scores, qualifying them for college credits upon enrollment.

A defining characteristic of a school is the honors bestowed upon it. Kickapoo High School had seven National Merit Scholar finalists and nine National Merit Commended Scholars in 1994 alone. For these achievements listed and many others not, I am pleased to honor Kickapoo High School on the 25th anniversary of its charter.

The teachers, students, administrators, and community of Kickapoo High School should be commended for their achievements and service to our Nation. All of those who have been affiliated with Kickapoo High School are charged with a duty to leave America as a better place. Kickapoo serves as an emblematic secondary educational institution and prime example of academic excellence in the United States of America.

THE CONSUMER PRICE INDEX

Mr. MOYNIHAN. Mr. President, some 32 years ago, in the administration of John F. Kennedy, I became Assistant Secretary of Labor for Policy Planning and Research. This was a new position. In this new position, I was nominally responsible for the Bureau of Labor Statistics. I say nominally out of respect for the independence of that venerable institution which long predated the Department of Labor itself. The then-commissioner, Ewan Clague, could not have been more friendly and supportive and in time I grew to know more of the field. At that time the monthly report of the unemployment rate was closely watched by capital and labor, as we would have said, and was frequently challenged. Committees regularly assembled to examine and debate the data. Published unemployment rates, based on current monthly survey methodology appeared, if memory serves, in 1948 and so the series was at most 14 years in place at this time. By contrast, the Consumer Price Index dated back to 1919. And yet, while the statisticians were increasingly confident of the accuracy by which they measured unemployment, they were never entirely happy about the CPI. Its computation was, and remains, a dif-

ficult and ever-changing effort. In particular, the statisticians worried that the Consumer Price Index was increasingly used as a surrogate for the cost-of-living index. They felt this would lead to great troubles as surely the CPI overstated inflation. I think they would have been even more alarmed to know that in the two decades that followed we would use the CPI to index some 30 percent of Government outlays and 45 percent of Government revenues.

This problem inevitably grew more salient at times of true inflation. Thus, on October 26, 1980, an article in the Business and Finance section of the Washington Post described the election difficulties President Carter was facing owing to double-digit inflation. The story noted "The consumer price index overstates the impact of inflation, the White House contends." As we know, it contended to no avail, but the difficulties with the CPI as a proxy for the cost of living continued.

In the spring 1981 issue of the Public Interest, Dr. Robert J. Gordon, now chairman of the department of economics at Northwestern University, wrote:

... the [United States] CPI is probably the single most quoted economic statistic in the world.

We are now slowly waking up to the further fact, well known in the economics and statistics communities, that the Consumer Price Index is not a measure of the change in the cost of living. It is so stated in a pamphlet published by the Bureau of Labor Statistics entitled "Understanding the Consumer Price Index: Answers to Some Questions":

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. For example, if the price of beef increases more rapidly than other meats, shoppers may shift their purchases away from beef to pork, poultry, or fish. If the charges for household energy increase more rapidly than for other items, households may buy more insulation and consume less fuel. The CPI does not reflect this substitution among items as cost-of-living index would. Rather, the CPI assumes the purchase of the same market basket, in the same fixed proportion (or weight) month after month.

Despite this caution from the agency that compiles the CPI, the index is used as a yardstick for adjusting Government benefits, including Social Security, and provisions of the Internal Revenue Code.

And yet, it is now well recognized that changes in the CPI overstate the change in the cost of living.

The administration recognizes this fact.

Congress recognizes this fact.

And a Commission of eminent economists appointed by the Senate Finance Committee recognizes this fact.

In an October 3, 1994, memorandum entitled "Big Choices," Dr. Alice

Rivlin, then Acting Director of OMB and now Director—and a distinguished economist who has served as the president of the American Economic Association—noted that among the options available to reduce the budget deficit were several COLA proposals including, and I quote:

CPI minus 0.5 “technical” reform (CPI may be overstated by 0.4% to 1.5%).

CPI minus 2 for five years.

The budget resolutions passed by the Senate and House built into their baseline lower CPI assumptions than were projected by CBO in January. The lower assumptions reflect the expectation that scheduled BLS revisions of the CPI will lower the reported CPI. The Senate assumed a two-tenths of a percentage point adjustment; the House assumed a six-tenths of a percentage point adjustment. The conference report adopted the Senate version.

In their report—Senate Report 104-82—the Senate Budget Committee noted:

In January, CBO projected CPI inflation would remain at 3.4 percent for 1998 and thereafter. The downward revision reported here relative to the January figures reflects CBO’s new appraisal that the 1998 benchmark revision to the CPI planned by the Bureau of Labor Statistics will likely reduce the rise in the computed measure of the CPI by 0.2 percentage points a year. Federal Reserve Chairman Greenspan and CPI experts have recently testified before the Senate that incomplete evidence suggests CPI inflation may be overstated by as much as 1.0 to 1.5 percentage points a year. However, in advance of further, more conclusive analysis, CPI biases remain speculative and have not been incorporated into the Committee assumptions.

And the budget resolution, adopted by the Senate on May 25, 1995, contained this language:

SEC. 304. NONPARTISAN ADVISORY COMMISSION ON THE CPI.

(a) FINDINGS.—The Congress finds that—

(1) Congress intended to insulate certain government beneficiaries and taxpayers from the effects of inflation by indexing payments and tax brackets to the Consumer Price Index (CPI);

(2) approximately 30 percent of total Federal outlays and 45 percent of Federal revenues are indexed to reflect changes in the CPI; and

(3) the overwhelming consensus among experts is that the method used to construct the CPI and the current calculation of the CPI both overstate the estimate of the true cost of living.

(b) SENSE OF THE SENATE.—It is the sense of the Senate that—

(1) a temporary advisory commission should be established to make objective and nonpartisan recommendations concerning the appropriateness and accuracy of the methodology and calculations that determine the CPI;

(2) the Commission should be appointed on a nonpartisan basis, and should be composed of experts in the fields of economics, statistics, or other related professions; and

(3) the Commission should report its recommendations to the Bureau of Labor Statistics and to Congress at the earliest possible date.

The conference agreement on the concurrent budget resolution for fiscal

year 1996 passed the Senate on June 29, 1995. The conference report included the following:

SEC. 309. SENSE OF THE SENATE ON THE ASSUMPTIONS.

It is the sense of the Senate that the aggregates and functional levels included in this budget resolution assume that—

* * * * *

... (6) a temporary nonpartisan commission should be established to make recommendations concerning the appropriateness and accuracy of the methodology and calculations that determine the Consumer Price Index (CPI) and those recommendations should be submitted to the Bureau of Labor Statistics at the earliest possible date.

Earlier, on March 13, April 6, and June 6, the Finance Committee held hearings on this subject. Testimony was received from 13 established economists who collectively represented virtually all the expertise that exists on this issue.

A remarkable consensus emerged at those hearings.

I ask unanimous consent that a list of the witnesses, along with their affiliations, and their estimates of the degree to which changes in the CPI overstate changes in the cost of living be printed in the RECORD.

There being no objection, the list was ordered to be printed in the RECORD, as follows:

ESTIMATES OF CPI OVERSTATEMENT

(In order of appearance of witnesses)

March 13, 1995 Hearing:

Chairman Alan Greenspan, Federal Reserve: 0.5 to 1.5 percentage points.

Cmsr. Katharine Abraham, Bureau of Labor Statistics (BLS): No estimate offered.

Dr. Robert Gordon,¹ Northwestern University Dept. of Economics: Minimum of 1.7 percentage points.

Director June O’Neill, Congressional Budget Office: 0.2-0.8 of a percentage point (based on CBO report 10/94).

April 6, 1995 Hearing:

Dr. Dale Jorgenson,¹ Harvard University Dept. of Economics: Around 1 percentage point.

Dr. W. Erwin Diewert, Univ. of British Columbia/Dept. of Economics: 1.3 to 1.7 percentage points.

Dr. Ariel Pakes, Yale University Dept. of Economics: 0.8 of a percentage point.

Dr. Joel Popkin, Popkin & Co. (former Assistant Commissioner for Prices and Living Conditions at BLS): No estimate offered.

June 6, 1995 Hearing:

Dr. Michael Boskin,¹ Senior Fellow, Hoover Institute, Stanford Univ.: At least 1.0 percentage point, maybe 2.0 percentage points.

Dr. Ellen Dulberger,¹ Director, Strategy and Economic Analysis IBM: CPI overstatement is greater than others have stated and likely to grow.

Dr. Zvi Griliches,¹ Harvard University Dept. of Economics: 0.4 to 1.6 percentage points.

Dr. Janet Norwood, Senior Fellow, Urban Inst. (former BLS Commissioner): No estimate offered.

Dr. Robert Pollak, University of Washington Department of Economics: No estimate offered.

¹ CPI Commission members.

Average of Mid-Point Estimates by CPI Commission Members: 1.3 percentage points at a minimum (assumes Dulberger’s minimum is 1.3 points, the average of other four members).

Mr. MOYNIHAN. Mr. President, again: Dr. Alan Greenspan, Chairman of the Federal Reserve Board—0.5 to 1.5 percentage points.

Dr. Dale Jorgenson, chairman of the department of economics at Harvard University—around 1 percentage point.

Dr. Robert Gordon, chairman of the economics department at Northwestern University—at least 1.7 percentage points. Note that in 1981 Professor Gordon wrote the Public Interest article, cited earlier, in which he laid out many of the issues related to the accurate measurement of changes in the cost of living.

Dr. Michael Boskin, professor of economics at Stanford University and Chairman of the Council of Economic Advisers in the Bush administration—at least 1 percentage point, maybe 2 percentage points.

In all, 9 of the 13 witnesses provided numerical estimates of the overstatement. The average of the estimates: about 1.1 percentage points. The calculation is based on a minimum estimate for some witnesses. Even if we assume a zero estimate of the overstatement for those who provided no estimate—and few, if any, would so contend—the average for all the witnesses would be 0.8 of a percentage point.

Not too different from the 0.4 to 1.5 percentage points noted by OMB Director Rivlin in her memo last October.

The complete record of these hearings is printed as Senate Hearing 104-69—Consumer Price Index. I hope Senators will obtain copies and review the hearing record.

Following the hearings, then Finance Committee Chairman Packwood and I, as ranking member, announced on June 26, 1995, the appointment of a nonpartisan Commission to:

... study the methodology used to calculate the Consumer Price Index (CPI) and to advise Congress on whether this methodology provides an accurate measure of the cost of living.

At that time I stated:

... Current law makes it clear that certain federal programs should be adjusted for changes in the cost of living. What is not clear is whether changes in the CPI, which is used as a proxy for changes in the cost of living, accurately measures these changes. A study by a non-partisan commission will provide invaluable advice to Congress on this important issue.

The Commission, chaired by Dr. Michael Boskin, issued its interim report on September 15, 1995.

The report, “Toward a More Accurate Measure of the Cost of Living,” included the following observations and conclusions in the executive summary:

... While the CPI is the best measure currently available, it is not a true cost of living index (this has been recognized by the Bureau of Labor Statistics for many years). Despite important BLS updates and improvements in the CPI, changes in the CPI have substantially overstated the actual rate of price inflation, by about 1.5% per annual recently. It is likely that a large bias also occurred looking back over at least the last couple of decades, perhaps longer, but we make no attempt to estimate its size.

... Changes in the CPI will overstate changes in the true cost of living for the next few years. The Commission's interim best estimate of the size of the upward bias looking forward is 1.0% per year. The range of plausible values is 0.7% to 2.0%. The range of uncertainty is not symmetric. It is more likely that changes in the CPI have a larger than a smaller bias.

... The upward bias programs into the federal budget an annual automatic real increase in indexed benefits and real tax cut.

Let me now elaborate on the implications of these points made by the Commission.

Current law requires the Government to adjust some benefits and tax provisions for changes in the cost of living.

The 1972 Amendments to the Social Security Act included this language:

Section 202. (a) 1 Section 215 of the Social Security Act is amended by adding at the end thereof the following new subsection: Cost-of-Living Increases in Benefits.

Similarly, section 104(f)(3) of the Economic Recovery Tax Act of 1981 states:

... the cost of living adjustment for any calendar year is the percentage ...

The objective of these statutes is clear: Benefits and Tax Code provisions should be adjusted for changes in the cost of living. However, the law stipulates that the adjustments should be based on changes in the CPI as a proxy for changes in the cost of living. But with mounting evidence that changes in the CPI overstate changes in the cost of living, implementation of the policy is thwarted. The law is being thwarted.

What can be done to ensure that the policies Congress has adopted are faithfully executed? That is, how can we ensure that adjustments in benefits and Tax Code provisions more accurately reflect changes in the cost of living? Two things.

First, continue to support ongoing efforts by the BLS in its routine updating and rebenchmarking of consumer expenditure patterns, and in its research activities. Talented and dedicated BLS researchers have identified many of the complex measurement issues that must be addressed when compiling a CPI in a world in which the quality of products changes and new goods are introduced with resolute regularity.

Second, Congress must recognize that, despite the best intentions of the BLS as it continues with its updates and research, the CPI is not, as the BLS readily acknowledges, a cost-of-living index. To achieve its policy objectives—so clearly stated in the law—Congress must implement legislative corrections that, when combined with the most accurate CPI that the BLS can produce, will result in changes in benefits and Tax Code provisions that accurately reflect changes in the cost of living.

As noted earlier, the Boskin commission on the CPI suggests that for now, the correction Congress should adopt is 1 percentage point.

The Commission's report also highlights the budget implications of fail-

ing to correctly implement policies designed to adjust for changes in the cost of living. We should not harbor any misgivings merely because these changes will dramatically improve the budget outlook. The error is there and should be corrected without regard to budget implications.

Even so, it must be acknowledged that the budget implications are enormous. One could say awesome.

CBO estimates a cumulative 10-year reduction in the deficit of \$634 billion from a 1 percentage point downward adjustment in automatic changes of benefits and tax provisions. By the 10th year the annual reduction in the deficit is almost \$140 billion. Extrapolating from these CBO projections, my staff estimates the 12-year cumulative reduction in the deficit at almost \$1 trillion.

And the corrections affect both sides of the budget ledger. About one-half of the cumulative reduction in the deficit is due to lower outlays; one-third due to higher revenues, and the remainder results from reductions in interest payments.

And while we are thinking about saving the Social Security trust fund, consider this fact. Harry Ballantyne, Chief Actuary of the Social Security Administration, estimates that the date of exhaustion of the OASDI fund is extended by 19 years from 2030 to 2049 by a 1 percentage point downward adjustment in the CPI.

Exhaustion is defined as the year in which the trust fund has used up all its reserves of Treasury securities with the expectation that annual outlays will continue to exceed annual income.

This is a real fiscal dividend. We can get things right and save the trust fund.

Mr. President, I ask unanimous consent that the following reports and documents cited in my remarks be printed in the RECORD after my statement.

First, "The Consumer Price Index: Measuring Inflation and Causing It" by R.J. Gordon, 1981, in the Public Interest 63: Spring.

Second, "Understanding the Consumer Price Index: Answers to Some Questions" by the U.S. Department of Labor, Bureau of Labor Statistics, May 1994.

Third, "Toward a More Accurate Measure of the Cost of Living" by the Advisory Commission to Study the Consumer Price Index, September 15, 1995.

Fourth, table on the change in deficit from a downward adjustment in the CPI of 1 percentage point by the Congressional Budget Office, March 15, 1995.

Fifth, memorandum prepared by Harry C. Ballantyne, September 28, 1995, on: Estimated Long-Range Effects of Alternative Reductions in Automatic Benefit Increases.

There being no objection, the material was ordered to be printed in the RECORD, as follows:

[From the Public Interest, Spring 1981]

THE CONSUMER PRICE INDEX: MEASURING INFLATION AND CAUSING IT

(By Robert J. Gordon)

Inflation is widely believed to be the most important economic problem facing the United States and most other countries in the world. Thus it is not surprising that the monthly publication of the U.S. Consumer Price Index (CPI) is so closely watched both inside and outside of government. Large increases in the CPI are bad news for Administration officials, particularly in election years, and may lead to sudden policy reversals such as the introduction of the Carter Administration's ill-fated credit controls in March 1980. Large increases in the CPI, however, are good news for millions of recipients of social security benefits, government retirement pay, and other payments that by law or contract must be escalated in step with the CPI. 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.

Imagine that someone pushes the wrong button on a computer at the Bureau of Labor Statistics (BLS), the division of the Department of Labor that is responsible for the CPI, and records that the increase in the CPI over a particular year is 15 percent instead of the true rate of 10 percent. Government officials would probably react with restrictive policy measures—some combination of expenditure reductions, tax increases, and higher interest rates. Thousands, perhaps millions, of Americans might be thrown out of work. Millions of others receiving social security benefits or union wages escalated by the CPI would enjoy a windfall gain, since their payments would go up by more than the true inflation rate. The unnecessary extra benefit payments would cause the government deficit to balloon, putting extra pressure on the Federal Reserve to print more money and finance still more inflation, while the higher union wage payments would put pressure on firms to raise prices faster than otherwise.

Exactly this chain of events occurred in the United States in 1979 and 1980, but not because of an easily correctable slip by BLS. Instead, a serious overstatement of inflation by the CPI was caused by built-in design flaws. These defects have come to light not through the snooping of some measurement-minded Woodward or Bernstein, but rather as a result of a growing discrepancy between the CPI and a competing government measure of consumer prices called the "Personal Consumption Expenditures deflator," published by a division of the Department of Commerce, and usually called the "PCE deflator" for short. Table I shows that after registering only a small difference in early 1978 and most earlier years, the inflation rate recorded by the two indexes grew apart by an amount that reached an annual rate of 5 percent in the first half of 1980.

TABLE I.—INFLATION RATES AS ESTIMATED BY THE CPI AND PCE DEFLATOR
[Percentage changes at annual rates]¹

	CPI	PCE Deflator	Difference
1. 1947-77	3.4	3.3	0.1
2. 1978-80 by half year			
1978, first half	8.9	8.3	0.6
1978, last half	9.0	6.8	2.2
1979, first half	12.6	10.0	2.6
1979, first half	13.0	9.8	3.2

TABLE I.—INFLATION RATES AS ESTIMATED BY THE CPI AND PCE DEFLATOR—Continued
(Percentage changes at annual rates)¹

	CPI	PCE Deflator	Difference
1980, first half	16.2	11.2	5.0

¹ Source: CPI from Bureau of Labor Statistics, PCE Deflator from Survey of Current Business, various issues. These figures do not reflect the data revisions announced in December 1980 for the PCE deflator. A preliminary inspection suggests that the inflation rate of the PCE deflator in the new data is between 0.5 and 1.0 percentage points lower for each period shown since 1977. Because the CPI has not been revised, the difference between the two indexes has been further enlarged by the revisions.

The story of the two inflation indexes is a fascinating one, even for those whose eyes glaze over at talk of measurement procedures and who prefer to treat government economic data as unchallenged gospel. Since the CPI and PCE deflator are compiled from a common set of underlying price data by two different sets of rules, part of the tale involves the rules themselves, why the lead to different results, and why the CPI rules are widely believed to be inferior to those used in the PCE deflator. Another aspect involves the internal workings of the BLS, where staff bureaucrats have long urged the replacement of obsolete rules for the measurement of housing prices but were forced by political pressure to retain the old rules in the new version of the CPI introduced in 1978. A final and less-reported chapter involves the adequacy of the underlying price data that both the CPI and PCE deflator share in common. These form the basis for all economic measures of real economic progress, or the lack of it, including those that show a drastic slowdown in the growth of U.S. productivity in the last decade. How effectively do official procedures handle innumerable situations when a new model or product costs more than the item it replaces, but differs in quality as well? New radial tires last longer than the old bias-ply type, and recent-vintage television sets both perform better and need fewer repairs than their predecessors. But if price indexes are not adjusted adequately for these quality improvements, inflation is overstated and the improvement in our productivity and standard of living is understated.

A TWO-CLASS SOCIETY?

The CPI was first published by the BLS in 1919 to help set wage levels for workers in shipbuilding yards, and its use as a standard for wage increases has always been one of its main purposes. Currently about 8 million workers are covered by collective bargaining contracts that provide for increases in wage rates based on increases in the CPI, and these wages set a pattern that millions of other workers try to emulate. More recently, many types of government payments have been linked to the CPI. Among those who reap a windfall if the annual CPI increase is overstated are 31 million social security beneficiaries and 2.5 million retired military and Federal Civil Service employees and survivors. Others receive payments geared to a particular component of the CPI, especially 20 million food stamp recipients and 25 million children who eat federally subsidized school lunches. In all about half the population, including dependents is affected by changes in the CPI.

The use of escalator clauses has created a two-class society, separating those who are protected against inflation, legally or by contract, from those who are not. Steelworkers, Chicago bus drivers, and other union members enjoying generous escalator clauses have moved several steps up the relative income ladder at the expense of white-collar workers and others whose wages are not escalated. Social security recipients enjoyed a 14.4 percent boost in benefits in July

1980, as compared to an increase in the government's average hourly earnings index of only 9.2 percent in the year ending that month. Use of that earnings index rather than the CPI for escalation in 1980 would have reduced the federal deficit by about 8 billion. Use of the PCE deflator would have been almost as desirable, saving about \$6 billion.¹ Thus some of the much-discussed financial crisis of the Social Security System results from the use of the CPI for escalation purposes.

While adjustment of payments is the most tangible function of the CPI, there are two other uses which figure prominently in discussions of economic performance and policy. The first and most obvious is that the CPI itself is a readily available measure of inflation and serves as a widely-quoted verdict on the success or failure of economic policy. The second is that the individual CPI item indexes for pork gasoline, and other products are the sources of other price indexes. The CPI and PCE deflator displayed in Table I are both based on the same price-change data for pork and gasoline, but they combined these individual item indexes with different weights. Because the Commerce Department procedures put less weight on energy prices, which rose rapidly during the 1978-80 period (as well as no weight at all on mortgage interest rates), they yield a slower overall increase when the PCE deflator is added up. It is the PCE deflator, and the broader "GNP deflator" of which it is a major component, that allow the Commerce Department to translate data a current-dollar sales and personal income into quarterly estimates of real Gross National Product. The basic measure of the economy's productive performance.² Real GNP, in turn, is divided by BLS data on hours spent at work to yield data on the nation's hourly productivity.

THE EVER-CHANGING MARKET-BASKET

The CPI reports the price in any given month of a so-called "fixed market-basket" of commonly purchased items. Today's price of the market-basket is expressed relative to what the same items would have cost in 1967, the arbitrary "base year" of the index. As shown on the top line of Table II, the CPI was at a level of 251.7 in September 1980, indicating that items costing \$10,000 in 1967 would have cost \$25,170 if purchased in September 1980. Public attention tends to focus on recent changes in the CPI rather than on the cumulative change since 1967. Thus, newspaper reports do not highlight the index level of 251.7, but rather the change over the past year and month. In September 1980, the change in the CPI over the previous year registered 12.7 percent, and the change from August to September was 1.0 percent, usually expressed at an annual rate. The sense of panic that surrounded the Carter Administration's economic policy in March and April of 1980 was directly set off by three consecutive monthly CPI increases of 1.4 percent, or 18.2 percent when expressed as an annual rate.

¹The actual social security increase was based on the CPI change in the twelve months ending in March, 1980.

²About two-thirds of Gross National Product consists of Personal Consumption Expenditures deflated by the PCE deflator. The other third consists of construction spending, business equipment purchases, government wages and purchases of goods, and the excess of exports over imports. Each of these other components has its own deflator based on a wide variety of data sources.

TABLE II.—A SAMPLE OF CPI ITEM INDEXES, SEPTEMBER 1980.¹

	Index Level (1967=100)	Percent change from September 1979
All items	251.7	12.7
White bread	219.6	9.4
Sirloin Steak	280.9	11.9
Eggs	179.9	5.4
Potatoes	313.2	57.2
Roasted coffee	426.1	0.0
Whiskey	137.6	6.7
Residential rent	195.1	9.0
Contracted mortgage interest	500.9	26.3
Fuel oil	585.4	21.3
Telephone services	137.0	3.5
Television	105.0	2.0
Women's dresses	168.5	-1.5
New cars	181.7	9.4
Airline fares	310.3	44.9
Hospital room	428.4	13.8
School books and supplies	221.0	9.7

¹ Source: Consumer Price Index Detailed Report, September 1980.

The task of constructing the CPI involves (1) determining what people buy, (2) determining where they buy, and (3) determining what they pay for what they buy. The first task was carried out by the BLS and Census Bureau in 1972-74 and involved quarterly interviews with about 20,000 families and a survey of another 20,000 families who were asked to keep diaries of small, frequent purchases for two weeks. Because this effort of carrying out the Consumer Expenditure Survey is so complex and expensive, Congress is only willing to allocate funds for such a survey every decade. The previous Consumer Expenditure Survey had been carried out in 1960-61 and was the basis of the CPI until 1977. Thus in late 1977 the "old CPI" was based on expenditure data that were sixteen years out of date, and the "new CPI" introduced in 1978 was based on an expenditure survey that was already five years out of date.

Determining where people buy, so that the right amount of information might be collected from particular retail outlets, discount stores, and mail-order houses, was accomplished by a "point-of-purchase" survey of another 23,000 families in the early 1970s. This scientific basis for the collection of price data represents a substantial improvement on the arbitrary choices of outlets in the CPI for earlier years. With the allocation of individual items and retail outlets established by these various surveys, the month-to-month job of collecting the actual price quotations is carried out by BLS data collectors who have considerable latitude to choose the specific brands and types of goods to be priced each month within the general item definitions laid down by the central BLS office. An incredible total of one and a half million individual price quotations are obtained each year, of which 700,000 are for food, 100,000 are for rent and property taxes, and the remainder are for other items. Data sources, called "reporters," include about 2,300 food store outlets, 18,000 rental units, 18,000 housing units, and 22,300 other sources.

THE IMPORTANCE OF WEIGHTING PROCEDURES

Every month the CPI publishes an overall index, summary indexes for major groups of items like food and apparel, and about 250 item indexes, a few of which are shown as examples in Table II. What is striking here is the wide variety of price increases registered by different items since 1967, ranging from 5 percent for television sets to 485 percent for fuel oil. Clearly the overall inflation rate registered by the CPI depends on how much weight is attached to each item. Someone who spends equal shares of his income on rent, TV sets, telephone calls, eggs, and whiskey, would have experienced a price increase since 1967 of only 51 percent, or a compounded rate of only 3.2 percent per

year. Someone else who spends equal shares on steak, potatoes, coffee, fuel oil, and mortgage interest, would have experienced an increase since 1967 of 321.3 percent, or a compounded rate of 11.7 percent per year. Since average hourly earnings increased by 7.5 percent over the same period, the first spending pattern would have allowed a substantial increase in real income, whereas the second pattern would have resulted in a drastic drop in real income.

Consumers are under constant pressure to shift their spending patterns to avoid goods that have unusually high price increases—for example, to reduce fuel usage in favor of wool sweaters, or to shift from coffee to whiskey. Any index like the CPI that uses fixed expenditure weights must exaggerate the inflation rate as compared to an index like the PCE deflator that uses current weights, since the CPI assigns relatively large weights to high-inflation items like fuel oil and coffee based on their shares in consumer expenditure in the "good old days" of 1972-73, before the consumer reaction against their increase in price. The fixed weights used in the CPI would not be an important defect if all products changed in price by roughly the same amount over long periods of time. But the large variety of price changes between 1967 and 1980 displayed by the index numbers for individual items in Table II has made the fixed-weight problem a source of upward bias in the CPI during the past three years, as obsolete weights magnify the high inflation rates of products like fuel oil.

How much of an exaggeration in the CPI's measured inflation rate is caused by this so-called "substitution bias"? We do not learn the answer to this question by examining the massive differences between the CPI and PCE deflator displayed in Table I, since these are largely caused by other factors besides substitution. Instead, we can determine the contribution of consumer substitution away from high-inflation items by examining the effect of three different weighting schemes for the data used in the PCE deflator. The first is the scheme used in the published "implicit PCE deflator" itself. Table III shows an example of how the implicit PCE deflator would be calculated for a simple economy consisting only of spending on coffee and whiskey. Sections 1 and 2 exhibit prices and quantities in three different periods: the 1972 base period and two successive quarters in 1980. Section 3 multiplies price times quantity in each period to obtain actual expenditures. Section 4 then computes "real" expenditures in constant 1972 prices by multiplying the actual quantities purchased in each period by the constant prices of 1972.

THE CONSUMER PRICE INDEX AND INFLATION

Table III.—METHODS OF CALCULATING PRICE INDEXES (FOR A HYPOTHETICAL ECONOMY)¹

	1972	1980	
		First quarter	Second quarter
THE HYPOTHETICAL ECONOMY			
1. Prices:			
Coffee per pound	\$1	\$4	\$5
Whiskey per bottle	\$5	\$5	\$5
2. Units sold:			
Pounds of coffee	5	3	2
Bottles of whiskey	1	2	3
3. Actual expenditures:			
Coffee	\$5	\$12	\$10
Whiskey	\$5	\$10	\$15
Total	\$10	\$22	\$25
4. Real expenditures in 1972 prices:			
Coffee	\$5	\$3	\$2
Whiskey	\$5	\$10	\$15
Total	\$10	\$13	\$17

Table III.—METHODS OF CALCULATING PRICE INDEXES (FOR A HYPOTHETICAL ECONOMY)¹—Continued

	1972	1980	
		First quarter	Second quarter
THE EFFECTS ACCORDING TO THREE INDEXES			
5. Implicit PCE deflator	100	169	147
6. Chain index of 1980 change			11.7
7. 1972 fixed-weight index	100	250	300

¹ Notes: The implicit PCE deflator in section 5 is 100 times the ratio of total actual expenditures (section 3) to real expenditures (section 4). The Chain Index in section 6 multiplies the price change for the second quarter of 1980 for each item (25 percent for coffee, zero for whiskey) by the average expenditures share of each product in both quarters of 1980 (22/47 and 24/47, respectively). The Fixed-weight index in line 7 multiplies the level of the item index for each period (100, 400, and 500 for coffee; 100 each period for whiskey) by that item's share in 1972 expenditures (50 percent for each product in this case).

The PCE deflator is simply defined as the ratio of actual expenditures to real expenditures, and this is written in section 5, along with the percentage change between periods. This extreme example reveals a defect of the PCE deflator, which uses weights that shift each period. The alteration in weights in successive periods causes the deflator to mix up the measurement of price changes with the effect of shifting weights. Thus, in the second quarter of 1980 the price of coffee increases by 25 percent, and the price of whiskey stays constant, but the PCE deflator registers a 13 percent decline in spite of the fact that no single price has dropped! Why? Expenditures in that quarter have shifted toward whiskey, which has had no price increase at all since the base year of 1972; thus the higher weight increases the influence of whiskey's cumulative absence of price change since 1972, which has nothing to do with actual inflation in 1980.³

How can we obtain the advantage of the up-to-date weights used in the PCE deflator without the deflator's disadvantage of mixing together price changes and weight changes? This is accomplished by the "chain index," which is calculated by averaging together the changes in individual prices between and periods rather than by computing an index level as in the case of the implicit deflator. These individual changes are weighted by the average share of expenditures of each category in the two adjacent quarters taken together. In our example the increase in the chain index is 11.7 percent (shown in section 6), which makes intuitive sense as an average of the 25 percent increase in the price of coffee and the zero percent increase in the price of whiskey. (Since the share of expenditures on constant-price whiskey is a bit more than half in the two quarters, \$25/\$47, the chain index comes out showing a bit less of an increase than a simple unweighted average of 25 and zero).

Finally, the third alternatives is to combine the coffee and whiskey prices with fixed 1972 expenditure weights. This creates an index analogous to the CPI. As shown in section 7, the fixed-weight index yields a 20 percent price increase for the second quarter of 1980, reflecting the higher weight of coffee in 1972 spending patterns. In this extreme case the bias in the fixed-weight index stemming from consumer substitution is represented by the difference between the 20 percent increase in the index compared to the 11.7 percent increase in the chain index.

While real-world price changes vary all over the map, the relatively large share in spending of items experiencing roughly average price increases makes the problem of consumer substitution in the actual CPI less

³ If the same example were recalculated for a deflator using a base of 1980, second quarter (rather than 1972), the result would be an increase in the deflator of 14 percent rather than a decline of 13 percent.

important than in our extreme example. This is shown in Table IV, which displays an array of price change indexes, ranging in order from the implicit PCE deflator in section 1 to the CPI itself in section 5. The five indexes here allow us to decompose the difference between the implicit PCE deflator and the CPI into three main factors. The chain index in section 2 differs from the implicit deflator in section 1 by eliminating the undesirable impact of changing weights, thus the difference between section 2 and section 1 shows the modest quantitative impact of shifting weights. Next, section 3 lists the PCE deflator recalculated with fixed 1972 weights. The difference between this fixed-weight version of the PCE deflator and the chain index in the section above shows the effect of consumer substitution away from items with rapidly rising prices. The difference is negligible in 1977 and 1978 but became magnified in 1979 and 1980, largely due to the over-weighting of energy prices in the fixed-weight index. Nevertheless, in the first half of 1980 shifting weights and the substitution effect together contributed only 0.8 out of the 4.4 percentage point difference between the Consumer Price Index and the implicit PCE deflator.

Table IV.—FIVE MEASURES OF INFLATION, 1977-80¹ (In percent)

	Late 1976-77	Late 1977-78	Late 1978-79	Late 1979-mid 1980
1. PCE deflator	5.6	7.4	9.9	11.6
2. PCE deflator with "chain weights"	6.0	7.8	10.3	11.9
3. PCE deflator with "fixed weights"	5.9	7.9	10.7	12.4
4. CPI with PCE treatment of home ownership	6.3	7.9	10.8	12.2
5. CPI	6.8	9.0	13.3	16.0

¹ Source: Alan S. Blinder, "The Consumer Price Index and the Measurement of Recent Inflation," Brookings Papers on Economic Activity, vol. 11 (1980, no. 2), Tables II, IV and VI.

Note.—CPI figures are for December through December, or December through June in the last column. PCE deflator figures are for fourth quarter through fourth quarter, or fourth quarter through second quarter in the last column.

ACCOUNTING FOR HOME OWNERSHIP

The bulk of the excessive inflation rate measured by the CPI can be explained by its bizarre treatment of home ownership. Section 4 displays a special version of the CPI that replaces the actual home ownership component by the PCE measure and weighting of home ownership cost. The difference between the actual CPI in section 5 and the special version in section 4 shows that the choice of home ownership treatment makes an enormous difference, a full 3.8 percentage points in the first half of 1980.

Far from being a source of higher prices, squeezed budgets, and falling living standards, most Americans have found home ownership to be a source of wealth creation and one of the few spots in the family budget that is largely insulated from inflation. The treatment of homeownership in the CPI makes the fatal error of treating the whole population as if it were in the predicament of a newlywed couple buying its first house. This unlucky pair, late arrivals on the housing inflation merry-go-round, over the past several years has indeed faced a substantial increase in the monthly payment required to own its first house. But the vast majority of home owners has been protected from these higher costs. Increases in home purchase prices for existing home owners are a source of higher wealth, and "leverage" (the small initial share of their down-payment equity) makes the value of their equity increase by a multiple of the percentage annual increase in house prices. Because income is properly defined as consumption plus the change in

one's wealth, higher home prices by this definition also raise individual incomes. Increases in mortgage interest rates do not represent a higher cost for holders of existing mortgages, since most of these were negotiated at fixed interest rates. The monthly payment to the local savings bank is the same today as it was in the month of the first payment when the house was purchased two or five or fifteen years ago, and thus is a steadily falling proportion of annual earnings that allows the paycheck to be diverted to other needs. Home ownership has been a blessing—a source of wealth and six-figure balance sheets for many Americans—rather than the curse that the CPI's treatment would imply.

In Table V the housing component of the PCE deflator is compared with the various parts of the rent and home ownership component of the CPI. It is evident that the difference between the PCE and CPI treatments involves both the weights and the actual price increases registered by the individual components. The housing component represents 17.4 percent of the weight in the PCE deflator, as contrasted with the 30.2 percent weight for rent and home ownership together in the CPI. The increase in the PCE component in the year to September 1980 was only 9.0 percent, as compared to a weighted average of 15.4 percent for rent and home ownership together in the CPI. There are numerous weak points, both major and minor, in the CPI treatment of housing. The most important are (1) the overweighting of the home-purchase and mortgage-interest-rate components, (2) the treatment of existing mortgage contracts as involving variable rather than fixed rates, and (3) the failure to subtract from the higher home prices and mortgage rate the benefits that consumers receive from interest tax deductions and from the capital gains due to higher house prices.

Table V.—RENT AND HOME OWNERSHIP COSTS: CPI WEIGHTS AND PRICE INCREASES¹
(In percent)

Item	Weight in total index, December 1979	Annual rate of change September 1979–September 1980
A. PCE deflator housing component	17.4	9.0
B. CPI components:		
1. Residential rent	5.3	9.0
2. Home ownership	24.9	16.8
Home purchase	10.4	13.8
Contractual mortgage interest cost	8.7	21.8
Property taxes	1.7	3.5
Property insurance	0.6	13.6
Maintenance and repairs	3.4	9.0

¹Sources: CPI: Same as Table II. PCE Deflator: Survey of Current Business, October 1980. PCE data refer to the quarter in which indicated month occurred.

1. Overweighting of home purchase prices and mortgage interest rates. Table V shows that the weight attached to mortgage interest is almost as large as that attached to home purchase. The CPI makes the incredible error of treating home purchase and mortgage interest payments as separate unrelated transactions; it counts the house price once as the weight for home price changes and then counts most of it again as the weight for changes in mortgage interest rates. This double-counting can be appreciated in an example involving a new home purchased for \$40,000 in 1972, financed by a 20 percent down payment (\$8,000) and a twenty-five-year \$32,000 mortgage taken out at a typical 1972 interest rate of 7.5 percent.⁴ The BLS procedure computes the weight for the purchase price component from the 1972–73

consumer expenditure survey based on purchases of newly constructed houses; if every survey respondent had annual consumption expenditures of \$20,000, and 5 percent of them purchased a new \$40,000 house, this would yield a weight for a home purchase of 10 percent. But that is not all. Fully half of the mortgage payments over the 25 year term (\$26,429, in this case) is included as an additional expenditure, so that mortgage interest costs receive a weight of 6.6 percent in this example. A minimum requirement for consistency in the CPI should be that the weight on housing reflects the amount actually spent—\$40,000 in this case. People do not buy houses and mortgages separately; they obtain mortgages so that they do not actually have to lay down \$40,000 in cash!

2. Assumption of variable rates on all existing contracts. The CPI does not describe the housing-cost experience of actual U.S. homeowners but rather of a fictitious society in which the interest rate on all outstanding mortgages is renegotiated every month. Imagine that the average mortgage lasts 10 years, and that the mortgage rate has risen in the past decade from 5 to 15 percent at a pace of exactly one-twelfth of a percentage point every month. Then the average rate paid on outstanding contracts would be 10 percent. Now imagine that on January 1, 1981, the rate on mortgage closings suddenly jumps from 15 to 17 percent. The CPI uses the mortgage closing rate for the first five days of the previous month, and so in this example the mortgage component of the February 1981 CPI would show an increase of 13.3 percent. If all other items were increasing at an average of 1 percent per month, or 12.7 percent per year, this treatment of the mortgage interest rate would be enough to cause scare headlines, since the annual rate of increase of the all-items CPI in February would be 27.9 percent. But in truth, since a single month is initially involved and the average mortgage lasts for ten years, less than one percent of total mortgage payments are affected by the new rate. The average mortgage interest rate paid would change from 10.0 to 10.1 percent, for an increase of just one percent, exactly the same as the assumed increase in all other items. Scare headlines would be avoided, and the February announcement of the CPI would report an annual rate of increase of 12.7 rather than 27.9 percent.

3. Use of actual rather than real after-tax interest rate. Does a higher mortgage interest rate actually raise the true cost of borrowing, as assumed by the CPI? Not necessarily, because borrowing cost consists of the actual interest rate paid, less the percentage increase in the price of the item purchased with the borrowed funds, less any tax deductions for interest paid. Sensible home owners and business borrowers know that a 15 percent interest rate is not a suffocating burden if borrowing allows them to buy cheap now and sell dear later. In fact it is easy to show how an increase over a decade from a 5 to 15 percent mortgage rate actually could have reduced real borrowing costs. Imagine that over the same period the inflation increased from zero to 10 percent, and that the income tax rate remained fixed at 20 percent. Since all interest paid (not just the net-of-inflation part) is deductible, the real cost of borrowing can decline if inflation is high enough.

THE HOME-OWNERSHIP BLUNDER, AND HOW TO RIGHT IT

There are no defenders of the present treatment of home ownership costs in the CPI, which has remained essentially unchanged since 1953.⁵ Yet year after year be-

tween 1977 and 1980 its damage grew as escalated union wages, government transfer payments, and the government deficit were pushed up. During the deliberations that led to the 1978 CPI revision, there was unanimous staff support in BLS for killing the present procedure. Yet the staff was overruled by the late Julius Shiskin, then Commissioner, who wrote that "I have decided that the present treatment will be continued . . . This decision is based on the fact that there is widespread disagreement among the business, labor, and Government advisers to the Bureau of Labor Statistics concerning the approaches to the cost of shelter proposal by the Office of Prices and Living Conditions."⁶ One interpretation of this remark is that the last refuge of a bureaucrat faced with controversy is to retain the status quo. Another possibility is that the key word in Shiskin's letter is "labor," and that labor unions were unwilling to accept any tampering with the CPI that might jeopardize the privileged position that they had enjoyed during the 1973–74 high-inflation period thanks to their CPI-escalated contracts. In light of the fact that the Carter Administration bowed to union pressure on the issue of the minimum wage, it is not implausible that union pressure was behind Shiskin's decision. In any case there is no doubt that labor unions have been among the main beneficiaries of his vote for the status quo.

The two main candidates suggested by economists to replace the present treatment are the same as those proposed by the BLS staff during the 1972–77 deliberations on the CPI revision—the "user cost" and "rental equivalence" approaches. In fact, in an end run around its own index, the BLS now publishes five alternative versions of the CPI using different measures of home ownership cost. Of the five alternatives, four represent different ways of treating user-cost, and the fifth is based on the rental equivalence method. (It is the fifth alternative that is displayed on line 4 of Table IV.)

1. The user-cost of housing. Economists love to dazzle their students with "user cost" formulas of the type developed in the early 1960's by Harvard's Dale Jorgenson for the purpose of explaining business investment behavior. The aim is to come up with a figure to represent the amount for which a capital good could be rented. Unlike the present CPI approach, which is based on the current price paid for new houses by the small fraction of people who actually purchase them in a given year, the user-cost approach measures the current annual capital and operating cost of home ownership for everyone. User-cost formulas typically sum up the annual mortgage interest costs, plus the interest that would have been earned on the down payment if it had been invested in a financial asset, plus operating costs like taxes, insurance, and repairs, minus capital gains due to higher house prices, and minus tax deductions made possible by the payment of mortgage interest.

The basic problem with the user-cost approach is that there are several alternative ways of measuring the ingredients in the formula, especially interest rates, tax rates, and capital gains. Are capital gains to be

consumer price index will be deleted and will probably be replaced with an estimate for rents" (New York Times, January 29, 1981, p. 1). This announcement thus endorses the conclusion of this section (written before the announcement) that the "rental equivalence" method should have been used all along. Unfortunately, the change will not be made until 1985, so this section of the text remains relevant for the first half of this decade.

⁶Letter from Julius Shiskin to Lyle Gramley of the Council of Economic Advisers, April 15, 1977.

⁴This example is taken from the article by Alan Blinder cited in the note to Table IV.

⁵In January 1981 the BLS announced that "the much-criticized home-purchase component of the

counted as those expected when the mortgage was taken out or those actually realized? Is the mortgage interest rate to be the current rate or an average of past rates? How is the personal tax rate relevant for mortgage interest deductions to be determined? The BLS provides four different measures of user cost to provide a menu of outcomes, and all of them display much more volatility than actual rent. If an economist's approximation of how much a house should rent for does not behave at all like actual observed rents, then that ought to be telling him something.

2. Rental equivalence. The idea of rental equivalence is simple and in fact is already used in the PCE deflator: Simply assume that the costs of home ownership moves in proportion to actual rents as measured by the CPI rent index, and apply a weight based on the estimated rental value of owner-occupied homes. Residential rent has increased more slowly than the average for other CPI items, and much more slowly than the present CPI home ownership component. Objections to the rental equivalence approach center around the fact that most single-family homes are not rented, and so the rental information collected by the CPI may not reflect hypothetical rents of single-family homes. Nevertheless landlords face the same interest costs as home owners and enjoy roughly the same tax deductions and capital gains. The fact that actual rents exhibit more gradual changes than hypothetical user-cost measures does not necessarily imply an error but rather reflects the tendency for prices of physical goods and services to adjust more slowly to changing conditions than prices of financial assets. Just as a company's stock price typically jumps around much more than the prices of the things it sells, so housing prices and interest rates jump around more than the rental value of houses. This makes sense in the case of rent, since changes in current mortgage interest rates do not actually affect landlords who have long-term fixed-rate mortgages, and changes in current capital gains have no impact (except on paper wealth) if the building is going to be held over a long period rather than sold at today's price.

Since the rental equivalence method is appealing, why not just adopt it? Use of rent data for the CPI home ownership component would justify expanding the sample of rent information to include more single-family houses. I suspect that much of the resistance to the rent approach stems from a belief that rent data are tainted, since rents have been rising so much less rapidly than the cost of construction (95 percent vs. 192 percent, respectively, between 1967 and 1980). But there is an economic reason for this divergence. My parents recall renting a house in Berkeley, California, in 1938 for \$65 per month that was also for sale at the same time for \$7,500. The house now would sell for \$250,000 but could not rent for \$2,167 a month (an equivalent percentage of sale price). In fact, a rent below \$1,000 would be typical for the kind of house in the current Berkeley rental market. Why? Landlords and home owners renting out their homes no longer have to recoup all of their cash mortgage interest and operating expenses from rent, since likely taxed capital gains and tax deductions on mortgage interest now pay part of the bill. Thus the slow increase in rents is not a fiction, but reflects economic reality.

ACCOUNTING FOR CHANGING QUALITY

Up to this point all of the issues have involved differences between the CPI and PCE deflator. But now we turn to the question of the changing quality of products, where both indexes are on the same footing because they use the same underlying price figures ob-

tained by the BLS data collectors. When a new model of a product is introduced that contains one or more extra features, part of its higher price may be explained by its higher quality. The gradual acquisition of higher quality goods has been an important source of a rising standard of living for Americans, and so we must make sure that adequate adjustments are made for the fraction of price increases that actually represent higher quality.

Quality change poses a problem for the CPI, which attempts to measure changes in the price of goods and services in a fixed market basket. The apparently straightforward task of collecting information on the price of a fixed set of goods is continually complicated by the fact that some goods go out of existence to be replaced by new models or new products. The issue of quality adjustments involves precisely how and when the new models are introduced into the overall index.

Over its history the CPI market basket has continually changed, providing an interesting—though usually out-of-date—commentary on social history. From 1918 to 1940, the CPI index that covered shaving was the price of a barber shave, and then switched in 1940 to the safety-razor blade, despite the fact that safety razors had largely replaced other barber shaves in the 1920's. From 1940 to 1952 the index item was the blade, joined from 1952 to 1964 by shaving cream, followed from 1964 to 1977 by the shaving cream alone, followed since 1977 by a combination of dental and shaving toiletry products. Since 1964 there has been no blade in the CPI, and thus no consideration of the new world opened up for most men by the invention of the double-edged blade in the early 1970's.

Other products have come and gone as well. In 1940 the index dropped not only barbershop shaves, but also high button shoes, men's nightshirts, and girls' cotton bloomers. The 1953 revision eliminated salt pork and laundry bar soap but added televisions, frozen foods, Coca-Cola, and whiskey. Pajamas, which had replaced nightshirts in 1940, themselves disappeared in 1964, leaving only sheets and blankets to cover the sleeping American male. Appendectomies also disappeared in 1964, the year funeral services were added. Among the new product categories introduced in the 1978 revision were pet supplies and expenses, indoor sports equipment, tranquilizers, and electronic pocket calculators.

How are new models and products introduced into the CPI? There are three main methods.

1. Direct comparison. When a quality change is considered to be "small," in the judgment of BLS staff members, it is neglected. All of the observed price change would be recorded as a change in the CPI item index, with no adjustment for quality change. If we assume that most model change-overs involve quality improvements, the direct comparison method imparts an upward bias to the CPI—that is, causes it to register too much inflation.

2. Linking. When the BLS staff members assess the quality change as too important to be ignored, then they introduce a linking procedure. This effectively imputes to the product whose quality changed the price movement of similar goods whose quality did not change. Let us imagine that an old-fashioned cotton sheet selling for \$5.00 is replaced by a polyester permanent press sheet selling for \$8.00 which lasts twice as long. The CPI linking procedure pays no attention to increased durability, but simply replaces the observed price increase by the actual price increase of other unchanged items in the same "household linens category."

3. Cost data. In some cases the BLS obtains the cost of the quality change directly from the manufacturer. First, staff members must determine whether a change claimed by the manufacturer to improve quality actually does so. The criterion for the judgment is whether the change improves the value of the product for the user. (Several years ago the BLS would not include a change by an auto manufacturer from a dial to digital clock on the grounds that this change did not increase the "user value" of the automobile.) The value of those quality changes that are not disallowed is based on the manufacturer's estimate of the extra cost involved in making the higher-quality item. This procedure is obviously subject to the flaw that the manufacturer may overstate the cost of the quality improvement in order to disguise a portion of actual price increases, particularly in a period in which government price controls or guidelines are attempting to hold a lid on prices. This source of error would tend to bias the CPI downward and cause it to register too little inflation.

The automobile is the only product which is given the full-blown cost-adjustment treatment. Every September several BLS officials travel to Detroit to consult with the major manufacturers in order to identify those specification changes on new models for which adjustments must be made. If a producer has introduced a new, heavier bumper, whether on its own initiative or to comply with federal safety regulations, the firm is asked to supply an estimate of the difference in the cost of producing the new bumper as compared to the old bumper. This difference in cost is then subtracted from the reported price increase of the new model automobile.

Because the BLS devotes so much more attention to automobiles than to other products, there is a chance that the recorded differences between the inflation rates registered by autos and other products may reflect differing quality-adjustment procedures rather than a true difference in price behavior. For instance, between 1972 and 1978 the measured price of automobiles went up 27 percent, but the price indexes for other types of moving mechanical equipment like tractors and construction machinery (part of the Producers' Price Index compiled by the BLS) increased by about 80 percent.

PRODUCT PRICE CYCLES AND INCREASED PERFORMANCE

The typical product, whether automobiles in the 1920's, TV sets in the 1950's, or electronic calculators in the 1970's, experiences after its invention an initial period of declining price, as its manufacturers spread the fixed cost of its development over more and more units sold. Then, as a product becomes "mature," there is less opportunity for efficiency gains to cancel out increased wages and other costs, so prices begin to rise. Three aspects of CPI procedures cause it to understate quality improvements and to overstate price change. First, the use of obsolete weights from decade-old expenditure surveys tends to place too little weight on modern products where price increases are relatively slow—this "consumer substitution" problem was examined above. Second, new models and products are typically introduced into the index much later than the date when their sales volume becomes important. And finally, the linking procedure, by far the most common quality-adjustment technique used by the BLS, tends both to treat new products as if they were mature products and to ignore performance improvements.

The long intervals between CPI revisions, and the officially sanctioned tendency for data collectors to cling to existing models

until they disappear from the marketplace, imply that items with declining prices are typically absent from the index. Albert Rees, who in 1960 performed a fascinating comparison of BLS item indexes with price data for the same products from mail-order catalogues, recalls with amusement a visit with a store owner to identify the particular model cooking pot that was then being priced by a BLS field representative. "Oh, you mean this old model up here on the top shelf. We never sell these any more," answered the store owner, "but that BLS field representative keeps asking us for its price."

More important are the new products that enter the CPI late in the product price cycle. The United States became a motorized society in the 1920's and 1930's, when there was an enormous improvement in the performance of automobiles along with a decline in their price—but the automobile was not included in the CPI until 1940. Penicillin entered the CPI in 1951, after it had already experienced a 99 percent decline from its initial price. The pocket calculator entered the CPI in 1978, after it had declined in price about 90 percent from early 1970-71 models and about 98 percent from the price of a comparable electromechanical desk calculator of the 1960's.

The linking procedure misses quality improvements for two reasons. First, as in the cotton sheet example, the price change is taken to be identical to other items in the sample product group that remain unchanged in quality. But these are likely to be mature products experiencing price increases, whereas the item that is improved in quality is more likely to be in the early stage of its product cycle. Perhaps more important, the CPI ignores changes in performance that tend to accompany model changes. In the cotton sheet example, the new sheet lasts twice as long. Since consumers presumably are buying years of service from long-lasting items like sheets, the CPI treatment ignores the lower price of a "sheet-year," since the service life in the example is assumed to double while the price only increases by 60 percent. (It is a sign of the times that many goods like sheets and draperies are officially classified as "nondurable" yet actually last longer than many "durable" goods.)

The most striking fact about the treatment of quality change in the CPI is that it is inconsistent with its own stated objective, which is to adjust for changes in quality when they improve the value of a product to the user. In the sheet example and in many others there is no attempt to measure the change in product performance. Consumers value sheet-years, motor-oil-miles, and tire-miles, rather than sheets, quarts of motor oil, and tires independent of their durability. F. Lee Moore has calculated that between 1935 and 1978 the price of tires per mile of tire-life declined by 9 percent, in contrast to an increase in the CPI tire index of 140 percent. Over the same period, the price of motor oil per mile declined by 52 percent as compared to an increase in the CPI of 234 percent.⁷ There are other examples of improved performance that are missed by the CPI's attention to "price per item" instead of "price per service desired by the user." Among these are the increased service life of light bulbs, spark plugs, and appliances.

Our previous discussion of the user cost of housing can be applied more broadly to any good which lasts a significant length of time. Consumers care about the total annual operating costs of automobiles and appliances having a given level of performance, not purchase price alone. Auto manufacturers have

diverted development efforts from the old concentration on styling and tailfins to a new obsession with increased fuel efficiency. Yet there is no procedure in the CPI to adjust for improvements in automobile fuel efficiency.⁸ A lab at M.I.T. several years ago studied the repair records of appliances and found that the frequency of refrigerator repairs had dropped by a factor of two, and TV repairs by a factor of four, between the mid 1950's and early 1970's.

In a study that makes allowances for improved electricity efficiency and other characteristics, I have estimated that the quality-adjusted prices of refrigerators, washing machines, and air conditioners declined at about twice the rate registered by the CPI between 1950 and the mid 1960's.

Performance improvements are not just limited to goods, but also extend to services. That vanishing breed, the domestic household worker, now accomplishes more per hour with modern appliances and fabrics than her 1925 counterpart, yet her "price" is a straight hourly wage. The apparently outrageous increases in hospital room charges exhibited in Table II disguise improvements in the quality of medical care provided to the typical patient, and today's guest at a Holiday Inn or other medium-priced hotel enjoys telephone and television service that was unavailable to his luxury-hotel counterpart of 50 years ago. An airline passenger mile is a more comfortable, faster, and safer, commodity than it was in 1955, and yet the CPI prices a homogeneous passenger mile. There is no doubt that train service has deteriorated, but this is of minor importance in an index that keeps its weight up to date.

Of all products in the U.S. economy, the one displaying the faster rate of price decline throughout the entire postwar era has been the electronic computer. Yet the U.S. government does not compile a price index for computers, so that the output and productivity gains achieved by companies like IBM and the office machinery industry as a whole are not captured by aggregate indexes of output and productivity. This does not involve the CPI directly, because until recently few computers were sold directly to consumers. Government officials are quick to admit that IBM's output and productivity achievements are missed in official data in the year the computers are manufactured, but they claim that the higher efficiency made possible by computers is accurately captured when they are used in subsequent years in the production of consumer goods. This position is partly true, since the use of computers to replace workers in consumer-goods factories has contributed to measured productivity advances.

Yet for a wide variety of consumer services the CPI is not capturing the improvements that the computer has provided. On many airlines computers make possible pre-reserved seats and one-stop check-in, and airline managements were willing to invest in computerized equipment in the belief that consumers should value the extra services provided. Yet the CPI does not value the extra services, treats an airline passenger-mile as an unchanged commodity, and leaves the impression in our national data that the investment in the extra computer has produced nothing. The same point applies to 24-hour money machines provided on street corners by banks, and other financial services. It is doubtful that the world-wide convenience made possible by major credit cards

would have occurred without the computer, yet the CPI ignores the saving of time and fees by consumers who no longer have to purchase so many travelers checks and letters of credit.

Even the much-criticized U.S. government has been a source of an unmeasured improvement in our standard of living. For 25 years we paid an increased gasoline excise tax, treated by the CPI as an increase in the price of gasoline, in order to finance construction of the interstate highway system. Automobile travel is now faster and safer, but this government activity is treated as having only costs, with no benefits.

The interstate highway example is interesting because it conflicts with a controversial decision that treats anti-pollution and safety devices on automobiles in the CPI as an increase in quality rather than an increase in price. Government environmental and safety legislation is treated as having wisely balanced the cost of the devices against the benefits received by the nation as a whole in reduced pollution and greater safety, in contrast to the interstate highway case where benefits are ignored. If government regulatory efforts, like most economic activities, are subject to increasing costs and diminishing benefits as more and more of the pollution is eliminated, then the CPI treatment may have been conservative a decade ago, in the early stages of regulation, but overly generous recently. The growing consensus that many recent government regulations do not provide benefits to balance their costs would imply that, at least for this one reason, the Consumer Price Index understates inflation.

As we plunge further into the murky depths of index-making, at some point we leave the realm of the statistician and enter the realm of the philosopher. Where do we draw the line between a new model of an old product and an entirely new product? The CPI states that the price of admission to movies increased 330 percent between 1948 and 1978. Yet the invention of television allowed the price of two hours of movie-like entertainment to decline substantially, even if we cancel out the agony of commercials against the saving in baby sitters, parking fees, and transportation expenses. A long list of such broadly conceived substitutions could be compiled—permanent press clothing for commercial laundries, phone for mail, appliance for domestic servants.

A BETTER INDEX

The CPI is a severely flawed index, as shown both by our comparison with the PCE deflator and our examination of the pervasive nature of unmeasured quality change. Yet it is striking that the BLS spent \$50 million during 1972-77 to revise the CPI without curing any of its major defects. In a six-month overlap period in early 1978, the expensively revised "new CPI" registered an increase that differed from the "old CPI" by only 0.1 percentage point.

It seems clear in retrospect that the BLS spent its revision money on the wrong things, improving the number of outlets covered or the number of consumers surveyed rather than investing money in more rent data on single-family homes or on performance data for newly introduced models and products. What the CPI needs, in addition to the use of more up-to-date weights and a rental equivalence approach to the measurement of home ownership costs, is a vastly improved effort to measure the improved performance and efficiency of consumer goods and services, as well as the occasional decline in product quality. Much can be done with existing performance and efficiency data available from the published test reports of Consumers Union and other organizations, and in selective cases the BLS could

⁷F. Lee Moore, "Index Mischief: Price versus Cost," *Electric Perspectives*, 1978, no. 5, pp. 8-27.

⁸In the case of automobiles the BLS has measured the price change on new downsized models as equal to models that are unchanged in size. This is the correct procedure if the fuel savings on the new models just balance the consumer value of the loss in comfort and performance, but not otherwise.

institute its own testing program or contract for tests from private organizations.

It is now 20 years since a committee headed by George Stigler recommended many of the same improvements in the CPI. It is discouraging that so little has been done by so many for so long. BLS officials tend to reject suggestions for a more imaginative approach to quality measurement as too "subjective," when what is needed is a more frequent application of simple common sense. 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." And in an era in which each change in the CPI sets off a wave of redistributional adjustments, that observation is precisely right.

UNDERSTANDING THE CONSUMER PRICE INDEX:
ANSWERS TO SOME QUESTIONS
PREFACE

The continually growing uses and users of the Consumer Price Index (CPI) have generated an increasing number of questions about the CPI. Although the Bureau of Labor Statistics (BLS) has provided extensive material to the public describing the CPI since its 1987 revision, much of this material has been quite technical. BLS has developed this pamphlet, therefore, to (1) answer frequently asked questions about the CPI, (2) familiarize users of the CPI with some of the most important of the new procedures introduced with the 1987 CPI Revision, and (3) help users of the CPI better understand and use it.

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WHAT IS THE CPI?

The Consumer Price Index (CPI) is a measure of the average change over time in the prices paid by urban consumers for a fixed market basket of consumer goods and services from A to Z. The CPI provides a way for consumers to compare what the market basket of goods and services costs this month with what the same market basket cost a month or a year ago.

HOW IS THE CPI USED?

The Consumer Price Index affects nearly all Americans because of the many ways it is used. Three major uses are:

As an economic indicator: The CPI is the most widely used measure of inflation and is sometimes viewed as an indicator of the effectiveness of government economic policy. It provides information about price changes in the Nation's economy to government, business, labor, and other private citizens and is used by them as a guide to making economic decisions. In addition, the President, Congress, and the Federal Reserve Board use trends in the CPI to aid in formulating fiscal and monetary policies.

As a deflator of other economic series: The CPI and its components are used to adjust other economic series for price changes and to translate these series into inflation-free dollars. Examples of series adjusted by the CPI include retail sales, hourly and weekly earnings, and components of the national income and product accounts.

An interesting example of this is the use of the CPI as a deflator of the value of the consumer's dollar to find its purchasing power. The purchasing power of the consumer's dollar measures the change in the quantity of goods and services a dollar will buy at different dates. In other words, as prices increase, the purchasing power of the consumer's dollar declines.

As a means of adjusting dollar values: As inflation erodes consumers' purchasing power, the CPI is often used to adjust consumers' income payments, for example, Social Security; to adjust income eligibility levels for government assistance; and to automatically provide cost-of-living wage adjustments to millions of American workers.

The CPI affects the income of almost 70 million persons as a result of statutory action: 43.1 million Social Security beneficiaries, about 22.6 million food stamp recipients, and about 3.9 million military and Federal Civil Service retirees and survivors. Changes in the CPI also affect the cost of lunches for 24.2 million children who eat lunch at school, while collective bargaining agreements that tie wages to the CPI cover about 2.8 million workers.

Another example of how dollar values may be adjusted is the use of the CPI to adjust the Federal income tax structure. These adjustments prevent inflation-induced increases in tax rates, an effect called "bracket creep."

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. For example, if the price of beef increases more rapidly than other meats, shoppers may shift their purchases away from beef to pork, poultry, or fish. If the charges for household energy increase more rapidly than for other items, households may buy more insulation and consume less fuel. The CPI does not reflect this substitution among items as a cost-of-living index would. Rather, the CPI assumes the purchase of the same market basket, in the same fixed proportion (or weight) month after month. About every 10 years the market basket is thoroughly updated to allow for the introduction of new products and services and to reflect more current spending patterns. (See question 6.) In addition, the CPI does not reflect taxes that are not directly associated with the purchase of specific goods and services. In other words, the CPI excludes taxes such as income and Social Security taxes.

It is important to note that local area CPI's cannot be used to compare levels of living costs or prices between areas. (See answer to question 17: "Can the CPI's for individual areas be used to compare living costs among the areas?")

WHOSE BUYING HABITS DOES THE CPI REFLECT?

The CPI reflects spending patterns for each of two population groups: All urban Consumers (CPI-U) and Urban Wage Earners and Clerical Workers (CPI-W). The CPI-U represents about 80 percent of the total U.S. population. It is based on the expenditures reported by almost all urban residents, including professional employees, the self-employed, the poor, the unemployed, and retired persons as well as urban wage earners and clerical workers. Not included in the index are the spending patterns of persons living outside urban areas, farm families, persons in the Armed Forces, and those in institutions (such as prisons and mental hospitals).

The CPI-W is based on the expenditures of urban households that meet additional requirements: More than one-half of the household's income must come from clerical or wage occupations and at least one of the household's earners must have been employed for at least 37 weeks during the previous 12 months. The CPI-W's population represents about 32 percent of the total U.S. population and is a subset, or part, of the CPI-U's populations.

DOES THE CPI MEASURE MY EXPERIENCE WITH PRICE CHANGE?

Not necessarily. It is important to understand that BLS bases the market baskets and pricing procedures for the CPI-U and CPI-W on the experience of the relevant average household, not on any specific family or individual. It is unlikely that your experience will correspond precisely with either the national indexes or those for specific cities or regions.

For example, if you or your family spend a larger than average share of your budget on medical expenses, and medical care costs are increasing more rapidly than other items in the CPI market basket, your personal rate of inflation (or experience with price change) may exceed the CPI. Conversely, if you heat your home with solar energy, and fuel prices are rising more rapidly than other items, you may experience less inflation than the general population.

This phenomenon explains why people sometimes question the accuracy of the published indexes. A national average reflects all the ups and downs of millions of individual price experiences. It seldom mirrors a particular consumer's experience.

HOW IS THE CPI MARKET BASKET CHOSEN?

The CPI market basket is developed from detailed expenditure information provided by families and individuals on what they actually bought. For the current CPI, this information was collected from the Consumer Expenditure Survey over the 3 years 1982, 1983, and 1984. In each of the 3 years, about 4,800 families, from around the country, provided information on their spending habits in a series of quarterly interviews. To collect information on frequently purchased items, such as food and personal care products, another 4,800 families in each of the 3 years kept diaries listing everything they bought during a 2-week period.

Altogether, about 29,000 individuals and families provided expenditure information for use in determining the importance, or weight, of each item in the index structure.

Due to time constraints, we used data from only the first 2 years of the Consumer Expenditure Survey to select the items to be priced. In addition, we update the sample of stores and service outlets in roughly 20 percent of the urban areas priced for the CPI each year. New items are introduced with these new samples.

WHAT GOODS AND SERVICES DOES THE CPI COVER?

The CPI represents all goods and services purchased for consumption by urban households. We have classified all expenditure items into over 200 categories, arranged into 7 major groups. Major groups and examples of categories in each are as follows:

Food and beverages (cookies, cereals, cheese, coffee, chicken, beer and ale, restaurant meals); housing (residential rent, homeowners' costs, fuel oil, soaps and detergents, televisions, local telephone service); apparel and its upkeep (men's shirts, women's dresses, jewelry); transportation (airline fares, new and used cars, gasoline, car insurance); medical care (prescription drugs, eye care, physicians' services, hospital rooms); entertainment (newspapers, toys, musical instruments, admissions); and other goods and services (haircuts, college tuition, bank fees).

In addition, the CPI includes various user fees such as water and sewerage charges, auto registration fees, vehicle tolls, and so forth. Taxes that are directly associated with the prices or specific goods and services (such as sales and excise taxes) are also included. But, the CPI excludes taxes not directly associated with the purchase of

consumer goods and services (such as income and Social Security taxes).

The CPI does not include investment items (such as stocks, bonds, real estate, and life insurance). These items relate to savings and not day-to-day living expenses.

For each of the over 200 item categories, the Bureau has chosen samples of several hundred specific items within selected business establishments, using scientific statistical procedures, to represent the thousands of varieties available in the marketplace. For example, in a given supermarket, the Bureau may choose a plastic bag of golden delicious apples, U.S. extra fancy grade, weighing 4.4 pounds to represent the "Apples" category.

HOW ARE CPI PRICES COLLECTED AND REVIEWED?

Each month, Bureau of Labor Statistics (BLS) field representatives visit or call thousands of retail stores, service establishments, rental units, and doctors' offices, all over the United States to obtain price information on thousands of items in the CPI market basket. For the entire month they record the prices of about 90,000 items. These 90,000 prices represent a scientifically-selected sample of the prices of goods and services sold to urban consumers throughout the country.

During each call or visit, the field representative collects price data on a specific good or service that was precisely defined during an earlier visit. If the selected item is available, the field representative records its price. If the selected item is no longer available or if there have been changes in the quality or quantity (for example, eggs sold in packages of 8 when previously they had been sold by the dozen) of the good or service since the last time prices had been collected, the field representative selects a new item or records the quality change in the current item.

The recorded information is sent to the national office of BLS where commodity specialists who have detailed knowledge about the particular goods or services priced, review the data. The specialists check the data for accuracy and consistency and make any necessary corrections or adjustments. These can range from an adjustment for a change in the size or quantity of a packaged item to more complex adjustments based upon statistical analysis of the value of an item's features or quality. Thus, the commodity specialists strive to keep changes in the quality of items from affecting the CPI's measurement of price change.

HOW IS THE CPI CALCULATED?

The CPI is a product of a series of inter-related samples. First, using data from the 1980 Census of Population, BLS selects the urban areas from which prices are to be collected and chooses the housing units within each area that are eligible for use in the shelter component of the CPI. The Census of Population also provides the data which allows the assigning of the number of consumers represented by each area priced for the CPI. Next, another sample of about 24,000 families serves as the basis for a Point-of-Purchase survey that identifies the places where households purchase various types of goods and services.

Data from the Consumer Expenditure Survey conducted from 1982 through 1984, involving a national sample of almost 29,000 families, provided detailed information on their spending habits. This enabled BLS to construct the CPI market basket of goods and services and to assign each item in the market basket a weight or importance based on total family expenditures. The final stage in the sampling process is the selection of the specific detailed item to be priced in each

outlet. This is done using a method called "disaggregation." For example, BLS field representatives may be directed to price "fresh whole milk." Through the disaggregation process, the field representative selects the specific kind of fresh whole milk that will be priced over time in the outlet. By this process, each kind of whole milk is assigned a probability, or weight, based on the quantity of it the store sells. If, for example, Vitamin D, homogenized milk in half-gallon containers makes up 70 percent of the sales of fresh whole milk, and the same milk in quart containers accounts for 10 percent of all whole milk sales, then the half-gallon container will be seven times more likely to be chosen than the quart container. After probabilities are assigned, one kind of milk is chosen by an objective selection process based on the theory of random sampling. The particular kind of milk that is selected by disaggregation will continue to be priced each month in the outlet.

To sum up, the price movement measurement (see question 8) is weighted by the importance of the item in the spending patterns of the appropriate population group. The combination of all these factors gives a weighted measurement of price change for all the items in all the outlets, in all the areas priced for the CPI.

HOW DO I READ OR INTERPRET AN INDEX?

An index is a tool that simplifies the measurement of movements in a numerical series. Most of the specific CPI indexes have a 1982-84 reference base. That is, we set the average index level (representing the average price level)—for the 36-month period covering the years 1982, 1983, and 1984—equal to 100. We measure changes in relation to that figure. An index of 110, for example, means there has been a 10-percent increase in price since the base period; similarly an index of 90 means a 10-percent decrease. Movements of the index from one date to another can be expressed as changes in index points (simply, the difference between index levels), but it is more useful to express the movements as percent changes. This is because index points are affected by the level of the index in relation to its base period, while percent changes are not.

In the following table, item A increased by half as many index points as item B. Yet, because of the different starting figures, both had the same percent change; that is, prices advanced at the same rate. On the other hand, items B and C show the same change in index points, but the percent change is much greater for item C because of its lower starting value.

We usually update reference base periods every 10 years or so to make it easier for people to relate changes in the CPI to other economic and cultural changes. We chose the 1982-84 period because it coincided with the time period of the CPI's expenditure weights.

	Item A	Item B	Item C
Year I	112.5	225.0	110.0
Year II	121.5	243.0	128.0
Change in index points	9.0	18.0	18.0
Percent change	(¹)	(²)	(³)

¹ Item A: 9.0/112.5100=8.0
² Item B: 18.0/225.0100=8.0
³ Item C: 18.0/110.0100=16.4

IS THE CPI THE BEST MEASURE OF INFLATION?

Inflation is the widespread and persistent increase in costs and prices over the Nation's entire price and cost structure, with expectations that the increase will continue to occur in the future.

Various techniques have been devised to measure different aspects of inflation. The CPI measures inflation as experienced by consumers in their day-to-day living expenses; the Producer Price Index (PPI) cap-

tures it at earlier stages of the production and marketing process; the Employment Cost Index (ECI) measures it in the labor market; the BLS' International Price Program measures it for imports and exports; and the Gross Domestic Product Deflator (GDP-Deflator) measures combine the experience with inflation of governments (Federal, State and local), businesses, and consumers. Finally, there are more specialized measures, such as measures of interest rates and measures of consumers' and business executives' expectations.

The "best" measure of inflation for a given application depends on the intended use of the data. The CPI is generally the best measure for adjusting payments to consumers when the intent is to allow them to purchase, at today's prices, the same market basket of consumer goods and services that they could purchase in an earlier reference period. It is also the best measure to use to translate retail sales and hourly or weekly earnings into real or inflation-free dollars.

WHICH INDEX IS THE "OFFICIAL CPI" REPORTED IN THE MEDIA?

Each month, BLS releases thousands of detailed CPI numbers to the press. However the press generally focuses on the broadest, most comprehensive CPI. This is known as "the Consumer Price Index for All Urban Consumers (CPI-U) for the U.S. City Average for all Items, 1982-84 = 100." Often, the media will report some or all of the following:

- a. the index level (for example, July 1992 = 140.5)
- b. the 12-month percent change (for example, July 1991 to July 1992 = 3.2 percent).
- c. the 1-month percent change on a seasonally adjusted basis (for example, from June 1992 to July 1992 = 0.1 percent).
- d. the annual rate of percent change so far this year (for example, from December 1991 to July 1992 if the rate of increase over the first 7 months of the year continued for the full year, after the removal of seasonal influences, the rise would be 2.9 percent).
- e. the annual rate based on the latest seasonally adjusted 1-month change. For example, if the June 1992 to July 1992 rate continued for a full 12 months, the rise, compounded, would be 1.7 percent.

WHAT INDEX SHOULD I USE FOR ESCALATION?

The decision to employ an escalation mechanism, as well as the choice of the most suitable index, is up to the user. When drafting the terms of an escalation provision for use in a contract to adjust future payments, both legal and statistical questions can arise. While BLS cannot help in any matters relating to legal questions, it does provide basic technical and statistical assistance to users who are developing indexing procedures.

Some examples of technical or statistical guidelines from BLS follow:

BLS strongly recommends using indexes unadjusted for seasonal variation (i.e., not seasonally adjusted indexes) for escalation. (See answer to question 14 for a further explanation of seasonally adjusted indexes and why we do not recommend seasonally adjusted indexes for use in escalation.)

BLS recommends using national or regional indexes for escalation due to the volatility of the local indexes. (See answer to question 15 for an explanation of this point).

If you have further questions, the Bureau has prepared a detailed report, Using the Consumer Price Index for Escalation. For copies write or call the nearest BLS regional office listed at the end of this report, or call (202)—606-7000.

WHEN SHOULD I USE SEASONALLY ADJUSTED DATA?

By using seasonally adjusted data, economic analysts and the media find it easier

to see the underlying trend in short-term price change. It is often difficult to tell from raw (unadjusted) statistics whether developments between any 2 months reflect changing economic conditions or only normal seasonal patterns. Therefore, many economic series, including the CPI, are seasonally adjusted to remove the effect of seasonal influences on the changes, thereby revealing the underlying trend. Seasonal influences are those that normally occur at the same time and in about the same magnitude every year. They include price movements resulting from changing climatic conditions, production cycles, model changeovers, and holidays. We re-estimate or revise seasonally adjusted indexes annually.

The unadjusted data reflect the actual prices consumers pay. Therefore, unadjusted data are appropriate for escalation purposes.

WHAT AREA INDEXES ARE PUBLISHED, AND HOW OFTEN?

Besides monthly publication of the national (or U.S. City Average) CPI-U and CPI-W, monthly indexes are also published for the four regions—Northeast, North Central, South, and West. Monthly indexes are also published for urban areas classified by population size—all metropolitan areas over 1.2 million, mid-sized metropolitan areas, small metropolitan areas, and all nonmetropolitan urban areas. Indexes also are available within each region cross-classified by area size. For the Northeast and West, however, some of the population-size classes are not available. BLS also publishes indexes for 29 local areas. These local area indexes are byproducts of the national CPI program. Each local index has a much smaller sample size than the national or regional indexes and is, therefore, subject to substantially more sampling and other measurement error. As a result, local area indexes are more volatile than the national or regional indexes, even though their long-term trends are similar. Therefore, BLS strongly urges users to consider adopting the national average (or regional) CPI's for use in their escalator clauses. If used with caution, local area CPI data can be used to illustrate and explain the impact of local economic conditions on consumers' experience with price change. Local area data are available on the following schedule:

We publish five major metropolitan areas monthly: Chicago-Gary-Lake County, IL-IN-WI; Los Angeles-Anaheim-Riverside, CA; New York-Northern NJ-Long Island, NY-NJ-CT; Philadelphia-Wilmington-Trenton, PA-NJ-DE-MD; San Francisco-Oakland-San Jose, CA.

Data for an addition 10 metropolitan areas are published every other month [on an odd (January, March, etc.) or even (February, April, etc.) month schedule] for the following areas:

- Baltimore, MD—odd.
- Houston, TX—even.
- Boston-Lawrence-Salem, MA-NH—odd.
- Miami-Fort Lauderdale, FL—odd.
- Cleveland-Akron-Lorain, OH—odd.
- Pittsburgh-Beaver Valley, PA—even.
- Dallas-Fort Worth, TX—even.
- St. Louis-East St. Louis, MO-IL—odd.
- Detroit-Ann Arbor, MI—even.
- Washington, DC-MD-VA—odd.

(Note: The designation even or odd refers to the month during which the area's price change is measured. Due to the time needed for processing, data are released 2 to 3 weeks into the following month.)

Data are published for another group of 12 metropolitan areas on a semiannual basis. These indexes, which refer to the arithmetic average for the 6-month periods from January through June and July through December, are published with release of the CPI for

July and January, respectively, in August and February for: Anchorage, AK, Kansas City, MO-KS, Atlanta, GA, Milwaukee, WI, Buffalo-Niagara Falls, NY, Minneapolis-St. Paul, MN-WI, Cincinnati-Hamilton, OH-KY-IN, Portland-Vancouver, OR-WA, Denver-Boulder, CO, San Diego, CA, Honolulu, HI, Seattle-Tacoma, WA.

Finally, BLS recently began publication of CPI's for two metropolitan areas on an annual basis. These indexes represent the arithmetic averages for the 12-month period from January through December of each year. They are published with the release of the CPI for January, i.e., in February. These areas are: New Orleans, LA; Tampa-St. Petersburg-Clearwater, FL.

WHAT AREA CPI SHOULD I USE IF THERE IS NO CPI FOR THE AREA I LIVE IN?

Although the BLS can provide some guidance on this question, users must make the final decision.

As noted in the answers to Questions 13 and 15, BLS strongly urges the use of national or at least regional CPI's for use in escalator clauses. These indexes are more stable and subject to less sampling and other measurement error than local area indexes. They are, therefore, more statistically reliable.

CAN THE CPI'S FOR INDIVIDUAL AREAS BE USED TO COMPARE LIVING COSTS AMONG THE AREAS?

No, an individual area index measures how much prices have changed in that particular area over a specific time period. It does not show whether prices or living costs are higher or lower in that area relative to another. In general, both the market basket and relative prices of goods and services in the base period vary substantially across areas.

The following illustration shows that while Area B has higher prices than Area A, the price change in Area A has been greater than in Area B. The CPI measures the rates of change in prices rather than the level of prices.

	Base period		Current period	
	Price	Index	Price	Index
Area A	\$0.30	100	\$0.55	183
Area B	0.60	100	0.90	150

WHAT TYPES OF DATA ARE PUBLISHED?

These are many types of data published as outputs from the CPI program. The most popular are indexes and percent changes. Requested less often are relative importance data (or relative expenditure weights), base conversion factors (to convert from one CPI reference base to another), seasonal factors (the monthly factors used to convert unadjusted indexes into seasonally adjusted indexes), and average food and energy prices. Index and price change data are available for the U.S. City Average (or national average), for various geographic areas (regions and metropolitan areas), for size classes of urban areas, and for cross-classifications of regions and size classes. Indexes for various groupings of items are available for all geographic areas and size classes.

There are individual indexes available for over 200 items (e.g., apples, men's shirts, airline fares), and over 120 different combinations of items (e.g., fruits and vegetables, food at home, food and beverages, and All items), at the national or U.S. City Average level. BLS classifies consumer items into seven major groups: food and beverages, housing, apparel and upkeep, transportation, medical care, entertainment, and other goods and services. Some indexes are available as far back as 1913.

Each month, indexes are published along with short-term percent changes, the latest 12-month change and, at the national item

and group level, unadjusted and (where appropriate) seasonally adjusted percent changes (and seasonal factors), together with annualized rates of change. These annualized rates indicate what the rate of change would be for a 12-month period, if a price change measured for a shorter period continued for a full 12-months.

The answer to question 15 provides information about the areas and size classes for which indexes are published. For areas, we publish less detailed groupings of items than we do for the national level. The following table illustrates this point:

ALL ITEMS	
Baltimore, MD	U.S. city average
Food and beverages	Food and beverages.
Food	Food.
Food at home	Food at home.
Cereals and bakery products	Cereals and bakery products.
	Cereals and cereal products.
	Flour and prepared flour mixes.
	Cereal.
	Rice, pasta, and corn meal.
	Bakery products.
	White bread.
	Fresh other bread, biscuits, rolls, and muffins.
	Cookies, fresh cake and cupcakes.
	Other bakery products.

Annual average indexes and percent changes for these groupings are published at the national and local levels.

Semiannual average indexes and percent changes for some of these groupings are also published.

Each month, we publish average price data for some food items (for the U.S. and 4 regions) and for some energy items (for the U.S., 4 regions, 4 size-classes, 13 cross-classifications of regions and size-classes, and for 15 metropolitan areas).

WHAT ARE SOME LIMITATIONS OF THE INDEX?

The CPI is subject to both limitations in application and limitations in measurement.

Limitations of application

The CPI may not be applicable to all population groups. For example, it is designed to measure the experience with average price change of the U.S. urban population and, thus, may not accurately reflect the experience of rural residents. Also, the CPI does not provide data separately for the rate of inflation experienced by subgroups of the population, such as the elderly or the poor.

As noted in the answer to question 17, the CPI cannot be used to measure differences in price levels or living costs between one place and another; it measures only time-to-time changes in each place. A higher index for one area does not necessarily mean that prices are higher there than in another area with a lower index, it merely means that they have risen faster since their common base period.

The CPI cannot be used as a measure of total change in living costs, because changes in these costs are affected by such factors as changes in consumers' market baskets, social and environmental changes, and changes in income taxes, which the CPI does not include.

Limitations in measurement

Limitations in measurement can be grouped into two basic types, sampling errors and non-sampling errors.

Sampling errors: Since the CPI measures price change based on only a sample of items, the published indexes differ somewhat from what the results would be if actual records of all retail purchases by everyone in the index population could be used to compile the index. These estimating or sampling errors are limitations on the precise accuracy of the index, not mistakes in index calculation. The accuracy could be increased by using much larger samples, but the cost

would be multiplied. Most of those who have examined the index have found it to be sufficiently accurate for most of the practical uses made of it. The CPI program has developed measurements of sampling error.

Nonsampling errors: These errors occur from a variety of sources. Unlike sampling errors, they can cause persistent bias in the index measurement. They are caused by problems of price data collection, logistical lags in conducting surveys, difficulties in defining basic concepts and their operational implementation, and difficulties in handling the problems of quality change. Nonsampling errors can be far more hazardous to the accuracy of a price index than sampling error, per se. BLS expands much effort to minimize these errors. Highly trained personnel are relied on to insure comparability of quality of items compared from period to period (see answer to question 8.); collection procedures are extensively documented and recurring audits are conducted. The CPI program has started a program of continuous evaluation to identify needed improvements and has introduced improvements as their benefits were proven and as our budget permitted.

WILL THE CPI BE UPDATED OR REVISED IN THE FUTURE?

Yes. The CPI will need revisions as long as there are significant changes in consumer buying habits or shifts in population distribution or demographics. The Bureau, by developing annual Consumer Expenditure Surveys and Point-of-Purchase Surveys, has the flexibility to monitor changing buying habits in a timely and cost-efficient manner. In addition, the censuses conducted by the Department of Commerce provide information that permits us to adapt to shifts in the population distribution and other demographic factors at 10-year intervals.

As a matter of policy, BLS is continually researching improved statistical methods. Thus, even between major revisions, we are making further improvements to the CPI. For example, changes in children's day care and nursery school expenses, until recently, had been represented by changes in State and local minimum wages. The development of an adequate sample of day care providers and nursery school reporters enabled us to obtain prices for day care and nursery school services directly.

HOW CAN I GET CPI INFORMATION?

BLS furnishes CPI data to the public in a variety of methods and formats.

The Electronic News Release: This is the quickest. It is reachable electronically immediately at release time (which is approximately 2 weeks after the reference month) through the BLS News Release Service. A fee is charged for this service. Write to the Office of Publications and Special Studies, Bureau of Labor Statistics, 2 Massachusetts Avenue, NE, Washington, DC 20212-0001, or call (202) 606-5888.

Telephone: A wide range of summary CPI data are provided on a 24-hour recorded message, including key CPI numbers plus the next release date. Call (202) 606-STAT. Another recorded message, of less than 3 minutes, provides information about the U.S. and Washington All Items CPI's and the next release date. Call (202) 606-6994. Technical information is available, between 8:15 and 4:45 Eastern time, Monday through Friday, at (202) 606-7000. BLS Regional Offices also provide CPI information by telephone.

Mailgram: This arrives overnight. It is provided through the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22151. It costs \$190 per year in the contiguous United States. It provides selected U.S. City Average CPI data.

Machine-readable form: A single magnetic tape which contains all current and historical

cal CPI data is \$95. Data diskettes are also available. These offer CPI-U and CPI-W indexes for the U.S. city average for 104 selected items, and All items indexes for 54 selected areas, for all months of the current year and the previous year. A single copy costs \$38 and a 12-month subscription \$290. These arrive about a week after the data are released. For information, write to the Office of Publications and Special Studies, Bureau of Labor Statistics, 2 Massachusetts Avenue, NE, Washington, DC 20212-0001 or call (202) 606-5886. Custom diskettes providing data requested by the user are also available. Call (202) 606-6968.

Free CPI Summary News Release: This 2-page release provides CPI-U and CPI-W indexes, 1-month and 12-month percent changes for 104 selected items for the U.S. city average, a brief analysis of recent CPI movement, and All items indexes for 36 selected areas and groupings of areas for available periods within the past 3 months, with their latest 12-month percent change. It arrives about 3 weeks after the release of the CPI. You can request that we add your name to this free mailing list by writing to the Office of Publications and Special Studies, Bureau of Labor Statistics, 2 Massachusetts Avenue, NE Washington, DC 20212-0001 or by calling (202) 606-STAT. BLS Regional Offices (see end of this brochure) also maintain free mailing lists for local and regional CPI information.

CPI Detailed Report: This is the Bureau's most comprehensive report on consumer prices. It is published monthly and costs \$26 a year, \$7 for a single copy. It can be ordered from: New Orders, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954. It includes text, statistical tables, graphs, and technical notes. Besides index data, the Detailed Report includes average prices for some food and energy items. It arrives 3-4 weeks after the release date.

Monthly Labor Review: The MLR provides selected CPI data included in a monthly summary of BLS data and occasional analytical articles and methodological descriptions too extensive for inclusion in the CPI Detailed Report. It can be ordered from: New Orders, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954. It costs \$25 a year, \$7 for a single copy.

Historical tables: These show all of the published indexes for each of the detailed CPI components listed in the CPI Detailed Report. They are available upon request. We impose fees for large requests. For information call (202) 606-7000.

Special publications: Various special publications are available upon request. Examples of these are: Relative Importance of Components in the Consumer Price Index, Using the CPI for Escalation, fact sheets like "Rebasing the Consumer Price Index" and associated conversion factors, and assorted checklists which describe the items eligible for pricing. For information call (202) 606-7000.

TOWARD A MORE ACCURATE MEASURE OF THE COST OF LIVING

(Interim report to the Senate Finance Committee from the Advisory Commission To Study the Consumer Price Index, September 15, 1995)

SEPTEMBER 15, 1995.

Hon. WILLIAM V. ROTH, Jr., *Chairman*,
Hon. DANIEL P. MOYNIHAN, *Ranking Minority Member*,
Committee on Finance, U.S. Senate, 211 Dirksen Senate Office Building, Washington, DC.

DEAR SENATORS ROTH AND MOYNIHAN: The Advisory Commission to Study the Consumer Price Index herewith submits its Interim Report in accordance with its char-

ter based on Senate Resolution 73, Section 11b.

Sincerely,

MICHAEL J. BOSKIN,
Chairman,
ELLEN DULBERGER,
Member,
ZVI GRILICHES,
Member,
ROBERT J. GORDON,
Member,
DALE JORGENSON,
Member.

EXECUTIVE SUMMARY

1. The American economy is flexible and dynamic. New products are being introduced all the time and existing ones improved, while others leave the market. The relative prices of different goods and services changes frequently, in response to change in consumer tastes and income, and technological and other factors affecting cost. This makes constructing an accurate cost of living index more difficult than in a static economy.

2. Estimating a cost of living index requires assumptions, methodology, data gathering and index number construction. Biases can come from any of these areas.

3. The strength of the CPI is in the underlying simplicity of its concept: pricing a fixed (but representative) market basket of goods and services over time. Its weakness follows from the same conception: the "fixed basket" becomes less and less representative over time as consumers respond to price changes and new choices.

4. There are five categories of potential bias in using changes in the CPI as a measure of the change in the cost of living. 1) Substitution bias occurs because a fixed market basket fails to reflect the fact that consumers substitute relatively less for more expensive goods when relative prices change. 2) Outlet substitution bias occurs when shifts to lower price outlets are not properly handled. 3) Quality change bias occurs when improvements in the quality of products, such as greater energy efficiency or less need for repair, are measured inaccurately or not at all. 4) New product bias occurs when new products are not included in the market basket, or included only with a long lag. 5) Formula bias occurs when the method of aggregating from the many thousands of elementary products for which price quotations are obtained to a modest number of groups of goods is inappropriate. The report discusses and estimates the size of each of the potential sources of bias.

5. While the CPI is the best measure currently available, it is not a true cost of living index (this has been recognized by the Bureau of Labor Statistics for many years). Despite important BLS updates and improvements in the CPI, changes in the CPI have substantially overstated the actual rate of price inflation, by about 1.5% per annum recently. It is likely that a large bias also occurred looking back over at least the last couple of decades, perhaps longer, but we make no attempt to estimate its size.

6. Changes in the CPI will overstate changes in the true cost of living for the next few years. The Commission's interim best estimate of the size of the upward bias looking forward is 1.0% per year. The range of plausible values is 0.7% to 2.0%. The range of uncertainty is not symmetric. It is more likely that changes in the CPI have a larger than a smaller bias.

7. The upward bias programs into the federal budget an annual automatic real increase in indexed benefits and real tax cut.

8. CBO estimates that if the change in the CPI overstated the change in the cost of living by an average of 1% per year over the

next decade, this bias would contribute almost \$140 billion to the deficit in 2005 and \$634 billion to the national debt by then. The bias alone would be the fourth largest federal program, after social security, health care and defense.

9. Some have suggested that different groups in the population are likely to have faster or slower growth in their cost of living than recorded by changes in the CPI. We find no compelling evidence of this to date, in fact just the opposite, but further exploration of this issue is desirable.

10. In our final report we expect to have a more complete analysis and evaluation together with specific recommendations for procedures to improve and/or complement the CPI.

I. INTRODUCTION¹

Accurate measures of changes in the cost of living are among the most useful and important data necessary to evaluate economic performance. The change in the cost of living between two periods, for example 1975 and 1995, tells us how much income people would have needed in 1975, given the prices of goods and services available in that year, to be at least as well off as they are in 1995 given their income and the prices of goods and services available then. For example, if a family with a \$45,000 income in 1995 would have needed \$15,000 in 1975, the cost of living has tripled in the interim.

If the American economy was quite static, with very few new products introduced, very little quality improvement in existing products, little change in consumers' tastes, and very small and infrequent change in the relative prices of goods and services, measuring changes in the cost of living would be conceptually quite easy and its implementation a matter of technical detail and appropriate execution. Fortunately for the overwhelming majority of Americans, our economy is far more dynamic and flexible than that. New products are being introduced all the time and existing ones improved, while others leave the market. The relative prices of different goods and services change frequently, in response to changes in consumer taste and income, and technological and other factors affecting costs. Consumers in America have the benefit of a vast and growing array of goods and services from which to choose, unlike consumers in some other countries.

But because the economy is complex and dynamic is no reason to bemoan the greater difficulty in constructing an accurate cost of living index. Major improvements can and should be made to the various official statistics that are currently used as proxies for changes in the cost of living, such as the well-known Consumer Price Index (CPI).

The Consumer Price Index measures the cost of purchasing a fixed market basket of goods and services. Based on surveys of households from some base period, the index sets weights (expenditure shares) for different goods and services. The weights reflect average or representative shares for the groups surveyed.² Keeping these weights fixed through time, the CPI is then calculated by attempting to measure changes from one month to the next in prices of the same, or quite closely related, goods and services.

But through time consumption baskets change, in part because of changes in the relative prices of goods and services, and therefore the weights from the base period no longer reflect what consumers are actually purchasing. This failure to adjust for the changes in consumer behavior in response to relative price changes is called substitution bias. It is a necessary result of keeping the

market basket fixed. Because the market basket is updated only every decade or so, as we get further away from the base period, there is more opportunity for relative prices to diverge from what they were in the base period, and for consumption baskets to change substantially.

Just as there are changes in what consumers purchase, there are also trends and changes in where purchases are made. In recent years, there has been a transformation of retailing. Superstores, discount stores, and the like now comprise a large and growing fraction of sales relative to a decade or two ago. As important as keeping up with the basket of goods that consumers actually purchase is keeping up with the outlets where they actually purchase them, so that the prices paid are accurately recorded. The current methodology suffers from an outlet substitution bias, which insufficiently takes into account the shift to discount outlets.

Many of the products sold today are dramatic improvements over their counterparts from years ago. They may be more durable and subject to less need for repair, more energy efficient; lighter; safer; etc. Sometimes, at least initially, a better quality product replacing its counterpart may cost more. Separating out how much of the price increase is due to quality change rather than actual inflation in the price of a standardized product is far from simple, but is necessary to obtain an accurate measure of the true increase in the cost of living. To the extent quality change is measured inaccurately or not at all, there is a quality change bias in the CPI.

The same is true with the introduction of new products, which have substantial value in and of themselves—not many of us would like to surrender our microwave ovens, radial tires, and VCR's—as well as the value of greater choice and opportunities opened up by the new products. To the extent new products are not included in the market basket, or included only with a long lag, there is a new product bias in the CPI.

Finally, in a dynamic, complex economy like the contemporary United States, there are literally many thousands of goods and services consumed. Price data are collected at a considerable level of disaggregation and how the price changes are aggregated into an overall index involves quite technical issues that can lead to a formula bias in the CPI.

Even if not federal program on either the outlay or revenue side of the budget was indexed, it would still be desirable to improve the quality of measures of the cost of living from the standpoint of providing citizens a better and more accurate estimate of what was actually going on in the economy, a way to compare current performance to our historical performance or to that of other countries. For example, the most commonly used measure of the standard of living is real income or output per person. To measure changes in real income requires the separation of nominal income changes from price changes. Obviously, that requires an accurate measure of price changes.

But numerous federal, state and local government programs and tax features are "indexed" for changes in the cost of living by the changes in the Consumer Price Index. The CPI is also used to index a large number of private sector contracts, including wages in collective bargaining agreements and rents, to name obvious examples that affect millions of Americans. Currently, slightly under one-third of total federal outlays, mostly in retirement programs, are directly indexed to changes in consumer prices. Several features of the individual income tax, including the tax brackets, are indexed; the individual income tax accounts for a little under half of federal revenues.

Congress indexed these outlay programs and tax rules in order to help insulate or protect the affected individuals from bearing the brunt of increases in the cost of living. Yet the Bureau of Labor Statistics, the agency responsible for compiling and presenting the Consumer Price Index, has explicitly stated for years that the CPI is not a cost of living index, presumably for some of the reasons mentioned above. If the Consumer Price Index as currently produced, and as likely to be produced over the next few years, is not an appropriate cost of living index for the task Congress had in mind, then it is desirable to consider alternative measures.

The consequences of changes in the Consumer Price Index overstating changes in the cost of living can be dramatic. For example, if use of the CPI is expected to overstate the increase in the cost of living by one percentage point per year over the next seven years, the national debt would be almost \$300 billion greater in 2002 than if a corresponding correction were made in the indexing of outlays and revenues.

This interim report proceeds as follows: Section II discusses the historical and prospective budgetary implications of changes in the CPI overstating changes in the cost of living. Section III details why the CPI is not a true cost of living. Section III details why the CPI is not a true cost of living index and discusses several sources of bias. Section IV describes in greater detail the bias from quality change and new products. Section V introduces the issue of separate price indexes for different groups. The Conclusion summarizes the interim findings of the Commission.

II. INDEXING THE FEDERAL BUDGET

The issue proposed for fiscal policy makers by an upward bias in the CPI 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.³

Social Security is by far the most important of the federal outlays that are indexed to the CPI. 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. The Economic Recovery Tax Act of 1981 indexed individual income tax brackets and the personal exemption to the CPI.

How important have the budgetary consequences of upward bias in the CPI been historically? Obviously, a precise answer to this question would require extended study, taking into account the timing of the bias, the parallel development of indexing provisions in specific federal outlays and revenues, and interest on the accumulation of debt that has resulted. An indication of the potential size of these effects can be inferred from one important historical example of one clearly identified source of bias. A careful study of this type, which focuses on the most important federal program affected by indexing, namely, social security benefits, has been conducted by the Office of Economic Policy (OEP) of the Department of the Treasury.

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—

¹Footnotes at end of article.

U). This altered the treatment of housing costs by shifting the costs for homeowners to a rental equivalent basis. The new treatment of housing costs was incorporated into the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W), used to index social security benefits, in 1985.

The rental equivalent measure of housing costs was a conceptual improvement and has been retained in subsequent official publications. However, housing costs in preceding years employed a "homeownership" measure "... based on house prices, mortgage interest rates, property taxes and insurance, and maintenance costs."⁴ 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. Similarly, housing costs in the CPI-W prior to 1985 have not been modified.

BLS developed an "experimental" price index, CPI-U X1, based on a rental equivalent treatment of housing extending back to 1967. This provides the basis for the OEP assessment of bias in the CPI-W. The bias for 1975, the first year that social security was indexed to the CPI-W, was 1.1 percent. This bias mounted over subsequent years, reaching 6.5 percent by 1982 and then declining to 4.7 percent in 1984.⁵

Overpayments of social security benefits resulting from the bias in the CPI-W mounted through 1983, reaching a total of \$7.1 billion or 7.1 percent of benefits paid in that year. These overpayments have resulted in a lower balance in the OASI trust fund and a larger federal deficit and debt. OEP estimates interest costs associated with these deficits at the rate of interest paid or projected to be paid on the OASI trust fund. Beginning in 1985 interest costs predominate in the total. In the current fiscal year the total cost is \$16.7 billion, of which \$12.6 billion is interest. The cumulative effect of just this one source of bias in the CPI-W via this one program on the federal debt amounts to \$213.2 billion, as of 1995.

In summary, the BLS made two decisions in revising the treatment of housing costs in the CPI-W in 1985. The first decision was to change the treatment of housing costs to a rental equivalent basis beginning in January 1985. The second was not to revise the treatment of housing costs for 1984 and earlier years. As a consequence of these two decisions the level of the CPI-W is 4.7 percent above the CPI-U X1, a measure of the cost of living based on the same primary data sources and similar methodology, but with a consistent treatment of housing costs.

The increases in federal outlays resulting from the bias in the CPI-W cannot be justified as cost of living adjustments. These increases are the consequence of an inappropriate treatment of housing costs before 1985 and have resulted in large transfers to beneficiaries of the OASI program that are devoid of any economic rationale. The overpayments have continued up to the present, but are declining in importance. However, the resulting decline in the OASI trust fund continues to mount due to rising interest costs and now contributes more than two hundred billion dollars to the federal debt!

Of course, nobody would suggest retroactively undoing the overindexing due to this or any other source of bias. The point of this discussion is to demonstrate how important it is to correct biases in the CPI (in either direction) as quickly and fully as possible before their consequences mount, indeed compound.

What would be the effect of an upward bias in the CPI on future deficits? More than half

of federal spending of \$1.5 trillion is now attributable to entitlements and mandatory spending programs. In January 1995 the annual Congressional Budget Office (CBO) outlook for the economy and the federal budget showed that this proportion is projected to rise to almost two-thirds of federal spending during fiscal year 1998. Cost-of-living adjustments at a projected rate of 3.0 percent will contribute \$43 billion to total spending on mandatory programs in that year and \$80 billion in fiscal year 2000.⁶ This is 6.8 percent of projected spending on mandatory programs in fiscal year 2000.

Testimony presented by the CBO to the Committee on Finance shows the impact of a hypothetical correction (reduction) of 0.5 percent in cost of living adjustments for fiscal years 1996-2000.⁷ Federal outlays would decline by \$13.3 billion in fiscal year 2000, while revenues would rise by \$9.6 billion. The decline in debt service resulting from reduced deficits in fiscal years 1996-2000 would be \$3.3 billion, yielding a total contribution to deficit reduction of \$26.2 billion in fiscal year 2000.⁸ This is more than ten percent of the deficit projected by CBO in that year.

The CBO has provided the Commission with projections of the impact of hypothetical corrections (reductions) of 0.5 and 1.0 percent in cost of living adjustments for fiscal years 1996-2005. With a reduction of 0.5 percent the total contribution to deficit reduction rises to \$71.9 billion in 2005. Of this amount, an increase in revenue accounts for \$21.9 billion and reductions in outlays, including debt service, amounts to \$32.7 billion (of which debt service is \$17.3 billion). The total reduction is almost seventeen percent of the projected deficit in 2005. The cumulative reduction in debt held by the public in 2005 is \$319.6 billion or about 2.7 percent of the GDP projected for that year.

CBO projections for the impact of a hypothetical correction (reduction) in cost of living adjustments of 1.0 percent are, of course, even more dramatic. The total change in the deficit in the year 2005 is \$139.1 billion. Federal revenues would be increased by \$40.8 billion and federal outlays reduced by \$98.3 billion, of the reduction in outlays \$34.4 billion can be attributed to lower debt service and \$63.9 billion to lower outlays on indexed programs. (See Appendix Figure A-1 for detail not reproducible in Record). The cumulative reduction in outstanding federal debt by 2005 is \$634.3 billion. (See Appendix Figure A-2 for detail not reproducible in Record). This is almost 9.4 percent of the debt projected for that year and almost 5.5 percent of the GDP!

Stated differently, if the change in the CPI overstated the change in the cost of living by an average of 1% per year over this period, this bias alone would contribute almost \$140 billion to the deficit in the year 2005. That is one-third the projected baseline deficit (which assumes no policy changes such as the current balanced budget proposals). More remarkably, the upward bias by itself would constitute the fourth largest federal outlay program, behind only social security, health care and defense!

In summary, an upward bias in the CPI would result in substantial overpayments to the beneficiaries of federal entitlements and mandatory spending programs. In addition, such a bias would reduce federal revenues by overindexing the individual income tax. In short, the upward bias programs into the federal budget every year an automatic, real increase in indexed benefits and a real tax cut. Correction of biases in the CPI, while designed to more accurately adjust benefits and taxes for true changes in the cost of living, would also contribute importantly to re-

ductions in future federal budget deficits and the national debt. These reductions can be attributed to higher revenues, lower outlays, and less debt service. Lower outlays-cuts in indexed federal spending programs and reduced interest payments-account for over two-thirds of the long-run deficit reduction, while higher revenues account for the rest.

III. THE CONSUMER PRICE INDEX AND A COST OF LIVING INDEX: MEASUREMENT ISSUES

A cost of living index is a comparison of the minimum expenditure required to achieve the same level of well-being (also known as welfare, utility, standard-of-living) across two different sets of prices. Most often it is thought of as a comparison between two points of time. As with any practical application of theory to index number production, estimating a cost of living index requires assumptions, a methodology, data gathering processes and index number construction.

There are two sets of potential biases in the CPI: biases relative to an "ideal" cost of living index and biases which arise within its own terms of reference. The strength of the CPI is in the underlying simplicity of its concept: pricing a fixed (but representative) market basket of goods and services over time. Its weakness follows from the same conception: the "fixed basket" becomes less and less representative over time as consumers respond to price changes and new choices.

Consumers respond to price changes by substituting away from products that have become more expensive and toward goods whose prices have declined relatively. As the world changes, they are faced with new choices in shopping outlets, varieties, and entirely new goods and services, and respond to these as well. These changes make the previous "fixed basket" increasingly irrelevant.

In trying to keep true to its concept in a rapidly changing world, the current CPI procedures encounter difficulties. Biases result when they ignore some of these changes such as the appearance of discounters, and also when they try to do something about them such as when items are rotated out of the sample and replaced with new items. Attempting to capture the changes in a way that tries to mimic the pricing of a "fixed basket" within a rather patchwork framework just cannot be done without introducing other problems into the resulting index. These different biases overlap and have been discussed under a number of headings: substitution bias; formula bias; outlet substitution bias; quality change; and new product bias.

The "pure" substitution bias is the easiest to illustrate. Consider a very stylized example, where we would like to compare an initial "base" period 1 and a subsequent period 2. For simplicity, consider a hypothetical situation where there are only two commodities: beef and chicken. In period 1, the prices per pound of beef and chicken are equal, at \$1, and so are the quantities consumed, at 1 lb. Total expenditure is therefore \$2. In period 2, beef is twice as expensive as chicken (\$1.60 vs. \$0.80 per pound), and much more chicken (2 lb.) than beef (0.8 lb.) is consumed, as the consumer substitutes the relatively less expensive chicken for beef. Total expenditure in period 2 is \$2.88. The relevant data are presented in Table 1. How can we compare the two situations? Actually, there are several methods, each asking slightly different questions and therefore, not surprisingly, giving different answers.⁹

TABLE 1.—HYPOTHETICAL EXAMPLE OF SUBSTITUTION BIAS

	Price in period 1	Quantity in period 1	Price in period 2	Quantity in period 2	Price relatives		Relative weights	
					P2/P1	P1/P2	1	2
Beef	1	1	1.6	0.8	1.6	0.63	0.5	0.43
Chicken	1	1	0.8	2.0	0.8	1.25	0.5	0.57

The simplest comparison is to ask "How much more must I spend in my current situation (period 2) to purchase the same quantities that I purchased initially (in period 1)?"¹⁰ This is the question asked by the CPI. The price index for period 2 relative to period 1 uses the initial period 1 basket of consumption as the weights in the computation. To buy 1 lb. of beef and 1 lb. of chicken in period 2 costs \$2.40. The price index for period 2 relative to period 1 is 1.20 (2.40/2.00), that is a 20% increase.

Intuitively, it is easy to understand why such a computation imparts an upward (substitution) bias to the measure of the change in the true cost of living. It assumes the consumer does not substitute (cheaper) chicken for beef. In the real world, as in the hypothetical example, consumers change their spending patterns in response to changes in relative prices and, hence, partially insulate themselves from price movements.

An alternative approach would be to ask the question "How much more am I spending in my current situation (period 2) than I would have spent for the same goods and services at the prices that prevailed initially (in period 1)?"¹¹ This price index compares expenditures in period 2 (\$2.88) with what it would cost to buy the current (period 2) market basket at the initial prices (\$0.80 for the beef plus \$2.00 for the chicken equals \$2.80). This price index is 1.03, that is only a 3% increase. This approach understates the rise in the true cost of living as it overstates substitution.

The idea of a cost of living index is not to keep the consumption basket fixed, but to allow for the substitution that follows relative price changes. The question answered by a true cost of living index is instead "How much would we need to increase (or decrease) the initial (period 1) expenditure in order to keep the consumer just as well off in period 2?" Such a question cannot be answered without knowing the consumer's preferences in more detail, but a very good approximation may be obtained by interpolating between the two answers (that arise from the different base periods). There are alternative ways of doing so, each involving a different mathematical formula. A commonly accepted approach is to use the geometric mean (the square root of the product) of the two answers.¹² In our example, this comes to 1.11, an 11% increase. By comparison, the CPI-type fixed base index contains an upward bias of 0.09 (1.20-1.11); thus, almost half of the increase in the CPI-type calculation is substitution bias.

How large are such substitution biases in the real world? That depends on how out of date the base period weights used in constructing the index are and on how much relative prices have changed in a consistent and permanent direction. If relative prices diverge over time and do not just fluctuate, there is a permanent bias in the standard fixed base formula. Since we have been experiencing various consistent price trends, the further one gets away from the base period (for which the weights are approximately correct), the larger the bias.

Most of the computations done for large groupings of commodities (relatively aggregated commodity levels) show small biases in the growth rates of the CPI, rising from about 0.15 percent per year in the first five

years after new expenditure weights are introduced, to about 0.30 percent per year in the subsequent five years. These estimates are based on research covering the period 1982-91 and updated to 1993.^{13 14} The bias increases as average consumption patterns drift further away from what they were in the base period. Therefore, this bias may be expected to increase further in the next few years, perhaps to 0.40 percent per year, until the newly revised CPI is released in 1998. At that point, the weights will be shifted to reflect average consumer expenditures in 1993-5, (and will already be four years out of date!). Although the substitution bias will then decline for awhile, it will grow subsequently as prices and consumption patterns drift away again from those in the new base period unless the BLS changes its procedures and moves toward some different index number formula with shifting weights.

These estimates may be low. They are based on computations using rather high level groupings (200 commodity subindexes) of the many underlying varieties and models of specific products and services and may miss some of the large substitutions that occur at the more detailed level. Indeed, one may interpret as additional evidence on this point, the results of a simulation experiment by BLS researchers which applied different index number formulae at the item, or "elemental," level, for price changes in 1991-2 and yielded an estimate of the bias equal to 0.50 percent.¹⁵

Recognizing the continuously changing assortment of commodities in the market, the BLS improved its price measurement procedures in 1978. The improved procedure chooses items to be priced based on a probability sample and rotates these items on a staggered, five year cycle. The idea was laudable, but embedding it in a conceptually "fixed-weight," "fixed-basket" index created unanticipated problems which have become known as "formula" bias.

In essence, the problem arises as the procedure exaggerates (gives too much importance to) the effect of short run variability of prices (such as items on sale). This bias was discovered and evaluated by BLS researchers and appears to be most important in seasonal items such as fruit and vegetables, but has apparently also affected the residential housing component of the index.^{16 17} The overall bias from this source has been estimated to be on the order of 0.50 percent per year. However, now that this formula bias is understood, procedures are being developed which will largely eliminate it when implemented.

While the formula bias in the CPI can, should and hopefully will be eliminated in the future, the problems of outlet and variety substitution are unlikely to diminish soon. Just as consumers change the goods they purchase in response to changes in relative prices as in the beef and chicken example, so do they change the location of where they make their purchases. The opening of a new discount store outlet may give consumers the opportunity to purchase a given good at a lower price than before. At present, the CPI procedures ignore such reductions that occur when consumers change outlets. However, if consumers cared only about obtaining goods at the lowest price, then we would observe all goods sold at the same price at all outlets. Instead, we observe low prices at

discount stores and warehouse clubs at the same time as medium prices at supermarkets and higher prices at convenience stores. Evidently, consumers care not only about prices, but the level of services such as availability of clerks, wrapping services, and the distance between home and alternative outlets.

Current procedures in the CPI ignore price changes when consumers switch outlets. This incorporates into the CPI the implicit assumption that price differentials among outlets entirely reflect the differences in service quality. This approach would be legitimate if the economy stood still with a stable set of outlets providing alternative levels of service quality. However, there has been a continuous increase in the market share of discount stores as more efficient technologies of distribution allow low price outlets to expand while older, higher priced outlets have contracted and in some cases gone out of business. This shift in market share indicated that many consumers respond to price differentials and do not consider them to be fully offset by difference in service quality. Completely ignoring all differences in service quality by incorporating all such price reductions into the CPI would err in the opposite direction. Further research is required to disentangle true changes in prices from changes in service quality. This problem is analogous to the need to disentangle the changes in prices from changes in product quality.

Quality change and new goods present the most difficult problems for measurement. They include capturing the introduction of new products in a timely manner; making direct quality comparisons of new products with existing ones; making direct quality comparisons of new products with other products against which they compete (in other classification groupings such as a new drug and the surgical treatment it replaces); and capturing the combined impact of quality and substitution as these new products displace others within and across their classification grouping.

A full treatment of these issues reinforces the problem of focusing on the "average" or "representative" consumer. Different consumers have different tastes and time costs, and hence value the appearance of new outlets and new products differentially, with some (the majority) becoming better off with supermarkets and others losing out as the corner grocery store disappears. The CPI is not equipped to account for special characteristics of different consumers or groups of consumers.^{18 19} The following sections explore some of these problems.

There are still other issues that would in principle apply to obtaining a true cost of living index (COLI). Consider two examples: the negative effects of higher crime rates and the concomitant purchases of security devices and higher insurance premiums and the positive effects of improvements in information technology that permit a parent to work at home when a child is ill. Surely these would enter a calculation of "the minimum expenditure necessary to be at least as well off." The Commission notes these considerations but is not prepared to quantify them at this time.

IV. QUALITY CHANGE

The difficulty created by quality change in existing products, and by the introduction of

new products, is highlighted by returning to the definition of a cost of living index—a comparison between two time periods of the minimum expenditure required to achieve the same level of well-being. What does the “same level” mean when entirely new products are introduced that were unavailable in the first time period?

A pervasive phenomenon called the “product cycle” is critical in assessing the issue of new product bias in the CPI and applies as well to new models of existing products. A typical new product is introduced at a relatively high price with sales at a low volume. Soon improvements in manufacturing techniques and increasing sales allow prices to be reduced and quality to be improved. For instance, the VCR was introduced in the late 1970s at a price of \$1,000 and with clumsy electromechanical controls; by the mid 1980s the price had fallen to \$200 and the controls were electronic, with extensive preprogramming capabilities. Later on in the product cycle, the product will mature and eventually will increase in price more rapidly than the average product of its class. 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. To the extent that the CPI over-weights mature products and underweights new products, it will tend to have an upward bias.

Our discussion of quality change and new product bias begins with a review of the methods used by the CPI to handle quality changes in existing products and then turns to problems posed by new products. The BLS has four different methods to cope with a model change for an existing product.

The “direct comparison” method treats all of the observed price change between the old model and the new model as a change in price and none as a change in quality. There is no necessary bias, because quality can decrease as well as increase. But in practice goods tend to undergo steady improvement, and often a better model is introduced with no change in price, causing the quality change to be missed entirely.

The “deletion” method makes no comparison at all between the prices of the old and new model. Instead, the weight attributable to this product is applied to the average price change of other products in the same commodity classification. To the extent that the deletion method is used, the CPI consists disproportionately of commodities of constant quality which may be further along in the product cycle.

The “linking” method can be used if the new and old model are sold simultaneously. In this case the price differential between the two models at the time of introduction of the new model can be used as an estimate of the value of the quality differential between the two models. Unfortunately, new models usually replace old models entirely, and the link prices are not observed. Also, a quality improvement in the new model can occur even if it costs less or the same as the old model, as in the case of the VCR where the price fell continuously while programming capability and reproduction quality improved.

The “cost estimation” method attempts to establish the cost of the extra attributes of the new model. Problems in practice with the costing method have been its infrequency of use, and the fact that it has been applied disproportionately in the case of automobiles relative to other products. This raises the possibility that there is a spurious upward “drift” in the price of other products relative to automobiles due to an uneven application of the costing method.

This list of method reveals at least two potential sources of upward bias, the use of the direct comparison method that does not address the quality issue at all, and the use of the deletion method that bases price change on models that are unchanged in quality and may be further along in the product cycle. A greater difficulty is that the CPI makes no attempt to create systematic estimates of the value of quality improvements which increase consumer welfare without raising the price of products. For instance, many consumer electronic products and household appliances have experienced a reduction in the incidence of repairs and in electricity use, and few if any of these improvements have been taken into account by the CPI.

The CPI uses only rarely an alternative methodology called the “hedonic regression method” for estimating the value of quality change. The hedonic approach can be viewed as an alternative method to manufacturers’ cost estimates in making quality change adjustments. It assumes that the price of a product observed at a given time is a function of its quality characteristics, and it estimates the imputed prices of such characteristics by regressing the prices of different models of the product on their differing embodied quantities of characteristics. Thus the hedonic approach is less a new method than an alternative to cost estimates to be used when practical factors make it more suitable than the conventional method.

By their very nature hedonic indexes require large amounts of data. Given the thousands of separate products that are produced in any modern industrial society, the need to collect a full cross-section of data on each product presents an insurmountable obstacle to the full-blown adoption of the hedonic technique. Further, it is impossible to construct a hedonic index in the timely fashion required by the CPI, with its orientation to producing within a few weeks an estimate of month-to-month price changes that can never be revised. Accordingly, most hedonic studies have been retrospective and can be used to gauge the accuracy of individual components of the CPI rather than being used in the actual month-to-month construction of the CPI. This is one important reason to consider broadening the concept of the CPI to include both the current index dedicated to timely measures of month-to-month price changes, and a second supplementary index produced with a greater time lag, and subject to periodic revision, dedicated to accurate measurement of price changes over years and decades.

We turn now to the issue of new product bias. There is no debate regarding the reality of the 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. For example, the microwave oven was introduced into the CPI in 1978 and the VCR and personal computer in 1987, years after they were first sold in the marketplace.

A second aspect of new product bias results from a narrow definition of a commodity. When a new product is finally introduced into the CPI, no comparison is made of the price and quality of the new product with the price and quality of an old product that performed the same function. For instance, people flock to rent videos, but the declining price of seeing a movie at home, as compared to going out to a theater, is not taken into account in the CPI. Similarly, the CPI missed the replacement of electric typewriters by electronic typewriters and then PCs with word-processing and spell-checking capability, or CD-ROM encyclopedias that cost far less than old-fashioned bound-book versions and eliminate many trips to the li-

brary. Inevitably, however, many new products embody genuinely new characteristics that have no previous counterpart. How does one value electronic mail that provides a new set of bonds and communication between parents and their children who are off at college?

This discussion of new products leads inevitably to deeper questions about changes in the standard of living of the average American. Positive changes made possible by consumer electronics need to be weighed against increasing crime rates that have forced some families to divert expenditures to burglar systems and security guards. The industrial revolution caused widespread air and water pollution, while numerous factors since the mid-1960s have caused a major decline in the presence of many types of contaminants in the air and water.²⁰

How large is the bias in the CPI introduced by inadequate treatment of quality change, and by the problems created by new products? Estimates of bias vary widely by product, and there are examples of both positive and negative bias. For instance, one study found an upward bias in the CPI index of TV sets of six percent per year, of which almost half was due to the failure of the CPI to place a value on reduced repair incidence and electricity use. Most other studies of consumer durable have found an upward bias in the CPI, except in the case of new automobiles for the period since the late 1960s. As stated above, the automobile is a complex product in which many small improvements have been made over the years. Evaluating the negative quality change in the shift to smaller cars as against the substantial improvements in fuel economy (which are worth different amounts in different periods, depending on gasoline prices) is a complex task. However, there seems to be little doubt that the CPI index for used autos has been upward biased, as few if any adjustments for quality change were made to this index during much of the postwar period, and the price index for used autos drifts upward relative to new autos by an implausible amount.

Studies have found a downward bias in the CPI in two important areas. Prior to 1988, the CPI index for rental housing (which since 1983 has also been used for owner-occupied housing) did not take into account the deterioration in housing stock quality as a result of aging and depreciation. Clothing is another problematic area, where the difficult task of separating taste or fashion changes from quality changes, as well as a strong seasonal pattern in clothing prices, may have created a substantial downward bias in apparel prices.

Thus we find that studies point to substantial upward bias for some products, mainly consumer durables, but countervailing downward bias for several important categories, namely home rent and apparel. Further, the sources of bias shift over time. Since 1987 the BLS has made an attempt to adjust the prices of used cars for quality change, reducing or eliminating that previous source of upward bias. Going in the opposite direction, since 1988 the BLS has eliminated the downward bias due to the failure to take account of aging and depreciation in rental housing.

Nevertheless, it is likely that there is a substantial upward bias in the CPI, however hard it may be to measure, and much of this is likely to come from new products. 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 satellite that tied together people in far-flung nations, or the television and VCR that allowed almost any motion picture to enter the home, or the 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.

In the concluding section of the interim report, we put forth estimates for the main categories of CPI bias, stated in the form of a "point estimate" and a range of uncertainty. In the category of quality change bias (excluding new product bias), we have chosen a relatively conservative point estimate of 0.2 percent per year. Existing studies of consumer durables, weighted by the share of consumer durables in total consumption, point to a bias of at least 0.3 percent per year. Our choice of 0.3 balances the effect of a possible downward bias in apparel against the likelihood that substantial quality change is missed in many areas of nondurable goods and services. Because we are more uncertain in the direction of a higher upward bias, our range of uncertainty for quality change is asymmetric, going from 0.2 to 0.6.

The most difficult question of all is to place a point estimate on new product bias. We have approached this question by carrying out the following thought experiment. Take the market basket of goods and services available in 1970 and labeled with 1970 prices. Take the market basket available in 1995 and labeled 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 modern anti-ulcer drugs; its color TV sets break down all the time; and its refrigerators use a lot of electricity. Consumers forced to answer this question are going to miss many benefits of modern life and are not going to say that four times as much income would be necessary—maybe 3 times, maybe 3.5 times, but not 4 times. That is the ultimate test of new product bias in the CPI.

To translate this approach into an annual rate of change, an answer of "3.5 times" would imply an upward bias of 0.54 percent a year.²¹ The commission has chosen to take a lower, more conservative point estimate of a new product bias of 0.3 percent per year, but to extend the range of uncertainty from 0.2 to 0.7 percent per year. We will attempt in our final report to assemble new evidence on this issue and to narrow the range of uncertainty.

V. SEPARATE PRICE INDEXES?

In principle, if not practice, a separate cost of living index could be developed for each and every household based upon their actual consumption basket and prices paid. As noted above, the aggregate indexes use data reflecting representative consumers. Some have suggested that different groups in the population are likely to have faster or slower growth in their cost of living than recorded by changes in the CPI. We find no compelling evidence of this to date, and in fact two studies suggest that disaggregating by population group, for example by region or by age, would have little effect on measured changes in the cost of living.²² Further, work on this subject remains to be done.

Beyond the different consumption baskets, it is important to understand our analysis of the sources of bias are applied to representative or average consumers. Some consumers will substitute more than others, and the substitution bias may be larger for some, smaller for others. Likewise, some are more likely to take advantage of discount outlets; others less so. Perhaps more importantly, the benefits of quality change and the introduction of new products may diffuse un-

evenly throughout the population. Some will quickly gain the benefits of cellular telephones, for example, while others may wait many years or decades or never use them. This is yet another reason why we have been very cautious in our point estimates for these particular sources of bias.

VI. CONCLUSION

While the CPI is the best measure currently available, it is not a true cost of living index. It suffers, as do all price indices, from a variety of conceptual and practical problems as the vehicle for measuring changes in the cost of living. Despite important BLS updates and improvements in the Consumer Price Index, it is likely that changes in the CPI have substantially overstated the actual rate of price inflation. Moreover, revisions have not been carried out in a way that can provide an internally consistent series on the cost of living over an extended span of time. More importantly, changes in the Consumer Price Index are likely to continue to overstate the change in the true cost of living for the next few years. This overstatement will have important unintended consequences, including overindexing government outlays and tax rules and increasing the federal deficit and debt. If the intent of such indexing is to insulate recipients and taxpayers from changes in the cost of living, use of the Consumer Price Index has in the past, and will in the future, overcompensate (on average) for changes in the true cost of living.

Table 2 presents the Commission's evaluation of the biases in using changes in the Consumer Price Index as a measure of changes in the cost of living for the recent historical past (the last few years). It presents point estimates, and plausible ranges of values, for each of the five sources of potential bias as well as the overall bias. Our best judgment of the overstatement of the change in the cost of living embedded in changes in the CPI for this historical period is 1.5% per annum. It is likely that a large bias also occurred looking back over at least the last couple of decades, perhaps longer, but we make no attempt to estimate its size.

TABLE 2.—ESTIMATES OF RECENT HISTORICAL BIASES IN THE CPI
(Percent per annum)

Source of bias	Estimate	Range
Substitution bias	0.3	0.2-0.4
Outlet bias	0.2	0.1-0.3
Formula bias	0.5	0.3-0.7
Quality change	0.2	0.2-0.6
New products	0.3	0.2-0.7
Total	1.5	1.0-2.7

NB: Total bias assumed to be additive across types and independent of the level of inflation. See text.

A plausible range of values is 1.0% to 2.7% per annum. The point estimate of 1.5% includes 0.5% for formula bias, which is the technical problem in using methods that impart an upward bias in the movement from elementary or extremely disaggregated price quotations to broader commodity groups. The BLS is aware of this problem, and is moving to correct it. Hopefully, it will be eliminated quickly.

Excluding formula bias, the point estimate is 1.0% per annum, and the range is 0.7% to 2.0% per annum. Note that the range of uncertainty is not symmetric around our point estimate. It is far more likely that changes in the CPI have embedded a larger than a smaller bias. The range of potential upward bias is significantly larger because we have been conservative in our point estimates of the biases from the sources of quality change and new products. The conceptual issues involved in measuring these two sources of

bias are even more difficult than the other sources, and the range of studies upon which to base such conclusions at this point is insufficient to support our "best judgment" as strongly as those for the other sources of bias. Hence, we have been especially cautious in these two areas.

Past is not necessarily prologue. What can we say about the likely sources of bias moving forward, as opposed to estimates of the biases looking back at recent history? We believe the substitution bias is likely to be as large or larger as in the recent past. It is likely that the substitution bias will drift up a little bit, perhaps to 0.4 %, until 1998 when the CPI will incorporate the new expenditure weights from the 1993-95 expenditure survey. Note that at that time the expenditure weights will still be four years out of date and thus much substitution may have already occurred. However, at that time it is likely that the substitution bias will decrease considerably, to no more than 0.2%. As time moves on, it will likely drift up again. So, even though the base year will be updated in 1998, it is likely that for several years the substitution bias will continue to be large then shrink for a short period before gradually drifting back up again by the turn of the century. Thus, a substitution bias on the order of 0.3% is likely to be a good approximation on average for the next decade, although not year by year.

Until and if procedures are changed, we expect the outlet substitution bias to be approximately 0.2% per year. As noted above, we believe the BLS has discovered, and is developing procedures to eliminate, the formula bias. Our estimate for the future of 0.0% assumes that the BLS will quickly and completely remove the formula bias. To the extent that methods are changed slowly or incompletely, a sizable formula bias will remain. Thus, again, the 0.0% is perhaps conservative, especially for the very short-run. Finally, our estimates for quality change and new products of 0.2% and 0.3%, which, as discussed above, we believe to be quite conservative, are likely to apply in the future as well.

TABLE 3.—ESTIMATES OF LIKELY FUTURE BIAS IN THE CPI
(Percent per annum)

Source of bias	Estimate	Range
Substitution bias	0.3	0.2-0.4
Outlet bias	0.2	0.1-0.3
Formula bias	0.0
Quality change	0.2	0.2-0.6
New products	0.3	0.2-0.7
Total	1.0	0.7-2.0

Assumes BLS quickly and completely fixes the problem. Will continue to be substantial until this occurs.

This brings our estimate of the upward bias of changes in the CPI as a measure of the change in the cost of living to 1.0% per year. However, the certainty that the Commission ascribes to alternative estimates clearly is greater the lower the estimate within the plausible range. For example, while 1.0% is our interim best estimate and likely to be conservative, we are even more certain that the lower end of our plausible range does not overstate the upward bias in the CPI.

These separate biases are approximately additive and likely to be independent of modest swings in the true inflation rate. Thus, a bias of 1% implies that when changes in the CPI show inflation rising from 3% to 5%, it is likely actually to be rising from 2% to 4%. Note the bias primarily affects the level, not the change, in the inflation rate. At very high rates of inflation, the bias may increase (one might assume greater outlet

and commodity substitution), but we currently have no evidence regarding this issue.

Figure 2 shows the compounding effect over time of such a bias on the index. While 1.0% may seem to be a small amount in any given year, cumulatively year after year it adds up to a sizable difference. [Figure 2 not reproducible in RECORD]

An additional word of caution is in order. This Commission has thus far relied primarily on studies already produced prior to the convening of the Commission, with a small amount of additional work that we have been able to commission in the two months since our inception. Thus, our judgments reported above are not much advanced beyond what was available in the three rounds of Senate Finance Committee Hearings earlier this year. Given the short time available to this Commission, there are many issues which we have not yet been able to explore adequately. While we expect the interim conclusions to hold up under further examination, they will also be subject to amendment as we proceed with our investigation.

In our final report we expect to have a more complete analysis and evaluation and will certainly have specific recommendations for procedures to improve and/or complement the CPI. It may be possible to implement some of these suggestions quickly, others may take considerable time and additional resources.

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FOOTNOTES

¹We would like to thank the staffs of the Bureau of Labor Statistics, Congressional Research Staff and the Congressional Budget Office for valuable assistance and cooperation in the early stages of the Commission's work.

²The two most commonly used measures are the CPI-U and CPI-W. The former is for urban consumers, roughly 80% of the population; the latter is for urban wage and clerical workers, about 32% of the population. Note that the expenditure shares may be quite different than the average for any particular household, and also on average for subgroups of the population. Also, the prices paid for some products may differ for some households from the prices actually sampled. In principle, if not practice, a separate cost of living index could be developed for each and every household based on their actual consumption basket and prices paid. The overall index is used to approximate this with the data reflecting representative consumers. Whether this is itself sufficiently misleading as to warrant separate price indexes for different population subgroups is discussed below.

³Congressional 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, p. 32.

⁴Robert Gillingham and Walter Lane, "Changing the Treatment of Shelter Costs for Homeowners in the CPI," Monthly Labor Review, June 1982, p. 9.

⁵James Duggan, Robert Gillingham, and John Greenlees, "Housing Bias in the CPI and its Effect on the Budget Deficit and the Social Security Trust Fund," Office of Economic Policy, U.S. Department of the Treasury, June 30, 1995, page 6.

⁶Congressional Budget Office, "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 1995, Table 2-8, p. 43.

⁷June O'Neill (1995), "Prepared Statement," Consumer Price Index, Hearings before the Committee on Finance, U.S. Senate, 104th Congress, First Session, Washington, U.S.G.P.O., Table 1, p. 146.

⁸All CBO budget estimates are relative to CBO's January 1995 baseline and do not include the small adjust assumed in the out-years of the budget resolution.

⁹Each method has come to be named for its inventor. See below.

¹⁰This index is called the Laspeyres index.

¹¹This index is called the Paasche index.

¹²This index is called the Fisher, or Fisher Ideal, index.

¹³A.M. Aizcorbe and P.C. Jackman, "The Commodity Substitution Effect in CPI Data, 1982-91," Monthly Labor Review, U.S. Bureau of Labor Statistics, pp. 25-33 (December 1993).

¹⁴Updated by BLS for the Commission.

¹⁵B.R. Moulton, "Basic components of the CPI: Estimation of Price Changes," Monthly Labor Review, U.S. Bureau of Labor Statistics, pp. 13-24 (December 1993).

¹⁶M. Reinsdorf, "The Effect of Outlet Price Differentials in the U.S. Consumer Price Index," in Price Measurements and Their Uses, M.F. Foss, M.E. Manser and A.H. Young (eds), NBER Studies in Income and Wealth, Vol. 57, pp. 227-254 (1993).

¹⁷B.R. Moulton, "Basic components of the CPI: Estimation of Price Changes," Monthly Labor Review, U.S. Bureau of Labor Statistics, pp. 13-24 (December 1993).

¹⁸Dale W. Jorgenson and Daniel T. Slesnick, "Individual and Social Cost-of-Living Indexes," Price Level Measurement, W.E. Diewert and C. Montmarquette (eds.), Ottawa, Statistic Canada, pp. 241-336 (1983).

¹⁹F.M. Fisher and Zvi Griliches, "Aggregate Price Indices, New Goods, and Generics," Quarterly Journal of Econometrics (1995).

²⁰The CPI implicitly values the improvement in air quality made possible by mandated anti-pollution devices in automobiles, since it treats the cost of mandated anti-pollution and safety devices as an improvement in quality rather than an increase in price. However, the CPI is inconsistent, since a portion of the higher cost of electricity, steel, and other products is also due to environmental regulation, and the benefits of higher air and water quality made possible by regulation of products other than automobiles is not taken into account.

²¹An index that rises from 1.0 to 4.0 over 25 years exhibits a compound growth rate of 5.55 percent per year. An index that rises from 1.0 to 3.5 over 25 years exhibits a compound growth rate of 5.01 percent per year. The difference is 0.54 percent per year.

²²See M. Boskin and M. Hurd, "Indexing Social Security Benefits: A Separate Price Index for the Elderly," Public Finance Quarterly, Volume 13, Number 4, pp. 436-449 (October 1985); Dale W. Jorgenson and Daniel T. Slesnick, "Individual and Social Cost-of-Living Indexes," Price Level Measurement, W.E. Diewert and C. Montmarquette (eds.), Ottawa, Statistics Canada, pp. 241-336 (1983). However, very preliminary unpublished work suggests that for the period 1982-91 the larger fraction of expenditures on out-of-pocket healthcare by the elderly combined with the more rapid rise in healthcare prices than overall prices for this period might lead to a slightly faster rise in a price index for the elderly. The rate of healthcare price inflation has slowed substantially of late, so it is unlikely this result will be reproduced for the mid-1990s.

²³The bias is currently running at 1.5% per annum or more, in our best judgment. We do not estimate it year by year for this period but believe this estimate is close on average for the period. Figure 1 is for illustrative purposes only.

CHANGE IN DEFICIT IF ADJUSTMENT MADE FOR CPI OVERSTATEMENT (1 PERCENTAGE POINT LESS)

[In billions of dollars]

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Change in Revenues ^a	-1.8	-5.5	-9.8	-13.1	-17.7	-23.0	-27.1	-31.8	-36.2	-40.8
Change in Outlays:										
Social Security/RR Retire	-2.6	-6.2	-10.1	-14.1	-18.4	-22.8	-27.4	-29.2	-37.8	-43.6
SSI	-0.2	-0.5	-0.8	-1.2	-1.9	-2.1	-2.9	-3.6	-4.3	-5.1
Civil Service Retirement	-0.2	-0.7	-1.1	-1.5	-1.9	-2.4	-2.9	-3.4	-3.9	-4.5
Military Retirement		^d	-0.3	-0.6	-1.2	-1.6	-2.0	-2.4	-2.9	-3.4
Vets Comp & Pensions	-0.1	-0.3	-0.5	-0.6	-0.9	-1.3	-1.6	-2.1	-2.5	-3.1
EITC ^a		^d	-0.5	-1.1	-1.8	-2.4	-3.1	-3.9	-4.7	-5.4
Other ^b		^d		-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Offsets ^c		^d	0.1	0.2	0.4	0.7	1.0	1.4	1.8	2.3
Total Outlay Change	-3.1	-8.4	-14.1	-20.2	-26.5	-32.7	-39.8	-44.1	-55.2	-63.9
Debt Service	-0.2	-0.8	-2.0	-4.0	-6.7	-10.2	-14.7	-20.1	-26.6	-34.4
Change in Deficit	-5.0	-14.7	-25.9	-37.3	-50.9	-65.9	-81.6	-96.0	-117.9	-139.1

^(a) Estimates for 1996-2000 prepared by the Joint Committee on Taxation. CBO, based on the JCT model, has extrapolated projections for 2001-2005.

^(b) FECA, Foreign service retirement, PHS retirement, and Coast Guard retirement.

^(c) Includes Medicare, Medicaid, and Food Stamp offsets to cuts in the Social Security COLA.

^(d) Less than \$50 million.

Notes: CBO estimates that the CPI has probably grown faster than the cost of living by between 0.2 and 0.8 of a percentage point in recent years. For purposes of these calculations, though, CBO has assumed an adjustment of a full percentage point. Revenue increases are shown with a negative sign because they reduce the deficit. Source: Congressional Budget Office.

[Memorandum as of September 28, 1995]
 From: Harry C. Ballantyne
 Subject: Estimated Long-Range Effects of Alternative Reductions in Automatic Benefit Increases—Information

The following table shows our estimates of the long-range effects of modifying the present-law calculation of all future auto-

matic benefit increases by reducing each increase by one percentage point (or alternatively one-half of one percentage point) from the present-law increase, which is equal to the percentage increase in the CPI-W. The estimates are based on the assumption that the reduction would first be reflected in the next automatic benefit increase, for December 1995, or, alternatively, that the reduction

would first be reflected in the automatic benefit increase for December 1996. The estimates are based on the intermediate assumptions in the 1995 Trustees Report and are shown for the combined OASI and DI Trust Funds.

Present law	Reduction of 1% effective December—		Reduction of 0.5% effective December—	
	1995	1996	1995	1996
Change in actuarial balance over next 75 years (percent)	1.44	1.41	0.74	0.73
Actuarial balance (percent) ..	-2.17	-0.74	-0.76	-1.43
Year of exhaustion	2030	2049	2048	2036
First year in which outgo exceeds tax income	2013	2018	2018	2015
Maximum trust fund ratio (percent)	269	408	397	332
Year Maximum ratio is reached	2011	2015	2015	2014

HARRY C. BALLANTYNE,
Chief Actuary.

SOCIAL SECURITY TRUST FUNDS

Mr. CONRAD. Mr. President, earlier today Senator DOMENICI inserted in the RECORD a column by Charles Krauthammer that displays a fundamental misunderstanding of the operation of the Social Security trust funds and attacks my position on this issue. I ask unanimous consent that the response written by Senator DORGAN and me, which ran in the Washington Post on March 16, 1995, to correct the many factual and logical errors in Mr. Krauthammer's argument, also be published at an appropriate place in the RECORD.

There being no objection, the material was ordered to be printed in the RECORD, as follows:

[From the Washington Post, Mar. 16, 1995]

UNFAIR LOOTING

(By Byron L. Dorgan and Kent Conrad)

Charles Krauthammer's uninformed defense of an indefensible practice ["Social Security Trust Fund Whopper," oped, March 10] demonstrates that it is possible to be a celebrated pundit yet know nothing of the subject about which one is writing.

In attacking us for our position on the balanced-budget amendment, Krauthammer misses the mark by a country mile on two very important points. First, he insists incorrectly that "Social Security is a pay-as-you-go system" that "produces a cash surplus" because "so many boomers are working today." Second, he ignores the fact that Social Security revenues were never meant to pay for expenses incurred in the federal operating budget. Missing both fundamental points undermines the credibility of Krauthammer's conclusions.

Here are the facts:

First, Social Security is not a pay-as-you-go system. If it were, Social Security benefits would exactly equal taxes, and there would be no surpluses. But there are. This year alone Social Security is running a \$69 billion surplus.

Apparently, Krauthammer completely missed the 1983 Social Security Reform Act, which removed the system from a pay-as-you-go basis. In 1983 Congress recognized that in order to prepare for the future retirement needs of the baby boom generation, we should raise more money from payroll taxes now than is needed for current Social Security benefits. We did that because when the baby boomers retire, there will not be enough working Americans to cover Social Security benefits on a pay-as-you-go basis. We will need accumulated surpluses to pay these benefits.

Second, Social Security revenue is collected from the paychecks of working men and women in the form of a dedicated Social Security tax, deposited in a trust fund and

invested in government securities. This regressive, burdensome tax (almost 73 percent of Americans who pay taxes pay more in social insurance taxes than in income taxes) isn't like other taxes. It has a specific use—retirement—as part of the contract this nation made 60 years ago with working Americans.

Because this tax is dedicated solely for working Americans' future retirement, it shouldn't be used either for balancing the operating budget or masking the size of the budget deficit. Krauthammer not only irresponsibly condones the use of the Social Security surpluses to do these things, he thinks we should enshrine this procedure in our Constitution.

He apparently does so because he doesn't understand the difference between balancing an operating budget and using dishonest accounting gimmicks to hide operating losses. To illustrate the difference and how it works to loot the Social Security trust funds, let's use an example a little closer to home for Krauthammer.

Assume that Krauthammer is paid a lucrative salary by The Washington Post, which puts part of the salary into a company retirement plan. Then let's assume The Washington Post comes upon hard times and starts losing money each year.

Here's where honesty matters. The Post has two choices. It could face up to its problems and move to balance its budget. Or it could follow Krauthammer's prescription and disguise its shortfall by raiding the employees' retirement fund to make it appear that the operating budget is balanced. Of course, the retirement fund would have nothing but IOUs in it when it comes time for Krauthammer to retire. At that point, even Krauthammer might recognize the fallacy of looting trust funds to pay operating expenses.

Absurd? Sure. But the flawed Republican balanced-budget amendment plan would in the same way keep on looting Social Security trust funds to balance the federal operating budget. Instead, we should take the honest course and begin the work now to bring our federal operating budget into balance without raiding the Social Security trust funds.

Contrary to Krauthammer's assertion, the only fraudulent point about this issue was his uninformed column.

CONCLUSION OF MORNING BUSINESS

The PRESIDING OFFICER. The hour of 2 o'clock having arrived, morning business is now closed.

JERUSALEM EMBASSY RELOCATION IMPLEMENTATION ACT OF 1995

The PRESIDING OFFICER. Under the previous order, the Senate will now proceed to the consideration of Senate bill 1322, which the clerk will report.

The assistant legislative clerk read as follows:

A bill (S. 1322) to provide for the relocation of the United States Embassy in Israel to Jerusalem, and for other purposes.

The Senate proceeded to consider the bill.

The PRESIDING OFFICER. The Senator from Arizona is recognized.

Mr. KYL. Mr. President, I am one of the original cosponsors of this legislation and would like to begin the discus-

sion of the legislation until the majority leader and the chairman of the Senate Foreign Relations Committee have an opportunity to come to the floor and make their opening statements in support of S. 1322.

This is historic legislation. It is important legislation, for a variety of reasons that affect everyone in this body and, frankly, most of the people in this country. It is a strong statement of foreign policy implications. It is a strong statement in support of our longstanding relationship with the State of Israel.

I want to begin by describing briefly what the legislation would do and what the rationale for the legislation is. The bill begins by making a series of findings which report on the history of the status of Jerusalem, leading up to some conclusions of policy by the U.S. Government. Let me state those conclusions of policy first.

The bill provides that:

It is the policy of the United States that—
Jerusalem should remain an undivided city in which the rights of every ethnic religious group are protected;

Jerusalem should be recognized as the capital of the State of Israel; and

the United States Embassy in Israel should be relocated to Jerusalem no later than May 31, 1999.

The bill then goes on to provide a mechanism for the President to establish, to relocate the U.S. Embassy in Jerusalem, and that that process would be completed by May 31, 1999. The bill originally provided for a beginning date in 1996, but out of deference to concerns expressed by the State Department and the President and others, that particular provision was taken out of the bill, primarily because, of course, the key is the date that the Embassy is opened, not the date that we begin construction on a new Embassy or the conversion of the existing consulate into a new Embassy.

Let me now turn to the findings that are stated in this legislation and then discuss a little bit of the history of this particular matter:

Each sovereign nation, under international law and custom, may designate its own capital.

And that is the first finding that we make.

Since 1950, the city of Jerusalem has been the capital of the State of Israel.

The second finding.

[It is] the seat of Israel's President, Parliament, and Supreme Court, and the site of numerous government ministries and social and cultural institutions.

That is our third finding.

In No. 4 we make the point that:

The city of Jerusalem is the spiritual center of Judaism, and is also considered a holy city by the members of other religious faiths.

(5) From 1948–1967, Jerusalem was a divided city and Israeli citizens of all faiths as well as Jewish citizens of all states were denied access to holy sites in the area controlled [then] by Jordan.

The sixth finding of this legislation is that: