

The Consumer Price Index: What Should be Measured?

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Introduction. In 1995, The US Senate Finance Committee appointed an advisory committee to study the Consumer Price Index (CPI). The committee (hereinafter referred to as the “CPI Commission” or the “Boskin Commission”) was composed of 5 members having expertise in the fields of areas of Economics, Marketing, and Social Sciences.

The Commission’s work was the first extensive evaluation of the nation’s price statistics since the 1961, when the Stigler Commission provided recommendations for suggested improvements in the measurement of inflation. Working without a budget, the CPI Commission assembled all existing research on the topic that had been conducted since the early 1940’s, including exhaustive work done by the US Bureau of Labor Statistics (BLS), the agency charged with the compilation and maintenance for the CPI.

The CPI Commission presented its initial report to Congress in 1995. Several Congressional hearings and academic articles followed which further evaluated the Commission’s Report and findings. The 1998 Symposia contained in the *Journal of Economic Perspectives* provided additional discussion of the issues, with the articles being directly written by the Commission members, Commissioners of the BLS, and several other academic scholars.

The Boskin Commission ----

Findings of the Commission. The Commission’s primary conclusion was that the CPI overstates changes in the cost of living by 1.1% per year, with a range of plausible values of 0.8% to 1.6% per year. The Commission noted that even though seemingly small, a 1.1% upward bias in the CPI could have large implications, when compounded over time. The cumulative effect of over-indexing the national budget for only a dozen years would amount to more than \$1 trillion. Further, since the CPI is an input on national income accounting, an overstated CPI implies that real GDP growth has been understated on a historical basis. Other writers have noted similarly large effects produced by an overstatement in inflation. For instance, Nordhaus estimated that a 1.1% CPI bias would amount to a real wage increase between 1960 and 1995 of 61% rather than the conventionally accepted 10% estimation.

The Commission felt that the fixed weight index system used by the BLS does not account for either consumer substitution or the quick incorporation of new products, and this resulted in an inherently upward biased count.

The Commission endorsed proposed changes to the CPI that were being contemplated by the BLS. The Commission had hoped that the BLS would use its findings to fundamentally change the nation's index. The Commission concluded that the BLS could, and indeed should, do far more to improve the CPI collection process.

Discussion of the Commission Findings. As an initial threshold matter, the Commission noted that inflation is an inherently difficult statistic to accurately measure in our “complex dynamic market economy”. The Commission felt that most of the problems of inflation measurement occur because of the rapidly changing nature of the economy and the concurrent pressure placed upon a statistical system that must keep up with those changes. The Boskin Commission had praise for the BLS however, believing that the Bureau's CPI program is a large, impressive and complex undertaking of the Bureau.

The Commission reviewed and critiqued the CPI collection process used by the BLS. The CPI is a compilation of consumer expenditures on goods and services. It excludes non-market activity, quality of life issues, cost and benefits of most government programs, and savings and the investment in future consumption purchases. The BLS collects 71,000 quotes on goods and services at 22,000 retail outlets in 44 geographic areas, all done on a monthly or semi-monthly basis. Retail outlets are chosen and rotated every 5 years. Information is also collected from 35,000 rental units. The Index is critically dependent upon a weighting mechanism that measures the cost of a fixed basket of goods from a base period (this is known as a Laspeyres Index). No substitution of goods is assumed in the methodology of the Index, with the elasticity of substitution being set at zero. Instead, the weightings for different commodities are adjusted about once a decade. The Commission keyed in this lack of substitutability, believing that an overestimation of the “true” cost of living thereby results.

The Commission felt that a number of other items also contributed to an overestimation of inflation. The BLS will rotate a new product into the CPI collection process through the use of sampling techniques, but the rotation is very slow to occur. In many instances, rotation will take place many years after there has been wide acceptance of the product. And, if the new product does not fit neatly into an existing BLS product survey, it may be a decade or more before the product is measured in the CPI composite. Examples where a decade long delay occurred includes VCR's, microwave ovens, personal computers, and cell phones.

The Commission also noted that the Bureau primarily collects pricing data during the weekdays. This generates an upward bias in the numbers, since many retailers will put items on sale during weekend hours to lure consumers into stores in their available off-work time.

The Commission was further concerned with the quality of products. The Commission rhetorically commented, “One would not want to count a major improvement in the quality of a product simply as inflation”. A quality improvement in a product resulting in a higher price of a product should not necessarily be considered inflationary in nature.

The CPI Commission believed that the BLS was not doing enough to separate higher pricing stemming from the quality improvement versus pricing increases generated from basic supply and demand considerations on the product.

Overall, the Commission provided evidence that upper and lower level substitutions accounted for 0.40% upward bias in the CPI; outlet substitution generated 0.10% bias; and new products and quality changes amounted to 0.60%. This totals 1.10% upward bias in the Index, with a plausible range of 0.80% to 1.60%.

Recommendations. The primary recommendation of the Boskin Commission was to move from a fixed weight index and towards the adoption of a cost of living index using superlative equations that utilize more current data. The Commission went on to actually recommend the development of two sets of indexes: one conducted monthly that produced initial estimations of the CPI, and a second index compiled yearly to introduce new information and research results into the final CPI measurement.

The Commission made many other recommendations. All of the recommendations were classified by an estimated length of time necessary for implementation to occur.

The short-term recommendations included a more frequent re-weighting of the basket of goods and services; increasing the pace of sampling procedures; the development of a monthly index; the adoption of a superlative index formula to account for a changing market basket; the abandonment of the no substitute assumption; a change from an arithmetic mean calculation to a geometric index, thereby allowing for the introduction of price elasticity of substitution in the process; the abandonment of decade long weighting systems with a move to a two or three year average of price expenditures; and the use of scanner data wherever possible instead of a physical collection of goods.

The Commission further believed that the substitution biases could be dealt with in a year or two by the BLS. The quality and new product changes would be more difficult to achieve in short time frames, and could largely be accomplished through the development of better technology (i.e. scanners) involving revised collection techniques.

Near term recommendations were composed of the following: new data collection procedures; a reorganization of organizational activities; and changes in the detail and organization of the various sub-indexes.

The long term recommendations were the continued examination of a “law of one price” rule; looking beyond the current market basket framework; the expansion of the consumer expenditure survey; and new monetary resources to fund additional research on an ongoing basis.

Supplemental Thoughts of the Boskin Commission. The Commission members used its own writings contained in a 1998 Symposia to review the various reactions to the original 1995 Commission report to Congress. The Commission felt that most of its initial findings and recommendations have been generally accepted, although

disagreement had occurred over the size of the upward bias. In one recent study, the substitution bias was found to be slightly higher than the Commission's findings, with a 0.5% bias, instead of the Commission's 0.4% estimate. Also noted were studies sponsored by Federal Reserve Board Chairman Alan Greenspan, that came to virtually the same conclusions as to the size estimate of the bias.

The Commission further noted a variety of criticisms to its Report, including not giving adequate attention to quality deterioration; understating the BLS's current quality revision efforts; making "far too many back of the envelope" calculations; not giving priority to issues concerning new product development; not recommending a separate pricing index for the elderly that would then be used for SSA indexing; and not including a separate index for the poor. Most of the criticism to the Report appeared to be centered on quality and new product issues, and few articles rejected the Commission's conclusions as to substitutability. The Commission therefore gave additional thought and research to the subcomponents of the CPI, and then made subsequent recommendations based on the collection of price data from independent sources.

The CPI Commission members responded to many of the subsequent criticisms to its findings by stating that the BLS is not focused on quality issues, and does lots of price adjustment only because it is forced to do so by the sampling techniques employed; that it is unfortunate that the BLS refuses to generalize results from one category of goods to another even with quite similar circumstances; and that the Bureau of Economic Analysis of the Commerce Department has moved to a Fisher ideal index for the measurement of real output and prices, so the BLS could do likewise.

In the controversial area of elderly cost estimations, the Commission argued that serious substantive issues were involved in the development of separate indexes for the elderly and the poor. The CPI Commission noted that several studies concluded that little difference exists on the cost of living for the elderly versus that of the general population. Indeed, the BLS has begun an experimental index for the elderly, but still has a fixed weight system attached to it, only with a larger fraction of expenditures devoted to medical care. This results in a higher inflationary rate for an elderly index due to the costs of medical care jumping by more than other goods. But, medical care may not be the area of the index where quality improvements are the most systematic. Geographic clustering of the elderly may also affect the composition or validity of such an index. The Commission was far from certain that separate elderly or poverty indexes were needed or even warranted, given the available evidence.

The Commission believed that the CPI is currently the best measure available. Since the CPI is not a cost of living index, it suffers from a variety of conceptual and practical problems. This leads to an overstatement of the true measure of inflation. The Commission opined that nothing in its own review of the literature written after the initial 1995 Commission Report changed any of its original findings or recommendations. Indeed, the opposite was the case: The Commission generally was of the belief that the literature written subsequent to its initial Report to Congress provides substantial support to many of its critical findings and recommendations.

The BLS Response ----

Discussion of the CPI Commission's Report. Two Commissioners of the BLS and the Chief of the Price and Index Number Research of the BLS penned comments in the Symposia on the Boskin Commission's initial Report and subsequent research. They initially agreed with the Commission that a cost of living index should be developed. There is broad support for the belief that any basket of goods and services, and in particular the CPI as currently constructed, tracks the upper bounds of a change in the cost of living. The BLS, on numerous occasions and over long time frames, has clearly enunciated to the public this precise point.

The substitution biases can show up at two levels: A lower substitution bias arises in the process of aggregating some 80,000 price quotations collected each month into a series of sub-indexes. Upper level biases occur when sub-indexes are then aggregated to form the composite CPI. The BLS has been experimenting for a number of years with the very formulas proposed by the CPI Commission to address the lower level biases. But the geometric formulas proposed by the Commission changes the assumption of price elasticity of substitution from zero (with the arithmetic mean) to a unitary elasticity. Neither of these assumptions are likely to provide a close approximation of the actual substitution in all cases. Eventually, scanner data technology may be helpful for on-going changes in the pattern of consumption, but the level of detail required to accurately measure lower level substitution is simply not yet available.

The upper substitution bias is a different problem. The BLS is currently experimenting with superlative based indexes and publishing such data. Survey data on consumer expenditures become available on a slower basis, however. The BLS is open to a monthly type of index, recognizing this time lag problem, although it is unclear at the present time what approach to approximating a superlative index would be most satisfactory. A fundamental change in the CPI without thorough testing would generate substantial confusion and loss of credibility in the Index itself.

On the quality and new product issues, the BLS already has procedures in effect on the quality changes. Currently, direct adjustments occur for price differentials associated with the differences in the old and new item characteristics. Examples of adjustments in auto pricing include better corrosion protection, improved warranties, sealing improvements, longer life spark plugs, and rust resistant fuel injection. It is clear that the linkage does not work perfectly. Some of the obvious examples of poor pricing linkage included new products with computers and other high tech equipment (Abraham). Procedures also currently exist for bringing new outlets and items into the survey. In response to the Commission's proposal of reclassifying 27 subclasses of the Index, the statistical evidence is rather sparse. The BLS Commissioners simply did not agree with these conclusions of the Boskin Commission. As a example, in the food and beverage category, the Commission findings rest entirely on unsubstantiated judgments regarding the relative "value" of increased variety on grocery store shelves and restaurants.

The BLS authors felt that much work remains to be done on the quality / new goods issues. Techniques in measuring consumer welfare from new products are in their infancy and may never adapt to a large-scale measurement program. Over half of the Commission's new goods / quality bias exists in the medical care and high tech consumer goods areas. The Boskin Commission offered few if any concrete suggestions for improvement in these areas.

The BLS asserted that it had a vigorous program of research and development aimed at improving the CPI. Several sub-indexes have been published, and various geometric formulas are being reviewed and evaluated. The BLS has been working on computer assisted data collection. Also, hedonic modeling is being attempted making use of changes in the characteristic of items being purchased. The BLS is giving greater emphasis on the development of a family of indexes approach.

The BLS response concluded by stating that "we do not believe it possible to produce a perfect cost of living measure. It is commonplace to observe that there is no single best measure of inflation" (Abraham).

Response to both the CPI Commission and the BLS ----

The CPI Commission's findings and recommendations fueled an extensive discussion and continuing debate in the economic literature. The following information summarizes the remaining articles of the 1998 Symposia, arranged by topic.

Support for the BLS Position. Some of the articles actually supported much of the work and current methodology of the BLS. One writer even felt that the Boskin Commission engaged in fragmentary research efforts, and that the BLS used methods that are objective, reproducible, and verifiable (Deaton). It is pragmatically difficult to develop an inflation index when the real world poses substantial problems for objective measurement. It is impossible to objectively decompose period to period pricing changes (Diewert). Another author urged caution in modifying the CPI, noting that a real risk exists of weakening the credibility and consistency of the Index, even when the changes are done on grounds of scientific accuracy. (Pollak). The same author concluded that the basic problem lies not in the CPI computation or with the BLS's procedures, but in what the CPI is being used for. The Index was originally intended to merely gauge the extent to which pricing pressure was occurring in a market economy. However, the nuances and intricacies of the CPI calculations are now affecting the collection and distribution of billions of dollars of public sector money as well as the distribution of untold amounts of private sector resources. This was not the intended purpose to which the Index was created.

Fixed Weight versus Superlative. As to the primary recommendation of the Commission concerning the adoption of a superlative index, one writer argued that the CPI Commission too quickly embraced a cost of living type of argument, and that we should look instead at what is desired from an inflation index (Deaton). If the CPI is so

hard to measure because of the impossibility of making quality corrections, perhaps the government should be more careful in its revisions. A Laspeyres fixed weight method is easily applied and explained in practice, increasing its legitimacy (Deaton).

Conversely, much of the literature supports a superlative index, but notes the practical difficulties involved, especially with the extensive time lags between the occurrence of current information versus the statistical usage of that information. A superlative index would be operationally infeasible in real time, and can therefore only be used as a trailing index. The difficulties may be reduced by the development of formulas with elasticity of substitution factored into the process in such a way so as to predict the inflation rate trend while still using lagged expenditure data (Diewert). Then, an annual Index could focus on the geometric equations using the superlative methods to adequately combine current information with older data.

But, it would be simply naïve to assume that a trailing index would necessarily grow less rapidly than a fixed weight index. A trailing superlative may end up merely reinforcing a fixed weight system, rather than updating it with more current data. And it is far from certain that the performance of superlatives could be realized in practice (Deaton).

Further, scanner technology will reduce the time delays in utilizing current information and in adjusting for new products. Additionally, a true cost of living index may have to begin at the household level. Such an index could take an average of the arithmetic methods (used with fixed weighting) and the geometric techniques (used with the superlative equations) to provide a reasonably close approximation of the underlying true cost of living. (Diewert).

Substitution Bias Issues. The literature contained nearly universal support for the existence of substitution biases, but contained little in the way of proposals for correction. Many statistical agencies approximate the representative outlet price quotations for use with a broader classification of outlet unit values and then aggregate those values with a modified Laspeyres formula (Diewert). The Boskin Commission was supportive of that approach, but such an approximation then introduces its own estimation errors. The literature supported weekend pricing data collection to reduce substitution biases. There was widespread agreement that scanner technology could potentially solve much of the substitution bias. Scanners could relate a pricing Index to more current and comprehensive actual pricing data instead of relying on older pricing information that would only be representative in nature, due to a more limited physical tabulation of price quotations. The BLS noted however that extensive reliance upon data scanners would be some years away, since the level of available detail left much to be desired.

For similar reasons, the articles strongly supported the CPI Commission's recommendation for an expansion of the consumer expenditure survey. The Survey only contains 7000 households per year. Thus, the Survey may form an inadequate basis for detailed regional and demographic profiles. A larger survey would fill important gaps in the statistical system, and could effectively improve the accuracy of the statistical techniques used by the Bureau (Deaton).

One article criticized the entire concept of representative sampling, arguing that heterogeneous techniques would more accurately capture the variation in actual pricing points, sorted across divergent income and demographic factors (Deaton). However, a move in this direction would further complicate an already overworked statistical system. The Boskin Commission felt that such a move could introduce unanticipated biases in numerous other directions, and should not be undertaken without a great deal of examination. Interestingly, by the time of the Boskin Commission, the BLS already had issued experimental Indexes and published data exploring a family of inflation indexes.

Another author felt that substitution biases could be more fully accounted for through mathematical intricacies, and went so far as to include an appendix on an approximate substitution bias formula (Diewert).

Quality and New Goods Bias Issues. Practical problems exist to pricing adjustments for quality changes, as well as analytical ones: Making such adjustments requires subjective evaluations that are in themselves open to debate (Deaton). Higher quality of a product may improve the overall utility of the consumer but may also not alter the choice for goods.

The typical disappearance rate of goods is 20% per year. Statistical agencies, including the BLS, will link old goods pricing in a base year with new goods pricing in the next year, so long as the goods are close in nature. Thus, the bias is introduced into the system: the new goods may have a higher price, but only due to the costs of the increased quality (Diewert). Without pricing adjustments to account for the quality improvement, the inflation statistic would be overemphasized in the data. IN practice, that is precisely what appears to have occurred. For instance, in 1993 alone, BLS measured 813,074 price quotations. Only 844 quotations received pricing adjustments for quality, representing less than one tenth of one percent of all quotations received by the Bureau. This demonstrates that the CPI does not adequately address quality changes. (Nordhaus)

While the CPI Commission noted the quality bias, it virtually ignored quality deterioration. Examples include the loss or reduction in rail service, and the end of house calls made by the family doctor. To estimate the economic loss of products disappearing along with a corresponding quality loss is a “daunting challenge” (Nordhaus).

Income Effects versus Quality Bias. One article expressed the opinion that the CPI is actually biased towards the upper income levels. The author believes that the CPI weights are accurate for 75% of the expenditure distribution, and may be upwardly biased for only the remaining 25% of the higher income population. The quality bias is thus largely related to income distribution, and quality may be a problem only for the upper income levels (Deaton).

Technological Impacts versus Quality Bias. A very interesting argument mentioned in one article concerned the on-going shift in technology that had been occurring throughout the modern industrial era. Using statistics on light bulb illumination since 1830 as an

example, the price linkage procedure never estimates the change in the price of the fundamental service as we move from the old to the new good. The fact that revolutionary changes drastically lowered the cost of lighting gets lost in the linkage (Nordhaus). The CPI overestimates the “true” cost of lighting, and does on a logarithmic scale. The cost of lighting was derived from a wide variety of studies on the efficiency of lighting devices and fuel prices. The CPI shows modest cost increases, while a “true” cost of lighting displays a dramatic lowering in the cost of lighting over the last 170 years, from base 100 to base 1.0 and lower. In fact, the conventional cost of light has risen by a factor of about 1000 relative to the true price. Averaged over the entire time period studied, the annual bias has been about 3.6% per year. This may indicate a significant upward growth bias in price indexes and a large downward growth bias in the statistical measurement of real output (Nordhaus).

Technical versus Political Issues. Underlying the entire discussion of the CPI was the realization that much of the academic analysis was being used for outright political purposes. Indeed, the Boskin Commission was formed during a period of intense gridlock between the two major political parties. Responding to the rancor of the political process, one author proposed to separate the discussion of the CPI along technical versus political lines. The technical issues should be addressed within an expert committee type of structure. This was done with the 1961 Stigler Commission, and it worked well (Pollak). Until technical committees come forward with further proposed changes, the CPI should be left comparatively intact, and only changed consistent with such recommendations. Making changes to a highly complex system without an exhaustive analysis could serve to aggravate the bias problems instead of correcting them.

The same author then proposed a very simple political answer. Until technical revisions occur to the CPI process, tax brackets and government transfer payments should be escalated by the CPI minus 1% (Pollak). This would be a overtly simple solution to a highly technical and convoluted problem, and it would neatly address the upward bias in the CPI. The current CPI indexing of transfer payments ends up producing real gains for constituents of the politicians. The overestimation of inflation has become a massive cost to the national budget, and is leading to “excessive transfers from young to old” (Pollak).

Response from the Literature - Theoretical Matters ----

Several articles went far beyond the recommendations made by the Boskin Commission, delving into theoretical issues that explored an amazing array of concepts. The following items summarize some of the more dramatic ideas.

Whose Cost of Living, and Whose Goods? One article suggested that as an initial item of discussion and debate, the first question that should be answered is “Whose cost of living?”, with the second question being “Whose Goods?” (Pollak). The literature lacks a definitive answer, and that impliedly supports a multi-factored approach for price indexing, with different indexes for different demographics and geographical areas. The

development of group indexes intended to survey a heterogeneous population is therefore theoretically preferred (Pollak).

The question of goods is one of inclusiveness. How inclusive and how broadly defined should the definition of “goods and services” really be? For instance, the value of public consumption is not included in the CPI. One article noted that we have only rudimentary measures of the biases occurring as a result of the lack of public financed consumption in the Index. The author ran a rough calculation, and made an initial estimation that the omission as to public goods increased the variation of accuracy in the cost of living data between 1960 and 1994 by 0.40% per year (Nordhaus).

What Should be Measured? - Utility. Another article explores the correlation between growth in median household income and the utility function of consumers. A survey of how people felt their economic status changed over the year was highly correlated to growth in median income levels - an upward bias in the CPI of 1.5% per year was estimated for this correlation (Nordhaus). This calculation offers a completely independent point estimate of the bias in the CPI based on people’s perceptions of their own financial condition. Interestingly, the estimate is consistent with the Boskin conclusions of an upward bias of 1.6% annualized.

Another writer proposed measuring the consumption of households, believing that consumption is an even better indicator of living standards than is household income, especially in light of evidence of consumption smoothing by the household over time (Deaton). Consumption can be measured by the Personal Consumption Expenditure (PCE) deflator. The PCE deflator attempts to count individual consumption expenditures after adjustments have been made between time periods. One recommendation was to simply use the PCE deflator instead of the CPI whenever a cost of living adjustment is needed for transfer payments (Pollak). A PCE deflator is especially relevant for transfer payments, since a consumption oriented statistic would be used to adjust the consumption of public goods. Further, with the PCE deflator rising more slowly than the CPI, the PCE may be measuring the cost of living more accurately than the CPI does. The Boskin article even commented on this fact. Thus, weighting arguably should be done according to expenditures (Pollak).

What Should be Measured? - Outputs. Some discussion was given in the literature to the relative merits of a separate index for the elderly to account for the accelerating costs of health care. One author argued for a more radical approach on that matter. The CPI Commission, as well as the BLS, views medical costs like any other input cost. A more appropriate concept would not count the medical cost as an input, but to treat the status of health care as an output. An adjustment for the value of higher life expectancy might increase real consumption growth by 1.3% per year (Nordhaus).

The output approach on medical cost issues can be expanded to a more generalized argument supporting a pricing index that measures the outputs of all relevant services rather than the cost of product inputs. Since it is impossible to measure consumer utility directly, the next best approach might be to measure the prices of fundamental

characteristic services that consumers typically value. While a new problem would thereby develop (no direct observation of pricing of fundamental services and qualities of life is available), at least the basic utility of consumers would be measured instead of mere inputs that may not directly correspond to the consumer's welfare. Nordhaus gives life expectancy as an example of the medical outputs that should be measured. Life expectancy is a key component of Quality of Life surveys that have been attempted over the years. By measuring outputs of services rather than the inputs, a pricing index would essentially be measuring the pricing related changes of critical variables to a individual's utility of consumption.

What Should be Measured? - A Distribution of Prices. Consumers find it worthwhile to shop around for a lower price. Thus, consumers face a distribution of prices rather than a single point value. The pricing indexes, including the CPI, are almost always constructed as if there is a law of one price. It is more realistic to envision a range of pricing. A distribution range of price levels arguably is better at approximating the prices actually being felt by the consumers.

Conclusions ----

In all likelihood, the Consumer Price Index currently overestimates the rate of inflation by about 1% per year, resulting in immense implications at the aggregate level as well as dramatically affecting households and firms at the individual level. The upward bias is probably the result of both substitution and quality biases. Fine-tuning of current statistical techniques and BLS agency procedures may reduce the impact of these biases. The basic problem may still exist even with fine-tuning however, due to the simple fact that the CPI as presently constituted, does not measure the cost of living. Instead, the CPI measures the price of a fixed weight bundle of goods and services between consecutive time periods. The current CPI should therefore be viewed as representing the upper limit of a probable distribution range of pricing changes of a fixed bundle of goods and services.

The Boskin Commission has made numerous recommendations for changes in both the current CPI and for the development of a restructured pricing index. The US Bureau of Labor Statistics has several initiatives underway. Indeed, many of the proposals advanced by the CPI Commission originated with the staff of the BLS and their research endeavors.

In addition to the CPI Commission and the BLS, many other interested individuals have provided comments and have generated proposals designed to address perceived problems in the current methodology used to estimate the CPI. These comments and proposals not only involve the technical aspects of the discussion, they also explore several theoretical issues that may ultimately lead to a fundamental redesign of the current economic indicator known as the Consumer Price Index.

Addendum ----

In 1999, one year after the academic exercises reviewed in this paper, the BLS changed to geometric means formulas for the CPI calculations, stating that geometric formulas may reduce the substitution bias. No information was given however as to the degree of reduction that the BLS was hoping for or expecting from the usage of the geometric formulas. As of 2002, the Bureau was researching hedonic formulas for use with specific products. The CPI Commission recommended both of these activities in its 1995 report.

By 2002, there was also evidence of widespread usage by the BLS on a family of indexes, with Indexes being available for both urban consumers and urban wage earners. Sub-indexes are available for 4 different regions of the country, 26 local areas, 8 major expenditure groups (including medical care costs), 200 individual products, and 120 combinations of products. Usage of a family of indexes was not part of the Boskin Commission's recommendation, as much as it was a part of the BLS initiatives and responses to the CPI Commission.

Much of the traditional CPI procedures of the BLS are still in use. The Bureau collects monthly information on 80,000 price quotations per month involving a physical check of 27,000 retail outlets by CPI assistants. The CPI is still based upon a fixed bundle approach rather than a cost of living method. References were made to research being conducted on the next major revision to the weightings, and there was evidence of representative sampling still being relied upon. There were no references made as to the adoption of scanner technology. The consumer expenditure survey was still based on comparatively few homes (some 5,000 per year was noted), and that the current CPI was based on survey results for the years of 1993, 1994, and 1995. The survey results for those years were used in developing the respective weighting of consumer expenditures for the current CPI. Thus, a decade long weighting system may still be in place, even though the Boskin Commission recommended moving towards a CPI based upon the past 2 to 3 years of survey data for the weightings.

No express references were made as to the usage of a superlative index measuring the true cost of living. Instead, it would appear that the BLS has adopted the usage of geometric formulas only as part of a fixed weighting system. The CPI Commission recommended adoption of the geometric equations as part of a superlative process aimed at developing a cost of living index. No evidence was made as to two separate indexes, one based on historical data, and the other based on trailing annual information of a more current nature that would then be used with a superlative process.

On a cautionary note, the BLS may be developing many of the recommendations of the CPI Commission, but just not publicly reporting it. Based upon what is publicly available however, it would appear that that traditional process of measuring a fixed bundle of goods and services is still very much part of the CPI methodology.

It is estimated that changes since 1999 in the way CPI is calculated may have reduced the overstatement in the changes in the cost of living to 0.5% per year.

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Robert A. Pollak, "The Consumer Price Index: A Research Agenda and Three Proposals", 69-78.

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