



SOCIETY OF ACTUARIES

Article from:

Risks and Rewards Newsletter

March 1999 – Issue No. 32



RISKS and REWARDS

The Newsletter of the Investment Section of the Society of Actuaries

NUMBER 32

MARCH 1999

Chairperson's Corner

by Joseph Tan

With this being my first column as chair of the Investment Section, I would like to take this opportunity to welcome the new Section Council members and to express the appreciation of the Council to the retiring members. Leaving us are Pierre Caron, Martin Leroux, Prakash Shimpi and Susan Watson. Joining us are Frederick Jackson, David Li, Christian-Marc Panneton and Peter Tilley. Our immediate past chair, Judy Strachan, is still with us. We thank her for leading the Council this past year and for her accomplishments. Luke Girard has been an editor for several years, and has now moved to an advisory position. We have appreciated his work during that time.

Also deserving our sincere appreciation are our three tireless newsletter editors: Richard Wendt, Nino Boezio and Anthony Dardis, and their associate editors. Without their assistance and

(continued on page 6, column 1)

Is the New CPI Different? Implications for Pension Plans

by Todd Rutley

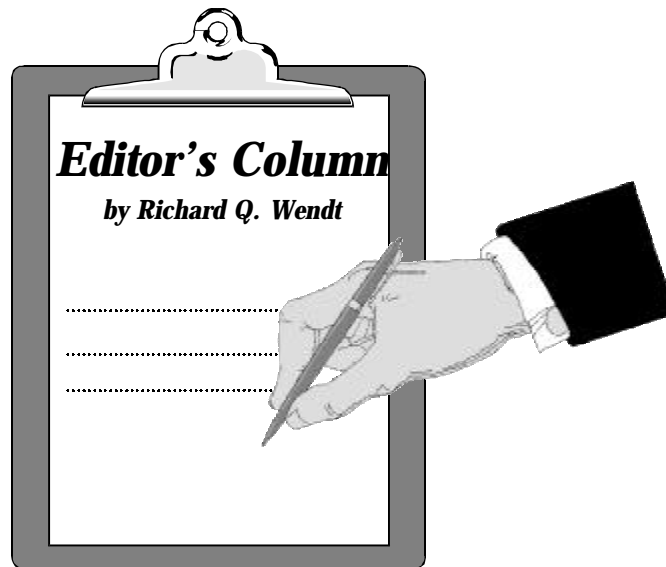
Changes to the CPI calculation methodology used by the Department of Labor have reduced the measured CPI rate by an estimated 0.7% over the 1995-99 period and other changes are being considered that could further reduce the CPI. The cumulative impact of these changes will reduce the CPI in the year 2000 by up to 1% relative to the pre-1995 methodology. Changes to the CPI methodology raise the following questions:

- Does the CPI accurately measure inflation?
- Will the change in methodology affect the economy?
- Will wage increases continue to track the CPI as they have in the past or will they exceed the new CPI as employees realize that the new CPI does not reflect their cost of living?
- Will bond yields be affected by the change in inflation methodology?
- Do CPI changes reduce the usefulness of "real" return numbers calculated by subtracting the CPI from nominal return data?
- Should Nominal Returns be used in investment analysis, rather than Real Returns?

(continued on page 3, column 3)

In This Issue

Page		Page	Page
Chairperson's Corner by Joseph Tan.....1	Report from the Society of Actuaries Annual Meeting in New York by Victor Modugno.....11	Investment Section Council Meeting in New York.....17	
Is the New CPI Different? Implications for Pension Plans by Todd Rutley.....1	Commentary: Social Security Income: Go Refigure by Aaron Bernstein.....12	The Euro Will Eventually Lead to Global Instability by Nino Boezio.....18	
Letter to the Editor: by Eric P. Lofgren.....2	Patenting In Insurance Starts Shaping Up as Robust Discipline by B. Foudre & P. Tryzna.....13	Announcement of Finance Research Funds Available.....19	
Editor's Column by Richard Q. Wendt.....3	National Economic Trends—The Long and Short (Runs) of Investing in Equities by Peter Yoo.....15	Photos from the Investment Section Breakfast.....20	
An Actuary Looks at Financial Insurance by Richard Q. Wendt.....4	Learning Curve—Credit Default Options by Geoff Chaplin.....16	Redington Prize Nominations by Luke N. Girard.....22	
Psychology and Financial Markets: Richard H. Thaler Addresses the Investment Section by Luke N. Girard.....9		Entry Form for the 1999 Market Triathlon Contest by Frank Grossman.....23	



As we enter 1999, there are a number of issues on the finance horizon that may affect investment actuaries. Whether you are working in the insurance or pension arena, the expectations for future inflation, U.S. budget surplus and interest rates will shape financial and political decisions for the next few years. The questions of privatization of Social Security and the investment of a portion of the Social Security Trust Fund in equities present intriguing questions. One prominent commentator wrote that the current budget surplus is mainly due to the incorporation of the Social Security inflows into the budget accounting mechanism and there may be some double counting of the surplus. Another commentator, reprinted in this issue, shows that equity investments and Social Security funding are inextricably linked, so that one can not be a solution to the other. A third commentator stated that a shift of the Social Security Trust Fund towards equity investments would raise bond yields, which would be good for Social Security investment income. None of these commentators were actuaries and actuaries need to speak out on the economic issues.

One article in this issue discusses financial patents, which is definitely a growth area. In an upcoming issue, we're anticipating an article on actuarial patents, which we hope will be of interest to our readers.

Unfortunately, the Denver Broncos won the 1999 Super Bowl. I say "unfortunately," because market pundits follow the Super Bowl effect, which predicts that the Dow Jones Industrial Average will have a good year following a Super Bowl victory by a team from the National Football Conference or the original National Football League. That category doesn't include the Denver Broncos. The prediction has been correct 23 out of 23 years. In the nine years that the NFC/old NFL team did not win, the Dow was down eight times; last year's Denver win was the first exception to that pattern. It remains to be seen whether 1999 will be another exception to the pattern. That brings us to the 1999 Triathlon, which asks you to predict the bond and stock market results for year-end. Our last Triathlon results were placed in a "safe place" by the contest editor and have not surfaced since. We apologize to those who had entered and especially to those who had accurate predictions.

We hope you made equally accurate investment choices. This year, the Investment Section Council has graciously offered to award \$100 prizes to the winner of each segment of the Triathlon. It is up to you to decide whether to follow the Super Bowl effect or your own crystal ball.

Is the New CPI Different? Implications for Pension Plans

continued from page 1

Does the CPI Accurately Measure Inflation?

The December 1995 report of the U.S. Senate Finance Committee's Commission on the Consumer Price Index (the Boskin Commission) stated that the U.S. CPI was an upwardly biased measure of the cost of living that most likely exaggerated inflation by 1.1 percentage points a year. The conclusion of the Boskin Commission has been supported by numerous other studies, including those by Federal Reserve Board Economists (see references). The old CPI methodology was faulted for many reasons including:

- **Substitution bias.** Fixed CPI consumption weights measure average prices not volume-weighted selling prices. This assumes that consumer demand is price-inelastic (i.e. it does not change when apples fall in price and oranges rise in price). This is important in an era of constant sales that makes the "real" price difficult to determine (this applies to food, retail, hotel, airlines, gasoline and other prices that change frequently).
- **New product bias.** Fixed CPI consumption weights are slow to adapt to changing consumption patterns which ignore new products and product substitutes (e.g. PCs and VCRs were not in the index until 1987).
- **Quality change bias.** The prior CPI methodology does not consistently reflect the difference between simple price increases and quality improvements. This is difficult to measure.
- **Outlet bias.** The fixed CPI methodology does not quickly account for the consumer benefit resulting from changes in distribution channels.

(continued on page 7, column 1)

Is the New CPI Different? Implications for Pension Plans

continued from page 3

For the reasons cited above, it was clear that the CPI overstated inflation in 1995. The degree of upward bias estimated by the Boskin report will be largely eliminated by the changes that are scheduled to take effect by the year 2000. Although the stated objective of the methodology change is to reduce the bias in the CPI measurement, it may make inflation even harder to estimate. Rapidly changing prices and distribution channels could result in very wide price dispersion for the same product over a short period of time.

Summary of Recent CPI Index Methodological Changes

1/1/1998—Updating of CPI basket to 1993-95 consumption patterns and decision to update more frequently in the future than in the past.

1/1/1998—Updating of CPI component classifications to reduce substitution bias.

1/1/1999—Adoption of Geometric mean calculation to reduce substitution bias.

The result of the recent and planned changes to the CPI is that the pre-1995 and post-2000 CPI series will not be based on the same methodology. Therefore, **historical inflation and real return data may not be comparable to future inflation and real return data.** This has serious implications for investors interested in real returns.

The Effect on the Economy

The Consumer Price Index is used to adjust Social Security benefits and to adjust the income brackets for the U.S. income tax. Changes in the methodology could have a significant effect on government income and expense. A methodology change that reduces the calculated CPI will reduce future increases in Social Security benefits and reduce future bracket increases for

tax calculations. Both effects will either increase the federal budget surplus or reduce any budget deficit, compared to no change in CPI methodology. A higher budget surplus would likely result in reduced government borrowing and lower government bond yields. These effects could significantly impact a broad spectrum of the public: Social Security beneficiaries, taxpayers, and investors.

The CPI and Wages

Aggregate wage inflation generally exceeds CPI inflation by a small increment that is attributed to productivity increase. This real wage increase is typically estimated at about 0.50%. This is based on the average relationship over the 1950-97 period. Chart 1 shows this relationship over the 1981-1996 period for the private sector labor force.

The historical relationship between the CPI and wage increases suggests that wages typically track the CPI fairly closely. However, this relationship may weaken in the future for several reasons. First, CPI changes caused by methodological changes will reduce the measured rate of inflation and the average employee's acceptance of this measure. That is, employees and unions may have come to accept the CPI as a

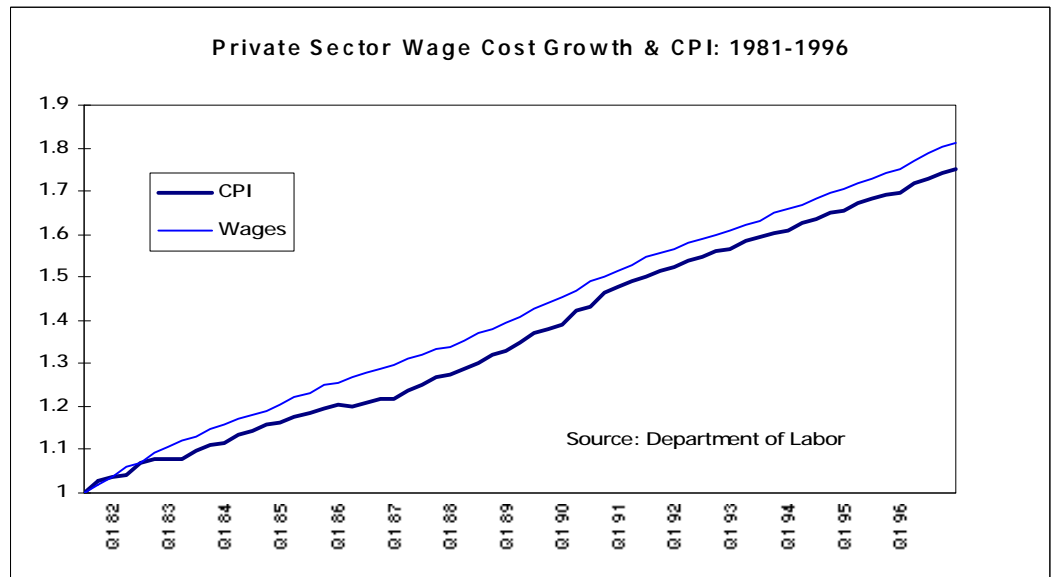
benchmark measure for pay increases because it had a built-in real wage increase due to the price measurement bias. Second, the relative importance of the CPI mismeasurement is high now that inflation is only about 1.5%-2.0% (i.e. the mismeasurement may account for 1/3 of reported inflation). Third, the labor force is becoming increasing "bipolar" as the gap between high and low wage workers increases due to changes in productivity. As a result, high skill workers may have average wage increases far higher than the rate for low skill workers. All of these factors suggest that the reliability of the CPI as a benchmark for wage increases may diminish.

The Impact of CPI Changes on Bond Yields

The long-term impact of CPI changes on bond yields is unclear. On one hand, the increase in government budget surplus will tend to reduce government bond yields. On the other hand, it is uncertain whether investors' inflationary expectations will change and, if so, whether bond yields would decline more than justified by changes in the budget surplus alone. For example, if the federal government suddenly announced that, starting tomorrow, the official CPI calculation would be arbitrarily reduced

Chart 1

(continued on page 8, column 1)



Is the New CPI Different? Implications for Pension Plans

continued from page 7

1%, it is unlikely that government bond yields would immediately drop 1%. Investors would presumably realize that an arbitrary change in the measurement of inflation would not truly affect their personal purchasing power and would not reduce their required yield for government bonds. If the methodology change were gradual and not perceived to be arbitrary, investors might adopt new inflationary expectations and reduce their required yield.

With respect to the suggested methodology change, the government is introducing the change on a low key, gradual basis, and there have been no published suggestions that the change is arbitrary. Therefore, the expectation is that the methodology change will act to reduce government bond yields over the long-term.

The Impact of CPI Changes on Real Investment Returns

The current changes in the CPI methodology may increase prospective real returns, depending on how capital markets react. For example, if interest rates do not decrease in line with lower calculated CPI, real stock and bond returns will be higher. Conversely, if real bond yields decline, this may lead to a decline in the required return on equity and higher equity valuation ratios (this appears to have happened over the last two years in the equity market).

The current revisions to the CPI indicate that historical inflation has been overstated with the result that both real returns and real economic growth over the last 25 years of relatively high inflation have been understated. This has important implications for investors because it reduces the reliability of historical data.

Are Nominal Returns a Better Measure of Investment Performance than "Real" Returns?

The relevance and accuracy of real investment return calculations depend both on the selection of an appropriate

measure of inflation and also on an accurate calculation of inflation. The analysis above indicates that the CPI is an inaccurate measure of consumer price inflation, which suggests that it is also an inaccurate adjustment measure to determine the real return on investment capital. This indicates that the CPI should be compared with other measures of inflation, including the GDP price deflator and the producer price index, in order to evaluate whether one of these measures would be a better measure of inflation for investment purposes.



The current changes to the CPI indicate that the CPI is not a consistent price measure over time and that pre-1995 and post-1995 real return comparisons for either investments or economic growth may be invalid. For these reasons, nominal returns appear to be a better measure of future investment performance than real returns using the consumer price index.

Todd Rutley, CFA, is an Investment Consultant at Towers Perrin in Philadelphia, PA.

REFERENCES

1) Boskin, Michael J., et al. 1996. *Toward a More Accurate Measure of the Cost of Living. Final Report to Senate Finance Committee from Advisory Commission to Study the Consumer Price Index* (December

- 2) Nakamura, Leonard I. "The Measurement of Retail Output and the Retail Revolution," Federal Reserve Bank of Philadelphia Working Paper 98-5, March 1998 (also forthcoming in the *Canadian Journal of Economics*).
- 3) Nakamura, Leonard I. "Is the U.S. Economy Really Growing Too Slowly? Maybe We're Measuring Growth Wrong," *Federal Reserve Bank of Philadelphia Business Review*, March/April 1997, pp. 3- 14.
- 4) Nakamura, Leonard I. "Measuring Inflation in a High-Tech Age," *Federal Reserve Bank of Philadelphia Business Review*, November/December 1995, pp. 13-25.
- 5) Reinsdorf, Marshall. "The Effect of Outlet Price Differentials on the S. Consumer Price Index," in Foss, Murray F., et al., eds., *Price Measurements and Their Uses*. University of Chicago, Chicago, 1993.
- 6) Reinsdorf, Marshall. "Price Dispersion, Seller Substitution, and the U.S. CPI," *Bureau of Labor Statistics Working Paper 252*, March 1994.