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INFLATION ISSUES AND RETIREMENT PLANS

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Rapid and steady inflation has eroded the value of pensions for retired persons. Coping with the effects of inflation has been a major problem for retirement systems today. Several aspects of this will be discussed.

1. How does inflation affect retirement income needs, age of retirement, etc.?
2. Are indexed benefits desirable and economically feasible, either for public or private pension plans?
3. What alternatives to indexed benefits are possible for inflation protection?
4. What implications will such inflation-adjusted benefits have on investment policy, funding patterns, and actuarial assumptions?

DR. SUSAN M. WACHTER:* Steady inflation at even a moderate level such as 8% per year rapidly erodes the value of pensions for retired people. For example, a steady annual inflation rate of 8% will decrease the real value of a pension by 50% in 10 years. Thus, it is clear that inflation is a serious problem for those depending on private pensions to maintain pre-retirement standards of living.

The problem, of course, does not exist for those relying entirely on Social Security benefits. Social Security benefits are fully indexed to inflation. The problem of paying for this indexation is transferred to taxpayers, and, in the coming decades, the taxpayer burden will increase significantly. We cannot look to the expansion of Social Security as a solution to inflation's erosion of private retirement benefits.

A solution to this problem would be relatively straightforward if private pensions could be fully or even partially indexed to a measure of inflation. The question of whether it is economically feasible and desirable to do so must be addressed. The question can be posed somewhat differently. If it is feasible and desirable in a world of no inflation to have benefits defined in nominal terms, is it not also feasible and desirable in a world of inflation to have defined benefits indexed to a measure of inflation?

The answer to this question depends on the value and cost of indexed pensions. If we can assume that inflation has no real effects, the cost of indexing pension benefits can be calculated relatively easily. Indeed, the extra cost of fully indexing a new plan to inflation is zero. That is, the

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cost of a new fully indexed plan would be the same as the cost of a new nominal plan in a world without inflation.

Assuming neutral inflation and nominal benefits, the cost of existing pensions is, of course, lower than without inflation. Under this assumption, changing from nominal pensions to fully indexed pensions requires either a decrease in the initial value of pensions (of approximately one-third, assuming 6% inflation) or a decrease in current wages (of 5% to 10%) to pay for indexation.

In essence, neutral inflation reduces the cost of a nominal defined benefit plan by the same amount that it reduces the real value of the benefit. In the past 15 years, however, pension plan sponsors' costs have not decreased by as much as retirees' real benefits because inflation has not been neutral.

Neutral inflation is due solely to anticipated excessive growth in the money supply and has no real effects on relative prices because the excessive money supply growth is anticipated. This must occur in a world either without taxes or where tax effects are neutralized. Under neutral inflation money is a veil, and increases in the money supply have no real effects other than to change the value of our currency.

With neutral inflation, the choice of an index to measure inflation is simplified. Essentially, there are two choices, a fixed weight index and an index where the weights, by which each year's prices are multiplied, are adjusted annually. The Consumer Price Index (CPI) is an example of a fixed weight index, and the Personal Consumption Expenditure Deflator (PCE) is an example of an index where weights are adjusted annually to reflect changing expenditure patterns. The CPI is determined assuming that people do not adjust their expenditure patterns to reflect changing relative prices while the PCE is determined assuming that there are perfect substitutes available for all goods whose prices increase. Thus, the CPI is biased upward and the PCE is biased downward. In addition, the treatment of housing in the CPI further biases this index upward when inflation rates increase and downward when inflation rates decrease. In a time of low inflation there is very little difference between the two indexes, and through 1970 they did not differ substantially. However, given the large relative price and tax effects of inflation during the last 10 years, the choice of an index matters a great deal. The annual rate of change in the CPI has been, on the average, 1% higher than the rate of change in the PCE, although there is no guarantee that this relationship will not be reversed if inflation decreases.

Even if we could solve the problem of determining the correct inflation index, there remains the more serious problem of the relationship of inflation to the real rates of return that pension funds can earn. Inflation during the last 10 years has not been neutral and rates of return on most asset portfolios have been negative in real terms. However, we cannot conclude from this that future inflation will be associated with negative real rates of return. Asset values in the past decade have been significantly decreased by unexpected inflation. We must separate the temporary effects, which are associated with this unexpected inflation, from permanent effects.

The cost of indexed pensions depends on the real rate of return and its variance, the inflation rate and its variance, and covariances among real rates of return and inflation rates. What does the past decade allow us to say about future real rates of return and inflation rates? We know that real rates of return on assets are affected by non-neutral inflation. Although the complexity of inflation's effects makes it difficult to measure the size of their impact on capital markets, the theory does allow some conclusions about the direction of the effects. We will discuss the effects under three categories: the effects of non-monetary sources of past inflation, the tax effects due to a non-neutral tax structure, and the effects of the uncertainty of inflation.

First, during the past 15 years inflation has been caused by demand-pull and cost-push factors, with the money supply erratically expanding at high rates. The initial inflationary spurt was due to demand-pull pressures from the war in Vietnam coupled with a war on poverty with no increase in taxes. The second inflationary spurt, during 1973 and 1974, was due to the OPEC increase in oil prices. Over this period, on average, the economy has been pushed to expand at rates that exceeded its potential. Demand-pull factors have redistributed income to less productive uses. OPEC increases in oil prices have had a negative effect on labor productivity and real rate of return. In addition, the lower overall growth of the economy can be attributed in part to a large youth cohort in the labor force. Each of these effects may have resulted in higher inflation and at the same time lower labor productivity and rates of return on capital. The lower productivity may have indirectly prompted inflation when monetary and fiscal authorities would not adjust for the lower growth potential of the economy. In the coming years, the decline in productivity and the real rate of return due to energy costs and government spending patterns will be turned around to some degree. In addition, the unskilled youth cohort is becoming more skilled so that the decline due to this factor will be mitigated.

Second, inflation during the past 15 years has occurred in an economy where the tax system is not neutral. Our tax system is graduated, so that with increased nominal incomes the effective tax rate increases. The impact of this graduation on investment and on rates of return of different assets is not well known. It is often said that our tax system has hurt profits in recent years, but it is by no means clear that it has done so. It is true that the inability for income to depreciate in real terms has increased effective tax rates. But it is also true that the real cost of debt has been negative, due to the combined effects of inflation and the deductibility of interest payments. Housing has clearly benefited and other investments have suffered, although the impact on non-housing capital is unclear. However, proposed tax changes are likely to raise overall real rates of return.

Third, inflation has been caused by erratic growth in the money supply that could not be anticipated. With growth in the money supply and uncertain inflation, relative prices are distorted. Capital markets in particular suffer because of the importance of long-term fixed contracts. Both lenders and debtors suffer due to the uncertainty of future inflation in their attempts to come to an agreement on nominally fixed interest rates. The long-term bond market in this country is long-term for the lender and short-term for the borrower, because the borrower generally has a call provision. With

long-term bonds, there must be substantial premium to lenders for the increased risk they bear. Indeed, one result of uncertain inflation has been that the level of long-term interest rates in relation to inflation rates and short-term interest rates has increased. Another effect, which is also to be expected, is less long-term borrowing because projects must justify the increased interest rates. There has been recent widespread attention given to the shortsightedness of American business planners. This shortsightedness may be in part due to the increased cost of long-term investing. Short-term debt instruments are not perfect substitutes for long-term capital because financing a long-term capital project is riskier if short-term instruments are used. The direction of the result is clear. The lack of long-term investment projects leads to a seeking out of short-term projects that would otherwise not be acceptable, lowers the overall rate of return, and raises the variance on all other investments.

Inflation may decline in the coming years. But uncertainty over inflation will not be removed from the system quickly although it may decline. Zvi Bodie has shown that the real rate of return on a risk-free portfolio, that is a portfolio of Treasury Bills hedged against unanticipated inflation by a small position in a diversified portfolio of commodity structures, has been approximately zero and, over the last 10 years, negative. It is unclear whether we will return to higher rates of return in our capital markets, but it should be clear that even so, the risk free real rate of return will be very low. By not returning to this level, due perhaps to the continued effects of uncertainty, we will experience a continuing negative real rate of return.

The best guess about what the future will hold is that real rates of return on portfolios of stocks and short-term bonds will be lower and variances will be higher. Real rates of return on portfolios of long-term bonds will be higher and variances will be substantially higher. Because the real rate of return on Treasury Bills has been only approximately .01% historically, it is clear that investing in these cannot guarantee a positive rate of return. Investing in bonds and stocks will most likely yield positive rates of returns in the long term, but with high variances by historical standards. Thus, it is risky to guarantee pensions indexed fully to inflation, based on any of these portfolios. We do not know how costly such a guarantee would become and whether employees would be willing to pay for such guarantees through lower current wages.

The alternatives to full indexation are partial indexation, ad hoc increases, or government support of private pensions. Partial indexation is risky to the retiree. If benefits are escalated at a constant percentage of the inflation rate or if a cap is imposed, the risk of a real decline in benefits grows with the level of inflation. Under these circumstances, retirees may prefer ad hoc benefit adjustments. Then benefits may increase with inflation when real rates of return perform well. However, there is no guarantee that pension benefits will increase with inflation.

Decreasing our reliance on Social Security and increasing our reliance on private pensions in the future may require making private pensions as attractive as Social Security in its linkage to inflation. If so, some government intervention may be necessary. Government-induced changes in capital markets that raise real rates of return may be possible. Other

intervention to raise real rates of return on pension portfolios may also have to be considered. England is using indexed bonds for this purpose and Canada is considering implementing rate change insurance. Serious attention to these alternatives may be necessary in the United States in the future.

MR. RONALD M. WALKER: My remarks will be made in the context of Canadian actuarial consulting practice. There have recently been five major studies on pension reform in Canada, as well as a national pension conference sponsored by the federal government which addressed pension problems in four major areas. These are coverage of the population within the pension system, equity for women, vesting and portability, and the indexing of benefits. The last two areas are directly related to the impact of inflation on pensions, and in all five of the aforementioned studies, this impact was recognized as a problem which needs to be addressed.

The effect of inflation on pension plans is to cause a redistribution of benefits and costs between the beneficiaries, the plan sponsor and the issuers of securities used for pension funding. Inflation impacts negatively on private pension plan beneficiaries by eroding the value of benefits during two time periods:

1. the period between termination of employment and commencement of pension payments, commonly referred to as the period of deferment, and
2. the period during which pension payments are made.

When an employee retires and pension payments start immediately, the second period is the area of concern. When an employee changes jobs and retains a right to a pension payable at a future date, both time periods are of concern.

Inflation also has a positive impact on the funding of pension plans by causing an increase in investment returns. This is partly offset by a negative impact on some existing assets. Because of the beneficial effects of increasing inflation to the issuers of fixed income securities used by pension funds, part of the positive result of inflation passes not to the pension fund but to the issuer of the security. Consequently the positive financial impact on pension fund assets is not equal to the negative impact on beneficiaries.

Pension Plan Design

In reviewing the effect of inflation on pension plan benefits it is usual to first review the design of defined benefit plans and the reasons for their adoption.

Defined benefit plans fall into three basic categories: flat benefit, career average earnings benefit, and final average earnings benefit plans.

Due to periodic renegotiation, some flat benefit plans are in effect final average earnings plans in that the renegotiated benefits are generally related to current earnings of the average member and, therefore, final earnings of retiring members.

Final earnings plans are now assumed to have been provided to protect members from inflation during their working careers. While this is an obvious result of the design, it was not the original objective. The earliest pensions were frequently related to final earnings under paternalistic arrangements where an employer made pension grants to employees retiring after periods of "long and faithful service". These benefits were not always directly proportional to service but as the need for pensions became recognized and as the numbers of retirees grew, they were converted to the familiar benefit based on a defined unit of final earnings for each year of service.

As the private pension industry grew, life insurance companies became active in the funding and delivery of pension benefits. Largely a result of that activity and the funding systems employed was the development of the career average type of unit benefit plan. In the low inflation environment of the 1950's and early 1960's, either type of earnings related benefit, final average or career average, could be used to provide an appropriate level of benefit for the average member. However, it was noted that a career average benefit design, when compared to a final earnings design, provided proportionately smaller benefits for members with long service and for members with rapid promotions, particularly late in a career. These results were contrary to the objectives of plan sponsors who preferred a benefit design which would favour members with long service and successful careers. This led to renewed interest in plans related to final earnings levels.

Prevailing attitudes toward pensions have changed materially since the 1960's. Pensions are now regarded more often as deferred compensation than a reward for long and faithful service. Plan designs now incorporate more considerations for equity in benefit definitions and for vesting of benefits for members changing employment. However, the significant point is that none of these plan designs were developed with any specific objective of combatting the erosive effects of inflation. Any of these plan designs, with appropriate benefit levels and sound vesting, can provide reasonable benefits for all members in a non-inflationary environment. The negative impact on the value of benefits is, therefore, clearly caused by inflation and not inherent to the pension system itself.

Indexation of Benefits

The commonly proposed solution to the problems caused by the negative impact of inflation is indexation of pensions in payment and of vested benefits during the deferment period. This is clearly treating a symptom of the disease rather than the disease itself. However, in the absence of a cure for the disease it may be appropriate to consider indexation of pension benefits so that a particular segment of the population does not suffer worse than the rest. Equally appropriately, benefits should not be escalated at a rate which provides better treatment for pensioners than the rest of the population. For example, recently price inflation has been greater than general wage escalation.

Benefits to be Protected

Benefits require protection from inflation during the payment period for pensioners and both the period of deferment and the payment period for employees who change employment, although the degree of protection might be different in each. Many employees change jobs for higher compensation, better prospects or both. It is not unreasonable to expect employees in such circumstances to accept a lower level of protection for vested benefits; for example, in the West German pension system a corridor of ineligible earnings is determined when an individual changes employment, to provide for this circumstance.

Level of Protection

The most common measure of indexation is the Consumer Price Index (CPI). A number of proposals have been made that a wage index would be preferable to enable pensioners to benefit from increasing living standards. Such a proposal has more applicability in the deferment period. The use of a wage index in a normal economic environment with a positive increase in real wages would increase ultimate benefits and, therefore, costs. Other proposals have been made for the construction of a special pensioner index to reflect the following factors:

1. the practical effect of substitution as particular goods or services escalate in price more than others,
2. the possibility that spending and substitution are age-specific,
3. the reduction in need for new saving and increase in return from accumulated saving, and
4. the hypothesis that needs reduce with increasing age.

There is disagreement in hypothesis four over whether such a reduction occurs at all and, in many cases, over the age at which reduction starts and the rate of reduction. A careful on-going survey should be designed to enable these factors to be tested both as to validity and rate of decrease at various ages.

Indexing Formulae

Two principal methods of indexing benefits in payment are presently under active consideration: a direct link to an index, including partial indexing, and benefit increases based on investment return, either of a particular fund or of a class of investments. Provided the index is appropriate, the first method guarantees that the beneficiary will be able to maintain a certain standard of living but the plan sponsor is required to underwrite the risk of unanticipated escalation. The second method provides protection to the plan sponsor in controlling costs but may not provide benefits which track inflation closely enough to provide proper protection for beneficiaries.

Funding Indexing Benefits

Conventional funding is capable of handling benefit indexation linked to the investment return on the plan assets. Indexation based on the investment return on a special class of investment either adds risk to the plan sponsor or requires special techniques. For example, a special fund could be administered for the assets applicable to pensioners (and deferred pensioners) using an appropriate asset mix. However, this technique limits the flexibility of the investment manager, creates some accounting difficulties at the date of retirement, and requires careful coordination with the asset mix for active employees.

Benefit indexation based on an external index adds substantial risk to the plan sponsor. A significant number of private plans have been able to make adjustments on an ad hoc basis which often has maintained a reasonable relationship to the CPI, but understandably plan sponsors are reluctant to underwrite a future commitment to full CPI indexing from the point of view of risk as well as appropriateness.

Underwriting the Risk of Indexing

A number of proposals have been made to assist plan sponsors in underwriting the risk of indexing benefits to an external index.

- Indexed Bonds are bonds under which the coupon rate consists of a guaranteed real rate of return plus the rate of inflation. Some argue that the market already provides this in large measure as bond yields increase with expectations of increased inflation, and that the introduction of these special securities would upset the capital markets.
- Inflation Insurance by Government was developed by Professor James Pesando in his monograph "Private Pensions in an Inflationary Climate: Limitations and Policy Alternatives". Essentially this would require the government to insure pension plans against the cost of indexing benefits caused by unanticipated increases in the index.
- Inflation Tax Credit, as proposed by the Royal Commission on the Status of Pensions in Ontario, would provide indexing by allowing pensioners to claim tax credits up to certain maxima. This proposal transfers the cost of indexing to other taxpayers.

Redistributive Effect of Inflation

As noted earlier, unless pension benefits are indexed to inflation, inflation will have the effect of redistributing income from beneficiaries to plan sponsors and/or the issuers of securities used in funding. This is not to say that plan sponsors have benefited directly from past inflation. Plan sponsors in Canada have been increasing their contributions to private pension plans at a rate well in excess of rates of inflation. Effectively, plan sponsors have been passing their benefits from inflation on to plan members in the form of improved benefit formulae and/or ad hoc increases to benefits in payment. To the extent that the issuers of securities benefit

from inflation, both beneficiaries and plan sponsors are net losers. To the extent that the plan sponsor's benefit has been applied to improve benefits for active employees rather than pensioners, there has been some effect of redistribution from pensioners to active members. However, there is no evidence that plan sponsors have generally benefited from inflation at the expense of plan beneficiaries.

Cost of Indexing

In an inflationary environment, indexed benefits are more expensive than non-indexed benefits. Increased investment returns because of inflation have been applied by plan sponsors to improve benefit formulae for active members by establishing funding levels based on moderately inflationary rates of return. Full indexation will require a change to financing benefits on the basis of a non-inflationary rate of return and will require substantially increased contributions, reduced benefits or both.

MR. HARRISON GIVENS, JR.: Employees are deeply concerned with the harm that inflation can do to their retirement security. People who live on a fixed income are essentially helpless in the face of substantial, sustained inflation. Employers are also deeply concerned, both because of the great cost of increasing benefits to offset inflation, and because employee fears are a real problem for company morale. Now employees cannot protect themselves; the major issue today is whether it is even possible for their employers to provide protection. Specifically, are the costs of coping with inflation too large for most employers to accept?

These costs can certainly be impressive. A pension benefit that increases 1% per year is worth about 10% more than one that is fixed. Based on that, a plan that fully indexes costs 50% more when inflation averages 5% per year; it costs 100% more when inflation averages 10% per year.

The implications for current plan contributions, as distinguished from long-range plan costs, are even worse when the plan is partly funded. With 5% inflation, a \$10 million accrued liability may increase to \$15 million, for a 50% rise in plan costs. But if the \$10 million accrued liability was funded to the extent of \$9 million, the unfunded liability increases from \$1 million to \$6 million! So the more fully funded the plan, the harder the impact of inflation on current contributions.

Finally, inflation erodes the value of the plan's existing assets. Higher inflation brings higher yields on new bonds, but a corresponding drop in value for existing bonds, and a related drop in stock prices. Well-funded plans are hit by erosion in asset values along with a leveraged increase in unfunded liability.

In summary, inflation brings three related problems: the cost implication for increasing benefits, a leveraged result for funded plans, and asset erosion for funded plans.

The problem of compensating pension benefits for inflation at acceptable cost is not impossible; it is only quite difficult.

Case 1. Consider the case of an employer adopting a defined benefit pension plan. This employer has a particularly optimistic viewpoint of the economy; in particular, he is sure that inflation will be brought under control in a year or two. He instructs his actuary to estimate costs on the long-term assumption of no inflation. The actuary assumes that investments will provide a return of 3% per year, and that salaries will increase -- for merit, seniority, and experience -- at 2% per year. The result is a recommended contribution of 100 units per year.

Case 2. In the meantime, the employer has been discussing with friends his intention to set up a pension plan. "Be sure to recognize inflation," they warn him. "Payrolls have shot up, and our pension costs have gone up murderously these last few years." Therefore he instructs the actuary to assume that inflation will persist at 6% per year forever.

The actuary does not have a separate assumption for inflation, but it does affect directly his assumptions as to salary scale and investment return. To maintain the 2% and 3% results in real terms, he increases the assumed annual salary increase from 2% to 8%, and he increases the annual investment return from 3% to 9%. Now, how much higher are the pension costs? They are actually one-third lower, only 67 units per year. How can that be? Plan assets will grow 6% per year faster than before, and so will liabilities. The distinction is that plan assets will benefit by the higher interest rates to the end of the employee's life, whereas the plan liabilities will be increased by salary increases only to termination of employment.

Case 3. The employer is delighted that he can provide his intended plan at one-third less than he expected to pay. But the actuary points out to him that a steady 6% inflation would be hard on the pensioners; the plan would not deliver the purchasing power that the sponsor had intended when he accepted a cost of 100 units. He explains that if the employer indexes benefits to inflation and they increase 6% per year, the funding level will be 100 units per year again. This is scarcely a coincidence. Clearly, the costs will be higher than 67 units, because now liabilities continue to grow until the end of life, instead of becoming fixed at termination of employment. The reason that costs return to 100 units is that with indexed benefits, the 6% per year impact is felt over the same duration -- to the end of life -- by both assets and liabilities. The new inflation measurement now impacts both sides of the balance sheet equally.

Therefore a plan providing satisfactory benefits in the permanent absence of inflation has the same cost implications as that plan with indexing in the permanent presence of a specified rate of inflation. The "same" cost implications means the same real dollars, or the same percentage of payroll.

In the more important case of existing plans, you will agree that moving the salary scale assumption from 2% to 8% while moving the interest assumption from 3% to 9% will have similar effects, but enhanced by the leverage of existing assets in the case of the unfunded liability. The normal cost will still decrease by a third. The accrued liability will also decrease by a third, and the unfunded part of that liability will decrease by the same dollar amount, but by a much larger proportion. Indeed, if plan assets are now more than two-thirds of the old accrued liability, the new accrued liability is over-funded.

If the sponsor of this existing plan indexes benefits, the normal cost and accrued liability will return to the old levels, and the unfunded accrued liability will be the same as before. Hence existing plans, like new plans, can index benefits without producing higher real costs than those anticipated in the absence of inflation. If the sponsor simply accepts the lower real cost of his plan brought about by the higher than expected investment return and does not use that cost savings to increase retired employee benefits, then the employer's gain is the employees' loss.

There is one more point to consider in this example. Existing assets, which have been expected to earn returns of 3% per year, will not hereafter be able to earn 9% per year. If there really is a change to a permanent level of 6% inflation, those assets are worth far less than their book value. If they are carried at book value, there will be substantial actuarial losses in the future because they will not produce the assumed 9% income; if they are carried at market value, they will have been marked down to produce hereafter the right return on their more modest value, but the substantial drop in the value of existing assets will impact costs.

Hence, for existing plans, inflation has the same offsetting impact on liabilities and future assets, but it can also murder existing assets. Conceptually, this means that when substantial, continuing inflation is a significant prospect, it is safer to fund on a pay-as-you-go basis. However, ERISA eliminated that possibility; the alternative is to hedge plan assets against the effects of inflation.

The essence of this analysis is that private pension plans can support indexing in the long run if they can control the damage done by inflation to existing plan assets. More specifically, if they can achieve a positive real return close to what could be earned in non-inflationary times, then plan costs as a percentage of payroll will be close to those expected in non-inflationary times, even though the dollar amounts will be staggering. But if asset damage is not controlled, either the employer must shoulder the financial consequences of that damage or the pensioners must bear the pain.

I have spoken so far of meeting inflation by indexing, mainly for simplicity. It is of course the rare plan, even today, that indexes. However, ad hoc increases are increasingly widespread, and if these are repeated enough, they produce the effect of indexing.

The fundamental issue is whether the purchasing power that the plan was originally intended to deliver is still manageable. Note the following comparisons between the cost of an indexed plan and the cost of the same plan without indexing, assuming that plan assets earn correspondingly more in times of inflation:

1. Without inflation, the costs are the same, because benefits and investment return are the same.
2. With inflation, costs are substantially higher for the indexed plan, because benefits are different and the investment returns are the same.

3. With inflation, the cost of the indexed plan in real dollars, or as a percentage of payroll, is the same as the cost that the unindexed plan would have had in the absence of inflation.

The fundamental insight of this analysis is to find the right comparison.

If the employer can indeed continue to earn, on average, a specified positive real return, then our analysis clearly holds. The present substantial inflation that brings benefit erosion also brings 13% returns on new purchases of government bonds. Nevertheless, there can easily be substantial investment loss if the present bond portfolio must drop greatly in order to provide prospective returns competitive with the higher bond yields. Now, of course, there is great difficulty in obtaining a positive real return, at least over certain intervals, but that is the real problem rather than the apparent enormous increase in pension costs that comes from indexing.

Why is this so important? Without a positive real rate of return pension plans will become an ever-increasing drain on company earnings, and yet a source of increasingly inadequate benefits to pensioners trapped by inflation. With a positive real return we can keep pensioners whole and yet keep pension costs -- in real dollars, or as a percentage of payroll -- at the level that was intended when the plan was set up in non-inflationary times.

Is it possible to assure a consistent, positive real rate of return on an existing portfolio? This is not the time nor the forum to discuss how such a demanding investment goal can be met. But perhaps I can convince you that the job is do-able by setting up an experience theorem, as follows.

Examine the opposite premise. Suppose it is not possible to obtain a positive real return on average over reasonable periods. How long would the country continue to have capital formation? What would be the implications for standard of living and political stability? If the prospects for a positive average real return were seen to be in serious question, the country would address the problem at every major level: political, economic, and social. As a cautious optimist, I conjecture that the country would find its way back to an environment where positive real returns are regularly available. If not, there would be far graver problems for the country than adjusting pensions for inflation.

MR. FRIEND: Thank you, Harrison. I'd like to ask the speakers whether perhaps it isn't true that inflation has saved some of our overly-generous non-indexed public pension plans. Through the redistribution of costs back to the public employer, costs are brought down, to appropriate levels perhaps, by not indexing. The trouble is, the public employee demands post-retirement indexing of legislators in the various states, and the ad hoc indexing leads to public pension increases. I propose that the overly generous non-indexed public plans introduce an option much like our joint and survivor payment option; that is, anyone who retires from such a generous program be required first to look at a CPI indexed slope on his pension and if he doesn't want it, to reject it. Then the legislature perhaps could say when large bodies of retired employees return for further improvements, "You had your chance."

MR. GIVENS: I'd like to answer your question on whether public plans that were not indexed have been saved in the sense that they are debtors and so debtors are helped by inflation. That is true if you can find a plan that has earned a real rate of return, but the fact is that broadly, investors, pension funds and others have not earned a real rate of return. It has been very hard to find a positive nominal rate of return, so there was the opportunity, but not much in the way of realizing that opportunity to recover ground where too much was promised.

DR. WACHTER: Mr. Givens, I cannot share your optimism that real rates of return will be positive over the long run. But assuming they can, what do you feel are the implications of a higher variance in the real rate of return, in terms of the long run impact that you don't make up a loss from one year to the next?

MR. GIVENS: This is the old adage that if you have a 50% drop in assets this year and a 50% rise next year, you are still down 25%. I think it makes it very clear that customers (pension plans) want, number one, a real rate of return; number two, a little less excitement in obtaining it. If they could have it each year, even better. That leaves a great opportunity for some bright people to fill a need.

MR. FRIEND: Dr. Wachter, do you think that the design of indexed benefits might not be improved using a type of catastrophic approach? In other words, employers would provide benefits with cost adjustments reflecting inflation in excess of a certain level, such as 2/3 of the excess over 3%. This is comparable to an insurance product where the cost is shared, such as with deductibles or coinsurance.

DR. WACHTER: It seems to me that either way the risk will be borne by the employee or the employer, and if you move in that direction, then the risk is to the employer. When the inflation rate is very high, the risk to the plan sponsor will be severe. I definitely don't believe that an employer can guarantee such a provision without substantial problems.

MR. GIVENS: I think if you can achieve a real rate of return, you can index fully.

DR. WACHTER: I'm willing to debate the question of real rate of return. I agree that if you can guarantee a positive real rate of return, there is absolutely no problem in indexing. I think that the crux of the issue is, can we guarantee a real rate of return? On that, I think it might be interesting to discuss more fully the historical evidence that we have on relatively risk free assets, that is, on Treasury Bills. The annual real rate of return through 1976 was .01%. Here is a portfolio with very little risk variance; Treasury Bills do track inflation relatively well. Since 1974 the real rate of return has been approximately negative 1%. In the future, I don't think we can at all guarantee the positive .01%.

MR. GIVENS: I agree with the principle that the problem is an investment problem. If I can give you a real rate of return, you can index. If you want to know how to get a real rate of return, I can tell you that too. First, use short term paper, not Treasury Bills. There are instruments other than Treasury Bills which produce a significant real rate of return.

Don't be greedy. Historically, you are doing well if you can obtain from 2% to 3% as a real rate of return. Second, try market timing. If you could be in stocks and bonds when they go up and in short term paper when stocks and bonds go down, you would have a marvelous return. Modern portfolio theory tells you it cannot be done. Time series analysis tells you how it can be done. The problem for large asset pools, is, the market impact of switching assets drives prices down when selling and up when buying, so it is not a solution for everyone. But it does work.

The trouble with these investment ideas is that they are focused wholly on the asset side, which is a fatal mistake. The current asset mix for prolonged periods of inflation has to turn out quite differently if you recognize liabilities. Suppose for simplicity that stock prices move in the same direction as bond prices though perhaps with larger movements. Suppose that you assess your present pension assets and liabilities. You carefully forecast where you will be one year from now but, of course, cannot be exactly right. Rising inflation could produce losses from conventional assets, while unexpectedly higher salaries produce a larger increase in liabilities than you anticipated. You have two sources of bad news if inflation is higher than you expected. On the other hand, if inflation is lower than you expected, you have asset gains and a slower rise in liabilities than you projected. Long term investments, whether stocks or bonds, make you highly leveraged; you win big or you lose big. You would prefer to have your assets gain with your liabilities regardless of inflation. Specifically, if inflation increases, you need larger asset gains than expected to cover liabilities that were larger than expected. Conversely, if inflation decreases, you can afford smaller asset gains than projected because liabilities will be smaller. You want some part of your assets in a strange investment for which the larger the rise in inflation the larger the asset gain, and for this you could afford to have the same asset lose when inflation declines. Most of you have such an asset in your own portfolio.

MR. FRIEND: You all, of course, know what asset in your own portfolio Harrison is talking about. I dare say that probably most of you have such an asset. He means your home mortgage.

DR. WACHTER: It is certainly true that we have all been very smart, much smarter than economists or investment advisors. I think there really was a sense that we all knew we should "mortgage up" because real interest rates have been negative, housing has appreciated as our tax bracket has gone up, and investments with tax-exempt aspects have done extraordinarily well. However, this advice would not have been so good if you had bought a house two years ago. The question is, should you invest in housing right now; will it give you the gains it has given you in the past? I think the answer to that depends very much on whether President Reagan's plan as currently being debated passes. Indexation of the tax structure is what he is proposing; he wants to reduce personal taxes to a level so that in three years our real taxes will not have increased. With that, I predict real housing prices will not move from where they are now, and in the past few years there have actually been losses on housing. So I do not think you have an answer there in the future, although you had one in the past.

MR. GIVENS: No, you've missed the point. The housing is not important at all. The asset you have in your portfolio that has been profitable to you is your mortgage.

DR. WACHTER: That is exactly what I mean. Borrowing is certainly a very attractive scenario and holding mortgages will not be nearly as attractive in the future as it has been in the past. I do agree with you that it would be useful to diversify. However, it does seem like yours is a forced solution. I'd like to address your solutions. I agree that short term paper does better than Treasury Bills. It has been estimated that investing in this produces, instead of a .01% rate of return over time, a .03% real rate. On long term or medium term rates of return, you advise to not be greedy, to ask for 2% to 3%. It is my understanding that in the good times, 1926 to 1974, the rate of return on long term and medium term bonds was 1.5%. What it will be in the future is a big question, that is, some real risk will be involved. On the third point regarding time series indications, you responded to this yourself. If we all did what we ought to, we all could not gain. So I'm not sure where the real rate of return is.

MR. FRIEND: Let me change the subject for a moment. You found on your chairs a chart (see next page) describing two situations, one non-inflationary and one inflationary.

In the non-inflationary environment, we had an unfunded obligation of 200 units and underlying payroll of 100 units. As time went on, the unfunded obligation was reduced dollarwise while payroll went up, and the ratio went from 2 to 1, to 1 to 1, to 1/2 to 1. In the inflationary environment, where payroll is moving up much more quickly, the ratio also went from 2 to 1, to 1 to 1, to 1/2 to 1, but the unfunded obligation increased. This scenario many of us see in our entry age normal pension funding where actuarial losses are not made up by the actuarial gains in assets. Many have expressed concern over the health of these plans because of the increasing unfunded obligations. It would be my assertion that each of these two plans is just as healthy as the other. The environment is changing, but there is no difference in the relative funded status. Are there any comments from the panelists on this or any observations along these lines from the audience?

MR. WALKER: We must not ignore the fact that there is the potential for the pension plan terminating, in which case the only protection for the plan members is the existing assets. But in the context of a pension plan which is ongoing, by far the largest single asset is future contributions. If those are related to a percentage of future payroll, it is a very rapidly increasing asset. What Ed's chart does is support a funding system commonly used in England which is not commonly used (if at all) in the United States, and is liable to become outlawed interestingly enough in recent proposed legislation in Canada. This is aggregate funding. In aggregate funding, you simply define total benefit costs as a percentage of future payroll and no one cares what the unfunded liability is. I think that is the major point; if we value our pension funds on an ongoing basis, then our largest single asset is our future contributions.

MR. GIVENS: But Ron, aren't you agreeing that the plan in the inflationary situation is not in distress?

MR. WALKER: Yes, exactly. This is because the cost is bigger in dollar terms but as a percentage of the payroll, the cost is relatively stable. In fact, it may well be decreasing, in that you are funding your unfunded liability, which you wouldn't do in a pure aggregate funding situation.

WHICH IS APPROPRIATE?

DOLLAR AMORTIZATION OF THE UNFUNDED OBLIGATION?

OR

AMORTIZATION OF THE RATIO OF THE UNFUNDED OBLIGATION TO PAYROLL?

NON INFLATIONARY VS. INFLATIONARY ENVIRONMENT

BY EDWARD H. FRIEND, F.S.A.

YEAR	NONINFLATIONARY			INFLATIONARY		
	UNFUNDED OBLIGATION	UNDERLYING PAYROLL	RATIO	UNFUNDED OBLIGATION	UNDERLYING PAYROLL	RATIO
0	200	100	2.0	200	100	2.0
15	150	150	1.0	300	300	1.0
30	112.5	225	0.5	450	900	0.5

NOTE: NONINFLATIONARY PAYROLL IS INCREASING 2.74% PER YEAR
 INFLATIONARY PAYROLL IS INCREASING 7.60% PER YEAR

MR. MICHAEL COHEN: I'd like to follow up on some of Ron Walker's comments, which I think go to the heart of the reason for this meeting. We are looking at retirement issues as a social policy. Part of the problem is that many employers look upon their pension plans, not as social instruments but as personnel management instruments. For example, I believe one of the reasons why there are very generous public plans (and the generosity generally resides in the early retirement provisions) is that they are used as a management personnel tool to get older people out and younger people in. Essentially what inflation has done is given employers the opportunity to use this personnel management tool, and the question of updating vested benefits is very germane here. Why should an employer give updated benefits to people who have left his employ? It is true that if there were no inflation, he would be giving a benefit that was valuable and worthwhile, but inflation has given the employer the opportunity to utilize gains for someone he is much more interested in, namely an active employee. Perhaps the panelists would like to discuss the question of social policy versus personnel policy in regard to plan sponsors.

MR. FRIEND: One of the things that the American pension system is most criticized about is its absence of portability. Many agencies and commissions have addressed this question. Of course, vesting is not portability; portability would mean an indexed vested benefit. If anyone who left employment were able to move to another employer and not receive only a pension based upon the final average pay from which he or she left employ, but would have a benefit indexed to that level which is corresponding at the time of retirement, then you would have a portable system. And as Michael has said, most employers would prefer not to do this because they want to spend the money on employees who remain.

MR. GIVENS: I do not think all employers will want to take care of vested lives. Not all employers will do anything alike. It depends very much upon why the plan was set up. Do you think you can show me an employer who set up his plan to be a master stroke of public policy or social burden? If so, he probably will take care of vested employees without your asking him. He may have set it up as a matter of personnel policy. He may have set it up because the company across the street had a similar plan. He may have set it up because the union bargained it. Depending upon why he has a plan and how he views it today, you will find out what he will do with any extra money that is made in investment return.

MR. WALKER: But, Harrison, regarding present attitudes. As part of personnel policy, pensions are more and more regarded as deferred compensation, and if they are deferred compensation, they should maintain their value for people who leave just as much as for people who stay. So I think you must be careful not to look at the pension as a dollar benefit, but look at the pension in terms of how it was negotiated, for what purpose, in what context, and how it is believed to have been accepted by the employees.

MR. COHEN: I think the point you were making is that in a non-inflationary environment, the pension system as it is currently constructed will probably

give reasonable pensions to people who stay with one employer or to people who move around. My point was that inflation allows the employer to select what he does with investment gains, and Ron, I agree with you that the gains should be used to redress the damage done to pensioners and to vested participants. I was not supporting the use of pension plans as a personnel tool. What we are discussing now is how can we fit pension plans into our social policy, and the problem is getting employers (plan sponsors) to see their social responsibility, which includes responsibility for an employee after he has left employment.

MR. GIVENS: I do not think you can say that yet about employers. They have not had inflationary gains to spend, because experience has been almost uniformly bad. We must focus on achieving these gains, then we attempt to influence how the employers use them.

MR. WALKER: Going back to the question of mobility, in comparing what the "reborn" Mazda auto company did, with what the Chrysler auto company is now doing, it has been pointed out that the first principle Mazda adopted was preservation of the work force, that is, encouraging no job mobility. It is interesting to compare the success of the Japanese economy, where the tradition has been against job mobility, with the success of many Western economies where we have the assumption (which I have seen no validity given to) that job mobility is good for business.

MR. FRAND DAVID: I would like to ask Dr. Wachter to comment on the following query, which was distributed to members of the audience:

"Suppose I owe a hundred dollars on which I pay 12 percent interest, and the rate of inflation is 10 percent. In this case the true interest cost is 2 percent; the remaining 10 percent represents in fact repayment of part of my debt. At the end of the year, I still owe the same number of dollars, 100, but the real value of my debt is now 10 percent lower, because of inflation."

These words are in a letter from two Harvard economists, printed in the New York Times, March 6, 1981. Those writers, Jeffrey Sachs and Olivier Blanchard, use that reasoning to assert that "the constant-dollar value of the (U.S.) public debt is hardly rising," i.e., "the Government is not really living beyond its means." "The properly measured deficit of the Federal budget for fiscal 1980 is about \$14.5 billion, or .005 of G.N.P., not the frightening \$59.5 billion cited in public debate."

Query: What do actuaries think of this line of reasoning? What are the implications of its acceptance by the public and the Federal budgetmakers?

DR. WACHTER: With the high inflation, there is no doubt we should all become as leveraged as possible. The negative side is with historical cost accounting there are substantial losses on equity, due to inflation. How the two balance is something I have given consideration to, and my preliminary feeling is that profits, if anything, have gained from inflation over the last period. This indicates to me that it is not only inflation that leads to lower rates of return.

MR. WALKER: The point is, though, we concern ourselves with market values and look at the negative impact of inflation on the immediate value of some equity. What effect does it have on the underlying or long-term values? One study showed that one of the best trackers of inflation is the dividend rate on a good portfolio of equities. In holding a house, you have the benefit of being an equity holder with equity leverage, rather than being a borrower.

DR. WACHTER: I would argue that the value of holding a house is the ability to leverage. Although it is true that the equity does increase, more and more people are buying houses to be able to borrow on their mortgages at negative rates of interest. As far as equity tracking inflation, it does it well in the long run. However, in terms of the long run, the important questions are (i) what is going on in the economy that is moving us toward a higher secular inflation rate and lower productivity and (ii) what does uncertain inflation itself do to the capital structure? I would argue, with respect to the second question, that the direction of the impact of this uncertainty on our capital structure is negative.

MR. WALKER: The variance or uncertainty is critical. It is a question of risk and the premium for that risk. What premium do you pay and where do you pay it? In the consideration of pension plans in a non-inflationary environment versus plans in an inflationary environment, although theoretically the costs are the same, the risk is very different and a premium must be paid.

DR. WACHTER: Underlining what you have said with respect to variance, let us suppose we can achieve a 2% or 3% real rate of return on an average. Suppose the variance of that return increases. If, in a single year, an asset portfolio loses 10% in real terms, there is no guarantee that that particular portfolio can make up the 10% loss in a future year, even though some other portfolio may. The loss your plan experiences is yours alone and many never be made up.

MR. FRIEND: I am curious to know whether the panel is seeing an inclination on the part of employers to return to having the employee help pay for his pension. Perhaps through thrift plans where individual account accumulations are used, the employee can be helped to help himself.

MR. WALKER: We have the opposite problem in Canada. Pension plans have traditionally been contributory, because employees can deduct their contributions for income tax purposes. My advice to clients setting up or amending plans is to make them non-contributory, because it causes many problems to have employees contribute to a company plan. Thrift plans, savings plans, or money purchase plans are fine, but it is best to keep employees from contributing to defined benefit plans. One example of a problem is what interest rate to credit on their contributions. Any rate selected would be the wrong one.

DR. WACHTER: Mr. Walker, I understand there are two proposals being studied in Canada. The first is a rate change insurance, where the government insures a plan's asset portfolio against the risk that the rate of return will fall below a certain level. The second is a provision that excess earnings will be given back to employees. How likely is one of these proposals to be adopted?

MR. WALKER: Either of those proposals could work, but neither is likely to be mandated. If the government mandates anything, it will involve an expansion of the Canadian Pension Plan, which is part of the Social Security system. Any impetus to implement either of the proposals must come from the private sector, which is fairly disjoint over this. Some employers want to help their employees but others would rather take advantage of the free market economy. Unless you mandate pension plans it makes no sense to mandate indexing for employers who have plans. There is a growing recognition in private industry that pension plans are a good thing to have, based on a belief in the value of capital, which implies a real rate of return. We are likely to move toward the excess interest index formula, because there the company can maintain some control over costs. The knee-jerk reflex CPI indexing is generally believed by sponsors to make costs too uncontrollable. Again, the impetus will come from the private sector.