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### Is Social Security a Regressive System?

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**Moderator:** MICHAEL M. C. SZE  
**Panelists:** ROBERT L. BROWN  
STEPHEN C. GOSS  
**Recorder:** MICHAEL M. C. SZE

*Summary:* This panel discusses the results of research that addresses the issue of whether Social Security is a regressive system with respect to both the Canadian and U.S. Social Security programs.

**Mr. Michael M. C. Sze:** We are fortunate to have Rob Brown, who is a professor at the University of Waterloo, on the Social Security Committee of the SOA and on the CIA Social Insurance Task Force. He is also a Vice President of the SOA. He will be talking about the paper that he has just written titled “Social Security: Regressive or Progressive?” published in the *North American Actuarial Journal* Volume Number 2, April 1998.

Steve Goss is the Deputy Chief Actuary of the Social Security Administration (SSA). He is well-known for his knowledge and opinions on Social Security.

Mr. Brown will be talking about the main topic and his paper pertaining to whether Social Security is regressive or progressive.

**Mr. Robert L. Brown:** This paper was the result of an opportunity that I had that academics get from time to time called sabbatical leave. It’s really a wonderful thing to be able to do, and I was fortunate enough to have a sabbatical leave last year. I applied for a grant from the Committee on Knowledge Extension and

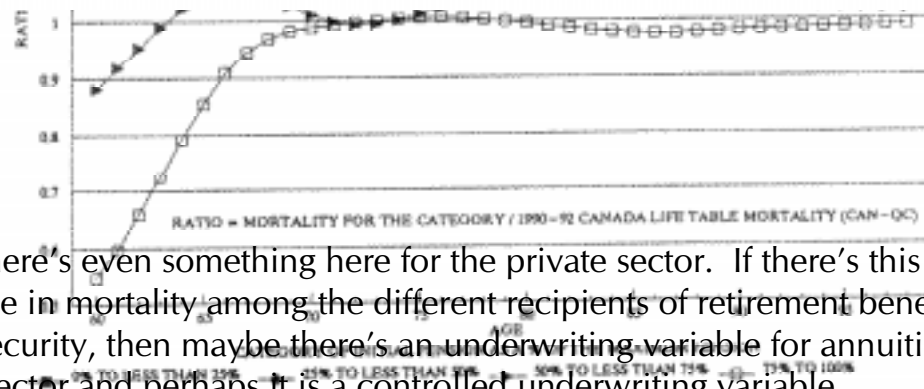
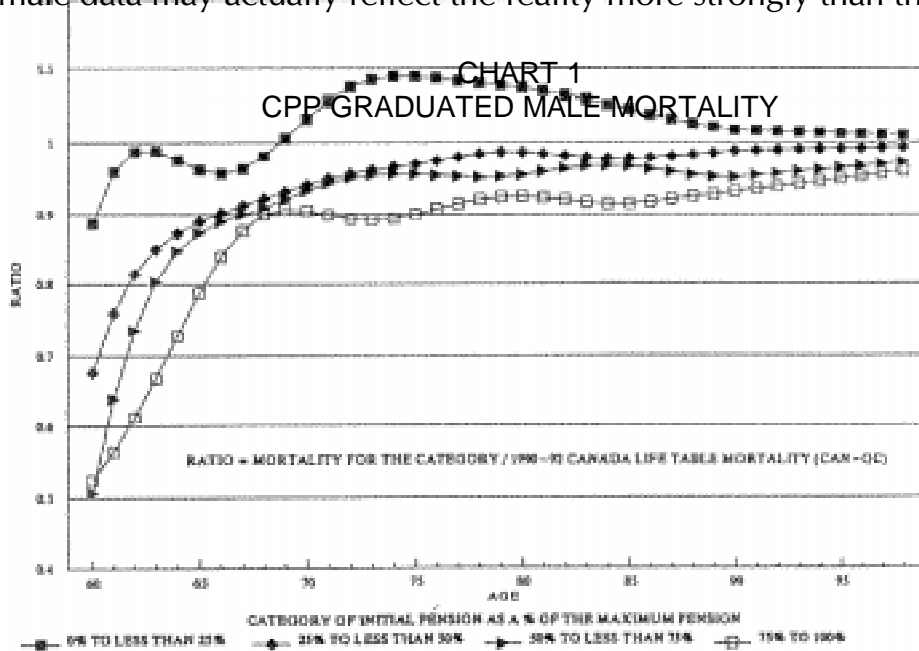
Research and was fortunate enough to get some support for my work. This paper has been submitted to and accepted by the *North American Actuarial Journal*, so it will be published in April 1998. The paper has three parts. I'm only going to talk about one part today, and that is the second section called, "Is Social Security Regressive?" The first part, "Is Social Security a Good Deal?" walks over some well-trodden ground. Robert Myers and Bruce Schobel have done excellent work in this area and there are other studies. I guess if there's a one-line conclusion to this part of the paper from my viewpoint it is, Why do we ask this question? Social Security is a wealth-transfer scheme, so why do we spend so much time trying to figure out whether every person in the imaginable universe gets a positive rate of return from the wealth-transfer scheme? It seems like an illogical question, but, as I said, we won't go into that part. I will discuss the third part of the paper briefly at the end of my presentation.

Why would we ask whether Social Security is regressive when we all know that there are parts to the design that are there explicitly to make it progressive? There's some new information, and very strong information, that there's a correlation between income and life expectancy, and this is a very strong variable in trying to look at all the things that could explain enhanced life expectancy. There seems to be something about being and feeling secure that allows you to live longer and income is certainly a part of that. It's stronger than many of the other variables, so that if you do multivariate analysis it actually overwhelms race as an explanatory variable and education as an explanatory variable. It really is a very strong variable in the process. High-income earners live longer which, of course, means they get Social Security retirement benefits for a longer period of time. If contributions were a flat percentage of earnings, then you'd have a regressive system. Everybody contributes a proportionate and constant percentage, but the rich people live longer and get a bigger benefit. So there has to be an offset. We know that there is. The question becomes whether we explicitly designed these plans to be progressive enough to overcome the fact that high-income earners live longer. So, have we designed enough progressivity into the system to overcome this new element?

Let me show you some evidence of this relationship between income and longevity. I have to thank Bernard Dussault and Steve Goss for much of this information. Bernard Dussault is the Canada Pension Plan (CPP) actuary in Ottawa. These graphs were produced by Bernard. They show the level of mortality graphed against the CPP retirement benefit that you are receiving.

Of course, your retirement income is a defined function of your career average earnings, so we have a number of things going on here. It's not enough to say that you're getting a bigger CPP benefit that's driving this. This is a reflection of your entire lifetime.

Chart 1 shows the male mortality, and Chart 2 shows the female mortality. The female mortality is more compact. There's not as much variation, but I argue in the paper that is partly because in the world we're describing, many females are getting benefits as survivors, and we may not be seeing the true reflection of the socioeconomic status of the females as much as we are seeing that in the male data. So the male data may actually reflect the reality more strongly than the female data.



I think there's even something here for the private sector. If there's this much difference in mortality among the different recipients of retirement benefits from Social Security, then maybe there's an underwriting variable for annuities in the private sector and perhaps it is a controlled underwriting variable.

U.S. data look similar. This comes from a paper by Duggan, so this shows survivorship rates by income level. The dotted lines go from \$25,000 of income to \$15,000, which is the midline. You can once again see the mortality difference for those with a lower income. I think it shows up a little nicer in the CPP data, but it's here, it's strong, and it's measurable in the U.S. Both countries show the same evidence.

CHART 2  
CPP GRADUATED FEMALE MORTALITY

Given that higher income earners live longer, is Social Security regressive? What are some of the countervailing forces that make Social Security explicitly progressive? Do they actually go far enough to offset this longevity problem? These are standard arguments. You've seen many of them before. Social Security also pays disability benefits and survivor benefits, and it tends to provide greater benefits to lower income earners, both because of the size of the benefit and the way it's designed, but also because the lower income earners have a higher frequency of attaching to these benefits, so both of those are reasons.

Also, we don't just have a Social Security system that is confined only to OASDI in the U.S. and The Canadian Pension Plan/Quebec Pension Plan (CPP/QPP) in Canada. We pay Social Security Income (SSI) Supplement in the U.S. and guaranteed income supplement and Old-Aged Security (OAS) or seniors benefit in Canada. Finally, benefits are taxable, and to the extent that taxation is progressive, the result can still be progressive, so you really should be studying net income when you answer these questions. I say that, because many of my learned colleagues who are not actuaries do make rather loud statements about the progressivity and regressivity of many of our systems. However, they tend to talk about pre-tax benefits and not post-tax benefits, and I think that's most unfair of them.

What if we accept those arguments, but people still want to just look at the retirement income benefit? Is the retirement income benefit progressive enough to overcome the difference in life expectancy? The answer is very clear in the U.S.—

your system of the eschewed primary insurance amount (PIA) completely overwhelms the difference in mortality and life expectancy. I have a couple of examples here. For workers at half the average industrial wage and the full industrial wage, the ratio of contributions is 2 to 1, and the ratio of benefits is 1.56 to 1, so that's a 28% relative advantage for the lower earner which is much larger than the difference in the life expectancy of these 2 workers. Even if you just look at the retirement income portion, you still have a progressive system.

It turns out that Canada is far more interesting. I'm going to have to explain the Canadian system, so that you get a feel for what we're talking about here. In the Canadian system, we have a guaranteed income supplement (GIS), which is based on need measured by income. Then we have a supplemental system called Old Age Security, but it gets clawed back if you're particularly wealthy. We have an earnings-related Canada/Quebec Pension Plan which is a function of earnings, so it actually gets bigger as you get up to a higher socioeconomic strata.

If we now ignore the GIS and only look at the Canada/Quebec Pension Plan, do we end up with a regressive system? It turns out the answer is still no, but it's because of something that's very subtle. I must admit I just gain more and more respect for the architects of these systems the more time I spend studying them. Of course, I'm giving them credit for having thought these things through and it may be that on a particular Tuesday afternoon they were fortuitous. If it was just chance, they sure rolled the die very nicely.

We have this thing in the CPP called the year's basic exemption. You don't make any contributions on the first \$3,500 of income, and you don't get any benefit at all if you don't earn \$3,500. If you earn \$3,600, then you make a contribution on \$100 and you get an earnings credit for that year of \$3,600. As you move along up to the average industrial wage of \$35,800, you can see that someone who is earning \$35,800 will not contribute on his or her first \$3,500. But can you see that you have a wonderful mathematical formula that says the ratio of contributions to what you gain in benefit is progressive? It's very subtle, but really marvelous.

Here's a calculation. The advantage to the worker at half the average industrial wage versus the full average industrial wage is 12%. The life expectancy advantage is 9%, so for those workers we just make it. I went further than that and studied several workers. This is Canada. Here are the life expectancies for those benefit bands that were in the graphs you saw earlier. The right-hand side shows the relative advantage in life expectancy. The relative advantage in life expectancy then narrows and gets smaller as you move up through these income bands. The top one is for an age-60 recipient, and this is for an age-65 recipient. The question is with the Yearly Maximum Pensionable Earnings (YMPE) how much advantage do we

have? You can see it's very large for those at the bottom stratum. I chose the break points, so this 1.48 is a 25% person and the 1.12 is somebody at half the average industrial wage. That was the number you saw a minute ago. There's a 12% advantage because of the YMPE, and there's a 9% life expectancy advantage for the wealthier person so the 12% advantage of the formula overwhelms the 9% life expectancy advantage, which means the CPP is still progressive.

At 75% the contribution formula gives a 4% advantage to someone at 75% of the average industrial wage and the life expectancy advantage of the wealthier person is 4%, so it's absolutely break-even for that one cell. Every other cell is still clearly progressive.

The final line in this actuarial drama of Hollywood proportions is that the government froze the YMPE in the recent Canada pension plan reforms. For this person who is absolutely just being matched in the advantages and disadvantages, if the YMPE is frozen and mortality continues to improve, this 4% advantage will go down and the 4% disadvantage or regressivity will go up. I may be back in a couple of years arguing that the Canada Pension Plan Retirement Benefit is no longer progressive.

After deciding that having more income might, in fact, cause you to live longer, I asked the question, why don't we just give everybody more Social Security? That would be good for population health as measured by life expectancy, so wouldn't that be good public policy? If you increase Social Security benefits, everybody lives longer. I did an experiment based on a hypothesis that I think I can defend strongly and it goes like this.

In 1940 the U.S. jumped ahead in the provision of Social Security by introducing OAS. Canada wandered along for quite some time with a lower level of benefits. The U.S. was ahead of Canada in Social Security from about 1940 to about 1966. Then in the 1960s a great deal happened in Canada because we had a growing population. We had a marvelous economy. We had rapidly rising wages, and we had a liberal government in the true sense of the word. This government introduced universal health care, the CPP/QPP, and the GIS in one parliament in the mid-1960s. Canada leaped ahead of the U.S. in providing economic security for its citizens.

If that's accepted, and I think I can make a strong argument that it would be, then you can go to the hypothesis that more Social Security is good for population life expectancy. I should be able to see more rapid mortality improvement amongst the aged in Canada over the period from 1940 to 1990 than in the U.S. Do you understand the hypothesis? But when I went to look at the data, they were not

there. In fact, U.S. mortality improved more rapidly than Canadian mortality in the period of 1940 to 1990. At the end of the paper, I say just throwing money at people won't make them live longer and I leave the question to you, and others, what is the magic button that we can press?

**Mr. Stephen C. Goss:** I just want to start off by saying that I've had the pleasure of reading Rob's paper a couple of times now, and every time I've read it, I've enjoyed it more and have found more of interest in it. I'm sure you will too when you go through it. As Rob indicated, the paper's really laid on a structure of three different items and I will, in my comments, not move quite so quickly over the very first part, even though it's not exactly tailored to what the nature of this topic is.

The first part is the discussion; it's kind of a literary review of money's worth analysis and Rob's analysis and viewpoints on money's worth analysis. The second one as Rob described is an analysis of the regressivity versus progressivity of the Canadian and U.S. systems. Finally, there is a very fascinating and new area that has perhaps a ground-breaking approach toward the theory of providing higher income at a higher age so it will tend to actually lower people's mortality at that stage.

First, on the issue of the money's worth review, Rob did a very nice job of telling about what is out there, in terms of various studies, and describing the different ways of looking at money's worth as has been done in the U.S. (to a great extent) and in Canada (to some lesser extent). One comment that I'd like to make though is Rob pointed out that several people have made a distinction between a money's worth ratio which is, in fact, calculated as the ratio of the present value of benefits to the present value of contributions made into a system. He suggested that that can conceivably lead to misunderstandings. That's a very, very valid remark and there certainly have been misunderstandings about it.

One of the particular misunderstandings that Rob cites relates to the choice of the present value discounting factor that one might select. I guess the point that I'd like to make about that is that if you look at these money's worth ratios, you'll see that the way they're actually calculated is, in fact, to select a present value discounting factor, so that you can put on equal footing for the time value of money, the benefits, and the contributions made within a system. In reality, you can look at these from a very different way that has nothing to do with present valuing. It seems to me that that's perhaps the more appropriate way to look at the so-called money's worth ratio. It should be done in a way that doesn't specifically deal with the present value techniques. The reason I think it's more appropriate is because it helps give us some insight into what the question is that these money's worth ratios are really attempting to answer.

If we talk to the average policymaker, of course, steer away from discussing present value techniques. We're not trying to answer the question of what is the present value of benefits relative to the present value of contributions. You tend to get many blank looks if you talk about that. On the other hand, you can say that what we're trying to do with the money's worth ratio is compare the stream of benefits that is available under a given system to what could have been provided under some other approach. In the case of the way that we do these money's worth ratios, in general, the other approach to which we're comparing a given system like the present law in Canada to the U.S. is what if people who had a defined-contribution plan had been simply putting in all their contribution dollars, their employer and employee money, into a defined-contribution plan that was investing solely in long-term U.S. government bonds? The people then would take the money out of this defined-contribution plan in exactly the same sort of pacing that occurs under the given plan against which we're making those comparisons.

What we end up with is a comparison of a nominal stream of benefits under the given plan that's in question versus the nominal stream of disbursements that would be possible from this defined-contribution investing in a long-term U.S. bond stream. For example, if the ratio is done technically, the present value is 0.75, which tells us that the plan in question will theoretically give you 75 cents for every dollar that could have been achieved had you been investing all that money in a defined-contribution plan. From that point of view, I think the message really is when these money's worth ratios are done what's really critical is to pay a lot of attention to what the present value discounting rate is. It's more than just a present value discounting rate that it represents. It's really the nature of the kind of plan against which we're comparing present law or some other plan that's primarily in question.

Many economists in the U.S. have long said that the proper thing to look at here is internal rates of return. There's much to be said for calculating the internal rates of return looking at the stream of nominal benefits payable under a system versus nominal contributions. Just solving for that rate of return will give you equality between the two. The only problem with that, and I think it's a fairly significant one, is that when you calculate the internal rate of return in general and in real terms, you're left with the problem of making a comparison. You get an internal rate of return that can be compared to what? If you have an internal rate of return for some past cohorts, during which time stock or bond yields were very high and you have an internal rate of return of 2%, you'd really want to be comparing it to what the alternative rates of investments were over that period of time. At a later time, if you also have a 2% internal rate of return, you must ask what you are comparing that to. It's not easy to determine over the lifetime of a cohort from the time of their contributions to when they receive their benefit.



What exactly was the comparative market return against which you would want to compare your computed internal rate of return? In some sense, I think it has a real initial appeal. It's relatively simple to understand that the internal rate of return is a percentage of interest rate. How to compare it in terms of what would otherwise be available under some other system becomes somewhat more difficult. So, the bottom line is I think that there is a great deal to be said for both of these approaches, but I just wanted to comment that I think we shouldn't sell short the concept of the so-called money's worth ratio.

Finally, I think Rob points out that all these methods are useful. The one important point about the money's worth ratio versus the internal rate of return is that at the end of the day there's a one-to-one correspondence between the two and if one plan is better than the other, it will be better than the other one on the money's worth measure. Ultimately, it really isn't all that terribly important which one we go with.

Rob did a comprehensive discussion of the regressivity or progressivity of the U.S. and Canadian Social Security systems. The U.S. Social Security System has a PIA formula that Rob said overwhelms the tendency towards mortality improvement. In 1995 we had this question arise at the Advisory Council for Social Security, and we scrambled to get material, which Rob has included in his paper, that showed relative death rates by income level, not just for aged, but for people of all ages. We wanted to do an analysis where we were looking at relative mortality rates by income at all ages, starting at one's working lifetime all the way through the highest ages. This was put into his model where we've normally done money's worth analysis using standard population mortality. That has been subject to criticism because it has not reflected these important mortality differentials by income. When we put in these differential mortalities that started at age 22 up to the end of life, we ended up narrowing the gap between the relatively high rates of return for low income versus the low rates of return for the high income by something like 10–20%. Before this work, people were suggesting that perhaps it would more than offset the tilt in the benefit formula. In fact, that really wasn't the case. It only offset maybe 10–20% in the calculations.

When we do these analyses of money's worth, should we really reflect the relative taxation that's going on? This is another issue that came up and was discussed a fair amount within the Advisory Council. In fact, we did some runs where we, in fact, took into account the relative levels of taxation under different plans to show what actually comes out at the end in terms of an after-tax disposable income.

When you evaluate what you get out of a life insurance plan or a private annuity, is that life insurance company or annuity company giving you a fair return? You don't

look at the return after the federal government or another level of government comes along and takes taxes out. You look at what the company took in and what the company gives you back. A case can certainly be made with respect to Social Security benefits that what you might want to look at is what goes in and what comes out from Social Security. It becomes trickier in the case of social insurance, because it's a federal government entity in both cases, so I think Rob's point is well-taken. The ultimate analysis that we ended up with for the Advisory Council was done on the basis of a pretax on the distributions. It is a very good point to raise.

The final thing that I want to address is some really interesting work. Mike will probably talk about this more. Rob, in his paper, made the suggestion that making changes to raise benefit levels for people in Canada and the U.S. might, therefore, result in lower mortality. We thought that there's a very strong link in terms of correlation between income levels and mortality, but suggesting that the higher income is causing changes in mortality did not seem like the primary feature. I think Rob has made a very good point, even though the analysis that Rob pursued didn't really bear that out. I think there might be some reasons for that. If I recall, the analysis that Rob put together really looked at the relative benefit levels versus income levels for people, and it primarily focused on the evidence of faster mortality improvement and the levels of mortality at the age level. The benefit levels being higher actually reflect the effect of higher income throughout life as Rob said. Rob attempted to look at the benefit levels and the relative mortality levels at higher ages. The relative mortality levels at younger ages are also a factor in this, and I'm struggling to try find what the point is here. Maybe it will come later.

There were so many other factors during the 1940–90 period in Canada and the U.S. other than just the effects on the relative levels of benefits under the Canadian and U.S. systems. It becomes very difficult to pull this out. I'm not sure that there's even any kind of careful regression analysis that could do that. There are so many factors. I think that this really remains an open question.

As you read this paper, you'll find some very, interesting discussion that Rob put in based on a paper by Wolfson et al, 1990, which suggested that the mortality difference by income is not, in fact, due to health considerations. It attempted to argue that, in fact, it really was very much an income-related item. The basis for this, according to Wolfson, was to look at a subset of individuals where the real earnings level later in life was increasing in real terms. This was within Canada. The argument was that if this is the case, then these people are not unhealthy. These people are in reasonable or maybe even better-than-average health if their real income is increasing. Therefore, if you're looking at those groups, then we don't have the argument that there is poor health. If you compare the high-income

people that have increasing earnings with the low-income people with increasing real earnings levels, and if you compare their relative mortality, we shouldn't be able to make the argument that one was healthier than the other. In fact, the data apparently indicated that the people with the higher income levels did, indeed, have substantially longer longevity than the people with lower income levels.

What struck me when I read this was that maybe the authors might have missed some of the point. The fact that people have increasing earnings levels doesn't necessarily increase their actual level of health, but I think it indicates what is happening to their health over time. If you have increasing earnings levels, that probably indicates that health is not deteriorating substantially, so the health status of the high-income and the low-income individuals in these groups was not deteriorating over this period. That does not suggest that the health levels of the high-income and the low-income individuals were not different. It's quite plausible and possible that the general health level of the people with higher incomes might have been better than the general health level of the people with lower incomes even though neither of them was substantially deteriorating over this period. I don't know if the study offers the possibility of exploring that additional point, but I think it would be one to look into in this regard.

**Mr. Sze:** Are we really asking the right questions? Why are we asking whether it's progressive, regressive, or adequate or whether it is equitable generation-wise? What is Social Security? In Bob Myers' words, it's like an education tax. You need to give so that other people can live, so pass the hat, everybody chip in, so everybody can eat from it. Why are we talking about progressive or regressive at all? I'd like to hear your opinions.

**Mr. Robert J. Myers:** In a sense, I think we are. It's not whether we are asking the right question, but we have to answer this question that so many people shouldn't be asking. We should be telling people that they aren't asking the right questions. I'm just delighted to see the masterful paper that Rob Brown wrote because it's such a good answer to some people who simplistically look at the question with tunnel vision. I saw a recent paper by a law professor out in California who simply looked at one fact and decided that the Social Security System ought to be abolished. He looked at the fact that black male babies born today have a life expectancy of 64 years. He, therefore, drew the conclusion, which everybody knows is meaningless, that every black male died at age 64. If they weren't going to draw benefits at 62, and they wouldn't reach 65, they would never get the benefit. Therefore, he concluded that Social Security was an unfairly discriminatory program, and the only solution was to eliminate it. Detailed and scientific papers like Rob Brown's are just the answer to those simplistic criticisms.

**Mr. Sanford B. Herman:** I want to just ask Rob Brown a couple of questions and make a comment. First, I'd like to address the subject of a proxy for income. My feeling is that income is highly correlated with education; therefore, throwing money at people at an older age isn't going to improve their education, cultural values, or the way they live. Therefore, that might be one of the answers.

The second thing is if you look at the cumulative effect of people's lifestyles through 65, there's probably not much you can do to change that mortality curve or differential going forward. Obviously, you have Medicare in the U.S. that begins to at least level off the health care system. It's like talking about someone who smoked to 65 versus someone who didn't and saying, "We're going to take that person and make him stop smoking cigarettes." The damage has been done, and there much you can do in those later years to bring mortality down and make it equal to the nonsmoker's mortality.

You didn't talk about the earnings test in the U.S., which, historically, was at one level before anything began to be taken away. Obviously, a person earning a lower income could work many hours before they ever even trigger this. A high-wage earner can work a few hours and will soon get cut back. With the move and the scheduled demise of the earnings test, does that change any of your analysis?

**Mr. Brown:** No, I don't think so. All of your points are valid. I'll start with that and maybe I'll go through them in the same order as you presented them. I give a long list of literature on studies that have been done trying to determine what is correlated with enhanced longevity. There are two or three studies that I can refer you directly to that say that income is a stronger explanatory variable than education. Now that does not take away from the fact that by the time you're 65, it's sort of all in the bag. It's a fait accompli and what you do with Social Security probably isn't going to change longevity.

There's an interesting public question. Perhaps what is happening is that people are being rewarded with longevity because they do many of the right things. If they're truly voluntarily not smoking, exercising, getting educated, and being aware of good habits, they should be rewarded. Should there be something in our Social Security and other aspects of public policy that says, do not take that away because you just happened to end up there by chance? It's not a reward for doing the right thing. Income, as an explanatory variable, overwhelms education as an explanatory variable.

I did not look at the earnings test in the U.S. It could be viewed as a claw-back. I must admit I view it as a definition of whether you are retired, and, if you view it that way, then you don't bring it into this kind of analysis. Did taking that away

change my analysis as well? I don't think so because I didn't include it in my analysis. Maybe I'm looking at it the wrong way, but that's my answer.

**Mr. Myers:** I think you have to realize that the retirement test gradually has been done away with. I think the original speaker sort of intimated that. The delayed retirement credits are gradually increasing that now, and as I recall, they are up to a level of 5.5% per year of delay for those currently reaching 65, and they will eventually get up to 8%. When it does get up to 8%, it's at about the actuarial equivalent, so there is no more earnings test. It's all taking actuarially reduced benefits at different ages before or after the normal retirement age.

**Mr. Goss:** If I could just add to Bob's point. Is the claw-back in Canada essentially a means test? If you have income levels at a given level, you simply have your benefits reduced and that's the end of the story. The earnings test in the U.S. is totally different from that; it's not anything like a claw-back really. We have two earnings tests. One that operates from age 62 for retired workers up to the normal retirement age, which is currently 65. In fact, if you have earnings above a certain level that is enough to have your benefits withheld; you end up adding a full actuarial increment to your lifetime benefit thereafter. The key is that you have your benefits withheld for that time, but in terms of your lifetime benefits, your benefit level is raised when you stop working. It's simply deferred to the point in time when you're actually retired. As Bob indicated, we're not quite there with this delayed retirement credit factor for people at the 65 and older age bracket or the 65–70 age bracket where people might have their benefits reduced and withheld.

I think one of the really interesting things about the elimination of the earnings test is that if we assume that people who are being hit by the earnings test are people with relatively high income who also have relatively low mortality and are relatively long-lived, then we will find that they would be advantaged by having their benefits deferred and would accept the 8% delayed retirement credit. If you live a very long period of time, you're much better off deferring your benefit start date and getting the higher benefit level. It's going to be curious to see the earnings test exempt amounts go up to the year 2002. I believe they will and they might eventually be eliminated. Will people understand this message, assuming the delayed retirement credit option still exists, and voluntarily decide not to accept their benefits until a later date? I think people in this room will do the analysis and decide that even without the earnings test, I might still defer the receipt of benefits.

Another quick point. Rob had asked earlier why do you ask these questions? I think that was primarily in relation to the sort of money's worth analysis. Mike's question was somewhat along the same lines of regressivity and progressivity, which is one of the things that becomes possible to look at through things like

money's worth analysis. Orlo Nichols has a historical perspective on when our office first started to do this money's worth analysis in very careful detail. We've almost lost the ability to compare these relative levels of benefits within a generation, which allows us to illustrate the extent of redistribution in some vague sense. The absolute levels of these have become much more interesting lately and indicate whether or not Social Security is a fair deal. That is perhaps a potential misuse of this system. If you want to look at it for the relative extent of redistribution across earnings levels, then actually the money's worth analysis is really good for that.

**Mr. Orlo R. Nichols:** I can make a few comments. Interestingly enough, the history of money's worth analysis goes back to something which is unrelated to all this—the issue of the state and local withdrawal from Social Security. There is also the issue of whether people who have been in the system should withdraw or stay in. What would they get from their additional benefits in relation to additional contributions by staying in the system? I realize that there are many problems with doing money's worth analysis, but it's the same argument as the regressivity versus progressivity debate.

There are many people out there who are asking the question and who are doing their own analyses. Most of the time they are doing them incorrectly. For instance, they are considering only the old age portion and yet are using the full tax in the OASDI, or maybe even the OASDHI tax. Of course, there are many people asking these kinds of questions. The latest example of that is when the 1995 Advisory Council had asked for a lot of money's worth analysis. This is why we're doing all of this.

**Mr. James C. Hickman:** A comment, a compliment, and a question. The comment is that in this kind of endeavor, we seldom can do planned experiments in the sense of intervening in a planned way to see what the effect is. Usually, we have to deal with observational studies where we try to find places where an intervention has occurred, and we didn't necessarily plan to see the effect. This puts a fundamental bind on our ability to be certain of cause-and-effect relationships.

The compliment is to Rob for, I think, doing an ingenious job of data analysis by comparing U.S. and Canada and the effect of money on mortality. Our ethics do not permit us to select at random a group of people and make them rich, make another group poor, and then march them through life. We would learn a great deal if we could do that. We have some of the same problems in medicine. In a sense, we make more progress in cancer therapy than others because people realize that it's very deadly and let us do things like that.

The question is for Rob. You've done a lot of reading on the correlation between the effects and mortality. Dr. Collins, the head of the National Institute of Health (NIH) Human Genome Project has said that all disease is genetic. Dr. Collins understands better than you and I do, that means each has a component. For example, about 5% of the people are apparently genetically immune to AIDS. Ninety-five percent is environmental, 5% is genetic. There are other diseases, like Huntington's disease, which is 100% genetic. This is a politically incorrect hypothesis, but as scientists we have to think about it. Is there a lurking variable here that's driving both income and health, so that increased income gives us better water systems, and sewer systems, and we all live longer? Has anybody, for politically correct reasons or scientific reasons, tried to uncover that lurking variable that may be driving both of these?

**Mr. Brown:** There's some really interesting literature that I had the opportunity to review when writing this paper. Let's look at what variables explain the improved life expectancy of the century. There's a huge debate going on in Canada right now as to how much tax money should go into a conduit labeled traditional health care delivery—doctors, nurses, hospital beds, and machines in hospitals. Where will the money make the most impact? Think about what caused life expectancy to improve this century. Pure water? Faster delivery of food? Pasteurization of milk? Better nutrition and more of an understanding of what is a healthy lifestyle? Traditional medical care delivery does not get into the top five variables. Then ask yourself where is the most potential for future improvement in life expectancy and traditional health care delivery doesn't get into the top five variables there either except for somebody speculating on some amazing discovery in a test tube somewhere that might be held by a medical doctor. We have some fascinating public policy questions here. There are now health care economists in Canada saying that spending more money on traditional health care might actually be perverse because you're taking society's funds away from other things that might have a bigger payback in life expectancy. It's a fascinating area. If you want to read more, I would recommend anything written by Bob Evans of the University of British Columbia who is one of the strongest proponents of this new philosophy. Another one is Frasier Mustard from McMaster University and the Canadian Applied Health Research. I love his papers because one of his co-authors is Dr. Frank, and I think Mustard and Frank are a wonderful combination.

**Mr. Sze:** If there are no other questions, why don't we talk briefly about the scope? Right now when people think about regressivity or progressivity they're always thinking about just the Social Security benefit, but is that the right scope? We have postretirement Medicare, we have unemployment, and we have disability and death. Why shouldn't we include those? Obviously, if we include those, the case is very strong that it is progressive. What do you think about that?

**Mr. Brown:** I'm going to jump in first because this is a similar question to the one you started with, Mike, which was why are we asking these questions? Steve and Bob, in a sense, have given the answer. We have to answer these questions because there are somewhat less informed people asking them all the time. Much of this paper is designed to give anyone who reads it information to then counter those kinds of arguments, which continue to be made. Somebody might have written a paper in 1955 that was completely debunked and, lo and behold, in 1962 the same paper's written by a different author and you have to debunk it again. In 1997 these papers are still being written, they're still being accepted, and they're still being published. You still have to go back and tell them they're wrong, unfortunately. That sounds sort of high and mighty and conceited, but I believe they're wrong.

**Mr. Sze:** That's right. It just seems like these questions should not even need to be asked, but people keep asking them. Therefore, isn't education lacking somewhere? It is not so much that there is a genuine problem that we are trying to seek a solution for; it is that the education is lacking and that people keep on asking these incorrect questions all the time.

**Mr. Goss:** Part of what's going on here is that we're in a generation that asks, what's in it for us? People are asking that kind of question more often than in the past. It's natural that people would be looking for this rate-of-return argument. One of the things that I think is sort of interesting in that regard is that in this latest Advisory Council, people of all political persuasions got together and decided unanimously that they would not suggest raising this taxable maximum level of currently \$65,000 and change above which you don't have to pay any taxes into Social Security. They decided they didn't want to raise that because it would change this money's worth analysis, and it would give even lower returns for the high-income people. There was a fear that they would not support the system. We have another social insurance plan in the U.S. called Medicare and the hospital insurance portion has exactly the same benefits structure for everybody, whether they have high-income or low income. It's true that high-income earners live longer and probably gain more access to benefits, but they pay into the system according to their earnings levels, and they get exactly the same benefit plan. Several years ago we eliminated the taxable maximum for the Medicare hospital insurance program, so that people who earned \$1 million or \$2 million paid 2.9% on their whole earnings amount. There was not an overwhelming outcry about this and that bit of legislation has stopped. It is curious that on the pension side of Social Security this is an overwhelming concern, but on the Medicare side, to date at least, it hasn't been.



**Mr. Douglas W. Andrews:** Since the people who are asking these questions aren't in the room to respond, I'll try to respond on their behalf. I think that the question itself is a valid question to ask, and I don't think that people should be criticized for asking the question. I think there has been good discussion about how the analysis and responding to the question or the attempts to respond to the question are unending. That's a fair criticism. But just step back and look at all of these Social Security programs. They are coming from taxation in many different forms, and it's realistic to ask about any taxation system whether it's progressive or regressive.

Mike, you used the example that we have to feed the people, so we should just pass the hat. I don't think passing the hat is the same thing as having a tax system. Passing the hat is a voluntary situation, but we have a mandatory tax in various forms, so it is useful to ask the question. We're starting from the premise here that it is valuable to have a Social Security system. In some cultures, particularly nomadic cultures, you just walk away from the older people on the ice flows when they're not able to keep up. We've looked at that and we've said, gee, that's a regressive system, we should do something else. We have a lot of taxes that go to deliver these benefits. I think that the question itself is valid. You know if you don't particularly like asking the question about the Social Security system, we could turn it to other areas. The education system has been mentioned a couple of times. Is the education system regressive or progressive? In Canada, at the university level, there's tremendous government subsidy in terms of the tuition fees, and who benefits from that? Do people who are educated live longer and do they have higher incomes? You wonder is that a progressive or regressive system?

**Mr. Myers:** I didn't mean to imply that people who ask these questions shouldn't ask them, or that they are just ignoramuses and they should keep quiet and do what's good for them or anything like that. I think it's very good that people ask these questions. As long as they listen to the answers and think about them, I think everything will come out all right.

**Mr. Sze:** I didn't say that these question shouldn't be asked, nor was I blaming anyone for asking the questions. What I was saying is the education process is lacking. The system is set up and working for the common good. I believe that there are people here who would probably believe in that. However, we have not educated the multitude out there to understand this. This is what is lacking and this is what prompted all the questions. I'm not saying that they shouldn't ask the questions, but what I'm saying is we have not educated them to the extent that they won't repeatedly ask these questions.

**Mr. Herman:** I have two comments on that. Number one, educating them about the nature of Social Security and the benefits relative to regressive/progressive

would be a good idea. I think the concern right now is that there's a credibility crisis that is perhaps not justified. The questions that people are asking are more along the lines of, "Am I going to get any money back or am I going to get what was promised to me," so this other issue gets pushed to the sidelines. I did have one other question. I'm very much aware of the impact of disability benefits and survivor benefits. It's very likely that one of the fixes of Social Security will be to raise the retirement age. Is that going to increase the pressure of these questions?

**Mr. Goss:** The answer that is generally given and is probably a very reasonable and fair answer is that if we were to raise the normal retirement age or the earliest eligibility age under the U.S. Social Security System, one of the possible answers is that the disability program will have to, in some sense, pick up the slack. Within the U.S. Social Security System and its disability plan, there are vocational factors, and there are considerations that are given to people as they get to higher ages (and they are not just medical factors) in terms of determining whether disability benefits are appropriate. I think it has been generally assumed, and we make estimates for raising the retirement age which presume that the difficulty of determining disability would be eased somewhat with higher normal retirement ages. Now, this doesn't answer the question altogether, because we do have a fairly typed definition of disability in this country. It's not an occupational definition under Social Security. It's defined as not being able to do any work in a substantial quantity within the economy. That's still a question. I think the disability portion of the program is able to offset some of the negative effects.

**Mr. Brown:** If you can educate people to see a logical link between improved life expectancy and the age of eligibility, then that becomes a hollow question. If it was fair last year when your retired life expectancy was 18 years, it's fair this year because you still have a retired life expectancy of 18 years even though you're retiring 4 months later. If you make that link and educate people about that link, it takes away the need to ask that question.

**Mr. Goss:** Rob mentioned that it is a very important link. There is the additional link of the morbidity or the health status of people. It raises this question: As life expectancy and mortality extend, is morbidity improving to the same extent? For example, what if all our mortality improvement were made by taking very sickly people, who would have died, and extending their lives. Rob rightly pointed out earlier that this is something that's relatively difficult to do and expensive to the health care delivery system. But if that's where most of our improvement in mortality were occurring, then the average morbidity in the population would not be improving by age or sex. It would actually be getting worse, and it would be very difficult to argue for raising the retirement age. In fact, increases in life

expectancy are a combination and are much more on the basis of improvement of health status. This is clearly an area where more research is necessary.

**Mr. Brown:** The age of disablement, on average, as actuaries would look at them, has been rising in parallel with life expectancy. This isn't anecdotal. The statistics for age of entry into extended care homes in Canada has been rising more and more. They used to take people in during their 60s. Now they don't see anybody until they're in their 80s. It isn't just because we have some home care facilities that we didn't have before; it's because the age at disablement and the population averages have been rising.

**From the Floor:** Someone at Syracuse University took a look at men who have retired early and men who retired after 65. Their health is not all that much different, but you would anticipate those who retired early would have been sicker.

**Mr. Goss:** That's different from your finding.

**From the Floor:** They did it for other reasons.

**Mr. John A. Beekman:** In 1985 Samuel Kotts at Case Western Reserve published a paper in *The New England Journal of Medicine* that was entitled, "Active Life Expectancy." At the time, I became very excited about that concept and dropped all of my other research items to focus on that. In hindsight, I didn't come up with significant papers, although there is one paper that I jointly offer that appears in *Actuarial Research Clearinghouse*. So far I have not seen Rob Brown's paper, but I intended to pick up a copy here. It sounds like a wonderful and exciting paper. I want to look at his paper in terms of that concept of active life expectancy. I may wind up doing nothing more than asking some questions in my discussion, in addition to saying that it's an excellent paper, but I do look forward to seeing what that concept could contribute to this learning process.

**Mr. Andrews:** I'd like to ask the question I wasn't able to ask before because of the process we were following. In the analysis that you did of improvement in mortality between the U.S. and Canada, I had expected that you were going to break that into the period from the 1940s through 1965 or so and try to see if there wasn't a greater improvement in mortality for the U.S. compared to Canada and then after 60, from 65 on to see if there was a greater improvement in mortality among Canadians compared to Americans. I haven't read your paper, so I don't know if that's how you did it, but it looked as though you did it over longer periods from the way you described. Did you do it in two separate periods?

**Mr. Brown:** The data are there. There's a data point every time there's a census. I used census data, so you can figure that out. I thought I would go back and start at the point when Canada was behind the U.S., so we should have had higher mortality. Then I would follow it through to the point where Canada was above the U.S. We should have had lower mortality given the hypothesis. You just look at the total time line rate of improvement. The conclusion, whether I'd broken it in parts or not, would have been the same. Am I missing something more subtle?

**Mr. Andrews:** I would not have thought that the conclusion would necessarily be the same. I would have thought that you'd be looking at relative improvements in mortality over each of the two periods. During the period from 1940 to 1965, when the U.S. was providing higher Social Security benefits, you'd expect relative improvements in mortality. However, from 1965 on, when Canada was delivering higher benefits, you'd expect greater relative improvements in mortality. I think you are looking at relative improvements in mortality rather than total improvements over the longer period. It's hard to know when they're ever going to be in sync, so you have to compare.

**Mr. Brown:** I understand your point somewhat better now. By using the paper, you can go back and do that analysis yourself.

**Mr. Sze:** Based on the analysis that we have done of U.S. and Canadian data from Social Security and the general population that Steve Goss and Bernard Dussault did, it seems as if during both periods the mortality improvement rate for Canada is lower than the U.S.

**Ms. Alice H. Wade:** You put up some graphs on the mortality by income. When I looked at what you put up for Canada, it seemed like the difference per income was greater at lower ages and then, when you put up the U.S., it seemed like it was greater at older ages. I was just wondering if you'd comment on that.

**Mr. Goss:** Rob, wasn't one mortality rates and the other survival rates?

**Mr. Brown:** One was mortality rates and one was survivorship.

**Mr. Goss:** That's why it's apples and oranges.

**Mr. Brown:** Yes. I think it's remarkable. I continue to be fascinated by this stuff. I guess it would be wonderful as an actuary to be able to help society achieve some breakthrough. You have all these spin-off benefits. The graph shows a narrowing in the differences as you go through this selection. You have to be more careful with age 60. That's the earliest possible retirement age with any benefit at all from the

Canada-Quebec Pension Plan. You do get some people who have been disabled coming in at that stage, so you have some heightened first-year mortality that can be explained away by removing the people who were on disability status as they came in.

**Mr. Sze:** There is an interesting thing about the graph; first of all, if you look at the older ages they're very close together. Ages 75–80 and above for most of the income groups are very close together as well. It's only in the initial years or earlier ages that it seems like the gap is widening. Somebody needs to study the very low-income group. Their mortality is substantially higher for many ages, and there must be some cause and effect that's related to more than just income. It is quite possible that these people may not have a full career contribution, causing low CPP income. That probably needs more study.

**Mr. Andrews:** When you were talking about the variation in mortality by income levels, I was thinking about much broader income levels than what we have here. This is Canadian data, so this is up to the YMPE. It would be interesting to know when analyzing the lower graph which are the people who are at the maximum CPP as you added in other forms of income that they have, such as, special retirement and investment income, to see if it would move down even lower with the higher income.

**Mr. Brown:** There are other studies that have been done by income levels that show that it just keeps on going. Whatever strata you define, you're going to find lower mortality.

**Mr. Sze:** I was talking to Bernard Dussault, who is the chief actuary of the CPP. They have that kind of longitudinal data, and we might be doing some research there.

**Mr. Myers:** This has been an excellent session at demonstrating what actuaries can do in the analysis of data. It shows that you shouldn't just look at things on the average or in the aggregate. You have to look at the underlying data to see what some of the causal effects would be. I've been interested in recent months in a number of papers. I haven't studied them carefully yet, but these papers show that the differences between African-American mortality and white mortality or total mortality are entirely due to income levels or past income levels. Of course, when we talk about income, we are not just referring to current income. This will indicate that, hopefully, over the years, as we have more and more effects of racial equality, the differences between African-American mortality and white mortality will not only continue to diminish, but eventually may be completely eliminated.

**Mr. Brown:** There's another paper that says that if you look at income, it explains away the race difference.

**Mr. Goss:** Sandy, I appreciate the point you made earlier about the education being very important as opposed to just benefit levels at later age because it jogged me to remember what my notes were. From that point of view, if we were to raise benefits that might have some little effect. People might be able to purchase more health care at that age. Changing the income levels to make them higher for people throughout their lives probably has a bigger potential payoff in terms of purchasing education, better nutrition, or whatever.

**Mr. Brown:** If you're talking about Social Security, is it more important to invest the trust funds in stocks or bonds or keep a 15-year-old in school and teach him or her computer skills? Is it better to keep the 15-year-old in school and teach him or her computer skills. That's mathematically more important to Social Security as a system than what you do with the trust funds in the stock market. It is sad that all these marvelous minds are being kept busy answering questions that really aren't questions. The questions are good, they're valid, and they should be answered, but I wish Steve Goss could do something far more productive for the world and for the citizenry of the U.S. than churn out rates of return studies. Of course, because Steve is the modest civil servant, he can't say what he'd really like to do, but somehow I think he might agree with me.

**Mr. Goss:** Rob, it would afford you the opportunity to do the same rather than pursue this. Rob, do you think the U.S., and perhaps Canada has moved in the direction it has in these areas because of a repugnance against taxation? If we want to move in the direction of enhancing the educational abilities of our countries and create a better capital stock, a better educated and prepared labor force in the future, we're attempting to do that primarily through taxation. Education is primarily public education in this country. Unfortunately, the investment in the stocks, as you indicate, would have some potentially positive effects on productivity and perhaps for the economic pie in the future, but not that much is done by way of encouraging corporations to go out and enhance education at younger levels. So, we have taxation and the investment in stocks, but taxes are not a popular choice.

**Mr. Brown:** They sure aren't, but I think some people misread the benefits from taxation. I am a guest in your wonderful country, but if you don't start to understand the connection between lack of education or educational opportunities and violence in the streets, then you're never going to find out that paying more taxes could mean that I could go for a walk outside the Washington Hilton at 11:30 at night which, by the way, I do not do. I do not walk in this city late at night. I do in Toronto, but I do not in Washington. I think there's a connection there. If we

can educate people about the total value of the transfer of resources, then maybe they would change their attitude about the payback for tax dollars.

**Mr. Andrews:** Rob has opened the discussion to where we ought to be investing the Social Security fund if, in fact, there was one. The argument is that we ought to be investing it outside this country in countries that are going to be growing and are more productive. They should be countries that have different demographics than our country, so that they'll be able to pay back when we need to liquidate. He continues to look within the closed system because he compares stocks and bonds in the closed economy to education in the closed economy. One might argue that with the state of our education system today, we'd be better off not investing in our education system, but investing in other countries' education systems where they're learning more and are going to have higher productivity. The instruction that our 15 year-olds are getting today is not really a good investment.

**Mr. Brown:** Yes. I can follow the logic of that argument, but you're not going to be able to walk the streets at night.

**Mr. Sze:** I believe that Social Security is not about today's productivity. It's about productivity 20 or 30 years from now. You invest now so that the productivity will increase 20 or 30 years down the road. What is the payback from overheating the stock market by pumping more money into it, assuming that people will save and invest in stocks and bonds? It only means that productivity would increase now. More things will be produced. You consume more today. You build up your appetite for consumption today and raise the platform, so that 20 or 30 years down the road, you will be dissatisfied. By then, you won't have the resources to consume as much. Productivity 20 or 30 years down the road should be built on the investment in education and research. If you have invested in those kinds of things, you won't have money to spend now. You don't build up your appetite now, so that your platform of expectation for expenses 20 or 30 years down the road would not be escalating. At that time, your research and your education would have paid off. Maybe that is the way that we should be going instead of trying to put money in the stock market.

**Mr. Goss:** I would interpret what Doug suggested about investing in the stock market as accomplishing exactly what he was suggesting, which is the idea of investing abroad. If you invest in the stock market, there are many multinational corporations out there. Net investments go wherever the rate of return is the greatest. Investing in stocks will achieve the highest return and movement abroad will go there if there are better returns. Accomplishing what you're suggesting would occur by investing in the market. What Rob and Mike are asking is, in a country like the U.S. and Canada, wouldn't we be better off investing in our own

and really building for the future a better capital stock through the quality of our labor force? I suspect the politics in Canada are different from how they are in the U.S.

**Mr. Sze:** I don't think that you can get more taxes, especially in Canada.

**Mr. Brown:** The challenge is to improve the quality of our labor force in the future. Do we have good ways of doing that other than through the government sector, which is not a popular way to spend money in this country now?