

RECORD, Volume 27, No. 2*

Toronto Spring Meeting
June 20–22, 2001

Session 30PD A Different Look At Social Security Systems

Track: EDUCATION AND RESEARCH/INTERNATIONAL/PENSION

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Recorder: KRZYSZTOF M. OSTASZEWSKI

Summary: Participants learn about the demographic, economic, and investment aspects of Social Security systems. Participants are given a chance to discuss alternative perspectives on Social Security systems, including such topics as demographics, microeconomics, and investment theory.

DR. KRZYSZTOF M. OSTASZEWSKI: This is a panel discussion that takes a different look at Social Security systems. I'll introduce a group of distinguished panelists. Rob Brown needs no introduction. If you haven't heard about Rob, I'm a bit surprised. He will speak about relationships of demographics and prefunding versus pay-as-you-go systems. Our second panelist is Dr. Leslaw Gajek, who is the now former president of the Social Security Administration of Poland. Poland was one of the countries that instituted a comprehensive pension reform mainly related to the reform of their Social Security system in 1999. Dr. Gajek was instrumental in that reform. He will speak on some important aspects of that reform. We know that reforms like that have been happening all over the world. This was one of the crucial ones in Europe recently. I'll discuss my research of the relationship of Social Security to capital markets. We will start with Rob.

DR. ROBERT L. BROWN: The audience I'd like to reach consists of the people who will be involved in discussing the future financing of OASDI in the United States. There is quite a debate going on now with the new president on whether or not part of OASDI should be changed into individual accounts, and everything that goes with individual accounts. We have two countries, at the very minimum, represented in the audience, and I wouldn't want to leave the Canadians out, as I

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[†] Mr. Gajek, not a member of the sponsoring organizations, is President of the Social Security Administration of the Republic of Poland.

am one myself. While I might be focusing on future amendments to OASDI, it's also the case that my comments bear the same relationship to recent events and changes to the Canada/Quebec Pension Plan.

For those of you not aware, the Government of Canada reformed Social Security in 1996-97. It rapidly increased the contribution rate to Social Security to create a larger investable fund. It will grow to something on the order of \$120 billion, or about five years' cash flow for the entire system. That's now being invested in private markets. They have now had a little bit more than a year of experience. Last year, they lost \$850 million. So that was a good start.

The question that I'm presenting to you is: Will prefunding solve many of the problems now facing social security? I'm going to present you with a number of propositions and hopefully lead you through them to a point where, at the end of my time, you might believe something different than what you do right now.

The first thing I want to say is that Social Security is not a large private pension plan. It is instead a macroeconomic wealth transfer scheme where workers share part of their product with retirees. This is true whether the plan is prefunded or not. This is absolutely the essence of Social Security. It's a transfer of goods and services whether it's prefunded or not. I like to use an analogy to water. We all understand water, and we can study it. If you study it at 99 degrees Celsius, at 50 degrees Celsius and again at 3 degrees Celsius, you might think you have a pretty good understanding of water. What you want to do is come back to Toronto at the end of January and in early February. The water will be quite a different entity. It becomes rock hard. We spend months playing hockey on it. If you want to go fishing, you have to drill a hole in it. If you fall, it hurts. What I'm trying to say here is you can't understand ice by studying water. In the same way, if your understanding of Social Security is an extrapolation of what you know about private pension plans, then I think you understand Social Security about as well as you understand ice by studying water. There is a disconnect when you go to a macroeconomic system. You have to prefund private plans because the sponsor can disappear. The company can go bankrupt. What does it mean if the government disappears? What does it mean if the country goes bankrupt? I can tell you, at the very least, that the financing of Social Security will not be your number one problem the next morning.

We have to do a little bit of actuarial science here. I present to you the contribution formula (Equation 1) for a fully funded individual account, where the individual makes contributions from age 20 to 65, the integral in the denominator, and receives benefits starting at age 65 of \$1 per annum. That's the integral in the numerator. The contribution rate is a function of longevity. The l 's are life table survivorship l 's, so these ratios give you the probability of survivorship. In some sense, it is a life expectancy. The other important factor in determining the contribution rate is the force of interest δ , and I call it a real rate of interest so that we have inflation indexed benefits. The discount rate is extremely important in determining the contribution required to prefund an individual account.

Equation 1

$$C = \frac{\int_{65}^{\infty} e^{-dx} I_x dx}{\int_{20}^{65} e^{-dx} I_x dx} \quad \text{assuming contributions start at age 20}$$

where: d is the real rate of interest earned on the invested funds, after inflation (both before and after retirement)

and I_x is the probability of being alive at age x .

If we switch to Social Security, the contribution rate required in social security is somewhat the same and remarkably different all at the same time.

Equation 2

$$C = \frac{\int_{65}^{\infty} e^{-rx} L_x dx}{\int_{20}^{65} e^{-rx} L_x dx}$$

where: r is the rate of increase of national wages on which contribution are made

and L_x is the actual number of people in the system aged x .

We have workers aged 20 to 65 making contributions to Social Security, and that is the integral in the denominator. It's the number of workers who contribute that is important. It's the actual number of people in the system at age X . Notice that this doesn't mean everybody aged 20 to 65. There are a number of reasons why you might not contribute. One reason is you might not be in the workforce. You have to be in the workforce before you are counted, in terms of the contribution rate to social security. Second, even if you're in the workforce, there might be particulars about the contribution formula that mean that you do not contribute. For example, in Canada, you don't contribute until you make at least \$3,500 a year. You might not contribute, even if you're in the workforce. Third, you might be in the workforce, but you might hide the fact that you're in the workforce by being part of the underground or cash economy. This is a very real problem in many countries of Europe. In Italy, the contributions to Social Security only come from about 20% of the people who contribute, which is similar to Mexico. There are all of these issues as to the capital L in the denominator.

Let's look at the numerator. Say we pay an elderly person (someone age 65 and over), \$1 a year. It's the number of people aged 65 and over who have somehow qualified for Social Security that matters. There is an actuarial discount rate, and it is there if national wages rise more rapidly than benefits. So if the economy is growing, then there is a discount factor, and this can be important in deciding whether you want to be paid as you go or fully funded as in the previous equation. Notice that what is important is the rate of increase of national wages on which contributions are made, and the ratio of the elderly to the people who contribute.

The equations look remarkably similar. For individual accounts, the contribution rate is mostly dependent on the real rate of interest. For pay-as-you-go, the contribution rate is mostly dependent on the ratio of elderly to contributors, with a secondary dependence on the rate of growth of national wages.

These are the critical parameters in determining the contribution rate required for individual fully funded accounts or a pay-as-you-go macroeconomic Social Security system. I want to say is that there is nothing inherent in these parameters that says that one system is more stable than the other. A fully funded system is as stable as real interest rates are stable, and the pay-as-you-go system is as stable as demographics are stable. Which would you rather predict today: real interest rates in 2030 or fertility rates in 2030? I'd say either one is a fool's game. I'm here to admit that I can't do either, but I understand how important that admission is because that is the essence of the stability of the two systems. If somebody says to you that inherent in full funding is stability, it's garbage, unless they can tell you what the real rate of interest is going to be 30 years out. There's nothing that says a fully funded system is, by definition, and in and of itself, more stable than pay-as-you-go.

In a country with a corrupt government, the only thing riskier than pay-as-you-go Social Security is fully funded Social Security. In fact, sitting in the first row is a Canadian actuary, Bruce McDonald, from whom I borrowed this very heavily. Bruce goes so far to say that the only thing that is scarier than pay-as-you-go Social Security is fully funded Social Security. Would you rather have your promises not fulfilled in a pay-as-you-go system, or would you rather have someone that's gone with your real money in a corrupt fully funded system? Of course, we're not ever here talking about Canada or the United States, but some other countries in the world do have to worry about these things.

If we look at the demographics in Canada and the United States, we see what you already know, which is that life expectancy is improving very rapidly, especially at age 65 (See Tables 1 and 2). There is a very rapid improvement. The Canadian life expectancy is just a little better than the U.S. life expectancy. It's about a half-year better. It turns out though that that's a bit of an anomaly. If a Canadian dies after about the middle of November, nobody really knows until the middle of March, so we pick up almost a half-year of life expectancy. But don't worry about that. It's no big deal. The key thing here is that life expectancy is rapidly improving.

TABLE 1
LIFE EXPECTANCY IN THE UNITED STATES

Year	At Birth		At Age 65	
	Male	Female	Male	Female
1920	55.6	57.6	12.2	12.7
1960	66.8	73.2	12.9	15.8
1990	71.8	78.8	15.1	19.0
1998* (est)	73.4	79.4	15.7	19.2

Source: U.S. Life Tables

*OASDI Trustees Annual Report, 1999,p62.

TABLE 2
LIFE EXPECTANCY IN CANADA

Year	At Birth		At Age 65	
	Male	Female	Male	Female
1931	60.0	62.1	13.0	13.7
1951	66.3	70.8	13.3	15.0
1971	69.3	76.4	13.7	17.4
1991	74.6	80.9	15.7	19.9

Source: Statistics Canada, Life Tables, Canada and the Provinces (several)

The second thing is the dramatic shift in fertility rates. Until very recently, Canada could easily have been labeled as the U.S. with just a slight change, but the shape would have been virtually identical (see Figure 1). In 1986, the baby boom generation in Canada was entering the work force. We are probably in the very best of demographic times in 2001. If you add 15 years to the data, everything would shift upward 15 years. What you have for the elderly dependents in both Canada and the United States are the World War I and depression cohorts. Those are very small cohorts. Your labor force then has available to it the entire baby boom generation. So the baby boom generation is now entirely in the labor force and at least employable, if not employed. Then, at the base of the demographic, what's supposed to be a pyramid is more like a python swallowing a pig. The base is another small cohort called the baby bust group. What is happening is interesting. In Canada, the fertility rate has continued downward. We're now at about 1.55. In the United States, it's sort of turned. It's now at about 2.09. It's really interesting because we were just rated exactly the same through the centuries until the last ten years. It then causes you to stop and say, why are we so much alike in so many ways? What explains the departure? It's something I'm working on right now, but I really don't have an explanation as yet.

Krzys has a macroeconomic market asset future option pricing theory that might explain it. Krzys just said Canada is becoming like the rest of the world. The fertility rate in Italy is 1.25. It is 1.9 in Poland today. Let me take you back to a

period of time when Canada designed its Social Security system. That would have occurred in the 1960s. At that time, a wise actuary would have assumed a long-term senior dependency ratio of about three workers for every elderly dependent. So the senior dependency ratio was 0.33, one elderly for every three workers. There was an annual increase in real wages of about 2% per annum and real rates of return after inflation of about 2% per annum. If you had then priced out the Canadian Social Security contributory plan, the Canada/Quebec Pension Plan (CQPP), it replaces 25% of wages up to the average industrial wage. The pay-as-you-go, once mature, would cost 11% of payroll; the fully funded system would cost 16.5. Things didn't stay that way. The future is not what it used to be.

If you did long-term assumptions today, you'd probably use a 0.4 senior dependency ratio. That's 2.5 workers for every elderly person. The increase in annual wages has been not very good in Canada; it is about 1% per annum real growth, and real rates of return after inflation have been relatively high. It is about 4%. I think a lot of actuaries would agree that those are relatively good long-term assumptions. Under those assumptions, the same plan would now cost 14.5% of payroll in pay-as-you-go and 7.2% under fully funded. You can see why there is interest in full funding.

I want to point out something. The people that initially chose pay-as-you-go for OASDI and for the Canada/Quebec Pension Plan were wise. It was a wise decision given the realities of the day. Of course, there are no stupid actuaries, but they made good decisions based on the evidence they had. Today full funding makes a lot of sense. What will this table be 30 years from now? Do you know?

The fact that the system started in pay-as-you-go was not a mistake, but just as funding makes more sense today, it is entirely possible that economic variables could shift and once again favor pay-as-you-go.

One of the arguments you're going to hear in the debate around individual accounts for Social Security is that a fully funded Social Security system makes you demographically immune. You go down to Washington, get a bank account, or in fact, invest yourself. You phone up your broker and ask how your Social Security account is. You've got \$3,871.42. Therefore, you don't have to worry about the ratio of elderly to workers. You build up your own account, and you retire on it. I would suggest to you that the probability of your getting money from Social Security increases if it's fully funded. What happens if everybody retires, and no one is left in the labor force? My money won't buy me anything. What happens if everybody wants to sell their shares in their mutual funds the same day I want to sell my shares? What happens if everybody wants to sell his or her two story, four-bedroom house the same day I want to? How am I going to play my golf game if there's nobody there to cut the grass?

Many of the demands of the elderly are labor specific. I need health care, I need nursing, I need golf games, and I need restaurant meals. I am just as dependent on having a new generation of workers under a fully funded Social Security system as I am under pay-as-you-go system. Totally funded may increase the probability

of my getting these pieces of paper, but the ability to consume is dependent on the next generation, whether it's pay-as-you-go Social Security or fully funded Social Security.

Phil Shieber looked at the net flow of assets into and out of pension and retirement savings. There is one reason for the good stock market. Recently, the baby boomers are saving for retirement, and there has been a net increase of funds chasing equities in the stock market. The increase in funding turns a corner, if you assume that the way we fund pension plans today continues through the liquidation of the baby boom. In the United States, at age 65, you tend to buy annuities. In the United States annuities tend to be backed with bonds, not stocks. You can change this a bit if you allow people to stay in the stock market a little longer, but this reality tells me that you're dependent on the next generation. Somebody has to buy your stock, somebody has to buy your bonds, somebody has to pay your coupon interest. If you're going to tell me that you have demographic immunity because you have fully funded Social Security, I have a bridge in Arizona that I'd like to sell you.

In my mind, if prefunding of Social Security is going to do any good, it needs to create three changes in the economy. First, prefunding must increase gross national savings. Second, those increased savings must be invested so as to increase worker productivity, not to keep the brother of the president happy in Florida. Prefunding of Social Security must be the best way to achieve the first two goals; if it isn't, there must be a better way. Why don't you encourage employer-sponsored pension plans if that's a better way?

In the 1980s, pension assets increased remarkably. There's no correlation between pension savings and gross national savings. In that period of time, what happened to cause us to save all this money in pension funds, but to not see an increase in gross national savings? What was happening was most of these governments were running deficits. Every time an individual saved a dollar, the government took it and spent it, and gross national savings at the end of the day didn't go up. Just having funded pensions doesn't necessarily mean you have increased gross national savings. In fact, the best way to increase national savings is to pay down the national debt. We appear to be running surpluses now, but most of the surplus in the U.S. in the unified budget is Social Security. Bush is about to give away all the surplus in tax cuts. Are we going to be able to pay down the national debt?

Another thing that we have to be concerned about is if you fully fund Social Security, and all of the assets are government bonds, then what have you achieved? As you think about this for more than 30 seconds, what's the cash flow? In pay-as-you-go Social Security, the workers contribute Wednesday morning, the elderly get benefits Wednesday afternoon. There are no assets. If there's a baby boom, then there's a problem, because the pay-as-you-go funding is going to have to increase when the baby boomers retire. If all of your assets are in government bonds, what's the cash flow? What happens when the baby boom generation retires? They are going to cash in their bonds. Who is going to have to

come up with the cash to pay for those bonds? It's going to be the workers of the day.

If you think about it, if Social Security contributions come from your right pocket and taxes come from your left pocket, then all you've done is transfer it from one pocket to another pocket. The timing and the amount of the cash flow are absolutely identical. It's absolutely identical on a macroeconomic basis. So you've done nothing macroeconomically.

Let's get into some of the other issues around individual retirement accounts. First, small accounts have very high administration costs. I don't know how President Bush would answer this. I didn't go to a third world country for these statistics. These come from Australia. Australia has gone to mandatory retirement with full funding. The administration costs are \$1,000; 14.82%; \$5,000, 2.96%; \$10,000, 1.48%; \$20,000, 0.74%; \$30,000, 0.49%. How is a poor person going to gain from this system, even if they get the supposed higher rates of return from equities or private investments? It's just going to be sucked up by agents, commissions, advertising, and head office administration. It seems that you have to answer that question. Under individual accounts, you pass all of the variables, like the mortality variable and the life expectancy variable, on to the individual. However, the investment variable now gets carried on one person's shoulders. There's no risk sharing in individual accounts.

What would happen if you had made constant 6% contributions into an individual account and put it in the stock market and earned the Dow Jones index? Here's how you could have retired at age 65. You can see replacement ratios are over 100%, but you can also see replacement ratios of less than 20%. This is the magnitude of the investment risk that is now being borne by one individual. It is not being risk shared as in the defined-benefit system. How are you going to answer that question?

There's nothing in the history of any country's Social Security system or in the literature that says that, inherent in the system, Social Security prefunding leads to higher national savings rates or improved worker productivity.

I'll go through the next part quickly. I've done some work at the University of Waterloo, my home campus, where I've looked at the aging problem in the Canadian context. I've looked at historic retirement ages. What is interesting is people are retiring earlier and earlier, and my concept was on a macroeconomic system. You can retire as early as you want as long as everybody has enough goods and services to be happy. The workers have to take care of themselves. They have to take care of the children, the unemployed, and the retired elderly. As soon as you can do that, you can retire.

We draft the expected retirement age, which is based on taking care of children, the unemployed and the elderly on a macroeconomic basis. We draft that against actual Canadian statistics on retirement. The graphs aren't all that exciting, but we went into it with the preconceived notion that there would be a lag between changes in wealth transfer requests and retirement age. Why would there be a

delay? There are at least three things that happened. First, there's a shift in the demand for wealth transfer up or down. The government, the employer, and the worker have to realize that there has been a shift. Then they react. The government might decrease taxes. The government might enhance Social Security, or it might go the other direction if there's more demand for wealth transfer. The worker sees that his employer just made his pension plan easier to retire early. He sees that taxes just went down, and he can retire earlier. So there are three stages of delay. We actually ran the model to optimize the fit and chose the optimal fit with a six-year delay between the change in demand for wealth transfer and the age of retirement. This is what happens with a six-year time delay (Figure 2)

There's a 92% correlation here. You'll even notice that they both go up when they're supposed to go up. This was because of the recession that took place in Canada, which increased unemployment immeasurably. On a macroeconomic basis, you get to retire when you satisfy the need for wealth transfer. If that's true, then what does the future look like when the baby boomers retire? We actually continue to retire or have the ability to retire earlier and earlier until 2006. That's when the leading edge of the baby boom retires. You're going to have to stay active longer.

When you can't sell your house and when you can't sell your bonds, and when the cost of the golf game goes up, and the cost of a back massage goes up, on a macroeconomic basis, the only response is to work a little bit longer. We don't need newspaper headlines stating that this has been declared. The other good news here is this assumes zero percent per annum productivity improvement. This is a worst-case scenario.

If we get productivity improvements, things are better. There's a discount rate. Canada has had 0.9% per annum productivity improvements. If I put that into the model, then retirement ages can fall until 2016 until they reach about 60.3. Then they have to rise less at about a half a year between 2017 and 2037. Then the baby boom starts to die and productivity increases take over. We're back to nirvana.

What happens if we have 1.5% productivity improvement? Being the actuary, I had to determine what productivity improvement would mean without an increase in the retirement age. I gave it to some students and they gave it to me to four decimal places. A 1.2895% productivity improvement means the retirement age never has to rise.

In fact, the shift in the labor force retirement age from 60.3 years in 2017 to 60.9 years in 2034 with normal achievable levels of productivity increase would result in stable demand on workers for wealth transfer and 1.9% productivity improvement would mean the retirement age would never have to rise. In short, proposed means to higher levels of funding in both Canada and the U.S. require further public policy debate. Society should not rely on fuller funding of Social Security to solve the problems inherent in providing retirement income security to an aging

population. The three ingredients that will provide security for Social Security are a healthy and growing national economy, an efficient and accurate records administration system, and an honest government. These cannot be attained by changing the way you finance Social Security. In fact, in my mind, the method of financing Social Security might be close to irrelevant to its future security. That's my different look at Social Security.

DR. OSTASZEWSKI: We had numerous reforms and changes in Social Security systems throughout the world that started more or less with a reform in Chile that was put in place on May 1, 1981. One of the recent ones was the reform in Poland, which started in 1999. We have a speaker who will tell us about the nature of that reform. It was a very interesting reform because it utilized a lot of actuarial science and elements of the Chilean reform, and elements of the reform in Sweden. In many ways, it was very multinational and actuarial. We welcome Dr. Gajek.

DR. LESLAW GAJEK: I would like to thank the organizers of this session who invited me to present some ideas concerning the Social Security reform in Poland. As Krzys said, this reform is one of the most fundamental and perhaps the most fundamental in Europe. It happened that I was one of the experts when the reform was planned. I must say that the system as is wasn't planned. The way it's being implemented is not exactly the same, and I think it is more of an issue in this Social Security reform. It happened and we have two years of implementing this reform. I have some interesting observations concerning such reform.

Perhaps you know that the Polish economic system used to be a planned command economy that was also related with the Social Security system. When the changes started in the beginning of the 1990s, there were real concerns regarding the Social Security system's stability and solvency. There was the lack of reform of the system that increased the risks, and lack of diversity that had slowed down the economy. This reform was even termed, *providing security through diversity*.

Diverse sources of the pension benefits are promised from the system, and this reform is based on the following principles. First, there are three pillars instead of one state Social Security, which was previously the only source of a benefit. We have the first pillar that is obligatory and that is based on pay-as-you-go rule. But what has changed is the rule of calculating the contribution and benefits. It is a defined contribution pay-as-you-go instead of defined benefits. The second pillar is also a defined contribution. The third pillar is the one that is organized by the employers or the employees. It consists of voluntary pension plans. The second point or the second characteristic of the new system is that it is much more related to the contribution. Benefits are much more related to the contribution paid by the employees. So its solvency, in the long term, is much more stable. There are also changes in the possibilities of early retirement. Normal retirement age is 65 for men and 60 for women. In the target system, there is no possibility to retire earlier.

In the new system, any pension privileges were eliminated. In the old system, the

rule was that almost every professional group had a kind of privilege, and, in effect, the average retirement age was lower than the one that was stated. We are in a transformation period, but in the new target system, there will be no privileges for any profession. The whole system is actually in a transition period from the defined benefit one to the defined contribution one.

I will give some details concerning the financial aspect of the plan. First, the contribution rate is 36.59% of wages before contributions, and it consists of several parts: the contribution for old age insurance is 19.52%; disability and survivors insurance, 13.00%, work injury, 1.62%, and sickness and maternity is 2.45%. The contribution for the old age insurance is split into two parts. The first part is for the first pillar of the system, and it amounts to 11.22%. The second part is for the second pillar, operated by private open pension funds for which the rate of contribution is 7.30%. This is also a special 1% contribution for the demographic reserve fund, which starts from 2002. The old-age and disability contribution is divided equally between employee and employer, but the contribution for work injury is paid by the employer, and the one for maternity/sickness is paid only by the employee.

Recent health care reform introduced a contribution for health insurance, which is also collected by the Social Security Administration of Poland. Such a contribution is currently 7.75% of taxable personal income. Finally, pension reform introduced a special upper limit for old age contribution equal to the multiple of 30 times the average salary. It was planned that this limit of contribution would provide room for the possibility of a third pillar voluntary old age insurance that was organized by employees or employers.

What is the experience of the reform so far? We have a structural deficit in the first pillar due to the transfer of some contributions to the second pillar. This deficit must be covered by the government. It has been covered by the revenues from the privatization of the national economy. In some sense, we have achieved a great success, as it was expected that about six million employees would choose private pension funds in the second pillar instead of the state system. The number of pension fund members turned out to be about ten million. This is a success, but it is also a source of a problem. It turns out that the reduction of contribution income due to the introduction of the upper limits, the so called 30-times-effect, was underestimated greatly. We have developed an additional deficit because of this effect. Also, the change of the system required special information technology solutions, and there were several difficulties in implementing these information technology systems. Because of this problem, there were some difficulties in collecting contributions from some companies; in particular there were special problems with collecting contributions from state-owned enterprises.

There was a crisis of public finance in Poland in 1999, and this was perhaps the reason for the change of the President of the Social Security Administration. When I came to the Social Security Administration in 1999, we prepared a new strategy and new approaches to the contribution payers. We also planned to increase the effectiveness of contribution collection. In the year 2000, the effectiveness in

contribution collection has increased greatly, and we achieved an effectiveness rate of 98.8% instead of 95.8% in 1999. In spite of the transition of the system, which created many information technology problems in 2000, the collected contribution increased. In 2000, we transferred to the second pillar 7.6 billion zloty instead of the 2.3 billion that was transferred in 1999. We also paid 3.3 billion zloty in Social Security system benefits. The collection process was much more efficient from state-owned enterprises.

What are the first implementation experiences? This is very interesting for those who plan to execute a similar reform. Actually, there has been a debate in Poland about our experiences, and we realized that such a reform is an enormous operation and financial undertaking. In Poland, the implementation was, in my opinion, too quick. The same thing happened in Bulgaria and in Hungary. We worked in a hurry, and the system and the society was not prepared enough when the transition started.

After two years, we stabilized the system and the private accounts transfers. The effectiveness of transferring the money to the second pillar is much better, although it will cost the budget an additional amount of money. We now realize that the social acceptance of the reform is much less now than at the beginning. In the beginning, there was almost enthusiastic acceptance of a fully funded system. People were told that they had value in money invested on the stock market or somewhere else, and for them, it was very attractive to be a capitalist and to be the owner of something. There was another possibility of transferring pension savings at death to some other person. This feature of the system was valued more, and it was more convenient for the future pensioners. People were very enthusiastic about such a change. What has happened is that the rate of return, which is obtained by private pension funds up-to-date, is significantly lower than the return rate, which is available elsewhere from, for example, banks or some other institution, or government bonds. This was not expected and people now realize that there was a special kind of risk in this business. It is not a riskless savings mechanism that would always increase with high rates. For them this is something really new. It is very important that the implementation of this reform should start when the legal regulations are ready. It should start when the institutions, which will operate the reform, are really ready.

I must say that this reform was politically supported from the left to the right. In fact, politicians all feel responsible for the effects of this reform. There is discussion about the effects of the reform, but it is rather certain that the properly funded pension system is not a temporary solution. It will be here to stay after the fall election. I am quite sure it will be carried on.

DR. OSTASZEWSKI: I will now try to tell you why I disagree with just about everything that Rob said. Probably the most important question pertains to whether any system is demographically immune. I don't know if you remember the energy crisis in the United States. I have a hard time remembering, but there was once an energy crisis in the early 1970s and 1979. You actually couldn't buy gasoline, and you had to wait in line. Sometimes they had signs saying, "Gas ten

cents — only if you pay in silver coins.” There were real shortages caused by state-imposed price caps. What we are talking about is the state-run pension system and the possibility that we will have shortages of state pensions. We worry about what’s going to happen. Of course, if you let the prices go up enough, there will be no shortages. That is the simple answer. During the Gulf War, we also had the problem with oil. In this case, however, we were quite immune to the reactions of OPEC because we allowed the prices to go up. We do now have a slight electricity shortage problem in California. Clearly the prices of energy are not high enough in California. They must rise to the point where people will, from all over the world, rush to build power plants in California. Since nobody is building power plants in California, obviously prices are too low. Let’s hope that that will soon change.

The question I wanted to ask you is which system — price regulation or pricing by the market — is immune to shortages of oil? The answer is: the market. I hope you will agree. The system of letting the prices float is immune to whatever OPEC does. It may hurt, but it is immune. The system of allowing your pension to be priced by the market is immune to demographics or anything else. You will have the pension that you will earn, priced by the market, if you let the market price your pension. As the government prices your pension, you might not have a pension or you might have a pension at a later time, or you might have some problems with obtaining your pension. You might have as much of a pension as government gives you. That is another solution. Rationing can be done too, and it always comes after price controls. If you want complete flow of oil or complete flow of retirement assets, you need market pricing. If you are okay with shortages and rationing, then government pricing will do the job. The entire economy could be run this way, and it is in Cuba. We will just have to decide about our principles.

The point that I want to make is that this is all about pricing of capital assets. The entire question is how we are going to price capital assets? It’s not about funding or not funding. The pay-as-you-go-system is fully funded. It is fully funded by the government promises to pay in the future. It is funded the same way as government bonds. There is absolutely no difference. You might imagine the pay-as-you-go system as all the contributions buying government bonds, and then, when the government needs to pay the benefits to you, it sells the bonds to the new contributors. How much of a benefit do you get in a pay-as-you-go system? You get as much as the legislation says you get. That is the only difference between pay-as-you-go and an officially funded system. In a pay-as-you-go system, the amount of your benefit is determined by the legislation, not by the market. Therefore, the pricing of this capital asset is done by the government and not by the market. The problem comes from pricing, and pricing by legislation might produce shortages and rationing. Some are satisfied with shortages and rationing; that is something that voters in California seem to prefer. We’ll see in the next election. We have this choice between government pricing and market pricing throughout the history. We have to choose.

The most important message is that in the Social Security or pension system run by the state, your right to those pensions is a capital asset like other financial assets. Let’s review the first principles. The productive capacity that we have in the

economy is derived from real assets: things that produce income one way or another. Financial assets, also known as capital assets, are claims to what is produced. Financial assets that we are used to are stocks and bonds, but there are other ways to make claims on future income—not just stocks and bonds but also derivative securities. In general, when we purchase capital assets, we pay for some kind of future consumption with today's consumption. We give up today's consumption for future consumption. There are theories out there that we are aware of about pricing those capital assets, such as the capital asset pricing model or arbitrage pricing theory and various options valuation theories. The most challenging question is about how this pricing is done by the market and the way it works. Nevertheless, it is all about buying future consumption with current consumption. We do exactly the same thing in private capital markets as we do in the Social Security system. We give up today's consumption in order to acquire future consumption. Future consumption cannot be certain; it's always uncertain. That's why the stock market is risky. As you might recall in 1987, after the stock market crash, President Reagan was giving a press conference, and he answered: "Ladies and gentlemen, markets fluctuate." That was his entire answer, and that was a very good sign to buy at that moment in time. In fact, in 1997, after the mini crash, President Clinton wasn't showing up for interviews, but Treasury Secretary Rubin was there. They asked him about the crash. He was an extremely sophisticated and intellectual Treasury Secretary. He also claimed that markets fluctuate. His attitude was, get on with it. It's tough that markets go up and down, but that's the way it is. It's very uncertain.

What I'm trying to say is that, like it or not, future consumption is something that's uncertain. You pay for it with current consumption and we can do this either through a state-run system or a private system, but it's always the same thing. The only essential difference is that in a pay-as-you-go system, the amount of your benefit is determined by the state.

I want to tell you a story as seen through the eyes of an individual investor in the United States. I think this is the angle that is probably going to be the most powerful in the current debate in the United States. It is the problem or the issue that is seen by the masses, although it is probably less after the last two years of total devastation in the stock market, but we'll see how it turns out. The problem is that people feel they don't get their money's worth in Social Security. This could have changed by now, because the last two years in the stock market have been extremely unpleasant, which is actually very healthy for the long-term stock market outlook. There have been a lot of people in the U.S. who have been expecting 20% to 30% returns on their stock portfolios. From that perspective, Social Security looks absolutely disastrous. Hopefully, their expectations are being somewhat adjusted, and there might now be the same people who expect negative 20% returns on their stock portfolios.

My point is that I'm going to ask you how it looks in terms of what you get for your contributions. What if we put your Social Security contribution into your individual portfolio, how is it going to fit? We don't have a rate of return on this. We only have, unfortunately, a glimpse of the rate of return from Equation 3.

Equation 3

$$g = \frac{1 + g_H}{(1 + g_C)(1 + g_T)(1 + g_W)} - 1$$

We can see that the rate of return in a stable pay-as-you-go system has to be the rate of growth of the underlying wages in the economy, assuming a constant payroll tax rate. Actually, if the payroll tax rate is not constant, what still matters is the rate of growth of taxes received by the system. That's what I'd like to find out for you. In the long run, the natural rate of return in the pay-as-you-go system is the rate of growth of taxes received by the system, and I will use that as a proxy for the returns in the Social Security system. I took the data for the U.S., and I looked at that rate of growth. We have an important comment to make, but before I proceed to that, I want to point out an argument. If your participation in Social Security gives you very high rates of return, that might have consequences, and if it gives you very low rates of return in relation to capital markets, that might also have consequences. I believe that arbitrage is the process that best explains capital markets. Of course, interest rates by themselves are priced by the demand for funds and supply of funds, but risky securities are priced in the context of risk perception, risk tolerance, and arbitrage.

In other words, if two securities produce the same returns, we should expect them to have the same prices. If the Social Security is too cheap, meaning that it produces very high rates of return, what should you do in that situation? You should sell capital assets. You should not save so much in capital assets and invest in your human capital because higher wages will give you better Social Security benefits. Of course, you should invest in consumption for two reasons. First, you don't need to save so much money, and second, a well-fed, well-dressed, and well-entertained worker is a happier worker and probably has higher productivity. There are reasons for thinking that if people receive very high rates of return on their Social Security contributions, they should have a lower savings rate. They should pay more attention to educating themselves and increasing their productivity. They also should consume happily. This might not be such a bad solution. That's always a fascinating angle to the debate. We complain a lot about Americans having a low savings rate. Is this really necessarily bad?

A very critical issue is that the rate of growth of taxes in the Social Security system is not just determined by the underlying growth of wages. It's also determined by how much the taxes are increased. When the Social Security system was started, the payroll tax rate was 2% — one plus one. Now it's 12.40%. Roughly half of the workers were covered by the system. Now it's roughly 99%. When the system was started, there was a very different relationship between wages subject to the payroll tax versus the index that was used for calculation of benefits. Those wages were subject to the payroll tax, or, more precisely, the upper limits were subject to payroll tax. This was roughly 120% of the index used for calculation of benefits.

Now it's over 240%, which is basically double. That was an effective way of doubling the taxes quietly and consistently over time. So we have tax increases not just by taxes being increased, but also by expanding coverage and by increases in the wages taxed by the system over time. The combined effect of that has been extremely powerful if you think about it.

There are two more questions. Retrospectively, these are the returns that were experienced by the people within the system. To them, they looked like real returns, but prospectively we can't really count on them, unless you convince me that we will raise the payroll tax in the same fashion over the next 65 years, meaning that we should raise payroll tax to roughly 78%. I don't think that will happen. We would also cover twice as many. We would raise the coverage rate to 200%. I don't know how. Cato Institute once put out a paper that said we should give foreigners a temporary working permit for five years and make them pay a payroll tax. The institute said we shouldn't give them any benefits. That would solve the entire funding problem very easily. That is a solution. It will solve a lot of problems, but it hasn't caught up with anybody. Somehow people don't like it.

In any case, I want to show you how those rates of return place Social Security participation in relation to other securities available in the private markets. How much of your portfolio should be invested in Social Security depends on your risk tolerance. Basically, I constructed the efficient frontier of U.S. capital assets using Social Security as one of the available assets. Table 3 is historical data about nominal rates of return from 1938 to 1998.

Table 3

Summary statistics of nominal rates of return, 1938-1998			
	Mean return	Standard deviation	Correlation with Social Security
Social Security participation	7.15%	20.71%	1.0000
Large capitalization stocks	14.01%	16.63%	-0.1409
Small capitalization stocks	19.13%	26.80%	-0.0813
Corporate bonds	6.00%	9.26%	-0.0676
Long-term Treasury Bonds	5.85%	9.76%	-0.1056
Intermediate-term Treasury Bond	5.68%	6.08%	-0.1031
Treasury Bills	4.24%	3.29%	-0.0937

Based on the entire existence of Social Security, its participation has been a security that has negative correlation with all capital assets. One of the very strong arguments for the existence of Social Security is that it provides an anchor against the volatility of other assets. Based on this data, it does, because it is negatively correlated with other assets; thus, it enhances the portfolio. This is based on the

period from 1938 to 1998. If we look at the real rates of return for the same period (Table 4), we still see the effect of negative correlation.

Table 4

Summary statistics of real rates of return, 1938-1998			
	Mean return	Standard deviation	Correlation with Social Security
Social Security participation	2.84%	19.00%	1.0000
Large capitalization stocks	9.81%	17.53%	-0.1008
Small capitalization stocks	15.55%	25.99%	-0.0535
Corporate bonds	2.81%	8.98%	-0.0317
Long-term Treasury Bond	8.58%	9.47%	-0.0686
Intermediate-term Treasury Bond	2.50%	5.90%	-0.0944
Treasury Bills	1.11%	3.19%	-0.1599

This is the entire history of nominal rates of return. Figure 3 shows how the early periods have extremely volatile changes in the rate of growth of payroll taxes. I would say the economy was basically getting used to the idea that once you hire somebody, you're going to have to pay the payroll taxes on them and that people receive those benefits from the government. There was very peculiar behavior there.

If you look at the period from 1974 to 1998, you see much more stable behavior; these are nominal rates of return (Figure 4). Figure 5 shows real rates of return from 1974. Why did I pick 1974? I was told by Richard Foster, Chief Actuary of the Health Care Financing Administration, that he studied the growth of wages, and he was amazed by how significantly wage growth dropped since 1974. I am one of the co-writers of the actuarial standards of practice for social insurance. Somebody once wrote to me that the Social Security Administration actuaries should be brought up to date on whatever process we have for punishing those who break the standards of practice. That person believed that they were using too low of a rate for the increase of wages prospectively versus what we see in the economic growth. I wasn't very convinced, because if you look at the historical growth of wages since 1974, you see the growth rate is dramatically different than before. This makes projecting future wages very hard. If you take the growth of wages since 1974 versus what it was before, you actually get a different probability distribution. The actuaries at the Social Security Administration are being very careful. It is true that if we have the higher growth of wages, it is entirely possible that the system is in much better shape than the statistics show, but we did experience this dramatic lowering of the average wage growth since 1974. There might be some turning around since 1997, but it is still uncertain. Lower wage

growth has hurt the Social Security system.

If you look at the period from 1974 to 1998, you'll see that actually Social Security has become positively correlated with stocks (Tables 5 and 6). This is very interesting. I was very surprised by this. I really don't like the idea of Social Security trust funds investing in stocks. You will see from the results of my research that if you invest the Social Security fund in stocks, you actually could be increasing the risk of the system. My result basically says that you should be investing the trust fund in bonds, which is the case now. This work seems to be an additional argument for that.

Table 5

Summary statistics of nominal rates of return, 1974-1998			
	Mean return	Standard deviation	Correlation with Social Security
Social Security participation	5.61%	5.03%	1.0000
Large capitalization stocks	16.12%	16.22%	0.4454
Small capitalization stocks	19.63%	21.42%	0.3082
Corporate bonds	10.47%	11.96%	-0.0802
Long-term Treasury Bonds	10.63%	12.47%	-0.1918
Intermediate-term Treasury Bond	9.32%	7.03%	-0.1701
Treasury Bills	7.02%	2.76%	-0.0085

Table 6

Summary statistics of real rates of return, 1974-1998			
Social Security participation	0.46%	5.95%	1.0000
Large capitalization stocks	10.61%	16.69%	0.6131
Small capitalization stocks	16.03%	20.78%	0.1924
Corporate bonds	7.15%	11.60%	0.2145
Long-term Treasury Bonds	7.31%	12.10%	0.1060
Intermediate-term Treasury Bond	6.03%	6.82%	0.0347
Treasury Bills	3.80%	2.67%	-0.3188

Unadjusted Social Security means that I didn't adjust for tax increases. Figure 6 shows the efficient frontier that a person participating retrospectively in Social

Security experienced. What you see here is that people with reasonable tolerance for risk, meaning a standard deviation of 0.10, would want 60% of their money in Social Security. This is what people see when they look back, because those tax increases have provided dramatic increases to the flow of funds in the system and have allowed for generous benefit increases. Social Security has been extremely popular because it has been a great deal because the money from tax increases was there.

FROM THE FLOOR: What are the axes in Figure 6?

DR. OSTASZEWSKI: There is standard deviation is on the x-axis and the rate of return is on the y-axis. In addition to the efficient frontier, we also have the portfolio allocation curve that is a percentage of the portfolio in Social Security. What you see here is that the optimal allocation for somebody who has this sort of middle of the road risk tolerance is 60% of their money in Social Security, which is, of course, less than what a typical person gets; however, for low-income people, that's not unreasonable. It is actually something that might be very typical. I want to show you that those percentages of optimal allocation for Social Security drop dramatically if you take away the tax increases (Figure 7). In fact, you get some dramatic effects. If you just take the data since 1974, then the reasonable person is supposed to short Social Security (Figure 8).

How do you short Social Security? You mortgage your future wages on your future benefits, and you basically go shopping and invest in stocks. That's a bit of a risky proposition, but then again, what do Americans do? They borrow money against their homes and they put all their 401(k)s in stocks. This year they are crying as a result, but that's not so unreasonable based on this allocation. In other words, there might be a portfolio allocation decision. If there is this close correlation with stocks, and if stocks outperform Social Security, you should short Social Security and invest in stocks. When I taught investment data analysis, I always showed this example to students. If you have a multi-national portfolio, and you include France, Germany, Canada, and the U.S., you typically end up shorting France and investing in Germany and shorting Canada and investing in the U.S. These countries tend to have a lot of correlation. They trade a lot with each other, but the German market generally outperforms the French market and the U.S. market generally outperforms the Canadian market. In fact, my Canadian students pointed out to me that the Canadian market is a very difficult market in which to invest. That's because when the U.S. dollar goes down, the Canadian market is punished because it's tied to the American market. When the U.S. dollar goes up, then natural resources go down in price, and the Canadian market is punished for that because it has a lot of natural resources. In other words, you're hurt either way if you invest in Canadian stocks. Canadian stocks are extremely challenging as an investment.

What I wanted to show you in these graphs is that, prospectively, people actually have every reason not to see Social Security as a very good investment in relation to other capital assets. We can't be absolutely sure that people will be completely rational about it because, there's now a lot of fear about stocks, and this might

change their perspective. Two years ago everybody was saying: I'll take Social Security money, put it in the stock market and be a millionaire. This has changed somewhat, but nevertheless, a diversified portfolio of stocks and bonds, prospectively, is almost sure to outperform contributions into Social Security. This will probably have a very powerful effect. I think this is something that people will take into consideration much more than the argument about macroeconomic stability or instability.

FROM THE FLOOR: I want you to know that I agree with Professor Brown 100%, and I think that probably the mistake that you're making, Professor Ostaszewski, is that Keynesian economics still apply. Keynes is not dead. The reality is that the defined-contribution plans tend to compress consumption and defined-benefit plans tend to increase consumption. It's my belief, based on Keynes economics, that, in fact, increasing consumption increases economic activity and that increases the share of the pie for everyone. Relative to Professor Brown's statements, I think that he was actually somewhat optimistic on his examples. I think that if we went to a fully funded arrangement, the 4% real return that he illustrated would depress immensely. Part of the reasons for my beliefs on that is I live in Japan, and they save like mad. My bank account there is with Citibank. As a matter of fact, I had to send Citibank in Japan my Social Security number this past year because the U.S. has decided that they want to keep track of all those interest payments. I earned \$8 on my Citibank account during the year 2000, which is ridiculous. The returns are terrible. Professor Gajek, I was very interested in your presentation. I was wondering if you can comment on how much influence the World Bank had on your decisions?

DR. OSTASZEWSKI: Could I make one quick comment? Of course, any time we want to increase consumption, tax cuts are a very nice means to that end.

FROM THE FLOOR: President Bush is going to prove you wrong on that.

DR. OSTASZEWSKI: We'll see about that. I would never underestimate Americans' ability to consume.

MR. GAJEK: I must say that this is a bit of a delicate question. I don't know if anyone from the World Bank is in the audience. The effect is that when the reform was prepared, the World Bank was very active in Poland. Some of its officers and experts from the United States advised the government to make some decisions that I'm not quite sure were wise. They pushed this reform forward. I didn't believe it was always very wise. They used an argument that I don't agree with. The argument was about the old-age crisis being the reason for problems with the Polish Social Security system. This is obviously not the case because the demographic situation will not occur for several years in Poland like it has in America. The old-age crisis will come after the next 15 years or so. Anyway, they had a very strong influence on the government. I don't know why, but it happened and the quickness of the reform is the effect.

FROM THE FLOOR: I think we know why they had such an influence.

DR. OSTASZEWSKI: I'm sorry, I can't resist making one comment. When we hear about this big crisis, my first reaction is to think there's no big crisis that a little work can't resolve. Much of the old-age crisis can be resolved if the elderly worked just a little bit more. You may think I'm being cruel telling people to go to work, but believe me, I would like some counselors to be available for my students who can tell them who the president was before Bill Clinton, because they usually do not know. Some students might know Bill Clinton's direct predecessor just because he had the same name as the current president. However, before George H. Bush, it gets really murky for them. If I try to discuss the way things were when Ike was president, things get extremely difficult. I would like some of the people who are now retired to be able to tell these young people what the world was like before. I think that would be a very good lesson. I know that there may be no formal arrangements for that kind of employment, but I think the country really needs it. I think we could resolve many financial problems and some social problems if we had employment for the elderly available easily and conveniently for them.

MR. ARNOLD A. DICKE: On the history subject you're certainly right. Anybody might need such a lesson, not just the kids. People now like to walk around and talk about the greatest generation being in the 20th century. I have read much about the generation of 1776, and I think there is no contest. I have a comment for Professor Gajek. I put the problem with the value that people in the U.S. put on Social Security at the foot of the Polish people. This is why. Back in 1977, I was in Poland, and in those days no one in Poland spoke English at all, so I had to learn a little Polish to at least say good day to people. As I walked down the street, I would hear people speaking English with an American accent. It was not only an American accent, but an accent from the city with the second largest Polish population—Chicago, where I come from. These Americans found that U.S. Social Security was extremely useful as a way of retiring in Poland. They were living at the very top levels of society, on what was considered a pittance in the U.S. Social Security these days makes up a very small part of a lot of people's incomes, so it doesn't have the same impact. I put it all at the foot of the Polish people being no longer willing to subsidize our retirees in the magnificent way they did in the past. I guess that's their right to do that.

I thought of a proposition for Rob, and it might help me understand things better. You talked about the fact that governments are frequently corrupt. That's one of the problems with funding. It seems to me the real proposition is that all governments are corrupt, but each in their own special way. I don't think the U.S. and Canadian governments are corrupt enough to abscond with the funds, but we have our own particular forms of corruption. In fact, in the U.S., I think we have two parties, each of which is fond of different forms of corruption. One party is always afraid that the other party is too close to the bankers and financiers and insurance companies, and the other group seems to have a great fondness for subsidies to various groups that vote for them. Do you have any thought as to the actual forms of corruption that are in the United States and Canada, and whether they have any further implications for the means of funding? Would it perhaps be a good diversification principle to have some part of the funding done one way and

some done the other?

MR. BROWN: Ten years ago, in the United States, there was a three-pillar system. You had Social Security and OASDI, which was a defined benefit. It was pay-as-you-go. Then you had employer-sponsored plans that were defined-benefit plans that were fully funded more or less. Then came individual savings, 401(k)s, IRAs, defined-contribution plans, and fully funded plans. What a perfect, wonderful mix, because there are times when the economic forces favor one, and there's times when the economic forces favor the other. Defined benefit is one, and defined contribution is another. Pay-as-you-go is one, and fully funded is another. What a wonderful diversified portfolio. So what are you doing? You're going to have defined contribution fully funded Social Security, defined contribution fully funded employer plans, and defined contribution fully funded individual savings. That's not actuarially diversified, and there is an economic scenario under which that is bad. That's the wrong hand basket of assets to have, in terms that Krzys likes to use. I can't advise that as an actuary.

Figure 1
Changes in the Canadian Age Structure

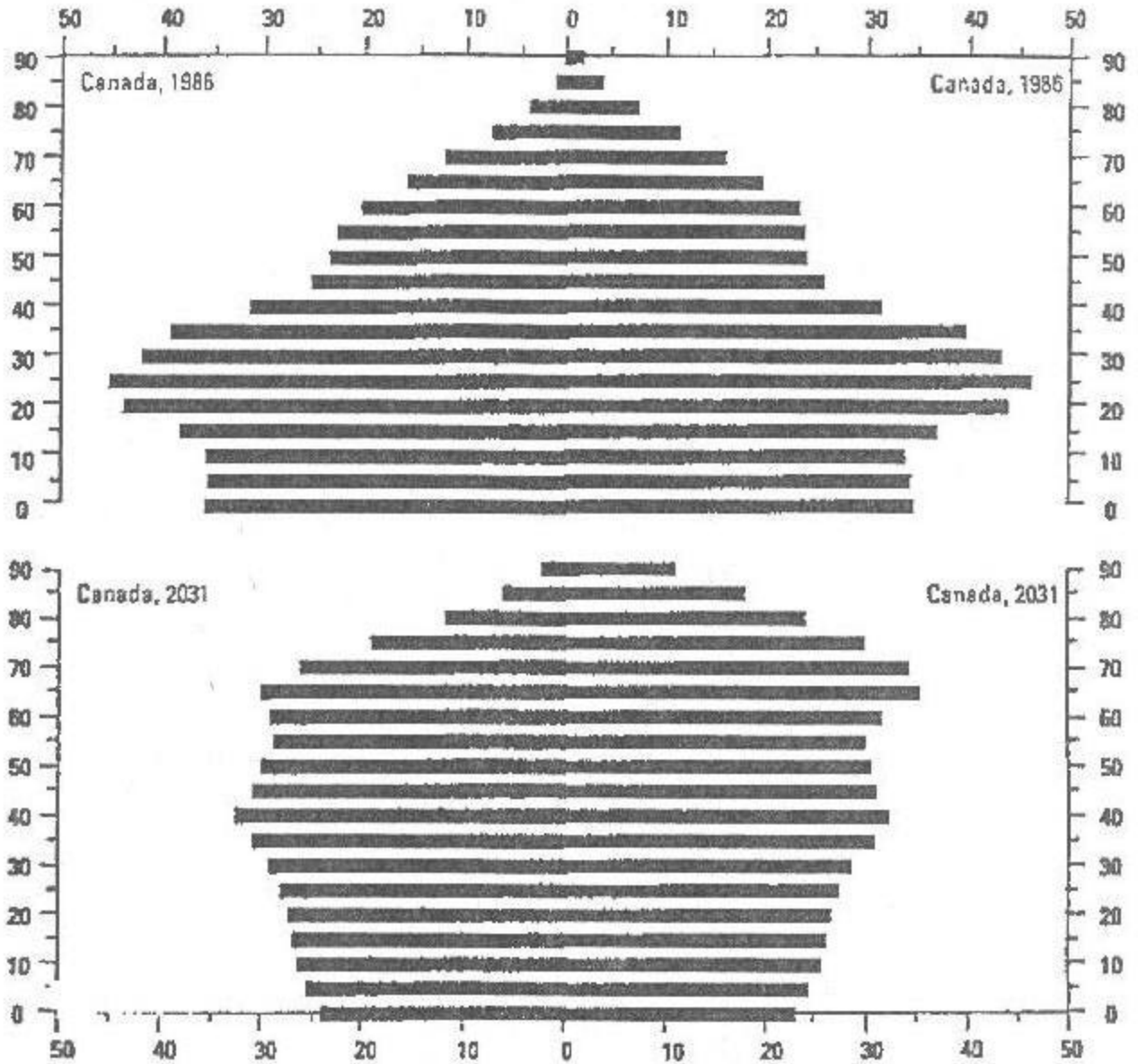


Figure 2

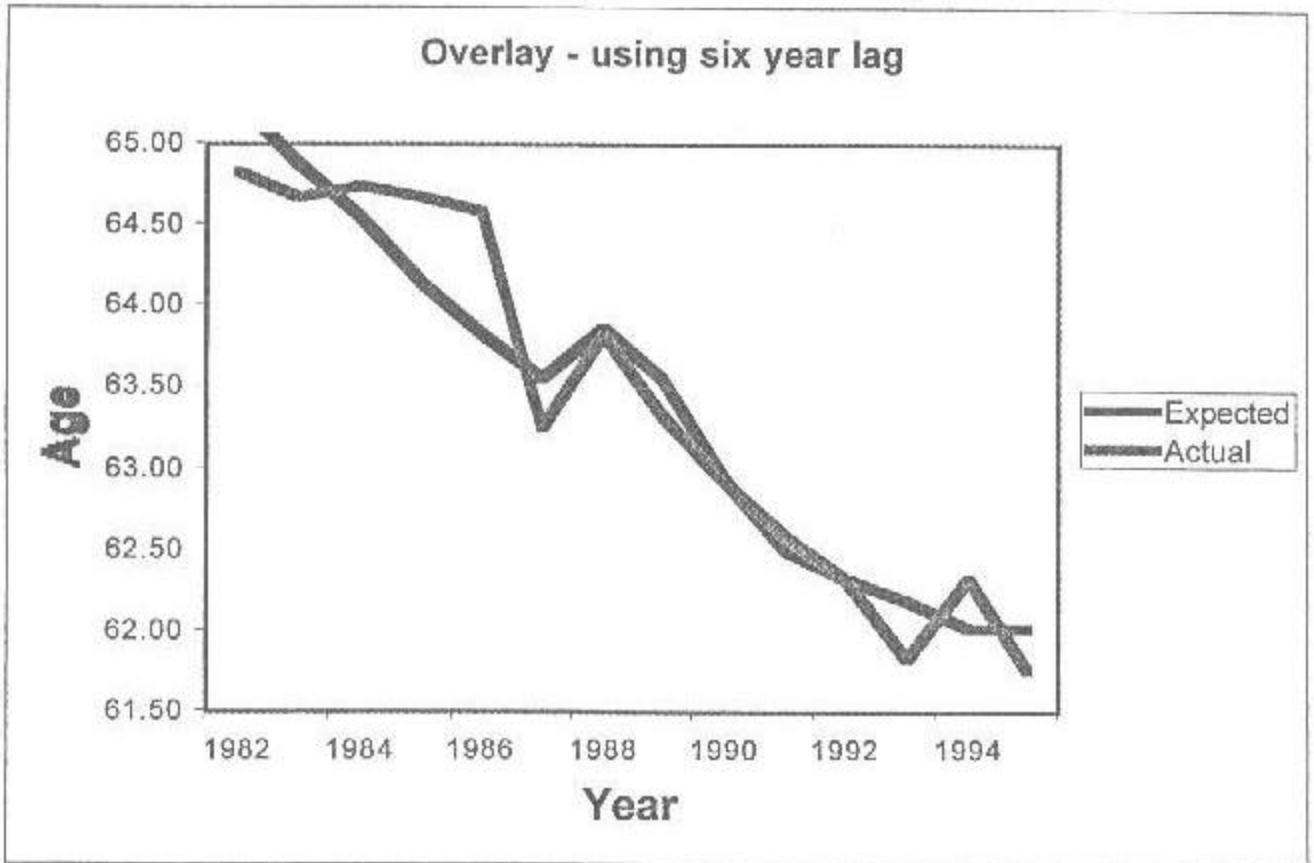


Figure 3

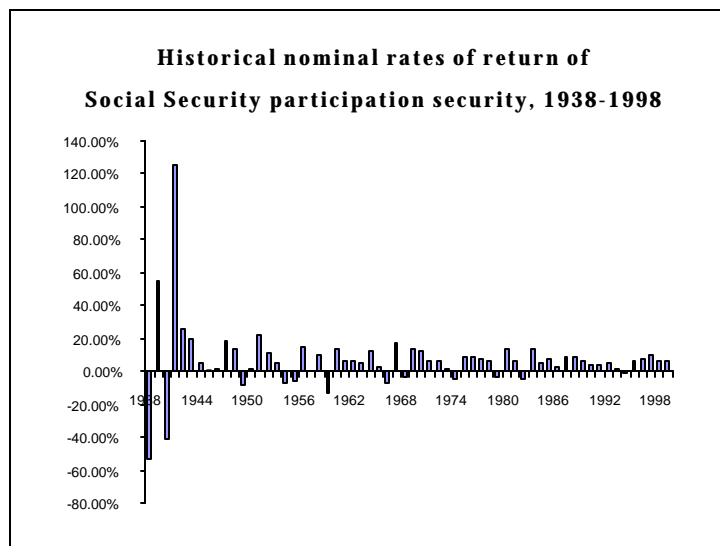


Figure 4

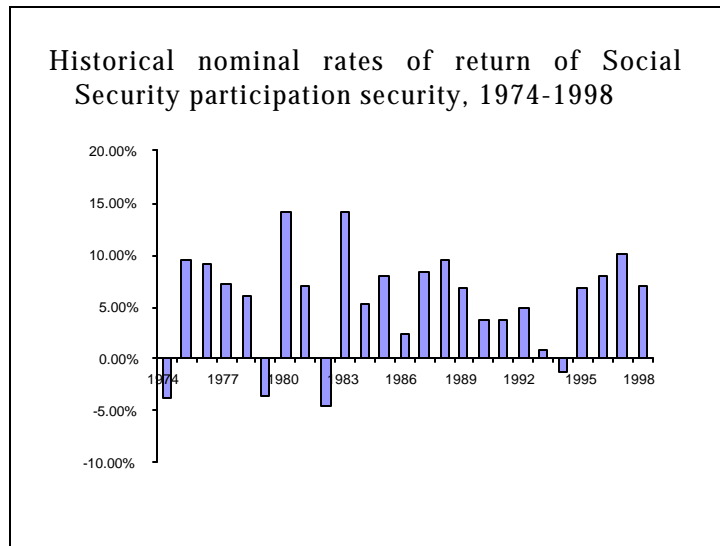


Figure 5

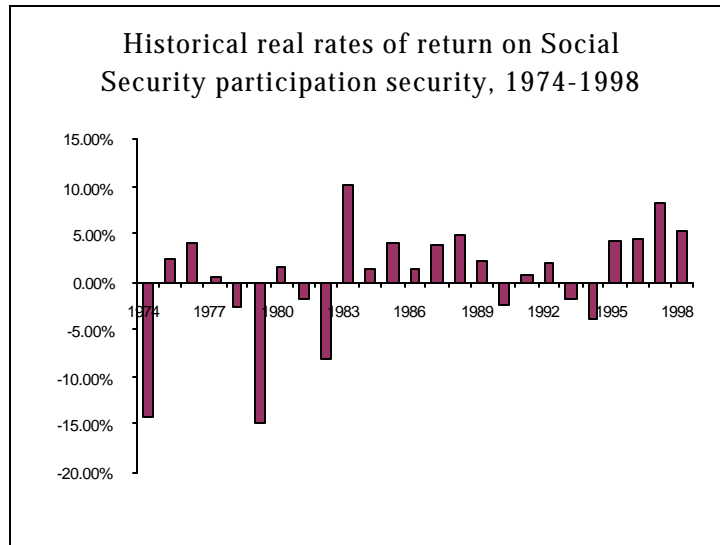


Figure 6

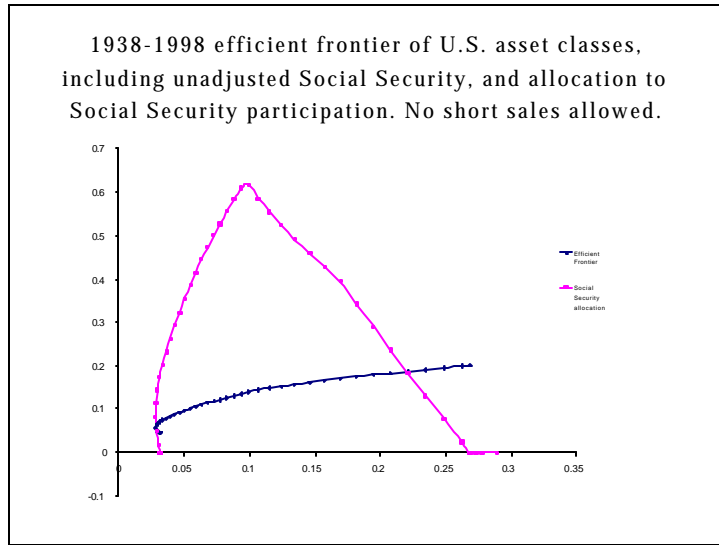


Figure 7



Figure 8

