Social Security Reform and Demographic Reality

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When I travel to give a speech, on whatever topic, I often find that the subject of Social Security comes up in the Q&A session after the speech. Because I have received so many questions on the topic over the years, I've decided that Social Security would be a good subject for careful treatment in a speech. Moreover, I'm convinced that the most logical audience for the topic is a young audience. That may surprise you, but I'm hoping that by the end of my remarks you will agree that Social Security is actually more of an issue for you than it is for those currently receiving Social Security benefits. Moreover, the issue is one for you today, and not just looking forward to your own retirement. The reason, in short, is that income you earn today in your part-time and summer jobs as students, and that you will earn when you graduate, will be subject to Social Security taxes. Current projections are that those taxes may have to rise dramatically to sustain the system. And, having paid those taxes, it is likely that the benefits you receive when you retire will represent a very low rate of return on your contributions to the Social Security system.

Before proceeding, I want to emphasize that the views I express here are mine and do not necessarily reflect official positions of the Federal Reserve System. I thank my colleagues at the Federal Reserve Bank of St. Louis for their comments; Howard Wall, assistant vice president in the research division, provided extensive assistance. However, I retain full responsibility for errors.

WORLD POPULATION TRENDS AND GOVERNMENT PENSIONS

Because it is important to understand why the Social Security system and similar systems in other countries are stressed, I begin with some basic facts about population growth. World population has more than doubled in the past 50 years, and has nearly quadrupled since 1900. A recent forecast from the United Nations, however, predicts that world-population growth will be slowing due to falling fertility. U.N. forecasters predict that, by mid-century, the world average fertility rate—that is, the average number of children a woman will bear in her lifetime—will have fallen to 1.85. At that rate, fertility will be below the replacement rate—the level considered necessary for population to stay constant—of about 2.1 children per woman. Consequently, world population is actually expected to begin declining sometime toward the end of this century.

This worldwide trend took root in developed countries where fertility rates are already well below its replacement rate. In fact, among large developed countries, only the United States still has a fertility rate above the replacement rate. These changes have largely been driven by the countries' prosperity: As countries become more prosperous, women tend to marry and have children later in life, resulting in fewer children over their lifetimes.

Although dramatic, the ongoing fertility trends in developed countries are not solely responsible for the projected fall in the world fertility rate. After all, these countries make up only about 20 percent of the world's population. Instead, it is rapid economic growth in develop-

ing countries, including the two most populous—India and China—that is generating the world-level trend. The case of China, in particular, illustrates how rapidly population trends can be altered. Partly as a result of rapid economic growth and partly because of the Chinese government's one-child policy, the fertility rate in China is now about 1.7, well below replacement rate. As a result, China's population is projected to reach a peak about 2030 and then to begin shrinking.

A decline in the birth rate obviously means that population growth will slow. But no fancy calculations are required to understand that a sharp decline in the birth rate will also create an imbalance in a population; the decline in the number of young people inevitably means that the proportion of older people in the population will rise. As a consequence, while the world's population growth has slowed, there has, therefore, also been an aging of the population.

A good summary measure of a population's age is the median age—the age such that half the population is older and half is younger. Over the last half century, the median age of the world's population has increased by 2.8 years, from 23.6 in 1950 to 26.4 in 2000. The U.N. forecasts median age to rise to 36.8 years in 2050. More developed countries are expected to have an increase in median age from 37.3 years to 45.2 years, and lesser developed countries from 24.1 years to 35.7 years. Japan is today the country with the oldest population, having a median age of 41.3 years. Japan is projected to have a median age of 53.2 years in 2050.

WHY POPULATION AGING IS SO IMPORTANT

Relatively few people seem to understand why population aging is so important. So let me present to you a highly simplified example to get the point across.

Suppose we have a country with a stable population in a long-run steady state, which means that the situation repeats itself year after year. Assume that there are one million births each year, that everyone goes to work at age 20, that each individual retires at age 60 and then dies at age 70. The example is obviously highly artificial, but that fact does not affect the argument I am about to make, because for present purposes the distribution of deaths at various ages above and below age 70 doesn't matter. And I'll assume that everyone works during the working years from age 20 to age 60.

Because each person goes to work at age 20 and retires at age 60, each person works for 40 years. Because the number of births is one million per year, at any given time there are one million 20-year old persons, one million 21-year old persons, and so forth up to one million 59-year old persons. Thus, the total number of working persons at any given time is 40 million.

With one million births per year, the total number of young dependents from age 0 to age 19 is 20 million. Because people retire at age 60 and die at age 70, there are 10 million retired dependents. Thus, the total number of nonworking dependents, young and old together, is 30 million. The 40 million working persons have to support themselves and the 30 million dependents. If we just use the example of food supply, the 40 million persons have to produce enough food for 70 million persons.

Now suppose that a breakthrough in medicine allows everyone to live to age 80 instead of age 70. However, assume that people continue to retire at age 60. In 10 years the retired dependent population grows to 20 million persons. The total number of dependents, young and old, grows to 40 million persons. The working population of 40 million must now support itself plus 40 million dependents, a total of 80 million persons. The dependency burden on workers has risen substantially.

What does the increase in the dependency burden mean to working people? Assuming they were as productive and hard-working as they could be in the initial situation, they now have to reduce their own consumption to leave enough food and other goods for the increased number of dependents. The total food supply has to be spread among more people; average food con-

sumption must fall by one-eighth because the food must be spread among 80 million persons instead of 70 million.

The calculation I just made assumed that the reduction in food per capita was spread equally across the entire population. But suppose we wanted to keep the food supply per person unchanged for both young and elderly dependents. Then, working people would have to reduce consumption enough that the increased number of elderly persons could consume an unchanged amount per year. If you make the calculation, you'll find that working people would have to reduce their own consumption by 25 percent. The argument applies to all consumption goods and not just to food.

Clearly, increased life expectancy in recent years is presenting exactly this sort of challenge to our society. If the retirement age remains unchanged, and the average annual pension also remains unchanged, and society continues to provide an unchanged level of goods and services, including schooling, to the young, then working people will have to reduce their consumption significantly. Elderly retirees will enjoy an unchanged standard of living, at the expense of working people who have to produce all the goods consumed by themselves and society's elderly dependents.

But, the situation the United States and other developed countries face is even more difficult than my example has illustrated so far. The reason is that not only has life expectancy risen but also the birth rate has declined. To illustrate the importance of this effect, consider a modification to my simple example.

The exercise we just discussed had one million births per year and each person lived to age 80. Now suppose the number of births declines suddenly to one-half million per year. This is a large decline, but in fact not far out of line with experience in some countries over the last 50 years. For the first 20 years, the number of young dependents declines. That decline is a net plus for working people, as they must support fewer young dependents. However, 21 years after the decline in the birth rate the number of working age people begins to decline. In that first year, one million persons retire but only one-half million persons join the work force. As long as the birth rate remains low, year after year the work force declines, while the number of retired persons does not begin to decline for another 40 years.

Because the number of working persons declines steadily, if there is no reduction in the consumption level of retired persons working persons must reduce their consumption year after year. Eventually, after 40 years, the work force is cut in half, to 20 million people, while the elderly dependent population remains at 20 million. There are also 10 million young dependents. Thus, the work force of 20 million persons must support itself plus a total of 30 million dependents.

With the sharp decline in the birth rate starting in about 1960, the United States and other developed countries face exactly this situation. As the baby boom generation retires, the number of elderly dependents will rise relative to the number of working age persons. For the United States, the elderly dependency ratio has risen from 0.17 in 1960 to 0.21 in 2000. The ratio is projected to continue to increase, to 0.37 in 2040, or more than double the 1960 ratio. The dependency ratio is defined here as the ratio of population 65 and over to the working age population.

ECONOMIC IMPLICATIONS OF THE GRAYING POPULATION

When a country has a stable population in a steady state, as in the first artificial example I constructed, a pension system can work quite easily. In my first example, you will recall, each person had a working life of 40 years and a retired life of 10 years. Essentially, income received over 40 years had to support consumption over 50 years. Ignoring compound interest for simplicity, saving $5,000 for each year of the working life would create a retirement nest egg of $200,000, which could then be spent at the rate of $20,000 per year for 10 retired years.

Assume that the $200,000 nest egg was invested in bonds. Then, as a retired person sold bonds worth $20,000 each year, working age persons would be buying the same bonds to accumulate their nest eggs. The process works smoothly, because there are four working persons for each retired person. Thus, four working persons each saving $5,000 per year buy $20,000 worth of bonds, or exactly the amount being sold by each retired person.

But this process doesn't work smoothly when the age distribution of the population becomes unbalanced. In my artificial example, when the birth rate is cut in half, eventually there are only half as many working persons as before but for a time the same number of retired persons as before. Thus, when a retired person sells $20,000 worth of bonds, there are only two working persons to buy the bonds. One possibility is that each working person buys $10,000 worth of bonds each year, instead of the $5,000 each person expected to save for retirement. Or, perhaps retired persons find that they cannot sell $20,000 worth of bonds each year, because their effort to do so depresses bond prices. If working persons refuse to buy more than $5,000 worth of bonds each year, then bond prices fall so that each retired person only ends up selling $10,000 worth of bonds, which cuts in half the standard of living for retired persons.

These consequences are unpleasant—that each working person, or each retired person, or both—end up with a standard of living below what had been expected. But, unfortunately, these consequences are an inevitable result of the change in the age distribution of the society given the assumption that people retire at age 65.

In the analysis so far, I have said nothing about Social Security. Any pension arrangement, public or private or mixed, must somehow deal with a changing age distribution in the society. The illustrative calculations we've just reviewed apply independently to private and public retirement arrangements, whether through individual savings, corporate or university retirement plans, or government plans such as Social Security. A large shift toward an older age distribution may make it impossible for both public and private pension systems to keep their promises. Or, it may be possible to keep the promises only by imposing a much larger burden on the working population than had previously been expected.

SOCIAL SECURITY IN THE UNITED STATES

Now I'll turn to a more explicit discussion of the policy consequences of the graying of the population on government pension systems—Social Security in the United States. Specifically, I will discuss the consequences of our Social Security system being a pay-as-you-go system, which means that benefits paid to retirees come from taxes paid by people who are working currently. Keep in mind, though, that the U.S. Social Security system would be strained even if it were fully funded rather than a pay-as-you-go system, because someone must buy the assets sold by a fully funded system to meet its pension obligations.

With a pay-as-you-go system, as the population of a country ages, the number of elderly persons receiving benefits rises relative to the number of working-aged persons who pay taxes. As a result, the average taxpayer must shoulder a larger and larger tax burden to support the pension system. Alternatively, retirement benefits must be cut either by raising the retirement age or by cutting the annual pension, or some combination.

When a worker pays Social Security taxes, the money is not put into a fund to collect interest until the worker retires. Instead, most of the money is used to pay the benefits of existing retirees. Only the surplus is put into the Social Security trust fund. In 2003, for example, Social Security benefit payments to retirees accounted for 89 percent of the revenue collected in taxes. In other words, only 11 cents of every dollar in Social Security taxes paid by current workers was put away to help pay for the future retirement benefits.

An optimist would point to the other side of this fact: The amount paid by workers in Social Security taxes exceeds the benefits being paid

out, so the Social Security trust fund has been growing. As long as the fund continues to grow, everything will be fine. But this optimism is short-sighted because before long the number of people receiving Social Security benefits will be growing faster than the number of people of working age. Specifically, the elderly dependency ratio—the ratio of the population aged 65 and over to the population aged between 20 and 64—will rise rapidly in coming years as those born during the baby boom of 1946-1964 come of retirement age.

So, although the Social Security trust fund is currently generating a surplus, it is, in fact, in actuarial deficit because the system will be unable to fund future Social Security commitments. Under current projections, without changes to tax and/or benefit levels, by 2018 the Social Security system will begin receiving less in taxes than it pays out in benefits. If adjustments are not made to benefit levels, the trust funds will soon need to be bolstered through higher taxes on those who will be working—which, presumably, will include most of you.

There has been some careful work on this subject by the Organisation for Economic Co-operation and Development (OECD), an organization comprised of economically advanced democratic countries, including the United States. OECD projections indicate that public transfers to retired persons for pensions and health care will increase in the average OECD country by 6 percent of GDP, from 21 percent to 27 percent, between now and 2050. Unless promised future benefits are cut significantly, substantial tax increases will be necessary to effect such transfers. However, as a recent OECD report concludes, drastic tax increases could make matters worse by reducing the incentives for market work and for saving.[1] Indeed, the OECD concludes that in many countries it may be necessary both to reduce promised benefits and to increase the incentives for work.

The United States, therefore, is certainly not alone in facing a significant challenge—the U.S. Social Security system faces the same demographics-driven problems as other countries. For the time being, the U.S. fertility rate is above the replacement rate, but fertility is projected to begin falling within the next couple of years. In addition, between now and 2050, the median age in the United States is expected to rise from 35 years to close to 40 years. As a consequence of these trends, policymakers in the United States face the same choice as those of other countries: increase the Social Security tax burden on the working population, or reduce Social Security benefit levels, or some combination.

BACK TO THE ROOTS

To understand the roots of the present situation, it is illustrative to look at the formative years of the Social Security system. In the midst of the Great Depression, the Social Security program was designed as a pay-as-you-go system so that benefits could be paid as soon as possible to retirees to provide them with some measure of basic income support. Social Security taxes were first levied in January 1937, and revenues were placed into a special trust fund. Under the original Social Security Act, monthly benefit payments were to begin in 1942; soon after it was enacted, the Social Security Act was amended to bring the vesting date forward to 1940.

Our present collision course began with the first Social Security payments. The first monthly retirement check was issued on January 31, 1940, to Ida May Fuller of Ludlow, Vermont. Over the three years that she contributed to the Social Security program, she paid a total of $24.75 in Social Security taxes. Her initial monthly check of $22.54 accounted for nearly all of the taxes she paid into the system, and she would go on to collect nearly $23 thousand in Social Security benefits over the rest of her life—more than 900 times the amount that she had contributed.

This example illustrates how the Social Security system has always been more of a

[1] OECD. "Strengthening Growth and Public Finances in an Era of Demographic Change." May 2004.

straight income-transfer program than a funded pension scheme. It was easy to make the system work in its early years because the labor force paying Social Security taxes into the trust fund was large relative to the number of beneficiaries receiving pensions. Over time, though, the number of those eligible to receive benefits grew relative to the number of those at work and paying taxes into the trust fund.

If it weren't for the significant demographic transformations that have occurred since the passage of the Social Security Act, the Social Security system would probably be not much different from any other income-transfer program: Taxes would be levied on one group of the population so that payments can be made to another group. In the early 1930s, U.S. Government forecasters predicted that at the end of the 20th century our nation's population would total some 145 to 150 million persons. The forecasters didn't count on the baby boom that came along after World War II, however, and their forecast turned out to be way off: By 2000, U.S. population had passed 280 million.

For many years, therefore, the large working population created by the baby boom could easily support a relatively small retired population of people born before 1946. Note especially that the cohort of persons born during the Great Depression of the 1930s was relatively small. Now the tables are turning, as the first of the baby boom generation retires. The relatively smaller generations born after 1960 will be the work force supporting a large number of elderly dependents.

WHAT TO DO

This discussion should make clear that the fundamental problem our society—and all aging societies—face is not fundamentally a financial problem but instead a problem of an excessive number of retired people relative to working people. This is a problem we can solve, and it is really a happy problem in many ways. We are living longer and in much better health—that can't be a problem!

Nevertheless, an implication of living longer should not be that younger people have to bear the entire burden of providing goods retirees will consume for those additional years. Would I ask my own children, who have their own problems of supporting themselves and their families, to support me so I can enjoy a life of retired leisure of many years of travel and sailing, which are two of my passions? I wouldn't do that looking my own children in the eye; nor am I going to look you in the eye and argue that you should pay an increasing tax burden to support me at an unchanged level of benefits for my relatively long life expectancy. And I don't think we as a society should collectively ask the younger generation to support all the additional years of retirement of the baby boom generation that modern medicine makes possible.

Unless those in my generation and the baby-boom generation want to place a huge tax burden on our children and grandchildren, we need to adopt some combination of the only two possible solutions. One is to reduce the annual payments to Social Security beneficiaries, and the other is to reduce the number of retirement years by raising the retirement age. These changes—whatever mix the country decides it prefers—should be phased in gradually, to avoid an undue impact on those who are close to retirement today. My own preference is to concentrate on raising the retirement age for full benefits, given that people are healthy and productive much longer than they used to be.

For a man with average income, our Social Security System is roughly neutral between ages 62 and 67. Beyond that age, however, the incentive to remain in the labor force is low. Put another way, the implicit tax of remaining in the labor force—foregone benefits—is relatively high. At a technical design level, there are a number of possible ways to create a more neutral system with respect to retirement age, so that at a minimum those who want to work longer are not penalized for doing so. The idea is that annual benefits need to be higher by an actuarially fair amount when retirement is delayed. By continuing to work past normal retirement age, people support themselves

and pay taxes that help to reduce the tax burden that would otherwise fall on others.

The United States has in place a gradual increase in the retirement age for full Social Security benefits from age 65 to age 67 by 2025. Our Social Security System was begun in the 1930s when the average 65-year-old person could expect to live about an additional 13 years; by 2000, those additional years at age 65 had risen to about 18. It makes sense that we lift the age of eligibility for Social Security payments in recognition of the increase in our expected life spans. However, it is clear that the increase in normal retirement age from 65 to 67 that is in current law does not go far enough to solve the problem.

It's worth noting that there is nothing sacrosanct about the retirement age, which has been determined largely by tradition rather than demographic trends. In 1881, the German government under Chancellor Otto von Bismarck designed the world's first old-age insurance system and chose 70 as the retirement age. At the time, life expectancy at birth in Germany was only 45 years. When the committee designing the U.S. Social Security system was deciding on a retirement age, committee members were guided by the retirement ages used by the 30 state-level systems that were already in place. Roughly half used 65 as the retirement age, while the other half used 70. At the time, the average life expectancy at birth was about 60 years, but is now about 78 years.

The OECD has recommended a number of other reforms to its member countries to encourage older persons to remain active participants in the labor force. These include removing labor market rigidities that discourage part-time employment, and implementing reforms that would increase the share of retirement income from private sources relative to public pay-as-you-go systems. Such policy reforms could help alleviate the fiscal challenges posed by aging populations both by lowering dependency ratios and by favoring economic growth.

CONCLUSION

Demographic change in the United States and elsewhere in the world presents enormous challenges. In much of the world, the combination of increased life expectancy and a reduced birth rate has created a situation in which the population is becoming unbalanced in its age distribution. We know this problem is right ahead of us, because the people have already been born. I hope I have convinced you that Social Security is not just a problem you will have to deal with when you come close to retirement age, but one you will have to address within a few years. An even more pressing problem, which I have not discussed today, is the Medicare system. Taxes to support retirement programs will fall on you, and not on those already retired. Retirees will face the possibility of benefit cuts, to be sure, but you will face the possibility of tax increases. We are truly all in this situation together, and we had better find a way to deal with it together.