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DEMOGRAPHICS

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A broad discussion of demographics as it applies to public and private pension plans in the future.

MR. RICHARD S. FOSTER: In the United States, the primary system of public income security is the Old-Age, Survivors, and Disability Insurance program (OASDI). The program covers over 90 percent of the country's employed and provides benefits to retired workers and their dependents, survivors of deceased workers, and disabled workers and their dependents. OASDI is financed by a payroll tax, paid equally by employers and employees (with self-employed persons paying about one and one-half times the employee rate). Throughout most of the program's history, the legislated tax rates have been designed to approximately equate tax income and program expenditures on an annual basis. Thus the OASDI program depends heavily on current noninvestment program income to meet current program expenditures.

In any given period, as a result, a fundamental factor in the viability of the program is the number of people contributing to the system relative to the number of people drawing benefits. Other things being equal, the cost as a percentage of currently earned income will vary directly with changes in the ratio of beneficiaries to workers. Demographic developments, then, which result in changes in the age distribution of the population, can cause corresponding changes in the level of tax rates required to support social security.

The effect of past and expected demographic trends on the cost of social security (as a percentage of taxable income) can be readily estimated by analysis of the resulting beneficiary/worker ratios. A convenient measure for this dependency relationship, and one that relies only on population statistics, is the aged dependency ratio. It is generally defined as the ratio of the population aged 65 and over to the population aged 20 through 64.

Current projections for the OASDI program (as summarized in the 1979 Annual Report of the Board of Trustees of the OASDI Trust Funds) indicate the following:

- The aged dependency ratio is expected to climb from .193 in 1979 to over .360 in the year 2035.
- The number of beneficiaries (including those under retirement age) per 100 covered workers, currently 31.3, is expected to reach 50 by 2035.

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-- Expenditures as a percentage of taxable payroll are projected to grow from about 10.4 percent in 1979 to almost 17 percent in 2035, primarily as a result of the changing ratio of beneficiaries to covered workers.

These projections are based on the Trustees' "intermediate" assumptions and assume a continuance of the OASDI program as defined in current law. Since the future cannot be predicted with a high degree of certainty, the actual experience will undoubtedly be somewhat different from the quoted estimates. The purpose of the estimates, however, is not to make guaranteed predictions of the future but to indicate how the OASDI program would operate under future demographic (and economic) conditions that can reasonably be expected to eventuate. Such estimates should be based on the most realistic assumptions that can be adopted at the time the projections are made. In view of the inherent uncertainty, however, alternative projections on the basis of different (but not unreasonable) assumptions should also be made to provide information on the sensitivity and possible range of variation associated with the projections. As will be illustrated below, long-range projections on the basis of alternative sets of assumptions can provide valuable insight into the future operations and future viability of today's social insurance programs and the promises that they make for the future.

Demographic Trends and Their Effects

Throughout history, mortality rates in the United States have shown a somewhat unsteady but persistent tendency to decline. The following table of average life expectancy statistics illustrates this trend:

Period	Average life expectancy (in years) in United States			
	At birth		At age 65	
	Males	Females	Males	Females
1940	61.6	65.9	12.1	13.6
1950	65.5	71.0	12.7	15.0
1960	66.8	73.2	13.0	15.8
1970	67.0	74.6	13.0	16.8
1977*	69.4	76.8	14.1	18.1

*Provisional estimates

Of interest are the relative lack of improvement for males from 1960-70 and the remarkably fast rate of improvement in the last few years due primarily to fewer deaths from diseases of the heart.

In the OASDI cost projections quoted earlier it was assumed that the decreasing trend in mortality will continue. The level of assumed improvement varies by age, sex, and cause of death; for instance, age-adjusted mortality rates from diseases of the heart are assumed to decline substantially in the future while mortality rates from respiratory disease are assumed to increase somewhat. Overall, the following aggregate decrease is projected, under the intermediate assumptions:

Projected decrease in mortality
from 1977 to 2050 (in percent)

<u>Age</u>	<u>Males</u>	<u>Females</u>
Under 20	43.1	54.7
20 to 64	31.9	46.3
65 and over	22.8	31.8
Total	27.3	36.8

Decreases in mortality generally result in an increasing aged dependency ratio. Mortality improvements at ages 20 to 64 (where average rates are already quite low) do not greatly increase the total number of such persons. Mortality over age 65 is much higher and any decline here results in a substantially greater aged population. The combined effect of lower mortality, then, is that the aged dependency ratio (and, consequently, OASDI expenditures as a percentage of taxable payroll) will increase significantly, as indicated below:

<u>Assumed decrease in mortality by 2050</u>	<u>Projected aged dependency ratio in 2035</u>	<u>Projected no. of OASDI benefici- aries per 100 covered workers in 2035</u>	<u>Projected OASDI expenditures in 2035 as percent- age of taxable payroll</u>
17 percent	.337	48	15.71
31 percent	.361	50	16.58
43 percent	.387	53	17.51

Although substantial reductions in mortality rates have been incorporated in the OASDI cost projections, no assumption has been made concerning a major breakthrough in mortality. Analysis of life tables with various causes of death eliminated indicates that with the exception of heart disease, an isolated breakthrough in disease control would not have an overwhelming effect on life expectancy in the United States. Major improvements in heart disease or concurrently in several other causes, however, could have combined results that would dwarf the improvement currently assumed. Similarly, complete understanding (and perhaps control) of the aging process itself would necessitate completely revised expectations concerning work and retirement. Such possibilities tax the imagination but are by no means impossible.

Another demographic factor with significant implications for social security is fertility. The trends in U.S. birth rates have been anything but stable in this century. Chart 1 graphs "total fertility rates" (sum of the age-specific birth rates for a given year) and reveals major declines and reversals, some of which are readily traceable to contemporaneous changes in economic conditions and social outlooks.

Future trends in fertility normally cannot be predicted with any degree of certainty. Birth rates will depend on such uncertain factors as the level of economic prosperity, the cost of childbearing and rearing relative to disposable income, and couples' outlooks toward the "quality of life" in the future. Due to the uncertain nature of such projections, it is advisable to choose a variety of fertility assumptions in order to determine how a social security program would operate under different future conditions--any of

which could reasonably be expected to occur. Fortunately, aged dependency ratios are not immediately dependent on fertility projections since newborn children do not enter the work force for 15 to 25 years and only reach the aged population after 65 years. The ratio does depend highly on past fertility levels and can, as a result, be forecast with reasonable accuracy for as much as 30 or 40 years. After this time, however, projected fertility begins to have a substantial effect on the results.

The post-World War II baby boom and the subsequent precipitous decline in fertility experienced in the late 1960's and 1970's (together with the expectation of continued relatively low fertility rates in the near future) produce marked changes in aged dependency ratios starting around the year 2005. As indicated in Chart 2, aged dependency requirements will increase substantially after the turn of the century, almost regardless of fertility trends between now and then, barring a sudden return to another prolonged baby boom. The following table illustrates the sensitivity of the projections to selected ultimate fertility rates:

Assumed fertility rate in 2005 and thereafter (children per woman)	Projected aged dependency ratio in 2035	Projected no. of OASDI beneficiaries per 100 covered workers in 2035	Projected OASDI expenditures in 2035 as percentage of taxable payroll
1.5	.453	63	21.01
2.1	.361	50	16.58
2.5	.314	44	14.44

It is interesting (and somewhat intimidating) to note the very dramatic increase that would result if the total fertility rate continued to decline from its present level of about 1.7, and remained at a lower level for an extended period.

A number of other demographic factors will affect the future cost of social security in North America. Most migration is by persons of working age or younger, so that if net immigration occurs, aged dependency ratios will be lowered, at least temporarily. Net immigration into the United States has not been a significant factor in this regard since before World War I, but conceivably could become an important source of future workers if the current low birth rates continue for an extended period.

Another demographic trend is of importance to the social security program. The incidence of disability among insured workers would not normally be expected to vary significantly over time, but from the beginning of the U.S. Disability Insurance program in 1957 incidence rates have been increasing, and it was not until recently that they began to level off and to decline. In the past 2 years, a substantial decrease has occurred. This variation is not readily explainable, but is thought to be related to a number of factors including economic conditions, benefit levels, and program administration. As the prime determinant of the size of the disabled population relative to the active working population, incidence rates have a direct effect on disability insurance costs as a percentage of taxable payroll. The United States Social Security Amendments of 1977 reduced disability benefit levels somewhat (particularly at younger ages), and this change is expected to have an ameliorating effect on future incidence rates.

At the same time that fertility rates have been declining, greater numbers of women have been both entering the labor force and participating over a longer length of time. This increasing proportion of females in the work force in recent years has added an element of growth to the working population that will not be reflected in the number of beneficiaries for many years. Together with the fact that the taxpaying participation of many women may result in only moderate increases in their future benefits (over what they would have received as dependents of survivors), social insurance costs are reduced in proportion to the extent of female labor force participation.

Implications for Social Security Policy and Development

The most notable effects of the demographic trends described concern the cost of providing social security benefits. There are, however, other considerations regarding policy and development that do not arise solely from financial pressures.

One obvious result of demographic change is that a program enacted many years ago may not be appropriate for the needs of the changed society. This development is now becoming apparent in the OASDI program: the current benefit structure, which was based on typical pre-World War II family units with working husband, dependent wife, and several children, may no longer be the best choice in view of today's multiple-worker families, few children, and so on. Current and future social security development will need to reflect such changes if the program is to meet the income security needs of the population in an equitable and rational manner.

As the social security program has expanded its coverage of the working population, and as the taxes necessary to support the system have risen, people have become more aware of social security and more interested in its structure, benefits, and costs. Currently, there is much misunderstanding of the program on the part of its participants. This misunderstanding can contribute to dissatisfaction if the social security program operates in a manner substantially different from the participants' expectations. A national, compulsory system of income security that will, over the next 10 years, collect taxes and pay benefits of over one and one-half trillion dollars, will obviously need the approval and support of its 140 million participants. Improved public knowledge of the current program's purpose and structure is an important step toward gaining this support. With sound knowledge and understanding of the current program, the public could decide on an informed, rational basis that the present program is satisfactory (and therefore worth supporting) or that particular changes are desirable to make the program more responsive to perceived needs but at a cost that is considered to be affordable. Actuaries, with their specialized knowledge of insurance and employee benefit plans, should recognize and utilize their ability to help acquaint the public with the facts.

Even with improved understanding, public agreement on social security goals may be difficult to achieve. The "numerator" and "denominator" of the aged dependency ratio have basically different concerns. The aged population naturally prefers benefit improvements while the working population would favor lower taxes. With the coming growth in the aged population, and with the older population's generally higher level of political awareness and participation, the potential for intergenerational conflict is very real and puts a further burden on all of us to help develop a system that is acceptable to participants at all stages in life.

As an integral part of these considerations, it appears that the overriding influence on future social security development will be the financial requirements resulting from the aging of the population. The past mortality and fertility trends and their expected continuation will place much greater demands on the productive sector of the economy in order to support social insurance programs as they are currently defined. This situation will develop almost regardless of the actual future patterns of the major demographic variables. Consequently, program development will undoubtedly be less concerned with benefit expansions or other liberalizations than it will be with changes that would help lower costs.

This climate is already apparent in the United States. In recent years, although many program modifications resulting in higher benefits have been proposed, few have received serious attention in Congress. In addition, many cost-saving provisions have been considered (and some enacted), including:

- Lowering the proportion of preretirement earnings that is replaced by OASDI in the event of retirement, death, or disability. (The 1977 OASDI amendments lowered benefit "replacement ratios" by 5 to 10 percent relative to current levels for workers retiring in the future.
- Raising the age at which workers can first become eligible for retirement benefits.
- Eliminating certain ancillary benefits, such as students' benefits, the minimum benefit, and lump-sum death benefits.
- Reducing OASDI benefits by any retirement benefits from noncovered government employment. (The 1977 Amendments included such a provision for spouses' benefits under OASDI.)

Proponents for financing a portion of OASDI from general treasury revenues have occasionally listed the post-2000 need for additional revenue as a supporting reason for such financing. However, to the extent that most general revenues are raised by taxes on current production, such a step would not lower the actual costs of social security in a given period, or transfer the cost to some other period.

That there will be future changes in the social security program is certain, although the exact nature of the change is not certain. It must be kept in mind that 25 or 50 years from now, society will have changed substantially, just as our current society is very different from what it was in 1930 or 1955. Solutions to social security problems that seem unacceptable or unlikely now may prove to be completely reasonable in the future.

The emphasis on the aged dependency ratio should not obscure an important fact: the total dependency ratio (defined as the population aged 65 and over plus the population under 20, divided by the population aged 20 to 64) is projected to decline for the next 30 years and is not expected to reach its current level again until about the year 2020. Thus, as many analysts have indicated, the costs of supporting the retired population may be offset to some degree by lower child-dependency costs. However, the transfer of revenue from child-dependency financing mechanisms (primarily private spending and state and local taxes) to the social security trust funds would require substantial changes in our social, economic, and political systems.

In the United States, social security policy and development have traditionally resulted from the collective desire of the population for reliable protection against the potential loss of their ability to earn a living. The need for income security is unlikely to diminish in the future. Difficult decisions will need to be made regarding how best to provide a reasonable level of protection against specified contingencies at a price that the nation can afford.

Sound decisions can best be made on the basis of careful analysis of the problem and constraints that are likely to develop--and such an analysis starts with a thorough understanding of the demographic trends underlying the very structure of our society. Actuaries, with their specialized training in demography and insurance, have the opportunity to perform a valuable public service in the coming years. I urge you to make your thoughts known to the public and to Congress.

MR. DAVID G. MATHIASSEN: I would like to start by asking the question, "What is a general economist and civil servant doing here talking to you about demography?" That story goes back several years to the Office of Management and Budget's (OMB) analysis of the retirement programs in the federal government, all 53 of them. (Of course, a small group accounts for most of the money.) It was at that time that, as economists, we discovered demography. In OMB we have found long range planning and budgeting very difficult, because the variables are subject to such great uncertainty that if you go out more than a few years, you say, "Well, on the one hand ... but on the other ...," and most people lose interest. In demography we have discovered that some things are more stable and more predictable than others. We have also discovered demographic analysis raises questions that, from the point of view of the allocation of our taxes, are disturbing.

Last fall we began preparing some analyses that resulted in a short presentation in the 1980 budget that was published in January. We were very concerned, because no one on the staff is a professional demographer, and some of the topics we were considering were rather speculative and had never been included in the budget before. One very positive result of the publication of a demographic section was that I was invited to come here. Another result was that most of those few pages were published in the Op Ed section of the Washington Post, which for us was stunning. Newspapers just do not republish the budget. Criticism from the real technicians in the field were few, so we have become somewhat bolder and we want to go on.

In brief overview, there is a controversy that I want to point out, without taking sides on the future demographic trends. One way of describing the difference of view is the difference of demographers Westoff and Easterlin. The Easterlin hypothesis is that the baby boom creates unsettled, insecure cohorts who have difficulty finding jobs and obtaining the benefits of the good life. Therefore, they have low fertility rates. They are followed by cohorts that are just the opposite. That is, the cohorts are small; the competition for jobs is not severe. They are relatively affluent and, therefore, there will be a new baby boom because of this changing sociological setting. The opposite Westoff view is that long-term fertility rates have been quite steady and that Easterlin is using an anomaly created by World War II to predict a whole series of cycles. For purposes of our analysis, we have generally assumed that we are probably facing at least steady if not further declining fertility rates. This implies no boom of elementary school children in the 1990's and worse dependency ratios.

Let me run through some of the budget impacts that we are concerned about. Retirement and disability benefits have risen from 18% of the budget in 1960 to 29% in 1980. Elementary and secondary education spending has declined from 1.6% of the budget in 1960 to 1.3% in 1980. That drop may seem insignificant, but anything going down in the budget is dramatic for us. Education is predominantly a state and local responsibility. So there is decreasing pressure at the state and local level because of lower education costs, and increasing pressure at the federal level because of retirement costs. Education spending did not decline as the baby boom graduated, so per capita federal expenses for education have gone up dramatically. Future budget allocations must anticipate continuing enrollment declines in the 1980's and also the possibility that the so-called echo of the baby boom -- that is, the children the baby boom have -- will temporarily increase the need for primary and secondary education. Higher education enrollment is voluntary and harder to predict. There has already been a 3.5% drop in college enrollment between 1977 and 1978. Looking at the demographic influences alone, and there may be offsets, we expect declines continuing into 1990 when enrollments will drop to the levels of the mid-1960's. As one small example of the implications of these trends, those who expect to receive Ph.D.'s and teach at the college level in the near future therefore may face a very disappointing job market.

The use of health facilities varies among age groups, and therefore changes in the demographic profile affect the demand for various kinds of health services. Since a large part of the nation's health bill is paid by the federal government, these trends are very important. Based on 1976 patterns of medical care usage and the demographic aging of the population, we expect total physician visits to increase from 1.1 billion in 1976 to 1.3 billion in the year 2000. Based on the current output of United States medical schools, the total number of doctors will far exceed the number needed to care for this relatively modest increase. HEW estimates suggest that we will need 450,000 doctors by 1990; based on current trends we will have 600,000 doctors.

Data on annual health care costs in 1976 illustrate the intermeshing of demography and the federal budget. First, total annual medical costs jump from \$550 per capita in the working years to an average of \$1,500 after age 65. Second, the federal, state and local governments' share of the cost jumps from 30% during the working years to 68% after age 65. Thus, as the baby boom moves toward retirement there is a stunning double effect on the budget.

Veterans' programs are going to shift dramatically as World War II veterans retire. By law, veterans over 65 are automatically classified as disabled, and have access to veterans' medical services. In the year 2000, 62% of all men over 65 will be veterans. The long term impact is profound.

If the current structure of all federal programs remains unchanged, retirement and disability benefits resulting from demographic changes will increase from 29% of the 1980 budget to 41% of the 2030 budget. Now that is just demographic; benefit increases and inflation effects are excluded. The single most important possibility for alleviating the tremendous strain that will be put on the working population is to increase the retirement age. According to our calculations, sustaining a retirement age of 62 would more than double the dependency ratio by 2020. Shifting the retirement age to 70 would keep the dependency ratio almost constant.

My second topic is very important but difficult: the national economic policy reflecting demographic changes. There are two sides to the national economy: the financial side, and the production of real goods and services. When we talk about dependency ratios in the year 2020, we are raising issues about how goods and services produced in that year are going to be divided between the workers and the non-workers, particularly the retired. We have been talking about sustaining a very large retirement population after the year 2000. But in the meantime, as the baby boom moves into middle age, it may, if it follows historical precedent, create a savings bulge, including savings through payments into retirement programs. During those high savings years this group will get "claims" in the form of retirement policies or entitlements to future Social Security benefits or savings bonds, etc. They will cash in those claims later, when they retire. Their claims will compete for the nation's output with those of the work force that is actually producing that output. Since it is very difficult to store the gross national product, how do we handle this switch from people who are moving into high savings years and then into retirement? High private savings rates, if not put to work through investment by the private sector, will tend to result in sluggish consumer demand. Can we switch the structure of our economy so that during those years there will be strong investment and therefore a more vigorous, more productive economy in the year 2000 and beyond? If the savings bulge does materialize (and please remember this is very speculative) and if it is wisely invested in productive resources, it could help to create a larger economic base beyond the year 2000. An effective national policy initiated before the baby boom retires can mitigate any disruptive results of demographic changes.

We have now in Washington a Presidential Retirement Commission, just getting under way, which has a very broad mandate to study these kinds of issues. That commission may help to increase the public perception about what is going on over the long term, so that by the time people do retire they will not be surprised by the conditions they face.

MR. RICHARD S. RASKIN: Most of us by now are generally aware that social and economic evolution in our society is linked to demographic changes. It is especially important to note that these demographic, social, and economic forces interact to produce changes in two areas of great interest. First is the legal environment, and this has been changing greatly with respect to benefits plans; the women's issue, with the Manhart Case and the Colby College Case, and the changes in the Age Discrimination in Employment Act are part of the pressures brought by changes in demographic realities. The second area is the utilization of various benefits by individuals. We are going to have to be concerned with various changes so that we can value the plans correctly. The changing legal environment and the changing utilization patterns will result in the evolution of a new generation of benefits. Actuaries will differ as to the degree in which they involve themselves in benefit design. Increased involvement of actuaries in this process should result in better benefit design. More efficient benefit design itself will impact both the legal environment and utilization, and then in turn affect the underlying demographic social and economic factors affecting plans. So we have a circular system; everything interacts with everything else, and it is difficult to analyze, but we have to be involved.

We have a system that basically is not going to be in balance. We cannot provide equivalent pensions on an indexed basis, buying the same amount of goods for a body of pensioners too large for the population to support.

Something has to give. Maybe we can increase productivity, but the trend seems to be the other way; productivity gains have not appeared in the last ten years. In the decades before that they were two or three percent per year, and we are not going to be able to jump up to a level that can support the kind of pensioners we seem to be getting-- more people retiring early, demanding a share of the affluent society. Without them working, we are not going to be able to do it. There are two obvious solutions. One is to increase the proportion of actual workers to eligible workers. This increase can come about by bringing even more females into the work force, but it is unlikely that the relative number of working women will support the anticipated growth in the number of older retirees. This growth comes from two factors: earlier retirement and improved mortality. The obvious solution is to increase the retirement age. That will also get more of us to work, and will reverse an apparent trend towards increased early retirement.

There are other solutions; maybe they are not possible but at least they are proposed. One is to increase productivity, and that is a good argument for more reliance on the private system and less reliance on Social Security, because in the private system we encourage savings. According to a Wall Street Journal article, 20% of the largest pension funds are expected to be diverted into European investments over the next few years. I do not see how that is going to help the American economy produce more, but that is part of the problem that we have. The other solution that people sometimes proffer is that we are going to be able to import workers -- immigration. That is not a reasonable solution, because the same problems that our economy faces are being faced by the European countries -- maybe they are even ahead of us in that problem. If we expect to give the younger workers a bigger load to bear in terms of carrying retirees, they may opt to go someplace else, and instead of having the ability to import workers, we may be losing workers that we do not want to lose. This is not something that does not happen. Look at England's "brain drain." Some of us feel that we may be not too far behind them.

There are two kinds of solutions. One is a self-adjusting mechanism: more women working and older people continuing to work. Those things happen because people feel a need for more income, so they go back to work -- at least that is part of the phenomenon. I do not want to dwell on the psychological argument, but I know that if I needed income or wanted to maintain my standard of living I would go back to work. My wife has to go back to work in order to send my kids to college. That kind of situation puts at least some additional workers back into the work system. The other kind of adjustment is a management adjustment, the kind the government can do. Perhaps that would induce private capital investment. We know that PBGC has been talking about book reserving. Maybe that would get companies to invest in themselves and in new productivity capacity. Less restrictive immigration policies would be another way for the government to bring in more workers.

These distinctions become blurred when the government, the companies, and the employees themselves manage to facilitate or impede a self-adjusting mechanism. Many pension plans now induce workers not to work by offering full unreduced pensions at ages below 65. In these plans there is no diminution of the trend toward early retirement. In fact, there is a continuing trend toward greater early retirement, and that defies everything we think would normally happen. These workers are not leaving the work force, but they are just retiring in the plan that they are under. The

employee takes a pension from his employer, and then goes to work for a competitor, and it is the guy who has a skill in demand that can go out and find the other job. Very often the competitor is a small business, while the first employer was a big business. So the first employer has a very benign attitude toward benefits. He provides post-retirement medical benefits free, so the employee does not join the medical plan of the second employer that is contributory and not as good. He draws it out of the first employer while working for the second employer, competing now against the first employer. We talk about changing the pattern, but unless we really get down to the nitty gritty and see what is happening, it is not going to be easy. The nitty gritty is made more nitty gritty because it is happening in the middle of the collective bargaining process. Something is very wrong here, where people are going out and getting other jobs, and are drawing more money than younger people in equivalent jobs.

We are concerned about future birth rates. There must be some element of truth in the Easterlin argument that I am not going to have children if I do not perceive that I can take care of that child, and I am more likely to have a child if I perceive that I can. If I am a young person and I only have the first job, and the older people have two jobs and are double dipping into the private system, that will depress the birth rate. Most economists agree that a birth rate substantially below the replacement level is not good for the society. So companies are facing a real problem in losing certain kinds of employees that they do not want to lose. When a shortage of workers develops, the problem will become much more significant. We have seen the beginnings of it and we are going to see it happen much, much more. All the fancy plans to increase the normal retirement age are not going to be very helpful if we have full unreduced early retirement.

Some companies go one step further. They have not only full unreduced early retirement, but also cost of living supplements, ad hoc cost of living supplements, not fully indexed, but partially indexed. They give these cost of living increases to all retired people, and do not distinguish between those who are retired and over age 65 and those who are retired and age 50. I have advised an employee, an officer of a client company, to take an 85% reduced pension at age 50 rather than a full pension at age 55 from his first employer. He has cost of living increases at 3.6% per year for those five years, and he is drawing more now at 55 than if he had waited for the deferred early retirement benefit. This kind of non-thinking about what is going on -- and the company that gave the pension is one of the top 20 companies in the United States -- cannot continue. The Social Security system is concerned about having two workers supporting one pensioner, but it is going to be worse for the private pension system if we have one worker getting an early benefit and getting that adjusted, and one retiring normally. There are big industrial companies out there today with two employees for each pensioner; it is not the unusual circumstance. If we are not careful, we are going to have a worse ratio than we are projecting in Social Security. Yet if you talk with the officers of these companies, and tell them what will happen to them five or ten years down the road, they are more concerned with Social Security, because that is what they are reading and hearing about.

It is important for us as a profession to take a stand and do something about the cost of living increase in the pension, about the early retirement benefit. It is going to be very difficult to induce employers to successfully negotiate to eliminate early retirement pensions. It is almost a practical impossibility to get an unreduced early retirement benefit eliminated. But

there are some things that we can do. We can talk to them about not giving, in a flat dollar plan, the full increase to the pensioner because that is the same thing as an indexed pension increase, and that happens in a lot of major negotiations. We can talk about deferring or not giving a cost of living increase from age of early retirement until age 65 or age 62. That is something that will have to happen and is something that employers must face now with their unions. The Department of Labor is pressuring employers to put those increases in the pension plan. Most of the ad hoc increases are not in the pension plan now. If we can limit these increases we can help eliminate the early retirement benefit which could hurt us down the road.

MR. CLYDE D. BEERS: We are talking in two major areas. One, on the government side, to increase the retirement age under Social Security and two, on the private pension side, to cut back on cost of living increases and early retirement benefits. The issue of Social Security age tinkering seems to be a short term solution to a long term problem of pay-as-you-go funding. Taking into account bulges in population is a more viable approach that is more along the lines of the private system, where pre-funding can react flexibly to the needs of the economy, rather than the forced payout of Social Security which is totally inflexible and driven by demographics. The private sector will fail unless it provides something over and above what can be obtained through Social Security or government systems. What it can provide is flexibility, and that flexibility greatly revolves around the issue of early retirement. I do not think we are going to go back to retirement at age 68 and 71. In fact a significant number of people want to retire at age 60 and earlier.

MR. MATHIASSEN: The question of fully funding Social Security is a question on which feelings run very deeply. If you fully fund it in an actuarial manner, large amounts of money will come into the government and build up balances in a trust fund. The question is, "What do you do with these funds?" It gets back to the issue that I alluded to, which I certainly find the most complex and the most difficult to explain, that you cannot store the gross national product. Going back to an earlier point, the irony is, if you do invest abroad you can then 20 years later cash in your overseas investment. This might be a rational policy. You build up an overseas asset, and then when you need it, you sell it.

MR. JONATHAN SCHWARTZ: One of the major problems that we have in the public sector is early retirement. In New York City, for the most part, the uniformed forces have 20 years and out, and the non-uniformed people have age 55 with no actuarial reduction. This leads to all kinds of things. New York City now has 11,000 firemen and 10,000 retired firemen. There is a fundamental problem that we have been wrestling in the public sector, which apparently also has begun to overtake the private sector: the purpose of any pension is to enable a person to live in dignity once he has left the labor force, not to give him a middle life subsidy when he moves on to a second career. I do not know if we have been too successful solving this problem in the public sector, but I hope you nip it in the bud in the private sector before it overtakes you.

MR. ROBERT MITCHELL: Our client actuaries are doing a good deal of projection valuation work for their corporate plans. The assumption is that the force will remain the same size. What assumption is better than that? Do you construct a complicated economic model of what an industry can do? Do you

make an assumption that corresponds to birth rates and employment patterns? Are we looking for new entrants of very young people now and very old people later?

MR. RASKIN: We do projection studies too, and a lot of our clients prefer to assume that the rate of growth continues. I do not think that is a good assumption. I think a static work force assumption is -- depending of course on the industry and company -- a better assumption, even with a declining employee group. The real question is not only the size of the working population, but also who will be the new workers and at what age will the present workers retire. The issue of full unreduced pensions is a very tough one. We have two clients in the same industry in one town in Ohio. One of the clients is mine and the other is another actuary's in the firm. I noticed an unusual pattern of early retirement at the plant, and I happened to be talking about it at lunch. The other fellow said, "Well gee whiz, we have the same thing." So we looked into it. What was happening was the employees of my client were leaving, going to work for his client; and the employees of his client were leaving and going to work for my client. We could identify, by Social Security number, the older employees who were changing jobs. The pension plan was not meant to have that flexibility. It is a major problem.

MR. MITCHELL: Mr. Mathiasen, can we obtain better information on behalf of the profession on capital formation projections? It is a tremendously fascinating field. Where are individual savings going? Where are pension plan funds going? How much capital is going to be available per person in 1990 vs. 2025? Where is it going?

MR. MATHIASEN: We are starting to struggle with those issues; the leadership in the Office of Management and Budget thinks they are interesting and important. Through some preliminary econometric work, we have begun to estimate the kind of capital formation that might be expected as the baby boom ages, and if it performs the way other middle-aged people have performed in the past. We hope to publish more in the budget; however, we need to be careful because many things besides demography affect the savings rate. Some scholars argue, for example, that the social security tax affects the savings rate; inflation expectations, and personal attitudes about consumption also affect the savings rate. I do not advocate a mechanistic approach of simply moving these people, by computer simulation, to a higher earnings rate, and then automatically assuming that their savings rate will be the same as a similar group in the past. You will not see the Office of Management and Budget publishing these kinds of savings rates as definitive predictions. There's a real issue as to whether we can use those savings productively. What will happen on the financial side? Who will handle all this money, if, in fact, it materializes? How will it be mobilized? Will the private sector actually want it and, if so, what will they invest in? These are very interesting questions and I do not have very good answers.

MR. E. ALLEN ARNOLD: The high rates of increase in productivity which we had in earlier years are the result of two things: innovation in techniques of managing factories and in inventions used in factories, and increasing use of energy. We cannot count upon the second of those in the future; in fact, we should assume that we will have decreasing use of energy. If that is so, we may not have productivity increases as in the last ten years, but we may have decreasing, perhaps even negative rates of productivity increase. One actuarial implication of this is that the Social Security projections may

be based on future productivity increase assumptions that are too high; likewise, the salary and interest rate assumptions underlying private and public retirement plans may be out of kilter. The second implication is that in 2025 or 2050 or so, when we have many more dependent-aged relative to actives, the total amount of goods and services available to the population will be much lower if we have negative productivity increases. It may be that what we are talking about in the more distant future is not maintaining pension benefits at the level that we are now shooting for, but rather keeping pension benefits in a reasonable relation to the standard of living of the active work force, even though everybody's standard of living may be less.

MR. MATHIASSEN: I agree with your comments on factors affecting productivity. There are also others. Our gross national product now consists more of service industries and less of goods, and productivity in service industries is either much lower or poorly measured or both. (Productivity for the federal government, for example is assumed to be zero in the Department of Commerce.) But it is also true that the labor force has changed. The productivity of female entrants in the labor force and of youths is below the productivity of middle aged workers, and so the changing composition of the labor force has also affected productivity. In the case of age it is a matter of inexperience, and in the case of women I suspect, but do not know, that they go into the kinds of professions - secretaries, sales people and things of that nature - where productivity is either low or poorly measured. I am not quite so gloomy as you about the future. We have reduced our estimates of the potential increase in the gross national product. That is an open recognition that productivity increases will be lower. I do not have any evidence to suggest that they would become negative, but the booms of the 1960's are probably over.

MR. YUAN CHANG: If we look at productivity and consumption, I agree with Mr. Mathiasen that you cannot store GNP, as that is a monetary phenomenon. However, you can store physical assets in a period when production is relatively high vis-a-vis consumption. Perhaps instead of allowing the standard of living to rise, you could store certain physical assets for "rainy days," periods where we face demographic projections of lower productivity. While there may be many ways of increasing productivity, including raising the retirement age, it would seem that some of the physical assets could actually be stored.

MR. MATHIASSEN: Conceptually you are absolutely right. The notion that we could literally bank things that are storable -- wheat, copper, petroleum -- is not the sort of program that one hears discussed very much, although it actually was discussed in the 1940's.

MR. RASKIN: Can you store the means to produce new things, can you improve your plant equipment, is that doing partially the same thing?

MR. MATHIASSEN: There has been very little hard analysis of this sort: it tends to be judgmental. Suppose we do invest money in things like steel and utilities. The demographic shift may be delayed long enough that a plant's capacity will be worn out when you need it. This means that you have to invest in factories that produce more investment goods which then eventually produce consumers' goods when you need them. That is what I was suggesting when I mentioned the need for a sound national economic policy to consider those issues.

CHART I

UNITED STATES TOTAL FERTILITY RATES: 1917-78

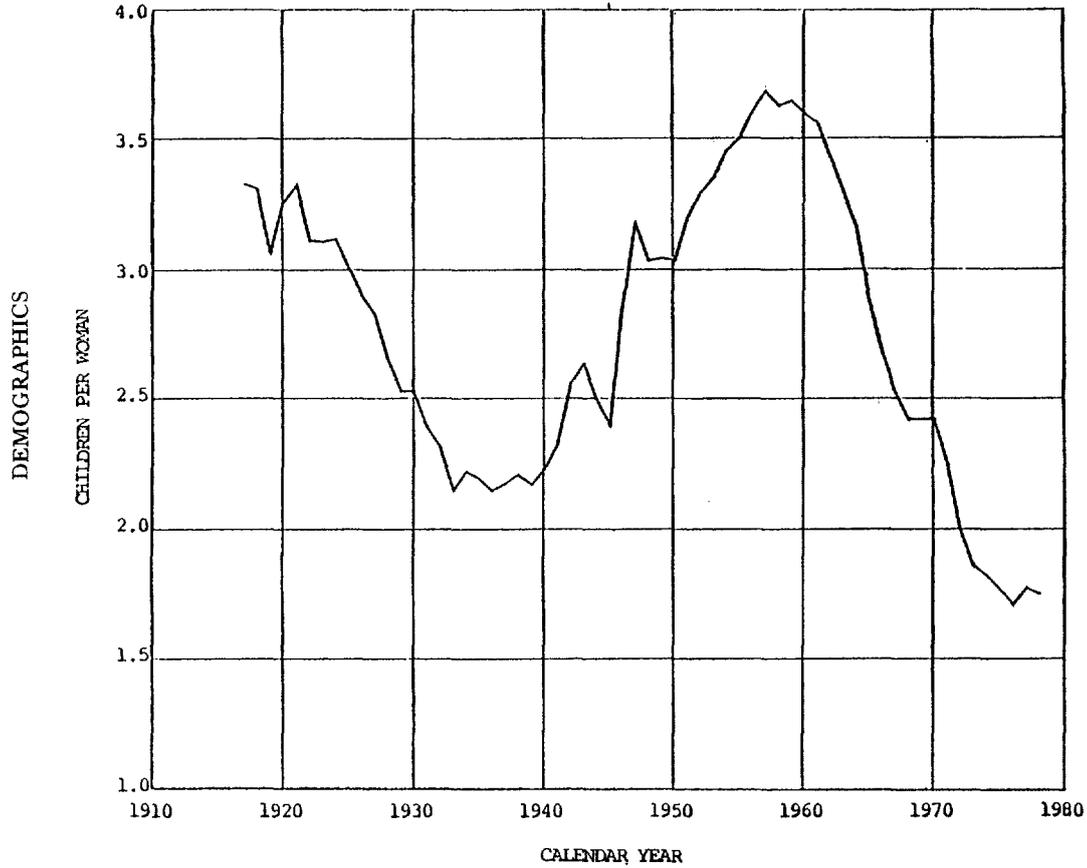


CHART II
 PROJECTED AGED DEPENDENCY RATIOS
 UNDER ALTERNATIVE MORTALITY AND FERTILITY ASSUMPTIONS

