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GLOBAL AGING: OPPORTUNITY OR THREAT FOR THE U.S ECONOMY?

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BEFORE THE

SPECIAL COMMITTEE ON AGING
UNITED STATES SENATE

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THURSDAY, FEBRUARY 27, 2003

U.S. SENATE,
SPECIAL COMMITTEE ON AGING,
Washington, D.C.

The committee met, pursuant to notice, at 10 a.m., in room SD–628, Dirksen Senate Office Building, Hon. Larry Craig (chairman of the committee) presiding.

Present: Senators Craig, Talent, Dole, Breaux, Wyden, and Carper.

OPENING STATEMENT OF SENATOR LARRY CRAIG, CHAIRMAN

The CHAIRMAN. Good morning, everyone. The U.S. Senate Special Committee on Aging will convene.

Today's hearing will explore the economics of global aging. When I say global aging I am talking about the human population of the world growing older. This hearing was called to help us better understand the opportunities and the challenges that lie before us on issues of concern to all Americans but especially the baby boom generation and their children.

The topic of global aging is directly related to many of the important issues this Congress has under consideration. The issues include one, strengthening Social Security, improving the quality of Medicare, improving long-term care, increasing economic opportunities for older workers, promoting economic prosperity, and providing for national security. Deliberations on these issues tend to focus on trends in the United States. Little attention is given to the broader impacts of global aging on our nation. So we are here this morning to improve our understanding and to build a record so we in Congress can make policies based on the best available information.

In the United States birth rates are roughly at replacement levels. Americans are living longer and that is a wonderful blessing. We understand all too well the pressures an aging society will place on our fiscal health as the baby boomers begin to retire. The United States faces the challenges of an aging population that if not addressed, could hurt our children and grandchildren. We in Congress have the opportunity to address these pressures.

But there is another issue that deserves attention—the impact of global aging on the U.S. economy—and today we have invited several top experts who will speak to this issue. We will hear about the familiar fiscal opportunities and challenges ahead. We will also

hear about labor and financial markets, economic growth, and the geopolitical opportunities and challenges before us.

Our first witness really needs no introduction. Chairman Greenspan, I want to thank you for agreeing to appear before us today. We welcome you to the Special Committee on Aging.

We have on our second panel three top thinkers of the economics of global aging. Joining us today on the second panel will be Paul Hewitt, Director of the Global Aging Initiative at the Center for Strategic and International Studies, Sylvester Schieber, Director of research at Watson Wyatt Worldwide, and Gary Geipel, Chief Operating Officer and Vice President at the Hudson Institute.

So I want to thank all of my witnesses beforehand for being here today. We look forward to your testimony and before I turn to Chairman Greenspan, let me turn to my colleagues here on the committee and the ranking member, Senator Breaux.

OPENING STATEMENT OF SENATOR JOHN BREAUX

Senator BREAUX. Thank you very much, Mr. Chairman, for calling this hearing and for assembling the distinguished panel that we are going to hear from.

Thank you, Mr. Chairman, for taking your time to be with us. We thank you for the good work that you do in advising the Congress in many of these very difficult areas.

I have said many times before that the good news/bad news story in this country—the good news is that people are living a lot longer and the bad news to a certain extent is that people are living a lot longer because we are happy they are—do not get me wrong in that regard—but because we have more people living longer lives, we have more people that participate in the entitlement programs, like Social Security and Medicare.

I have to leave, Mr. Chairman, because Secretary Thompson is testifying in the Finance Committee right now on the issue of Medicare reform and it is very clear if you look at demographics in this country we are looking at a potential time bomb where 77 million baby boomers will soon become eligible for both Social Security benefits and Medicare benefits and we are fast approaching the time where we no longer are going to be able to sustain the pay-as-you-go system.

There are some very difficult and very tough political decisions that are going to have to be made on both of these programs. The sooner we begin the process, the sooner we become willing to tell our seniors in this country and their children and grandchildren the truth about what we are facing, the easier it will be for the Congress to reach a solution to these very difficult problems.

So thank you and thank Chairman Alan Greenspan particularly for being with us.

The CHAIRMAN. Senator Breaux, thank you. We appreciate you staying as long as you can but we understand the importance of that hearing.

Let me turn to my colleague, new to our committee. Senator Dole, do you have any comments?

STATEMENT OF SENATOR ELIZABETH DOLE

Senator DOLE. Thank you.

Chairman Greenspan, it is always a great pleasure to welcome you to hearings and I look forward to your comments this morning. I, too, have another committee scheduled at the same time so I will have to slip out after your comments but I am delighted to see you here.

The CHAIRMAN. Without objection. Thank you very much, Senator Dole.

Now let me turn to Senator Wyden of Oregon. Senator, welcome.

STATEMENT OF SENATOR RON WYDEN

Senator WYDEN. Thank you, Mr. Chairman, and I look forward to working closely with you, as we have in the past, and I am very pleased to see Mr. Greenspan here, as well.

I am going to have a number of questions with respect to global productivity and inflation after the chairman has done speaking but suffice it to say what we are faced with is a worldwide demographic tsunami. There are going to be millions of baby boomers retiring in 2010 and 2011 in this country and I think suffice it to say throughout much of the western industrialized world, so it is critically important that we get into these issues.

I am very pleased that the chairman is here today because I frankly think government has dawdled on these topics. I think we have played a bit at the margins but have failed to really articulate the kinds of policies that are going to let us get our arms properly around this huge bow wave of retirees that I think literally amounts to a demographic tsunami.

So I look forward to your statement today, Mr. Chairman.

The CHAIRMAN. Well, with the threat of a demographic tsunami sweeping down on us, Chairman Greenspan, again welcome to the committee. Please proceed.

STATEMENT OF ALAN GREENSPAN, CHAIRMAN, FEDERAL RESERVE BANK

Mr. GREENSPAN. Thank you very much, Mr. Chairman. As you pointed out, the world's population is growing older as a result of both declining fertility and increasing life expectancy. These trends manifest themselves in at least two important dimensions—a more slowly growing population and labor force and an increase in the ratio of the elderly to the working age population.

The so-called elderly dependency ratio has been rising in the industrialized world for at least 150 years. The pace of increase slowed greatly with the birth of the baby boom generation after World War II but elderly dependency will almost certainly rise more rapidly as that generation reaches retirement age. The changes projected for the United States are not so severe as those projected for Europe and Japan but nonetheless present daunting challenges.

Of course, it is difficult to predict the age structure of the population in the more distant future. Although we have a good idea of the size of the working age population over the next 20 years or so—remember, its members are largely already born—forecasting the number of children and future immigration and population growth is much more conjectural. Even with the substantial uncertainty that surrounds these forecasts, population aging in a developed world is not likely to be a temporary phenomenon associated solely with the retirement of the baby boom generation. Rather, under current projections the retirement of that generation should be viewed as hastening the transition between the current distribution of age and one in which the population is notably older.

As you know, the aging of the population in the United States will have significant effects on our fiscal situation. In particular, it makes our Social Security and Medicare programs unsustainable in the long run, short of a major increase in immigration rates, a dramatic acceleration in productivity growth well beyond historical experience, a significant increase in the age of eligibility for benefits or the use of general revenues to fund benefits. Indeed, according to the intermediate projection of the Social Security trustees, the level of Social Security contributions under current law begins falling short of legislated benefits by approximately 2017.

While the prospect of a shortfall in Social Security is reasonably certain given the changing composition of the population, the range of possible outcomes in Medicare is far wider. Rapidly advancing medical technologies, essentially inelastic demand for medical services for the elderly, and a subsidized third-party payment system have created virtually unconstrained demand.

How the financing pressures that accompany increasing retirement are resolved will have profound but uncertain effects on the structure of both private and public pension plans. The total investment income of these funds, in conjunction with retirees' other forms of income, must be sufficient to finance a satisfactory standard of living.

The real resources available to fund pension benefits depend on the economy's long-term growth rate, which in its simplest terms is determined by the growth rate of labor employed plus the growth rate of the productivity of that labor. Because of the demographic

trends associated with aging, by 2030 the growth rate of our working age population is expected to decline by half.

One natural response to population aging will almost surely be for a more fit elderly population to increase their participation in the labor force. Americans not only are living longer but they are generally living healthier. Rates of disability for the elderly have been declining, reflecting both improvements in health and changes in technology that accommodate the physical impairments that are associated with aging.

In addition, work is becoming less physically strenuous but more demanding intellectually, continuing a century-long trend toward a more conceptual and less physical economic output. For example, in 1900 only one out of every 10 workers was in a professional, technical or managerial occupation. By 1970 that proportion had doubled and today those types of jobs account for about one third of our total workforce.

Despite the improving feasibility of work at older ages, Americans have been retiring at younger and younger ages. Some analysts believe this trend has slowed, although few anticipate a rapid turnaround. But rising pressures on retirement incomes and a growing scarcity of experienced labor could induce greater labor force participation.

Immigration, if we choose to expand it, could prove an even more potent antidote for slowing growth in the working age population. As the influx of foreign workers in response to the tight labor markets of the 1990's showed, immigration does respond to labor shortages.

An expansion of labor force participation by immigrants and the healthy elderly offers some offset to an aging population. However, it is heightened growth of output per worker that presents the greatest potential to boost the growth of gross domestic product. A significant rise in the growth of labor productivity will be necessary if the standard of living of retirees is to be maintained and that of workers is to continue advancing.

One of the more direct ways to raise growth in output per hour is to increase saving and investment, which augment the capital stock available to workers. Another is to increase the incentives for innovation. Efficiency gains, broadly defined, currently account for roughly half the growth in labor productivity. Though augmenting saving and investment should raise future labor productivity and thereby help provide for an aging population, the incremental benefit of additional investment may itself be affected by aging. Without a growing labor force, the amount of new equipment that can be used productively will be more limited and the return to capital investment could decline as a consequence.

What actually happens to the saving rate in the next three decades will depend importantly on the behavior of the baby boom cohort during their retirement years. Over the post-World War II period the elderly in the United States, contrary to conventional wisdom, seem to have drawn down their savings only modestly. The reasons are not entirely clear. Often people bequeath a significant proportion of their savings to their children or others rather than spending it during retirement. If the baby boom generation contin-

ues this pattern, then the U.S. household savings rate may not decline significantly, if at all.

Future labor productivity, however, is determined by more than just saving, investment, and capital intensity. One of the remarkable features of the economy over the past 7 years or so has been the acceleration in the pace of the innovative use of capital by workers rather than increases in the amount of capital per worker.

Therefore, it is important to address the possibility that aging will affect the rate of innovation either through a rearrangement of existing capital resources or through technological advance. Although discovery of new technologies is to some degree a matter of luck, we know that human activities do respond to economic incentives. A relative shortage of workers should increase the incentives for developing labor-saving technologies and may actually spur technological development.

Economic historians have argued that one reason that the United States surpassed Great Britain in the early 19th Century as the leader in technological innovation was the relative scarcity of labor in the United States. Patent records for this period show that innovation did respond to economic incentives and that the scarcity of labor clearly provided incentives to develop new methods of production.

The aging of the population means that the government will inevitably need to make a number of changes to its retirement programs. These changes in themselves can have profound economic effects. For example, aside from suppressing economic growth, large increases in payroll taxes can exacerbate the problem of reductions in labor supply, whereas policies to promote longer working life can ameliorate it.

Reductions in benefits through changes to the age for receiving full retirement benefits or through reforms to slow the growth of Medicare spending or through other means can affect retirement, the labor force, and saving behavior. In addition, policies that link increases in longevity over time to the eligibility age for Social Security and perhaps Medicare may need to be considered. Such linkages would help protect the financial and hence the economic viability of these programs.

The aging of the population is bound to bring with it many changes to our economy, some foreseeable, many probably not. Though the challenges here seem great, the necessary adjustments will likely be smaller than those required in most other developed countries, but how we adjust will also matter. Early initiatives to address the economic effects of baby boom retirements could smooth the transition to a new balance between workers and retirees. If we delay, the adjustments could be abrupt and painful.

Fortunately, the U.S. economy is uniquely well suited to make those adjustments. Our open labor markets can adapt to the differing needs and abilities of our older population. Our capital markets can allow for the creation and rapid adoption of new labor-saving technologies and our open society has been receptive to immigrants. All these factors put us in a good position to adjust to the inexorabilities of an aging population.

Thank you, Mr. Chairman. I request that my full text be included in the record.

The CHAIRMAN. Certainly it will become a part of the record, Mr. Chairman, and again we thank you for being here.

We will move to a round of questions for those senators who are here and thank you, Senator Dole, for attending.

You have obviously offered up some substantial challenges to us as it relates to an aging population in this country and the rest of the world. Mr. Chairman, historic experience suggests that the impending global labor shortage has the potential to unleash an era of technological progress. If this were to occur, what would happen to relative returns for savings and investment?

Mr. GREENSPAN. Well, Mr. Chairman, I think it depends to a large extent on the type of investment that is made. It is fairly apparent if you just think in terms of what would happen if you had a decline in the population but the same capital infrastructure, it is pretty obvious that there is a surplus of capital and the rate of return would fall. But if you can find technologies which enhance the capability of individuals to produce or, as I like to put it in the extreme form, if human beings produced robots which did the same thing they did, then clearly there is a very significant rate of return on that. Our actual equivalent is in the high-tech area in computers, which clearly have enabled us to do types of things which human beings do and in many cases do them in a far superior manner. Those types of investments will tend to have fairly significant rates of return.

The CHAIRMAN. I think I know the answer to this but what effect would this have on the value of financial assets, then?

Mr. GREENSPAN. The value of financial assets is going to depend to a large extent on two things. One, of course, is the innovations and the nature of the types of investments that are made but also how we address and resolve the issue of the huge increase in benefits which in projected to start sometime in the beginning of the next decade and under current services budgeting would create a very substantial increase in the unified budget deficit, higher real interest rates, and presumably a weakening in the capital values throughout the economy.

So it really depends on, whether we, in fact, create these innovative types of equipment which could be a major solution to the shortage of labor but unless we restructure the underlying governmental programs, all of the potential benefits that could accrue from these innovations could be unwound because of fiscal distortions which work their way through the financial system and, by moving real long-term interest rates higher, must invariably move the capitalized value of other assets lower.

The CHAIRMAN. Let me ask this last question. You indicated that delaying initiatives in strengthening Social Security and improving Medicare, and our colleague just left to go down to a Medicare hearing where we are looking at some reform, will make program adjustments more painful for baby boomers when they eventually retire. Can you describe the potential economic effects of delay on the baby boomer generation and their children?

Mr. GREENSPAN. I am sorry; of delaying changes in the programs?

The CHAIRMAN. Yes.

Mr. GREENSPAN. Well first, one of the better ways of getting a context here is if you ask yourself when you are dealing with major programs, government programs which affect the economy, ask yourself how would the economy adjust if those adjustments had to take place solely in the private sector and there were no government programs?

For example, we can very readily determine that if Social Security, Medicare, and Medicaid benefits only rose at the rate that the GDP was rising, say in the year 2010 and going forward, and you therefore obviously covered a very significantly less proportion of, for example, medical expenditures than indeed the population would want, then you ask yourself well, how would the rest of it, if it needed to be done, be financed in the private sector? Clearly what would happen is that medical services, which are highly valued in the system, would probably elbow out the second and third cars that we see in a lot of people's garages. People would probably spend less on certain leisure and entertainment issues. In other words, what you would get would largely be what we get now, on allocation of consumption expenditures over a broad set of products. In that environment you would probably not get a change in the budget deficit. You probably would not get increases in interest rates.

Therefore what all of this tells you is that it is crucially important to find a way to appropriately bring the private sector into the issue of financing medical care in a much broader way than we have done. If we are going to get an appropriate solution between the portion of Medicare that is financed and whatever part of it is not publicly financed, make certain that it is financed appropriately by whatever incentives or whatever we have to do in the private sector.

In other words, it is going to require something different from what I would call the hard-edged problems that you get if you have basically mandated programs when we are dealing with a very large shift from people in the working age population into retirement.

So I think there are solutions here and the sooner we begin to think of how to phase in, the easier it is going to be because there is no doubt that while economists may not be terribly good in making long-term economic forecasts, demographers are extraordinarily accurate in making forecasts of what the population will look like 10 and 15 years ahead.

The CHAIRMAN. Well, thank you. Let me turn to my colleague from Oregon, Senator Wyden.

Senator WYDEN. Thank you, Mr. Chairman.

Chairman Greenspan, I think we would both agree this question of global productivity is right at the heart of the ball game in terms of a bright retirement future for seniors here and around the world.

Let me ask you about this. Of the western industrialized nations, our country and throughout the West, the United States has higher wages, better health care and better pensions. When you hear the question of improved global productivity, the first thing that comes to mind is, why not leave those places and go other places where there are lower wages, lower health, and lower pensions? When we talk about global productivity, what would you advocate in terms

of global productivity initiatives that would lift a lot of boats around the world so as to be responsive to this demographic trend?

Mr. GREENSPAN. Well, Senator, I think the issue of productivity worldwide goes beyond the global aging issue. I think that the so-called development economists have been struggling now for quite a good deal of time and have become a fairly significant segment of the economics profession and they are beginning to identify the necessary if not always sufficient conditions that create productivity in various different areas.

I do think, however, that as you are implying, the aging does make a difference. I would think, for example, that since productivity—let us take the United States—would be greater if our population growth and working age population is moving up, so, ironically, what that suggests is that increased immigration in the United States could very well be a factor in improving overall productivity and indeed I think it has already been a factor in that regard.

What will tend to happen if the demographers are right—and in this case they can scarcely be wrong for the next 10 or 15 years—but if they are right then there will be very significant pressure for individuals, younger individuals residing in so-called emerging economies to move to those developed economies which are projected to have fairly significant declines in population. It will be the extent of the political resistance to that flow which will to a large extent, I think, determine, as you may put it, world aggregate productivity. The flow of people probably matters more than we realize in this context.

Senator WYDEN. Another issue that is very much on the mind of seniors of this country, and we talked briefly about it when we visited before the hearing, is millions of seniors have much of their net worth today in their home. There is significant concern among seniors and frankly other people about the possibility of a real estate bubble, a housing bubble, and that somehow this would cause them great economic damage.

What is your sense about the prospect of a housing bubble, a real estate bubble? You and I talked about it and we were concerned some years ago about a technology bubble and I was encouraged by your answer with respect to the housing bubble and I think it would be helpful for the country to know your view on that.

Mr. GREENSPAN. Senator, I think the issue of the housing bubble arose mainly as an analogy to the stock market bubble. The one thing I think we can say with reasonable assurance is that the analogy is pretty stretched because, as you know, if you sell a home, you have to move out and besides the transaction costs on the sale are really quite large and that inhibits the degree of turnover.

But more importantly, there is not a national housing market in this country. There are localized markets and indeed it is possible in localized markets for bubbles to emerge and indeed there are cases. We can name a number of metropolitan areas in which home prices have surged and then come down very dramatically, obviously Silicon Valley being one of the obvious cases, but there are a lot of them.

But an overall decline would probably require that the demand for new housing significantly weakened. But on the database that we make our judgments from, it looks as though the level of replacement of housing is not very large, meaning that the absolute level of home completions plus mobile homes is not that much larger than the change in household formation. A significant part of household formation reflects immigration, which is holding up household formation, and one must presume holding up new construction.

While I am not going to say that there is no possibility of house pricing declining—there is; house prices declined 20 or 25 years ago for a while—but the notion of a bubble bursting and the whole price level coming down seems to me as far as a nationwide type of phenomenon really quite unlikely.

Senator WYDEN. Thank you; that was an issue important to my constituents.

I want to ask you about inflation and seniors, as well. Suffice it to say we all understand that for so many seniors their income is fixed and inflation essentially gobbles it up. Compounding the problem is, of course, today a lot of the investments that seniors turn like CDs, paying relatively low rates of return.

In your view what rate of inflation would allow the economy to grow at this point while, at the same time, keeping seniors from getting shellacked? In other words, we are trying to figure out how to balance these two kinds of considerations and given the fact that you are in the monetary business, I would be interested in your thoughts on that.

Mr. GREENSPAN. Well, Senator, we have always argued that the optimum price pattern to facilitate maximum sustainable long-term economic growth is effectively stable prices. As I and a number of my colleagues at the Federal Reserve Board in fact, the Federal Open Market Committee—have been pointing out for now quite a while, we are pretty close to price stability. The reason we say that is that the price indexes which we tend to follow have still, despite the major improvements in them, a fairly significant amount of upward price bias and as a consequence of that, as sort of a rough cut, we are probably not all that far from price stability and that is probably where we should be—neither, I might add, in an inflationary environment or a deflationary one.

Senator WYDEN. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Wyden.

Now let me turn to my colleague from Missouri, Senator Talent. Welcome.

Senator TALENT. Thank you, Mr. Chairman. I want to thank you for holding this hearing and thank the chairman of the Federal Reserve Board for being here.

The CHAIRMAN. You were not here for opening statements. If you have comments——

Senator TALENT. No, although I will probably have a comment before my question. Normally one comes to these hearings to ask questions and I cannot stay as long as I want but I think I probably learned as much by your questions and the questions from the senator from Oregon as I may from my own.

Let me just ask you to elaborate a little bit, Mr. Chairman, because the tenor of your testimony—I caught the tail end of it but I have managed to read through it—was, I think, very encouraging. Let me sum that up and then ask you to elaborate a little bit.

We in this committee have to deal with the coming problems that we are going to be confronting with Social Security, and Medicare, not to mention issues like long-term care, and demographic changes that if the world we are in does not significantly change and begin changing pretty soon are going to present very, very difficult problems.

What I appreciated about your testimony was your suggestion, that if, we begin changing soon, there are a number of different strategies that we could follow which will minimize if not eliminate, a lot of the pain that we would be confronting, but we have got to do something and begin doing something soon.

How true is it? Is it fair to speculate that if we could agree on reasonable strategies to promote growth and productivity that we really could have some confidence that we might grow and produce our way out of this thing, along with other changes that would naturally occur as people react to this coming crisis? One of the things you point out, for example, is people simply working longer because they want to. They are healthier, they work longer, they produce longer, which is already happening.

I mean if we will agree on what we can do to make this great economy grow and produce regardless of then how we are going to distribute what it produces and the social goals and the rest of it, cannot we have some confidence that maybe this thing is not going to be as terrible as if you look at it right now you think it may be?

Mr. GREENSPAN. Well, Senator, there is just no question that a necessary condition to get us beyond the big bulge of the baby boom retirement is a marked pick-up in the rate of growth. It does not seem likely, however, that if we stay with the existing obligations that we have committed and project them through the period, say 2025, that we can accelerate economic growth so that that would be the sole means by which to achieve a solution.

The reason why I suspect not is that largely because of the fairly significant changes in productivity that have occurred, say, since 1995 and the pace that continues today, we are already up sufficiently high where the amount of additional increase in the rate of change of productivity is not what it was in 1992 where we then had a lot of leverage to go back up.

So what we will be doing is finding that while we can get up to what our historic maximum levels have been, we are the cutting edge economy in the world. That is, there is a limit to how far a cutting edge economy's productivity can grow and it is essentially determined by the state of knowledge and the state of intelligence of a particular population.

I mean one may ask if we were much smarter we could have foreshortened the increases in technology or the changes in our economic structure that occurred say between 1900 and 2000 and done it in 50 years instead of 100. Now the trouble with it is we are human beings and we have certain capabilities.

Therefore I think it is important for us to do everything we can do to improve economic growth. If we do not have economic growth,

I do not think there is a solution here, period, in what we are dealing with. But if we can get first maximum economic growth and then make certain types of adjustments as we phase into the marked increase in the commitments that occur after 2010, then I think this is a solvable situation. But I think we have to understand that over the years we have committed to the American people a level of benefits in Social Security and in Medicare which are high relative to the capacity of the economy to support and we have to make judgments as to whether, in fact, we are capable of ratcheting up the growth rate to effectively say we can afford it and if not, and I must say to you I expect not, we have to review what the nature of those commitments is and make them far more capable of being fit into the capacity of this economy to service them.

Senator TALENT. As I search for areas where we might achieve enough of a political consensus and therefore a political will to do something, it just strikes me after all the struggle over Social Security reform and the rest of it, that maybe it might be better to devote some of this energy into coming to some agreement about how we really do maximize growth and how we can all reach a way where politically we can do that, which all of us agree will at least make it possible or easier to deal with the problem.

Then second, take some confidence from the fact that the American people will on their own make adjustments in response to what they see coming. I had an economics professor who said "Look, the most important principle in human behavior is this, that the crew of the Titanic stopped doing dishes when the ship hit the iceberg." As people see us approaching the iceberg, they will plan on working longer. They will accommodate to it. I think lifestyles will begin changing. Those two things, the points I am making, I take from your testimony.

For example, you mention that the post-war population as it aged ended up spending a lot less of their savings than people thought. My parents certainly did that. If the baby boom generation does the same, which I think it will because I think the baby boom generation is going to see the greater need of their children to have some of their assets than maybe they might have figured all of these trends, these reactions will work in our favor and maybe make this easier to handle, but we do have to begin thinking about this, planning about this, and working together now. That is the clear import of your testimony—we have to begin doing something now or soon.

Thank you. I guess that was an opening and closing statement combined, Mr. Chairman. I appreciate that.

The CHAIRMAN. Senator, thank you.

We are joined by Senator Carper. Senator, welcome. Questions, comments?

Senator Carper. Thanks, Mr. Chairman.

Chairman Greenspan, nice to see you again. It has been almost 24 hours. My wife has been on a business trip and comes home today and I was sitting here thinking that I have seen more of you in the last week than I have seen of her and I am looking forward to her return. But you look great; you look great.

Mr. GREENSPAN. I have seen more of you than my wife and I wish she would return, too.

Senator Carper. We have a common bond here.

Senator Talent was saying that after the Titanic hit the iceberg the crew stopped washing the dishes. As we approach this fiscal iceberg that lies ahead, I am not sure that people will stop washing the dishes. Maybe they will stop eating out and then they will start washing dishes again. We will see what happens.

I have been here a little over 2 years and as fiscal year 2001 began, we saw budget surpluses are far as the eye could see and there was talk of retiring our publicly held debt and how that would affect the Social Security Trust Fund. I am just going to ask you to kind of walk us back in time to those heady days of late 2000 when we were much more optimistic about our fiscal future than we are today.

Just to refresh our memories, what were going to do with all those extra monies? How were we going to pay off our public debt? How did that figure into the long-term health of Social Security and Medicare?

Mr. GREENSPAN. Well, Senator, as you recall, the Congressional Budget Office, in evaluating what the current policy outlook, was estimated that over the 10-year period there would be approximately, as I recall, $5.7 trillion worth of accumulated surpluses. The basic reason for that was not that they were blind-sided on the impact of stock prices on the revenues that had occurred earlier but very small technical changes were made in the relationship between incomes, capital gains, and taxes on stock options. All that was well known. What was not in the CBO's forecast was a 50 percent decline in stock prices and what that did to those revenues.

But when they looked as though they would be out there, there was a very strong presumption that if we retired the debt, that as we moved into the early years of the next decade, while we would invariably be running fairly large unified budget deficits, the level of the debt to GDP would be starting at a quite low level and that we could probably sustain running significant deficits for a protracted period of time because the debt started off very low, if I may put it that way.

Now regrettably, that choice has been lost and we are back to the same problems that we perceived back in the mid–1990's. We had conversations back in the early 1990's which replicate very much what we have been talking about today. There was that period, though, where there was the possibility or perceived possibility that we would have adequate revenues to essentially book the forward unified budget deficits and then sort of capture them by lowering the debt and essentially find that the amount of adjustments that would be required would be much less than we are now obviously going to have to face.

Senator CARPER. A number of people including, I believe, the president, have suggested that we ought to lower Social Security taxes for some of our workers and allow them to divert a portion of their Social Security, their payroll taxes, into other investments. We still have an obligation to, my mom, for example, that she and her generation would continue to receive the benefits that have been promised to them under Social Security but we would allow

a younger generation, maybe my children, to divert a portion of their payroll taxes into other kinds of investments but still pay something into Social Security.

That was an idea that intrigued a number of people, maybe still does, but it was, I think, more intriguing 3 years ago than it is today.

One of the things I wrestle with as we face that proposal is how are we going to pay the obligations to my mother's generation and maybe to the boomer generation that I am a part of if we divert the monies that otherwise would be needed to pay those benefits? It was not as difficult a mountain to climb 3 years ago as I believe it is today. I would just invite your comments on that observation.

Mr. GREENSPAN. There are several issues involved here. I have always been attracted toward moving significant amounts of retirement resources into the private sector. In fact, I had a long presentation about 5 years ago before this big revenue surge and then loss occurred before a special task force of the Senate Budget Committee in which I raised the issue of various different ways to essentially move funds from the public to the private sector and have minimal guarantees and mechanisms which I thought would be useful for coming to grips with the Social Security problem.

I suspect, although I grant you it certainly does not sound this way when one hears the rhetoric, that the Social Security problem in quotes is a relatively small one that has to be adjusted. I think the really serious fiscal problem is Medicare and the reason for that is that, as I pointed out in my prepared remarks, we have had a remarkable increase in technology, and the advent of being able to get very much greater insight into the structure of how we function as human beings has opened up huge potential avenues for pharmacology and for other types of technologies which I think over the decades in the future are going to be in increasingly greater demand.

So we have got this very difficult problem, as Senator Breaux said, which is a difficult problem and a wonderful solution of this remarkable technology which we are dealing with but which has increased the cost of medical care generally.

I personally do not think it has increased the price of medical care. I think our price indexes are just plain overdoing it. I do not think all of this increase in cost is real. I mean it is a major improvement in medical services and the demand for that because it is so good is creating the possibility of a much larger demand than I think people have previously anticipated. Certainly when the original debate on Medicare was occurring there was not even the remotest notion of what potentially lay out there in improved technologies.

This is something that I think we have to become aware of and try to find a way in which with our limited economic resources we can capture this technology in the most effective way for the American people. That is going to be a more difficult problem, I suspect, than Social Security.

Social Security, as difficult as it is, is basically a defined benefit program with actuarial calculations and judgments and estimates and we are pretty good at that. The real problem is going to be how

we take this wonderful bonanza of technology and find the best way to employ it.

The CHAIRMAN. For the sake of our time and the chairman's, I would limit all three of us to one last question each. Senator Carper? We will just work our way back.

Senator CARPER. OK, good.

I have heard you talk before about the way we determine how benefits should be raised, how benefits should be raised and the market basket that we use to determine what the increase should be and benefits each year and I have heard you say that there are other options that we should consider that are truly reflective of the price increases that people who are retirement age face. Would you just take a minute and talk about that again, please?

Mr. GREENSPAN. Senator, if you go back to the original Social Security legislation you are going to find that the escalation of benefits essentially, according to the will of the Congress, was to increase benefits according to the cost of living and at the time, the only measure that we had of the cost of living was the Consumer Price Index, which is effectively what we use. But it has always been an issue of whether that really, truly measured the cost of living and one of the reasons basically is that it has a fixed weight system which biases it upward.

Since the original views of indexing both Social Security and the tax structure, we have improved our ability to measure the cost of living and indeed the very latest version is the Bureau of Labor Statistics so-called chain-weighted price index, which is a far superior measure of the cost of living. I suspect that judgment would be agreed to by virtually every economist I know.

Therefore, the issue arises whether we really want to index benefits more than the cost of living or is it the will of the Congress to stay with the cost of living? If it is the latter, it makes a big difference. You will find, for example, if we had used the chain-weighted CPI, we would have probably had a budget deficit about $40 billion less in fiscal 2002, a little more than half because of the tax bracket shifts and a little less than half on the issue of benefits.

So if you want to come at the budget in a manner in which technical changes are appropriate, I think you will find that cumulatively over the years it makes a very significant difference and if we do it now it would make a rather large difference by the year 2010.

Senator CARPER. Thanks very much.

The CHAIRMAN. Senator Wyden?

Senator WYDEN. Thank you.

Mr. Chairman, I want to go a little bit further on this question of health care productivity. We sort of touched indirectly on it, but one of your many contributions, was early on you pointed out that information technology a few years back was going to give us a chance for this incredible opportunity for productivity growth. I am curious about your thoughts as it would apply to health care in particular.

For example, electronic medical records could be an extraordinary opportunity for increasing health care productivity. We know if someone sees three doctors today that there is a very high

likelihood that doctor three will not know a whole lot about what doctor one and doctor two have done, so you have to basically start all over.

I see nurses when I go to health care programs spending astronomical amounts of time charting, for example. If they had a palm-like device, for example, they could probably handle a lot of that.

I am curious if you have given any thought to steps that would increase health care productivity, basically taking what you said about IT, information technology as related to the economy as a whole, and brought it to the health care field, particularly as it applies to government. I mean if you look at these government health care programs, I think it is fair to say we are technological Luddites. We are not making the investments in these technologies that it seems to me could do in health in terms of increasing productivity what you have correctly advocated in other areas and I am curious about your thoughts with respect to increasing health care productivity.

Mr. GREENSPAN. Senator, I think you are hitting on one of the areas where we are still back in pre-World War I days. I am still looking at prescriptions written by doctors. I cannot understand them now any more than I could when I was young. There is a remarkable amount of actual paper that goes on prescriptions and then building into the health care records of individuals and I think you are quite right, that we now have the technologies to integrate a very significant amount of medical records of individuals into central systems.

You do have a privacy issue here, which has been one of the major problems preventing that, and I am not sure how you get around it. But technology is there to very significantly reduce administrative expense.

Remember a very large part of improved technology in medical care does not come from biomedicine or pharmacological insights. It comes from information technology systems. I mean MRI is a system which has got very little to do with biochemistry. It is an electronic insight of remarkable importance. I think that the synergies of various technologies are clearly where a great deal of overall innovation is going to occur and especially in the medical area.

Senator WYDEN. I want to observe the chairman's rule about just one question. I would hope, because I thought what you said about IT made a huge difference early on as it related to the economy generally, that you and your excellent staff people would look some more at health care productivity because I think even as it relates to privacy, if we were to do nothing else in this country other than to say on a voluntary basis, on a voluntary basis if someone wanted to direct their health care providers to have electronic medical records, this could very significantly boost our productivity and go right to the point that you have talked about for years in terms of output per hour.

I may follow up with you some more on this because I think it is a chance to really extrapolate from what you said about productivity generally in the health care field where, of course, costs are rising.

So thank you, Mr. Chairman.

Senator CARPER. Mr. Chairman, could I just make an observation? Senator Wyden has put his finger on a very important point. I have just written a piece for a DLC publication, Blueprint, on this very issue.

I recently met with some folks visit from the Patient Safety Institute and the Delaware medical society who put something together called the Delaware Health Information Network. I believe they are onto something. I talked to a guy the other day who told me he was taking 15 different medicines, he has seven doctors, and my guess is that those doctors are not talking with each other and are not aware of the kind of interaction that those meds are having. There are ways not just to save money here but really to improve patient care.

I think the issue about privacy can be addressed.

The CHAIRMAN. Well, I thank you for that. If you will recall some weeks ago we had a hearing that touched—we had a couple of witnesses that touched on that as it relates to the kind of voluntary effort of counseling that is going on now with our seniors, but the technology side of it for all is very, very significant.

Mr. Chairman, one last question for me. You talked about large increases in payroll tax would suppress economic growth and reduce the incentive to work in what will likely be an era of labor shortages. This seems to make a strong economic argument against raising payroll taxes in an effort to strengthen Social Security or Medicare in any significant way. Can you elaborate on how increases in payroll taxes would suppress overall economic growth?

Mr. GREENSPAN. Well, all taxes, by their very nature, suppress growth. The question is that they are there hopefully not just to suppress growth but to raise revenue for purposes that the government thinks are important.

I think with respect to Social Security and Medicare as a first approximation, I would certainly say not to solve the problem by moving up taxes. You may end up at the end of the day with a whole series of adjustments that you have made and there is a small part that still has to be done and you may decide that it is the least worst final alternative, but one has to keep in mind that raising taxes is not merely a revenue-raising phenomenon; it has negative impacts on the tax base from which you are making those revenue increases.

The CHAIRMAN. Well, Mr. Chairman, again we thank you very much for coming this morning and expressing your views on this very important issue. You have offered us great insight. I think the record we build here—as you know, we are not an authorizing committee but we value our ability to be the town crier on occasion, as many of the authorizing committees move in certain areas that we are involved in, to build records that we can then make available to our colleagues here in the Senate as decisions are made.

So again thank you very much. We appreciate it.

Mr. GREENSPAN. Thank you, Mr. Chairman.

[The prepared statement of Mr. Greenspan follows:]

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Statement of

Alan Greenspan

Chairman

Board of Governors of the Federal Reserve System

before the

Special Committee on Aging

United States Senate

February 27, 2003

Mr. Chairman and other members of the committee, I am pleased to be here today to discuss the economic effects of the aging of the global population. In so doing, I would like to emphasize that the views I will express are my own and do not necessarily represent those of the Federal Reserve Board.

The world's population is growing older as a result of both declining fertility and increasing life expectancy. These trends manifest themselves in at least two important dimensions: a more slowly growing population and labor force, and an increase in the ratio of the elderly to the working-age population.

The so-called elderly dependency ratio has been rising in the industrialized world for at least 150 years. The pace of increase slowed greatly with the birth of the baby-boom generation after World War II. But elderly dependency will almost certainly rise more rapidly as that generation reaches retirement age. The acceleration will be particularly dramatic in Japan and Europe. For example, in Japan the population share of the elderly, defined here as those at least 65 years of age, climbed from 12 percent to 17 percent in the past decade, and demographers expect it to reach 30 percent by 2030. The absolute size of Japan's working-age population is already declining and is projected to fall 20 percent over the next three decades. Europe's working-age population is also anticipated to recede, and the share of the elderly in its overall population is expected to rise markedly, though less so than in Japan.

The changes projected for the United States are not so severe as those projected for Europe and Japan, but nonetheless present daunting challenges. Over the next thirty years, the growth rate of the working-age population in the United States is anticipated to slow, from about 1 percent per year today to about 1/2 percent per year by 2030. At the same time, the percentage

of the population that is over 65 will rise markedly--from less than 13 percent today to perhaps 20 percent by 2030.

Though the overall population is expected to continue to age, much of the aging of the labor force has already occurred with the aging of the baby-boom generation. Once the baby boomers begin to retire, the mean age of the U.S. labor force is expected to stabilize.

These anticipated changes in the age structure of our population and work force result largely from the decline in fertility that occurred following the birth of the baby-boom generation. After peaking in 1957 at about 3-1/2 births over a woman's lifetime, the fertility rate in the United States fell to less than 2 by the early 1970s, and then rose to about 2.1 by 1990.[1] Since then, the fertility rate has remained close to 2.1, the so-called replacement rate, or the level required to hold the population constant in the absence of immigration or changes in longevity. The decrease in the number of children per family since the baby boom has inevitably led, with a lag, to a projected increase in the ratio of elderly to working-age population.

Increases in life expectancy, too, have been substantial. In 1950, a man 65 years of age could expect, on average, to live until age 78, whereas now he can expect to live until over 81. And if current trends continue, by 2025 he can expect to live to 83 and, by 2060, to 85. Women's life expectancy is projected to increase about the same amount, from 81 in 1950 to roughly 85 today, 86 in 2025 and 88 in 2060.

Of course, it is difficult to predict the age structure of the population in the more distant future. Although we have a good idea of the size of the working-age population over the next

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[1]The fertility rate used here is the total fertility rate. It is measured as the average number of children who would be born to a woman in her lifetime if she were to experience the birth rates by age observed in any given year.

twenty years or so--its members are largely already born--forecasting the number of children and future immigration and population growth is much more conjectural. Just recently, for example, the United Nations revised its forecast of world fertility rates downward from its projection only three years earlier; according to the new forecast, world population is expected to begin actually declining in the latter part of this century, whereas under the previous forecast, it was expected to continue growing.

Even with the substantial uncertainty that surrounds these forecasts, population aging in the developed world is not likely to be a temporary phenomenon, associated solely with the retirement of the baby-boom generation. Rather, under current projections, the retirement of that generation should be viewed as hastening the transition between the current distribution of age and one in which the population is notably older.

The populations in most developing countries likewise are expected to have a rising median age, but they will remain significantly younger and grow faster than our population over the foreseeable future. Eventually, declines in fertility rates and increases in longevity may lead to similar issues with aging populations in the developing world but likely only well after the demographic transition in the United States.

As you know, the aging of the population in the United States will have significant effects on our fiscal situation. In particular, it makes our social security and Medicare programs unsustainable in the long run, short of a major increase in immigration rates, a dramatic

acceleration in productivity growth well beyond historical experience, a significant increase in the age of eligibility for benefits, or the use of general revenues to fund benefits.[2]

Indeed, according to the intermediate projection of the social security trustees, the level of social security contributions under current law begins falling short of legislated benefits by approximately 2017. While the prospect of a shortfall in social security is reasonably certain given the changing composition of the population, the range of possible outcomes in Medicare is far wider. Rapidly advancing medical technologies, essentially inelastic demand for medical services for the elderly, and a subsidized third-party payment system have created virtually unconstrained demand.[3]

How the financing pressures that accompany increasing retirement are resolved will have profound, but uncertain, effects on the structure of both private and public pension plans. Private pension assets already account for about 12 percent of household financial assets in the United States, a level that will almost certainly increase over the next decade. The total investment income of these funds, in conjunction with retirees' other forms of income, must be sufficient to finance a satisfactory standard of living.

The real resources available to fund pension benefits depend on the economy's long-term growth rate, which in its simplest terms is determined by the growth rate of labor employed plus

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[2]Because social security benefits are tied to productivity growth with a lag, only a rate of productivity growth well above historical experience could completely resolve social security's long-term financing problem.

[3]Constraining these outlays by any mechanism other than prices will involve some form of rationing--an approach that in the past has not been popular in the United States.

the growth rate of the productivity of that labor. As already noted, by 2030 the growth rate of our working-age population is expected to decline by half.

The fraction of the working-age population actually employed will doubtless be affected by improvements in health or changes in the economic returns to working. Labor productivity has historically been affected by changes in the amount of capital available to each worker, the pace of technical progress and, perhaps more subtly, changes in the experience of our workforce. These elements are key to assessing the economic effects of aging.

One natural response to population aging will almost surely be for a more fit elderly population to increase their participation in the labor force. Americans not only are living longer, but they are generally living healthier. Rates of disability for the elderly have been declining, reflecting both improvements in health and changes in technology that accommodate the physical impairments that are associated with aging. In addition, work is becoming less physically strenuous but more demanding intellectually, continuing a century-long trend toward a more conceptual and a less physical economic output. For example, in 1900, only one out of every ten workers was in a professional, technical, or managerial occupation. By 1970, that proportion had doubled, and today those types of jobs account for about one-third of our workforce.

Despite the improving feasibility of work at older ages, Americans have been retiring at younger and younger ages. Some analysts believe this trend has slowed, although few anticipate a rapid turnaround. But rising pressures on retirement incomes and a growing scarcity of experienced labor could induce greater labor-force participation.

Immigration, if we choose to expand it, could prove an even more potent antidote for slowing growth in the working-age population. As the influx of foreign workers in response to the tight labor markets of the 1990s showed, immigration does respond to labor shortages.

An expansion of labor-force participation by immigrants and the healthy elderly offers some offset to an aging population. However, it is heightened growth of output per worker that presents the greatest potential to boost the growth of gross domestic product. A significant rise in the growth of labor productivity will be necessary if the standard of living of retirees is to be maintained and that of workers is to continue advancing.

One of the more direct ways to raise growth in output per hour is to increase saving and investment, which augment the capital stock available to workers. Another is to increase the incentives for innovation; efficiency gains, broadly defined, currently account for roughly half the growth in labor productivity.

Though augmenting saving and investment should raise future labor productivity and thereby help provide for an aging population, the incremental benefit of additional investment may itself be affected by aging. Without a growing labor force, the amount of new equipment that can be used productively will be more limited, and the return to capital investment could decline as a consequence.

What actually happens to the saving rate in the next three decades will depend importantly on the behavior of the baby-boom cohort during their retirement years. Over the post-World War II period, the elderly in the United States, contrary to conventional wisdom, seem to have drawn down their savings only modestly. The reasons are not entirely clear. Often people bequeath a significant proportion of their savings to their children or others rather than

spending it during retirement. If the baby-boom generation continues this pattern, then the U.S. household saving rate may not decline significantly, if at all.

The faster rates of aging in Europe and Japan may also directly affect investment and, hence, the growth of labor productivity here in the United States. If saving rates in these countries decline, global capital flows to the United States that have contributed significantly in recent years to financing domestic investment are likely to decline. As in the United States, much will depend on the extent to which retirees in these countries draw down their savings. For example, the saving rate in Japan, even with the rapidly aging population, has not declined to the extent that some had predicted. However, if households in Japan were to start consuming more and saving less, Japan's trade surplus would likely shrink as consumption of imported goods rose. Some of the elevated level of their imports would be exports from the United States, and our trade balance would improve, all else being equal.

Jobs requiring unskilled labor are likely to continue moving to developing countries, and this transfer may increase foreign direct investment by U.S. firms. Most other developed countries are unlikely to be able to offer higher rates of return because they are already aging faster than the United States.

Many developing countries have the potential to offer higher rates of return because of their younger and more rapidly growing populations and currently low stocks of capital, but the realization of this potential is far from guaranteed. Historically, returns to investment in many developing countries have been held down by several inhibiting factors: low levels of education, poor infrastructure, and, perhaps most important of all, capricious legal protections.

Clearly, if net capital inflows into the United States decline, so must our current account and trade deficits. Any such declines must be offset by higher domestic saving--including government saving--if domestic investment in plant and equipment and in housing are to be maintained.

Future labor productivity, however, is determined by more than just saving, investment, and capital intensity. One of the remarkable features of the economy over the past seven years or so has been the acceleration in the pace of innovative use of capital by workers, rather than increases in the amount of capital per worker. Indeed, as I pointed out earlier, such innovation accounted for about one-half of the rapid increase in labor productivity that we observed in the late 1990s. Therefore, it is important to address the possibility that aging will affect the rate of innovation, either through a rearrangement of existing capital resources or through technological advance.

Economists understand very little about how technological progress occurs, and research about the effects of aging populations on technological innovation has been sparse. On the one hand, some commentators have worried that an aging population will lead to a less dynamic economy and a lower rate of technological progress; they cite, for example, the fact that the majority of Nobel prizes in the "hard" sciences were awarded for discoveries made by the winners early in their careers. Such issues may have less import going forward, however, as most of the aging of the workforce has already occurred. On the other hand, a slowed rate of growth or a decline in the working-age population may raise technological growth. Although discovery of new technologies is to some degree a matter of luck, we know that human activities do respond to economic incentives. A relative shortage of workers should increase the incentives

for developing labor-saving technologies and may actually spur technological development. Economic historians have argued that one reason that the United States surpassed Great Britain in the early nineteenth century as the leader in technological innovation was the relative scarcity of labor in the United States. Patent records of this period show that innovation did respond to economic incentives and that the scarcity of labor clearly provided incentives to develop new methods of production.

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The aging of the population means that the government will inevitably need to make a number of changes to its retirement programs. These changes in themselves can have profound economic effects. For example, aside from suppressing economic growth, large increases in payroll taxes can exacerbate the problem of reductions in labor supply, whereas policies to promote longer working life can ameliorate it. Reductions in benefits--through changes to the age for receiving full retirement benefits or through reforms to slow the growth of Medicare spending or through other means--can affect retirement, the labor force, and saving behavior. In addition, policies that link increases in longevity over time to the eligibility age for social security, and perhaps Medicare, may need to be considered. Such linkages would help protect the financial and, hence, the economic viability of these programs.

The aging of the population is bound to bring with it many changes to our economy--some foreseeable, many probably not. Though the challenges here seem great, the necessary adjustments will likely be smaller than those required in most other developed countries. But how we adjust will also matter. Early initiatives to address the economic effects

of baby-boom retirements could smooth the transition to a new balance between workers and retirees. If we delay, the adjustments could be abrupt and painful.

Fortunately, the U.S. economy is uniquely well suited to make those adjustments. Our open labor markets can adapt to the differing needs and abilities of our older population. Our capital markets can allow for the creation and rapid adoption of new labor-saving technologies, and our open society has been receptive to immigrants. All these factors put us in a good position to adjust to the inexorabilities of an aging population.

The CHAIRMAN. Now let me invite our second panel forward. Again let me repeat that joining us today on our second panel will be Paul Hewitt, director of the Global Aging Initiative at the Center for Strategic and International Studies, Sylvester Schieber, director of research at Watson Wyatt Worldwide, and Gary Geipel, chief operating officer and vice president of the Hudson Institute.

Paul, we will start with you if you will pull the microphone as close as possible to your comfort so we all can hear. Please proceed.

STATEMENT OF PAUL S. HEWITT, PROGRAM DIRECTOR, GLOBAL AGING INITIATIVE, CENTER FOR STRATEGIC AND INTERNATIONAL STUDIES, WASHINGTON, DC

Mr. HEWITT. Thank you, Senator. Mr. Chairman, thank you for your leadership in scheduling this hearing on the opportunities and threats of global aging. I would be remiss if I did not also acknowledge the contributions of Senator Breaux to the CSIS Commission on Global Aging, which has been examining this question for 3 years now.

The commission's central finding was that the challenge posed by global aging is pervasive, it will affect everything from individual life plans to international security agreements. Global aging will generate important economic opportunities but it will also create unprecedented dangers. Which of these forces triumphs will depend on the course of policy reform over the next few years, not just in the United States but in countries the world over.

It will surprise some to learn that America is probably going to age less over the next half century than any other country in the world. The Census Bureau projects that our median age will rise by just 3.6 years, barely half the rate of the previous 50 years. The median age of the world is on track to rise by 9.7 years over this period, while the typical Mexican at mid-century is expected to be 16 years older than her counterpart of today. As shown in the first table in my testimony America's age structure will be converging with that of the developing world and diverging from those of our allies.

Population aging is creating important opportunities in the developing world. In a phenomenon known as the demographic bonus, falling fertility directly increases per capital incomes even as it frees women to participate in labor markets and enables families to spend more on health and education. The result can be a virtuous circle of economic growth and political stability.

Falling fertility has made such a difference in China. Last year China produced 5 percent of global output but accounted for one-third of global growth.

Yet in order to capitalize on this bonus, societies must also provide employment. Without jobs, growing labor pools translate into ballooning legions of unemployed who, in turn, are the source of social unrest. It was the recognition that unemployment had caused so much upheaval in the first half of the 20th Century that led every industrial country to establish generous welfare states in the aftermath of World War II. Yet safety nets are expensive and this means they are likely to remain modest in the low and middle income countries for the foreseeable future. This means that social

peace in these regions will depend perilously on the state of the global economy.

For example, China estimates that its economy will need to grow at 8 percent a year just to prevent unemployment from rising.

A particular concern then is the fact that aging is increasing the potential for crisis throughout the developed world. As shown in Table 2 on the right, CSIS estimates that by 2040 today's old-age benefits will consume an additional 12 percent of GDP a year in a typical developed country. Were these imbalances permitted to accumulate, by the mid–2020's budget deficits in the rich countries would consume all of their savings, making them dependent on capital flows from the Third World to fund domestic investment. Long before this happens, of course, capital shortages and default risks would spill over into the global markets and disrupt growth everywhere.

Mr. Chairman, a complete discussion of these budget estimates can be found in the 2003 Aging Vulnerability Index, which is published by Watson Wyatt and CSIS. I would like to request at this time that a copy of this report be inserted in the record as an appendix to my written testimony.

The CHAIRMAN. We will do that. We will file that and appendicize it to your testimony. Thank you.

Mr. HEWITT. Thank you. In fact, we are concerned that the potential for fiscal crisis may be much greater than these numbers suggest, as was hinted by Chairman Greenspan just a moment ago. Labor shortages are projected to cut GDP growth by an average of .7 percent a year in Japan and .4 percent in the EU–15 over the next 25 years. This means that even at full employment, economic growth in these regions will fall under 1 percent after 2015. Growth is essential.

More immediate and worrying, however, are the effects of depopulation on product markets. In Germany and Japan shrinking numbers of older and thriftier consumers already are creating overcapacity in many industries, from construction to retail, that used to be engines of economic growth. The loss of pricing power in these sectors not only has been deflationary but fiscally destabilizing as collapsing corporate profits and rising bank losses have deprived governments of needed corporate income tax revenues.

If demography is the culprit in this malaise, as I believe is the case, then there is a high potential for fiscal instability in the near term. It remains that properly managed, the industrial world's aging could prove a boon for the developing world. Slowing growth in the rich countries will translate into fewer profitable investment opportunities in our domestic economies. In response, managers of capital increasingly will look abroad to developing countries with large labor forces and low productivity where infusions of capital and technology and know-how can generate out-sized returns. In this win/win scenario, rich country retirees would maintain high rates of return on their nest eggs while helping to accelerate economic development in the poorer regions.

Realizing this potential will require an historic expansion of global trade and investment alongside fundamental structural reforms in both the developed and developing regions. The rich countries will need to place much more of the retirement burden on saving—

for example, by expanding private pensions—to ensure that they remain capital exporters. Meanwhile, the developing countries must create physical, educational, financial and legal infrastructure so that they become safer, more productive places to invest.

Last but not least, we will have to find some way to avoid instability in the Middle East and sub-Saharan Africa where an ongoing explosion of youth foreordains higher unemployment and falling living standards for at least the next two decades and possibly beyond.

In conclusion, Mr. Chairman, America and the other developed countries must avoid the temptation of spiraling deficits that divert our saving into unproductive government debt. It is essential that we tackle entitlement reform not just for ourselves but for the economic and political stability of the world. Thank you.

[The prepared statement of Mr. Hewitt follows:]

Testimony by Paul S. Hewitt
Program Director, Global Aging Initiative
Center for Strategic and International Studies
Before the
Senate Select Committee on Aging
on
Global Aging: *Opportunity or Threat for the U.S. Economy?*
February 20, 2003

Mr. Chairman, thank you for your leadership in scheduling this hearing on the opportunities and threats of global aging. I would be remiss if I did not also acknowledge the contributions of Senators John Breaux and Chuck Grassley and Judd Gregg to the CSIS Commission on Global Aging, which has been examining this question for three years now. The Commission also included three senior House Members; the former prime ministers of Japan, Italy, and India; and five current or former cabinet ministers; plus leading experts from international organizations and the private sector. Former Vice President Mondale was the original co-chair for the U.S. side.

The Commission's central finding was that the challenge posed by global aging is pervasive. It will affect everything from individual life plans to international security. Global aging will generate important economic opportunities. But it will also create unprecedented dangers. Which of these forces triumphs will depend, in no small measure, on the course of policy reform over the next few years—not just in the U.S., but in countries the world over.

It will surprise some to learn that America will probably age less over the next 50 years than any other country in the world. The Census Bureau projects that that our median age will rise by just 3.6 years—barely half the rate of the previous 50 years. The median age of the world is on track to rise by 9.7 years over this period, while the typical Mexican at mid-century will be 16.2 years older than her counterpart of today. As shown in Table 1, America's age structure will be converging with that of the developing world and diverging from those of our allies.

Table 1
Change in Median Age for Selected Countries and Groupings, 2000 to 2050

	U.S.	LDCs	World	Europe*	Japan	China	India
2000	35.5	18.2	26.5	37.7	41.2	30.0	23.7
2050	39.1	26.5	36.2	49.5	53.1	43.8	38.0
Increase	3.6	8.3	9.7	11.8	11.9	13.8	14.3

Source: United Nations; Census Bureau for U.S.
* Includes all Europe plus Russia (47 countries)

Population aging is creating important opportunities in the developing world. In a phenomenon known as the "demographic bonus," falling fertility directly increases per capita incomes, even as it frees women to participate in the labor market and enables families to spend more on health and education. The result can be a virtuous circle of economic growth and political stability.

Yet in order to capitalize on this bonus, societies must also provide employment. Without jobs, growing labor pools translate into ballooning legions of unemployed, who, in turn, are a source of social unrest. It was the recognition that unemployment had been the root of so much upheaval in the first half of the 20th century that led every industrial country to establish generous welfare states in the aftermath of World War II. Owing to their high costs, safety nets in the low- and middle-income countries are likely to be modest for the foreseeable future. This means that social peace in these regions will depend perilously on the state of the global economy.

Of particular concern, then, is the fact that aging is increasing the potential for crisis throughout the developed world. As shown in Table 2, CSIS estimates that by 2040, today's old-age benefit promises will consume an additional 12 percent of GDP a year in the typical developed country. Were these imbalances permitted to accumulate, by the mid-2020s, budget deficits in the rich countries would consume all of their savings, making them dependent on capital flows from the third world to fund domestic investment. Long before this happens, of course, capital shortages and default risks would spill over and disrupt growth everywhere.

Table 2
Percent Change in Old-Age Outlays in 12 Countries
Over 2001 Spending Levels

	2010	2020	2030	2040
Australia	1.0%	3.2%	5.2%	6.9%
Belgium	1.3%	4.7%	9.2%	12.0%
Canada	2.3%	6.4%	11.0%	14.0%
France	2.8%	7.4%	11.3%	13.8%
Germany	0.3%	2.9%	7.5%	10.2%
Italy	1.8%	5.1%	9.6%	12.9%
Japan	4.4%	7.6%	10.1%	14.8%
Netherlands	2.0%	5.5%	9.4%	12.3%
Spain	1.2%	4.4%	10.9%	19.5%
Sweden	1.3%	3.4%	6.0%	8.0%
UK	0.4%	1.3%	3.3%	4.3%
U.S.	1.9%	6.3%	10.1%	12.0%

CSIS Aging Vulnerability Index (2003)

A complete discussion of these budget estimates can be found in the *2003 Aging Vulnerability Index*. Mr. Chairman, I would like to request that a copy of this report be inserted into the record as an appendix to my testimony.

As dismal as these figures are, flagging economic growth could make matters worse. Surging labor forces have accounted for roughly half of all GDP growth in the developed world over the last 25 years. Yet the Organization for Economic Cooperation and Development estimates that shrinking labor forces will cut GDP growth by an average of -0.7 percent a year in Japan and -0.4 percent in the EU-15 during next 25 years. Even if productivity continues rising at past rates, GDP growth in both regions will fall under 1 percent by 2020—and in fast-aging Japan, Italy and Spain, worsening labor shortages will produce semi-permanent aging recessions.

More immediate, and worrying, are the effects of depopulation on product markets. In Germany and Japan, shrinking numbers of older and thriftier consumers already are creating overcapacity in industries, from construction to retail, that used to be engines of economic growth. The loss of pricing power in these sectors not only has been deflationary, but fiscally destabilizing, as collapsing corporate profits and rising bank losses have deprived governments of needed corporate income tax revenues. If demographic rather than cyclical factors are behind the malaise in Japan and Germany, as I believe they are, then the era of aging recessions may already have begun.

It remains that the industrial world's aging need not deprive developing countries of their demographic bonuses. Slowing growth in the rich countries will translate to fewer profitable opportunities for domestic investment. In response, managers of capital increasingly will look abroad to developing countries with large labor forces and low productivity, where infusions of technology and know-how can generate outsized returns. In this win-win scenario, rich country retirees would maintain high rates of return on their nest eggs while helping to accelerate economic development in the poorer regions.

This is already happening on a modest scale, mostly in the form of direct investment by multinational corporations. But much larger capital flows are needed if foreign investment is to play a meaningful role in developed world retirement finances. Maximizing this potential will require an historic expansion of global trade and investment alongside fundamental structural reforms in both the developed and developing regions. The rich countries will need to place much more of the retirement burden on saving—for example, by expanding private pensions—to ensure that they remain capital exporters. For their part, the developing countries must create the physical, educational, financial and legal infrastructure needed to become safer, more productive places to invest. Last, but not least, any aging strategy built around global synergies will require a stable geopolitical environment.

This brings us to a second demographic threat. Exploding unemployment and radicalism in the world's most youthful regions could wreck global prosperity by throwing "sand in the gears of cross-border connectivity," in the words of Stephen Roach.

Social scientists disagree on whether extreme youth is a precursor of conflict. After all, many young societies are peaceful, from Botswana to Bangladesh. Yet it remains that youth gluts characterize the world's hot spots: 16 of the 25 youngest countries have experienced major civil conflicts since 1995. Nor is it sheer coincidence that radical Islam flourishes in Palestine (median age of 16.8 in 2000), Saudi Arabia (18.4), Afghanistan (18.1), Iraq (18.8), and Pakistan (18.9), where the typical citizen is a teenager. Any comprehensive theory of global conflict will reflect that the 20th century's bloodiest upheavals, from Europe's Great War to China's Cultural Revolution, began with surpluses of teenagers.

During the next three decades, labor pools will grow by 146 million in the Arab world, and 402 million in Sub-Saharan Africa—with most of these gains coming in the volatile 15-30 age group. Rising unemployment and falling per capita incomes are a foregone conclusion. At the very least, the coming decades will see massive migration from these impoverished regions to a depopulating Europe whose welfare states are not equipped to handle the income inequality this will entail. At the worst, financial shocks from deteriorating welfare state finances and political shocks from ballooning third world unemployment will feed on one another, creating an era of turmoil from which none of our social compacts will emerge intact.

Mr. Chairman, the era of global aging is underway. It is shaping such seemingly disparate events as deflation in Japan, financial flows to China, and the rise of radicalism in the Middle East. Managing this transition will require an extraordinary degree of policy coordination across national borders. In the best of all worlds, America will be the pivot point in this transition. We will serve as a bridge between a younger third world that must soon become the engine of global economic growth, if there is to be global growth, and aging Japan and Europe, whose leaders must discover prodigious reserves of political will, if their creaking welfare states are not to collapse and drag the rest of the world into economic and political chaos. Needless to say, this latter task will be much easier if we can put our own house in order.

Leading the global aging transition will require more than favorable demographics, a large military, and economic and cultural primacy. It will require us to articulate to a wider, and frequently skeptical, world not simply the threats posed by the aging challenge, but the opportunities as well.

The CHAIRMAN. Paul, thank you very much.
Mr. Schieber.

STATEMENT OF SYLVESTER SCHIEBER, PH.D., VICE PRESIDENT, WATSON WYATT WORLDWIDE, WASHINGTON, DC

Dr. SCHIEBER. Mr. Chairman, thank you for the invitation to testify here this morning. I am going to focus on capital market issues that I believe are likely to arise in response to the global aging phenomenon that we have been talking about here this morning.

Capital markets, like others, have both a supply and a demand side and we have to look at both to understand the implications of aging. According to the prevalent economic thinking today, we are in a period when savings rates are relatively high in the developed world. The role of savings is to supply capital to our economies to spur economic growth. In the future, however, as our populations age significantly, current models of behavior suggest that savings levels are likely to fall.

It is not just the supply of savings that is important; it is also what we do with those savings. If a large portion of personal savings are soaked up by government deficits as developed societies try to maintain their current support levels for the elderly, then those savings will not be available for investment to spur economic growth. When we look at our own social insurance systems and others in the developed world, there is real concern in this regard.

It is also possible that private savings will be squandered as some countries try to prop up sagging demand associated with advanced aging. What has happened in Japan in the last decade. It is a good example of what we should strive not to emulate.

Because of the relatively high savings rates that now exist in the developed world, an interesting phenomenon is unfolding. The ultimate surge in retirements that we are going to experience is still sometime off but we are in a situation now where labor forces in some of these countries may already be shrinking.

As Chairman Greenspan noted earlier, with savings rates increasing at the point where workforces are stabilizing or possibly declining, you may end up with excess capital. At least for a while, there is going to be a tendency to substitute capital for labor. In fact, when we look at Germany, France, and Italy, labor shares of business sector output have already been falling over the last 10 or 15 years, reflecting more intensive capital usage. But economic theory tells us that as capital intensity increases, rates of return will fall.

In my prepared remarks I present some analysis that we have done looking at rates of return across the corporate sector across the developed world, and what we have found is that the rates of return, the ability of corporations to create surplus value in the older countries is significantly less than in the younger countries, countries with lower aged dependency ratios. In fact, we found that a country that has a 0.10 higher dependency ratio will have companies on average that have an 18 percent lower surplus value in their corporations—a very significance difference just on the basis of the aged dependency ratio within those countries. The results of that analysis are in Table 4 in my prepared remarks.

Table 5 in my presentation, the first Table 5—I apologize; there were two Table 5s—the first Table 5 shows the aged dependency ratios in a number of the major developed countries across the world. At the end of the 20th Century the United States had one of the lowest aged dependency ratios among these countries and we have undoubtedly benefited from the ability to generate higher returns because of it. Over much of the last 15 to 20 years the United States has been a significant importer of capital, in large part because our domestic savings rates are relatively low but also because our returns on investment have been relatively high.

As we look to the future, the aged dependency ratio in the United States and elsewhere around the world is projected to increase and to increase significantly. For some period of time the United States might be the beneficiary of this evolving picture as we continue to attract capital because we are in a so much better position than the rest of the developed world. But as our own population ages it will become increasingly efficient to seek alternative places to invest our own capital.

With an abundant supply of labor and a lower stock of capital, developing nations had the potential of generating higher rates of return to capital investment than countries with high capital/labor ratios. This is not simply a one-sided proposition, for the developed nations. The shifting of capital has a tremendous potential to dramatically increase the productivity rates and the standards of living in the underdeveloped economies of the world over the coming decades.

Getting the economic and legal infrastructures in place in the developing countries of the world to solve the global aging dilemma is a great challenge. When we look at Table 7 in my prepared remarks we see that much of the supply of surplus labor that is going to be available in the world over the next 30 years will come from countries that have cultures that are very different than ours.

Beyond cultural differences there are other potential barriers to significant investment in these nations. Capital owners must be able to invest in opportunities within a framework of regulatory and civil law that is enforced on an evenhanded basis. Business dealings must be aboveboard and open to review. There have to be statute- and case-based legal systems that allow disputants in business deals to resolve differences when they arise.

Concerns about the financial markets and the political and legal infrastructures lead many investors in the developed world today to have a home bias in terms of their investing. To continue this pattern in the face of aging populations will be extremely inefficient. It will be inefficient for those countries themselves.

As we put all of the elements of this picture together, the United States is in a better position to weather the aging of its population than virtually any of the other countries of the developed world. We should remain a relatively attractive market for investment much further into the global aging phenomenon than most of the other developed countries and should continue to see foreign flows of capital into our economy. At some juncture, however, the slowdown in our own labor force growth will inevitably mean we will suffer the consequences of capital deepening that are already hitting other developed nations. Before that occurs we should pursue

policies that allow us to take our own surplus capital to other parts of the world where there will be sufficient labor to use it effectively.

As we think about the challenges the aging developed world faces, we ought to quit concentrating so much of our energies on the immediate reform of social insurance programs in the developing world and help get in place operating frameworks where capital can flow freely to stimulate real economic growth. As the developed countries realize rewards of capital infusions that allow their own national incomes to rise, there will be plenty of time to reform their own national retirement systems. Thank you very much.

[The prepared statement of Dr. Schieber follows:]

Global Aging: *Opportunity or Threat for the U.S. Economy?*

Testimony by:

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For:

United States Senate
Special Committee on Aging

February 27, 2003

The observations, comments, and conclusions drawn here are the author's and should not be construed as those of Watson Wyatt Worldwide or any of its other associates.

Mr. Chairman and members of the Committee, thank you for inviting me to testify before you regarding the issues related to global aging and its implications for the U.S. economy. I am going to focus on some of the capital market issues that I believe are likely to arise as the average age of populations across the world, especially the developed world, increase in the coming decades. Capital markets, like any markets, have both a supply and demand side. The implications for each may be somewhat different so I will consider each separately before offering some summary observations about the potential policy implications that you might want to consider.

The Implications of Global Aging on the Supply of Savings

Economists often think about the process of saving for retirement in the context of a theoretical life-cycle model to explain saving and consumption patterns of individuals at varying ages.[1] In its simplest form, the life-cycle model suggests that workers will borrow against the expected stream of future earnings during the early phases of their lives to start their families, buy their homes, and so forth. During the middle phase of their working lives, they pay off their early career debts and accumulate excess assets by regularly consuming less than they earn. The accumulating assets can be laid away at interest to be reclaimed and used later when the ability or inclination to "earn" a living is greatly diminished. The life-cycle model can be enhanced by allowing the family unit, as opposed to a single individual, to define the time horizons for borrowing, saving, and retiring. It also allows one generation to bequeath some share of its lifetime accumulation to subsequent generations.

One of the more controversial issues related to cross-sectional analyses of the life-cycle model has been the effects of organized retirement programs on saving behavior. The life-cycle model suggests that the provision of retirement benefits through a social security program or an employer-based pension should result in lower individual saving by workers covered by such plans. A number of cross-sectional analyses support this conclusion. For example, Martin Feldstein has concluded that national retirement systems funded on a pay-as-you-go basis result in reduced national savings rates because workers offset their other savings to the extent their public pensions represent personal wealth in their retirement portfolios.[2] Other analyses conclude that saving through retirement plans does not fully offset saving outside these plans.[3] In a broad review of the literature in this area, William Gale concludes that estimates that find that pensions have little effect on saving outside them have been inappropriately developed resulting in systematic biases that understate the extent to which pension saving leads to reductions in non-pension wealth accumulation.[4]

An alternative to using cross sectional data to document the life-cycle model of consumption and saving is to track a segment of a population across time. But the use of such panel data has its own set of problems. Probably the most important is related to the timing over which data is gathered. For example, if the period observed is one of abnormally high returns on assets, increases in net wealth might be observed during the period a sample of the older population is studied despite consumption behavior consistent with the life-cycle model. In a survey of the literature in this area, Michael Hurd concludes that the evidence seems to support

the life-cycle model.[5] But there is still considerable variation in patterns of wealth decumulation not explained by this model. Some of it may be due to bequest motives. Part may be due to concerns of the elderly over longevity risk and the extent to which they have annuity income. Everything else being equal, one would expect a person whose retirement wealth is largely annuitized to consume at a higher rate than one whose wealth was not. The latter has to self-insure against outliving his or her retirement savings whereas the former has such insurance provided through the annuity arrangement.

Yet another way to test the relevance of the life-cycle model is to look at variations in savings across countries with varying age structures. Here Richard Disney cites a 1990 Organization of Economic and Cooperative Development (OECD) study that estimated that the net household saving ratio varied significantly and negatively across countries in proportion to the portion of national populations aged 65 and over. Disney identifies a number of technical problems with the study that cast doubt on its conclusion. His own attempts to replicate the OECD findings found a negative relationship between both national savings rates and household savings rates and the aged dependency ratios in OECD countries, but did not find these relationships to be statistically significant. However, Disney did find a strong and statistically significant relationship between the average growth in fixed capital formation and the aged dependency ratios across OECD countries. Overall he concluded that the cross national evidence tends to confirm the predictive power of the life-cycle model.[6]

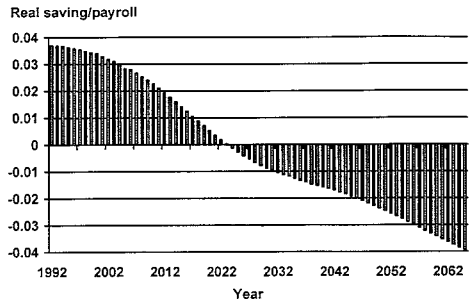
If the evidence supports the life-cycle theory of savings, then the age structure of a society has the potential to affect the aggregate saving rate in a country. If older people tend to save at lower rates than their younger counterparts, having more old people will reduce savings rates. This can occur through the collective effects of individual changes in saving behavior as populations age or it can arise through the operation of retirement programs.

About a decade ago, John Shoven, an economics professor at Stanford University, and I created quite a stir when we wrote a paper reporting the results of simulations of the private U.S. pension system through the retirement of the baby boom generation.[7] In our baseline simulation, we assumed that employers would continue to contribute to their pension plans at the rate they were then contributing and that workers would draw benefits at retirement in accordance with the benefit formulas then prevalent in the system. The results of our baseline simulation are presented in Figure 1.

The figure shows the total real saving of the private pension system (projected contributions less benefits plus real inflation-adjusted asset returns) relative to the projected total private payroll in the economy for 1992 to 2065. We used total payroll as the scaling factor simply because it is a readily available by-product of the Social Security forecasting operation. What Figure 1 shows is that under our assumptions the pension system would continue to generate significant investment funds for the American economy for the first 20 years or so of the projection period. In fact, the decline is very minor for the first ten years and then it steepens considerably. We projected that by 2024, the private pension system would cease being a net

source of saving for the economy. We estimated that the system will then become increasingly a net dissaver. By 2040, the net real dissaving is more than 1.5 percent of payroll and by 2065 the negative saving is projected to reach almost 4.0 percent of payroll. We suggested the change of the pension system from a large net producer of saving to a large absorber of saving would likely have profound implications for interest rates, asset prices and the growth rate of the economy.

Figure 1: Potential Real Saving of Private Pensions Relative to Total Private Payroll for the Years 1992 to 2065 Assuming Current Plan Characteristics and Contribution Rates Persist



Source: Sylvester J. Schieber and John B. Shoven, "The Consequences of Population Aging on Private Pension Fund Saving and Asset Markets," in Sylvester J. Schieber and John B. Shoven, eds., *Public Policy Toward Pensions* (Cambridge, MA: MIT Press, 1997), pp. 238.

One implication of the baseline projection that we made in the early 1990s was that the private defined benefit pension system would run out of money before the baby boomers had completed their retirement period. Since pension law requires that employers fund their pension obligations, federal law precludes the scenario depicted in Figure 1 from occurring. We predicted at the time that we wrote the paper that employers would either accelerate their funding

in future years or they would curtail their plans. Since then, we have seen some combination of the two actually occur. Indeed, it has been the unfolding of a predictable surprise.

In the paper we wrote summarizing our analysis, we emphasized that the timing of the prediction of the change in pensions from a net buyer of assets to a net seller is very sensitive to our assumptions about the rates of return earned on pension investments as well as to the assumed level of pension contributions. However, we concluded that the pattern of Figure 1 is almost inevitable; only the timing could be somewhat different than pictured. If investment returns exceeded our fairly conservative assumptions, then the decline of the saving contribution of pensions would be more modest and delayed in time. Still, we thought that the demographic structure is such that it would by necessity occur. It is not even correct to think of this as a negative development. After all, pension assets are accumulated to provide for the resources needed by the elderly in retirement. It is only natural that when we have an extraordinarily large number of retirees, the real assets of the private pension system will shrink and the system will at least temporarily cease being a source of new investment funds for the economy.

Compared to the remainder of the developed world the demographic situation the United States faces is a relatively minor problem. While the U.S. fertility rate has rebounded to essentially full replacement in recent years, Italy's and Spain's fertility rates are below 1.2 and dropping. Germany's and Japan's are around 1.3 and show no signs of increasing. Where fertility falls short in creating the possibilities of continued population, labor force, and economic growth, immigration merely accentuates the situations various countries face. For the United

States, immigration means that our labor force is likely to continue to grow for at least the next couple of decades. While our labor force growth will be less than what we have experienced over the working lives of virtually all people in the workforce today, it will be positive. Japan, Germany, Italy, Spain, and a host of other developed countries will likely see their labor forces begin to decline by the end of this decade or during the next one.

The flow of funds in and out of funded pension plans affects savings rates. But the potential effects of population aging on funded pension funds in most of the developed world may not be as large as they are in the United States. The funded pension system in the United States is much larger than it is in other countries with the possible exceptions of Canada, the United Kingdom, and the Netherlands. It is important to note, however, that funded pensions are not the only way people save.

Comparing cross sectional survey data across a number of countries, as we do in Table 1, actually suggests that the life-cycle model discussed earlier may not apply and that population aging might lead to increased saving rates. In the United Kingdom and Japan, savings rates seemingly increase steadily with age from age 55 to 64 and up. In Canada and Germany, there is a dip in the savings rate from ages 55 to 64 to the next age category of 65 to 74 but then it increases again for the age group 75 years of age and older. It is only in the United States and Italy that the savings rate actually falls from age 55 to 64 onward, but in the case of Italy, the saving rate is still remarkably high. It is only in the United States that savings rates actually turn negative at advanced ages. Overall, the results in Table 1 suggest that the aging of the

populations in much of the developed world might actually result in an increase in available savings to fuel our capital growth in the future. That conclusion would be premature.

Table 1: Estimated Personal Savings Rates for Selected Countries by Age

Age	United Kingdom	Canada	Japan	Germany	Italy	United States
25-34	6.22	1.50	11.00	11.00	13.26	8.72
35-44	9.42	4.00	20.15	14.00	15.57	14.21
45-54	12.24	6.50	17.60	16.00	17.65	14.75
55-64	7.62	10.00	19.70	10.00	17.94	10.81
65-74	11.36	6.00	20.20	7.50	16.52	-4.88
75+	19.82	8.00	26.45	10.00	15.70	-6.54

Note: Ages are of the household head/reference person and savings rate in each age group is for all households in their respective samples.

Sources: U.S.: Bureau of Labor Statistics, http://stats.bls.gov/cex/2000/Standard/age.pdf; Japan: Kitamura et al. (2000), Table 3, pp. 5; Italy: Brugiavini et al. (2000), Table 7, pp. 27; UK: Banks et al. (March 2000), pp. 63-4; Germany: Borsch-Supan et al. (2000), Table E1; Burbidge et al. (1994), Figure 1.9, pp. 39-41.

The Implications of Global Aging on the Demand for Savings

The results in Table 1 have the potential to be very misleading if we use them to assess the implications of savings rates by age in the developed economies of the world. These are estimated personal savings rates taken from survey data. Data of this sort is often unreliable. While older people might have more difficulty in recalling detailed information in regard to their income and savings level than younger ones, there is no reason to believe that such recall differences would be great enough to account for the relatively consistent pattern in the table. The real problem with Table 1 is that it focuses purely on the supply of savings and not on the

use of personal savings. There is reason to believe that global aging will also affect the demand for savings, including for things other than investment. It is going to do this in a couple of ways.

Using Government Deficits to Cover Retirement Costs

One of the results of modeling public retirement systems in the major developed countries around the world has been a growing awareness of the potential problems an aging population can pose. This awareness has motivated a number of countries to adopt new policies that will ameliorate the burden that retirement obligations will impose on their economies. Sweden and Italy are phasing in notional account defined contribution plans that promise to significantly curtail benefits for future generations of retirees. Germany and Japan have adopted legislation to reduce retirement benefits to varying degrees in their existing systems and have implemented voluntary tax-favored savings programs similar to the 401(k) system in the United States. Canada has adopted an increased schedule of payroll taxes so today's workers can pre-fund a portion of the benefits for future retirees. France has modestly reduced the generosity of private sector pensions, changing the indexing formula and number of years required to qualify for full benefits. The United States has debated reforming its social security pension system but has been unwilling to adopt sufficient changes to sustain it over the long term. The United Kingdom has modified its national retirement system over to an extent where it appears the country will not face the fiscal demands most developed countries will but where growing elderly poverty will likely be the ultimate price to achieve this end.

In 2001, the European Commission (EC) and Organization of Economic Cooperation and Development (OECD) developed a set of estimates of the potential growth in fiscal costs associated with population aging in the various countries in their memberships. The results of these projections are reflected in Table 2. The projections reflected the governmental retirement and health financing systems as they operated at the time of the projections and did not include anticipated changes in law. There is substantial reason to believe that the projections may err on the low side because some of the assumptions underlying them seem overly optimistic.[8]

Table 2: Estimated Age Related Spending for Old-Age Pensions, Health Care and Long-Term Care as a Percent of GDP in 2000 and 2050 for Selected Countries

	Old-age pension		Health care and long-term care	
	2000	2050	2000	2050
Australia	3.0 %	4.6 %	6.8 %	13.0 %
Belgium	8.8	12.1	6.2	9.2
Canada	5.1	10.9	6.3	10.5
Denmark	6.1	8.8	6.6	9.3
France	12.1	15.9	na	na
Germany	11.8	16.8	na	na
Italy	14.2	13.9	na	na
Japan	7.9	8.5	5.8	8.2
Netherlands	5.2	10.0	7.2	12.0
New Zealand	4.8	10.5	6.7	10.7
Norway	4.9	12.9	5.2	8.4
Spain	9.4	17.4	na	na
Sweden	9.2	10.8	8.1	11.3
United Kingdom	4.3	3.6	5.6	7.3
United States	4.4	6.2	2.6	7.0

Source: Thai Than Dang, Pablo Antolin, and Howard Oxley, *Fiscal Projections of Aging: Projections of Age Related Spending* (Paris: OECD, September 2001), Economics Department Working Papers No. 305, p. 25.

The fact that there is greater awareness on the part of policymakers about the problems associated with aging societies or that they have adopted policies to deal with it raises the question of whether the developed countries are doing enough to respond to the challenge aging populations pose. Some countries have clearly done a great deal more than others in modifying the structure or the generosity of their retirement systems with the goal of reducing the prospective burden of aged dependency to tolerable levels. But then, some countries face a much larger aged dependency problem than others. For example, the aged dependency ratio in Italy, Japan and Spain in 2050 is projected to be about twice that of the United States. It may not be as crucial that the United States adopt policies to deal with its aging or that it do it as soon as those with a more serious aging problem. But then again, the United States has such a relatively expensive health system with attendant costs for its aged dependents that health cost inflation might more than offset any benefits from having less aging dependency.

In the European Union, the members are subject to the Stability and Growth Pact that requires that they run their government budgets "close to balance or in surplus." The expectation that each member of the EU will abide by this agreement gives this set of developed economies, all with aging populations, a unique cross national interest in addressing the problem of rising aging obligations. It is not a coincidence, then, that the EC and OECD have made a major contribution in helping detail the costs of aging across the developed economies. Both organizations are based in the heart of the EU. One is exclusively made up of its members and the other is significantly comprised of them.

The European Commission recently reviewed the budget plans of the EU members against the standards in the Stability and Growth Pact from both a short-term and intermediate-term perspective.[9] In virtually all of the cases, they included comments in their country reviews on the sustainability of the national pension system under current law. In a number of cases, they also included comments about the costs that would be associated with aging under the health care system. In 10 of the 15 country reviews, there was a recommendation that further adjustments would likely have to be made to the pension system for the country to stay in compliance with the Stability and Growth Pact over the longer term. This conclusion was based on the modeling of the pension systems done by the EC and included assumptions that other non-age related functions of the various governments would continue to operate in the future at roughly the same size as currently relative to the size of the national economy.

As the European countries confront the budgetary challenges they face in curtailing their pensions, they are undoubtedly going to be affected by a set of countervailing pressures. On the one hand, it will be tempting for each country to pursue policies in their own home countries that meet the needs and desires of their own local populations. The natural inclination might be for a country to ignore the claims future aged dependency will impose on its economy under the assumption that it will simply use deficit financing to cover the costs associated with an aging population as it arises. Such an approach, however, would violate the Stability and Growth Pact. How these pressures are resolved remains to be seen. But there is already evidence that social insurance budgets are driving some of the major EU countries to the brink of violating the treaty.

And the full impetus of aging burdens is still on the horizon. If the EU and other developed countries do depend on deficit financing to cover public retirement claims, the deficits will soak up savings going on in the household sector, diverting them from productive investment. In this scenario, household savings would not contribute to economic growth.

The implications of the aging phenomenon for savings may not be solely dependent on the existence or richness of unfunded retirement programs. Japan's economy has been in the doldrums for most of the past decade. Part of the reason for that is reflected in Table 1 which shows personal savings rates to be much higher than the other large developed economies of the world. Part of the reason Japan has had so much trouble getting back on a path of strong economic growth has been the lack of demand for goods and services in the household sector. But the government has repeatedly undertaken major structural projects over the last decade financed with government deficits in order to stimulate demand in hopes of pumping up the economy. The government debt during this period has gone from one of the lowest in the developed world to one of the highest. The deficits have soaked up much of private household saving. Among other things, it has been used to build airports that are now sinking into the sea and bridges that go nowhere. The long-term benefit of these savings will likely prove negligible for Japan as it contends with the most rapidly aging population in the developed world.

In North America, Canada has accelerated the increase in payroll tax rates to fund its system and reduced some benefits that put its pension commitments on much sounder footing than just a few years ago. It is attempting to create real savings and investment in its economy to

help ameliorate the burden on workers down the road. But there are still concerns over whether Canada's system is sufficiently funded. In the United States, an increase in the normal retirement age is now being phased in but there is nearly universal agreement that the pension system is not sufficiently funded to sustain benefits for the retirement of the baby boom generation. There are no signs of consensus on how the US system will be adjusted in response to its underfunding.

The EC and OECD projections suggest that the majority of countries have not yet addressed the challenges posed by their aging populations. The picture drawn by the EC relative to the EU countries is clear. Ignazio Visco (2001) at the OECD looking at the broader spectrum of developed economies reaches the same conclusion. He observes that "the need to continue responding as early as possible to the economic and fiscal pressures associated with ageing populations is, therefore, not reduced when the most recent reforms introduced in OECD countries are taken into account."[10] Until the developed countries of the world adjust their retirement systems to bring them into some semblance of cash flow balance, the aging populations of the world pose a long-term threat to the availability of sufficient savings to support the need for productive investment capital.

Timing of Savings and Investment Shifts Due to Population Aging

If a government uses deficit financing to provide retirees with a sufficiently high retirement income that they save a substantial portion of it, the personal saving is illusory. This is potentially a problem that many countries face in the future but it should not be a serious one for another 10 to 15 years in many cases. Alternatively, there is an interesting phenomenon that

is now beginning to arise in some of the countries where fertility rates have been quite low for twenty years or more. The ultimate surge in retirements has not yet occurred but labor force growth has come to a halt or even begun to turn negative in a few cases. Because of the age structure in these societies, savings rates may increase for a decade or so. As workforces stabilize or begin to shrink, there will be a natural tendency to substitute capital for labor so the added savings may be welcome. But only up to a point.

The substitution of labor for capital will happen through natural market adjustments in the relative prices of the two factors of production. As with any other good or service in a market economy, increasing scarcity of an important resource will result in increases in the price that goods or service can demand. As domestic labor markets tighten in the developed economies of the world, there will be upward pressures on wages within them. The rising costs of labor will cause business owners to look to other means to expand the productive capacity of their organizations. In most cases this would result in capital investment, substituting machines for the more expensive human capital. The result is that population aging can be expected to change the balance between capital and labor. In particular, it is likely that capital will take on an increasingly important role in the productive capacity of the developed economies.

In many cases, capital deepening in the developed economies will be financed through domestic savings. The working age population within a decade of retirement will typically be among the highest savers in the economy. Even though elderly retirees may have a higher savings rate in some cases, their retirement incomes on which they base their savings are smaller

than those of working people and thus workers save more in absolute terms. Unless government budgets are badly out of balance, many countries should be realizing relatively high levels of saving over the coming decade. This should support considerable capital investment. There is some evidence that this has already begun to occur in some of the more rapidly aging countries of Europe. Poterba reports that labor shares of business sector output in Germany fell from an average 66.1 percent in the 1970s to 63.5 percent in the first half of the 1990s. In France the comparable shares fell from 69.0 percent to 61.6 percent. In Italy they declined from 65.4 percent to 61.0 percent.[11] The shrinking labor share reflects more intensive capital usage.

As industrialized nations rely more on capital for the production of goods and services, the extent that developed economies will be successful in meeting the demand pressures in their societies will depend on the efficiency with which the capital is utilized. If each new unit of capital can continue to be used as effectively as the last, capital deepening can be an efficient substitute for labor and could ease the burdens of population aging in aging societies. But if the capital buildup results in excess capacity in an economy such that there are machines left idle or there is a mismatch with human capital skills, the outcome will be rising costs per unit of output. Consistent with standard economic theory, as capital becomes a greater share of the productive capacity of an economy, the tendency is for the rate of return to capital to fall.

In order to see whether we could detect any effects that aging might already be having on rates of return on capital, we attempted to quantify the impact of the age structure in a number of developed countries on value creation in the corporate business sector. A standard way to

measure the surplus value of a business is through the ratio of the market value of a company's debt and equity to the replacement cost of its assets. This ratio is often known as Tobin's Q, named after its creator, economist James Tobin. It measures the ability of a firm to earn above average returns on its assets. If countries with aging populations are incurring slowed labor force growth and substituting capital for labor, firms' ability to create surplus value should be reduced. If firms in these economies create less surplus value their rates of return should be lower.

To measure the effect of population aging on the ability of firms to earn above average returns, we estimated the relationship between Tobin's Q for publicly traded firms in the developed economies in the OECD and the old age dependency ratio—individuals 55 and over to those age 20 to 54. The dependency ratio is a summary indicator commonly used to measure the extent of aging in a society. A higher dependency ratio suggests there will likely be a greater reliance on physical capital to meet output needs in the most rapidly aging economies. If the capital deepening that results from the demographic transition underway in the aging economies results in lower returns, we expect that where dependency ratio are high or rising, Tobin's Q will be low or falling. To capture how these relationships have changed over the past decade, we include three separate time periods of 1991, 1996 and 2001 in our analysis. Table 3 reports the number of companies and the means and standard deviations for Tobin's q and the old age dependency ratios.

There are several other factors which can have an effect on Tobin's Q that we controlled for in the multiple regression analysis. How much a firm's market value is above the value of its

assets on the balance sheet depends on the type of business in which a firm operates. To control for these potential effects, we control for industry, the number of business lines a firm engages in, and the size—i.e., log of total assets—of the firm. The financial characteristics of the firm are also likely to have an effect on Tobin's Q. Firms that are more susceptible to cyclical variations will have greater variance over the cycle than others. We used the long-term debt leverage of the firm relative to total assets to control for this. Since financial statements do not provide direct measures of labor expense, we used selling, general and administration expenses and capital intensity as a proxy for labor costs. Additionally, we control for asset turnover in our model to account for the ability of organizations to substitute knowledge for working capital. Firms able to better leverage their customer relationships with intellectual capital will be able to turn greater sales relative to their assets. Because of the data limitations we were unable to control for important factors such as advertising and R&D expense, which increase the value of the firm's non-balance sheet assets. To a certain extent industry controls account for these influences.

Table 3: Selected Characteristics of Firms Analyzed to Evaluate Effects of Population Aging on Corporate Returns

Year	No. Firms	Mean Tobin's Q	Std Dev Tobin's Q	Mean Dependency Ratio	Std Dev Dependency Ratio
1991	3463	1.62	1.86	0.444	0.053
1996	5366	1.78	2.48	0.463	0.066
2001	9000	1.45	1.59	0.544	0.090

Source: *Standards and Poor's Compustat Global Database.*

The results from the multiple regression analysis are provided in Table 4. The table shows that a higher dependency ratio in a country in which an organization is incorporated has a significant negative impact on Tobin's Q. A country that has a 0.1 higher dependency ratio will have companies, on average, that have an 18 percent lower Tobin's Q. This effect is even stronger for the periods 1996 and 2001. For the 1996, a 0.1 higher dependency ratio resulted in a 22 percent lower Tobin's Q. For 2001, a 0.1 lower dependency ration was associated with a 23 percent lower Tobin's Q.

Table 4: Multiple Regression of Dependency Ratio in the OECD Countries on the Financial Performance of Corporate Firms in Those Countries

	Estimates	t-value
Intercept	1.138	7.13
Dep. Ratio	-1.822	-4.81
Dep. Ratio 1996	-0.394	-2.01
Dep. Ratio 2001	-0.464	-2.28
Leverage	-0.200	-9.51
Size	0.000	-0.02
SG&A	0.001	6.78
Capital Intensity	0.014	3.00
Asset Turnover	0.020	4.27
Industry	x	
Country	x	
Year	x	
R-Square	0.1311	
Adj R-Square	0.1289	

Source: Watson Wyatt Worldwide.

Notes: The dependent variable is log [(market value of equity plus debt) divided by total assets]. The dependency ratio is the ratio of individuals 55 and over to those 20-54.

Implications of Global Aging on US Capital Markets

In order to provide a frame of reference to put the results in Table 4 in context, Table 5 shows the aged dependency ratios as we defined them for developing our regression analysis. Looking across countries, the countries with significant baby booms after World War II had much lower aged dependency in 2000 than the others. The United States is by far the largest of these and undoubtedly has benefited from the ability to generate higher returns because of it. Over much of the last 15 to 20 years, the United States has been a significant importer of capital, in large part because our domestic savings rates are so low.

Table 5: Ratio of People Ages 55 or Older to Those Ages 20 to 54 In 2000 and Projected for 2010 and 2020 for Selected Countries

	2000	2010	2020
Australia	0.418	0.518	0.636
Canada	0.416	0.538	0.719
Denmark	0.531	0.664	0.781
France	0.510	0.635	0.769
Germany	0.599	0.661	0.863
Italy	0.592	0.698	0.874
Japan	0.610	0.824	0.936
Netherlands	0.455	0.589	0.752
Norway	0.506	0.619	0.737
Spain	0.522	0.592	0.760
Sweden	0.612	0.727	0.831
United Kingdom	0.536	0.616	0.760
United States	0.417	0.509	0.647

Source: Author's calculations from United Nations Population Division, *World Population Prospects: The 2000 Revision.*

As we look to the future, the aged dependency ratios in the United States and elsewhere around the world are projected to rise significantly. In most cases the increase will be at least 0.1 over this decade and in many cases it is more. In Japan's case the increase is expected to be 0.21 for the decade. There is little respite as we look at prospects from 2010 to 2030. The results shown in Table 4 and overlaid on Table 5 suggest that many of the developed countries may not be prime spots in which to find investment opportunities in coming years. For some period of time the United States might be the beneficiary of this evolving picture as we continue to attract capital out of the rest of the developed world. But as our own population ages, it may become increasingly efficient to seek alternative places to invest our own capital.

Capital-labor ratios will likely continue to rise in countries where the rate of growth in the labor pool is slowing. They could rise rapidly when working populations actually start falling, as they are expected to in a number of countries during this decade. Further increases in the capital-labor ratios in some of the developed economies today almost certainly imply that relative rates of return will be lower in those economies than in others where capital could be used more efficiently because of more ample labor supplies. If the capital owners in the developed economies of the world are concerned about the efficient use of their capital and find rates of return declining in their domestic markets because labor pools are shrinking, they will need to attract additional labor to their capital. If they cannot do that by importing labor to their domestic markets because of the inhibitions against immigration that exist in some areas, they can do it by taking the capital to the workers in other parts of the world.

With an abundant supply of labor and a lower stock of capital, developing nations have the potential of generating higher rates of return to capital investment than countries with high capital-labor ratios. Industrialized economies can take advantage of more favorable economic opportunities by shifting capital abroad and the production capacity that goes along with it. In the context of using this potential to meet the consumer demands that will likely persist in aging societies as labor supplies start to contract, capital owners will be able to repatriate returns on capital investments abroad in the form of goods and services. Thus, capital flows have the potential to ease the rising demand pressures for goods and services that are likely to ensue with the aging of the developed societies.[12]

This is not simply a one-sided opportunity for the developed nations of the world to take advantage of their less-developed neighbors. The shifting of capital has the tremendous potential to dramatically increase the productivity rates in the underdeveloped economies of the world over the coming decades. Raising productivity in the poorer nations of the world should have exactly the same effects on the workers there as it did in the developed countries of the world in the decades after the end of World War II. The tremendous increases in the standards of living that occurred in those countries after the war were largely attributable to the rapid increases in the productivity of workers in them.

Capital flows are generally classified into two major categories: portfolio investment and direct investment. Both types of investments are components of a country's capital account in the balance of payments. While both investment types infuse foreign capital to finance

investment and stimulate economic growth in the receiving country, there are some major differences in the two. In a nutshell the key factor distinguishing the two types is control. Portfolio investments represent the flow of funds abroad for the purchase of financial assets of a firm or government in order to receive interest, dividends, or capital gains in return. The flows of funds for portfolio purposes are investments in which the lender gains no operating control over the borrower. With direct investment, however, the investor does gain control. Typically this refers to the purchase of land or the acquisition of ownership shares in an attempt to control a foreign business operation. However, the line between what is considered control is often nebulous. For example, if a U.S. corporation purchases shares in a Mexican firm, it may or may not gain operating control depending on the magnitude of the purchase relative to the Mexican firm's outstanding stock. Official U.S. government statistics and also statistics from the OECD assume that ownership of 10 percent or more of the ordinary shares or voting rights of an enterprise wields some influence over its management and constitutes direct control. This is consistent with the International Monetary Fund classification, but does not necessarily represent the definition used by all countries.

As the developed nations of the world grapple with the effects of population aging and capital deepening in their domestic economies, it is likely that they will induce international capital flows in the form of foreign direct investment and portfolio flows. Empirical evidence indicates that this mechanism may already be at work with their surge in recent years. To gain a sense of how foreign capital flows have become of greater importance in the world economy in

recent years, Table 5 shows the inflows of net private capital and its components to various emerging regions of the world. Between the 1970's and 1990's, the emerging market economies have seen roughly an eight-fold surge in net private capital investment. Nearly all regions of the world have benefited from these inflows with Africa being somewhat an exception.

There was a slowdown in net private capital flows at the end of the 1990s, largely a result of the financial crises experienced in Asia and Russia that severely damaged investor's confidence abroad. In fact, capital flows to many of the Asian economies over the late 1990's completely dried up. While slowdown is evident in portfolio flows and bank loans extended to the developing world, the long-term expectations remain strong. Foreign direct investment, shown in Table 6, has continued to show remarkable growth by more than doubling for all emerging economies from what it was as recently as the early 1990's. The upsurge in FDI has been far-reaching across the developing world with the Latin American countries showing the greatest boost. The sharp slowdowns in portfolio flows in the 1996 to 2000 period is reflective of their oftentimes short-term nature and the ease with which these funds can "round-trip" or be withdrawn with little more than the flick of a computer key.

The pattern of FDI flows from the developed to less developed countries with much less growth of flows in the other direction makes eminent sense in context of the capital deepening that has been occurring in the developed economies. Calvo et al. argue that a major impetus for rising foreign capital flows throughout the early 1990's was the sustained decline in world interest rates.[13] One of the potential explanations for the low interest rates in the developed

Table 5: Net Private Capital Flows to Emerging Markets
(in Billions of U.S. dollars)

Net Private Capital Flows	1971-1975	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000
Total emerging market economies	67.0	85.4	69.4	104.3	717.3	481.7
Africa	27.5	54.9	32.5	13.0	30.9	45.6
Developing Asia, crisis countries	10.4	36.2	49.2	15.2	182.7	-1.8
Other Asian emerging markets	8.2	12.7	17.4	28.1	90.3	71.2
Middle East	-20.2	-115.9	-46.2	14.3	156.1	19.0
Western Hemisphere	39.4	111.8	48.5	18.0	194.2	286.1
Net Private Direct Investment						
Total emerging market economies	14.3	25.7	52.0	77.8	304.9	722.1
Africa	4.7	3.4	5.4	10.7	14.5	36.1
Developing Asia, crisis countries	2.9	5.1	7.9	17.4	35.4	47.3
Other Asian emerging markets	2.1	4.6	12.2	16.3	120.8	228.5
Middle East	-3.1	-4.3	3.7	2.1	18.4	30.4
Western Hemisphere	10.2	19.3	25.0	31.3	84.9	284.0
Net Private Portfolio Investment						
Total emerging market economies	1.1	3.1	30.1	19.5	320.9	167.1
Africa	0.9	-0.7	0.7	-4.6	9.2	20.4
Developing Asia, crisis countries	0.3	0.9	8.7	1.2	68.9	47.4
Other Asian emerging markets	0.1	0.2	0.9	-2.1	13.5	-5.5
Middle East	0.0	0.0	13.2	27.4	40.2	-26.4
Western Hemisphere	-0.2	3.0	6.4	-2.2	148.8	98.7
Bank Loans and Other						
Total emerging market economies	51.5	56.5	-12.7	7.0	91.4	-407.5
Africa	21.7	52.2	26.4	6.8	7.2	-10.9
Developing Asia, crisis countries	7.0	30.1	32.7	-3.4	78.5	-96.8
Other Asian emerging markets	6.1	7.9	4.2	13.9	-44.1	-151.8
Middle East	-17.0	-111.6	-63.3	-15.3	97.6	15.1
Western Hemisphere	29.7	89.7	17.0	-11.0	-39.5	-96.6

Source: International Monetary Fund, *The World Economic Outlook (WEO) Database,* October 2001.

Table 6: Foreign Direct Investment Inflows and Outflows to and from Non-OECD Economies

	Outflows of DI to Non-OECD Countries *(percentage of GDP)*				Inflows of DI from Non-OECD Countries *(percentage of GDP)*			
	1981-1985	1986-1990	1991-1995	1996-2000	1981-1985	1986-1990	1991-1995	1996-2000
Australia	0.131%	0.213%	0.001%	0.190%	0.039%	0.414%	0.566%	0.413%
Austria	0.036	0.031	0.085	0.395	0.045	0.030	0.049	-0.076
Belgium-Luxembourg	0.083	0.503	0.093	0.746	0.103	-0.004	-0.021	1.637
Canada	0.503	0.167	0.404	0.781	0.053	0.052	0.088	0.135
Denmark	0.055	0.061	0.063	0.428	0.006	0.000	0.056	0.279
Finland	0.060	0.240	0.127	0.272	0.007	-0.007	0.009	0.041
France	0.057	0.354	0.603	0.472	0.044	0.234	0.263	0.040
Germany	0.111	0.035	0.130	0.328	0.019	0.023	0.019	0.081
Ireland	-	-	-	-	0.071	0.015	0.028	0.002
Italy	0.174	0.096	0.143	0.160	0.067	-0.026	0.036	0.014
Japan	-	-	-	0.327	-	-	-	0.039
Netherlands	0.077	0.446	0.637	1.346	0.174	0.276	0.188	0.526
Norway	-	0.328	0.092	0.930	-	0.011	0.004	0.366
Portugal	-	-	0.063	2.330	-	-	0.171	0.328
Spain	0.095	0.088	0.225	2.257	0.195	0.531	0.160	0.048
Sweden	0.580	1.089	0.802	3.613	0.191	0.246	0.518	1.410
Switzerland	-	0.671	0.538	2.120	0.817	0.049	0.027	0.153
United Kingdom	0.454	0.394	0.455	0.837	0.092	0.121	0.082	0.097
United States	0.088	0.161	0.311	0.335	0.068	0.059	0.031	0.094

Source: Author's calculation from the Organization for Economic Co-Operation and Development, *Source OECD, International Direct Investment.*

nations was the demographic effect on national savings rates. Large segments of the populations in the developed economies were in the middle of their careers during the 1990s, at earnings level peaks that filled tax coffers and drove down public deficits, and increased savings rates.

Lower interest rates in the developed nations attracted capital owners to the higher yielding investment prospects of the developing economies. The 1997 World Bank Policy Research Report suggests the trend also reflects the growing integration of world capital markets and the globalization of investments.[14]

While there are certain benefits to be had from the capital owners in the developed economies investing abroad, they come with certain risks. The shocking realities of the risks faced by capital owners investing in developing nations are often played out through high financial market instability – the worst of which end up as crises. This was made readily apparent with the 1995 Tequila crisis in Mexico, the Asian crisis of 1997-98 as well as the Russian and Latin American crises in 1998-2000. In most cases, crises are the result of massive amounts of financial inflows – especially portfolio flows – not being channeled to the most productive investment opportunities, leading to a progressive deterioration in the balance sheets of the domestic financial sector. Without adequate capital controls to limit the flight of capital, these countries are subject to sudden reversals, which could decimate domestic financial markets. This high volatility reflects the limited depth of financial markets in many developing countries, as well as the maturity mismatch in trying to finance long-term projects with short-term money.[15] These risks, which have come to rattle the emerging markets in recent years, have certainly undermined investor confidence and hampered the returns to global financial integration. The degree of financial volatility, crises and contagion has made the current state of affairs socially costly and politically disappointing in emerging economies.[16]

To avoid the hardships of capital reversals while continuing to liberalize the financial markets will require developing countries to pursue policies that maximize the benefits from global capital flows and avoid the associated dangers. The World Bank Policy Research Report suggests that developing nations must pursue a sound macroeconomic policy framework, a sound domestic banking system with a supervisory and regulatory framework and a well-functioning market infrastructure and regulatory framework for capital markets.[17] Many countries have made significant changes to their regulatory structures to open their financial markets. But the 1997 World Bank Report contends that many of the countries "lack the prerequisites for a smooth journey, and some may be so ill prepared that they lose more than they gain from financial integration."[18] While the path towards financial liberalization is inevitable with the advancements in communication and new developments in finance, the developing countries may decide at what pace they wish to travel to avoid the potential pitfalls of opening their financial markets.

Getting the economic infrastructure in place in the developing countries of the world is only part of the challenge that both the developed and developing segments of the world face. The countries in the groups listed in Table 7 suggest that there will be a great deal of surplus labor around the world over the coming decades if we can figure out how to tap it effectively. Those countries where this surplus labor exists in the general geographic proximity of Europe have predominantly Islamic populations. The two largest countries in the Southeast Asian segment, in the geographic proximity of Japan, with the largest populations are the Philippines and Indonesia, again countries with sizeable Islamic populations. At the beginning of the twenty-

first century, many of the nations with predominantly Islamic populations seem to be at political odds with many of the nations in the developed world in one way or another. These tensions will have to be resolved in some mutually agreeable fashion if anyone expects there to be significant investment flows from the developed countries to these less developed ones.

Table 7: Working-Age Populations in Various Sections of the World in 2000 and as Estimated by the United Nations for Selected Future Years

	2000	2010	2020	2030	Change from 2000-2030
European Union	229,312	231,239	224,121	205,250	- 24,062
Eastern Europe[a]	185,665	191,725	177,748	157,947	- 27,718
Northern Africa[a]	85,730	113,316	137,611	157,713	71,982
Western Asia including Middle East[b]	92,431	120,024	149,407	178,509	86,078
Region North of Arabian Sea and Persian Gulf and around Caspian Sea[c]	132,886	178,300	226,419	275,691	142,806
Japan	79,074	75,904	68,993	65,070	- 14,004
Australia/New Zealand	13,709	15,258	15,979	16,108	2,399
China	770,108	877,195	914,719	900,254	130,146
India	519,958	645,151	765,617	854,728	334,770
Southeast Asia[a]	275,172	341,031	398,645	433,773	158,601
Canada	18,943	20,911	21,517	20,985	2,043
United States	167,105	186,967	197,288	198,257	31,152
Mexico	51,316	63,492	74,047	80,586	29,269
Central America less Mexico[a]	16,497	22,262	28,745	34,984	18,487
South America[a]	186,693	227,782	259,997	281,967	95,274

Source: United Nations Population Division, *World Population Prospects: The 2000 Revision.*

In various parts of the developing world there are other potential barriers to significant investment by foreign capital owners. These have to do with having in place the legal framework

and processes that allow capital owners to invest in opportunities within a reasonable legal framework of regulatory and civil law that is enforced on an evenhanded basis. The legal registration and disclosure requirements on entities based in the developed economies of the world require that business dealings be above board and open to review. There also has to be a statute and case-based legal system that allows disputants in business deals to resolve differences that might arise as a result of investor relationships.

Concerns about the financial markets and the political and legal infrastructures in many parts of the developing world have left many investors cautious about investing in developing markets to the extent that portfolio allocation models suggest would result in optimal diversification. Instead, many foreign investors, in particular, pension funds maintain a "home bias" and invest the greatest portion of their assets domestically. Holzmann reports that in 1995, the earliest data that was available, OECD countries invested nearly 89 percent of their pension assets in their own domestic markets.[19] This is not isolated to only the developed economies, as 99.3 percent of non-OECD pension assets were invested within their own domestic borders. The unwillingness of pension funds to flow abroad to the developing economies is partly the result of investor confidence, but largely the result of restrictions that many countries have regarding the investment of pension assets in foreign securities. As long as these barriers remain, both the developed as well as developing countries will continue to struggle achieving the benefits that might result from greater integration of the developed and developing economies.

Conclusions

As we put all of the elements of this picture together, the United States is in a better position to weather the aging of its population than virtually any of the other countries of the developed world. We should remain a relatively attractive market for investment much further into the global aging phenomenon than most of the other developed countries and should continue to see foreign flows of capital into our economy. At some juncture, however, the slowdown in our own labor force growth rates will inevitably mean we will suffer the consequences of capital deepening that are already hitting other parts of the developed world. Before that occurs we should pursue policies that will allow us to take our own surplus capital to other parts of the world where there will be surplus labor that can use it effectively.

In order for that to happen on a widespread basis, we should be pursuing policies that encourage the less developed countries to put in place the infrastructure that will allow us to invest in markets that operate efficiently. These countries need capital markets that will allow investment money to flow to its most efficient uses. In places like China, much of the foreign investment money has been siphoned off to bail out inefficient state owned enterprises as the existing regulatory structure limits the access to free market activities. In places like India, there are often bureaucratic hurdles that effectively preclude foreign investment as an option. The hurdles may be different in other parts of the developing world but often have the same result of limiting the access of foreign investment to opportunities that would reap the greatest returns. Another hurdle that China has had to contend with in attracting foreign investment is the

perception that the legal system is ambiguous and that disputes are settled through personal contacts rather than controlled by formal contracts and court enforcement. It scores low relative to the developed countries in regard to corruption and governance indicators. Much the same can be said for other developing countries around the world including some in our own hemisphere. If investing itself is not difficult enough, many developing countries have limitations that make it difficult, if not impossible, to repatriate returns on investment back to the owners' countries. If returns on capital in these developing economies cannot be realized by foreign owners, the likelihood of foreign investment may be a dream that will never be realized.

As we think about the challenges the aging developed world faces within this very decade, we ought to quit concentrating so much of our energies on the immediate reform of social insurance programs in the developing world and help get in place operating frameworks where capital can flow freely to stimulate real economic growth. As it does so, the wages paid to labor will rise in the developing world and standards of living with them. At the same time, the returns on capital will exceed those attainable from overinvestment in the developed world and help to address the retirement financing issues the developed economies now face. As the developed countries realize the rewards of capital infusions that allow their own national incomes to rise, there will be plenty of time to reform their own national retirement systems.

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The CHAIRMAN. Thank you.

Now let me turn to you, Gary. Please proceed.

STATEMENT OF GARY L. GEIPEL, PH.D., VICE PRESIDENT, HUDSON INSTITUTE, INDIANAPOLIS, IN

Dr. GEIPEL. Thank you very much, Senator Craig. It is a great privilege for me to represent Hudson Institute before this committee with its crucial agenda. It is also a privilege for me to join these particular colleagues on this panel. Hudson Institute prides itself on a reputation for understanding workforce development, but with regard to the implications of global aging, there is very little we could do to improve on the work that CSIS and Watson Wyatt have done, particularly represented by these gentlemen. They have almost single-handedly carried the burden of describing the magnitude of the challenges and some of the potential solutions, so I am privileged to join them.

I was asked specifically to address some of the implications of global aging for workforce issues and to begin I would offer the headline that the challenges posed by global aging for the U.S. workforce are serious but perhaps not as bad as some of the implications posed by entitlements and capital flows, which we have already heard about today. They are also relatively much less serious in this country than they are in other parts of the developed world, and I would argue they are perhaps a bit more subject to influence by public policy in a way that is less politically contentious and sensitive.

I would like to, given the time involved here and the fact that we are at a fairly stage in understanding these challenges, I thought my contribution might be best focussed on offering a big picture sense of the equation that is involved in understanding the impact of global aging on the workforce. I offer what amounts to a four-part equation, starting with, of course, the challenges in general of global aging for the workforce, which I will try to unpack in more detail. Second, factors specific to countries or indeed regions within countries that either exacerbate or mitigate the more general challenges. Third, the policy levers that are available, both public and private, to help ease some of the challenges for the workforce. Finally, a set of wild cards that could dramatically bring about either the worsening or the bettering of the situation. I would argue that only by looking at that full equation can one truly understand the outcomes likely to occur for the workforce as a result of global aging.

So just briefly, what are the general challenges? Well, if you assume that the available workforce for the next 25 to 50 years consists only of the current population in any given country and the children they are likely to have, then clearly you have a problem on your hands in most of the developed world, at both ends of the talent spectrum. You have a double whammy on the high-skilled end, where you have the retirement or death of your most experienced and knowledgeable individuals at the same time as you have smaller numbers of younger college graduates coming into the workforce due to low birth rates. You also have a double whammy on the low-skilled end of the spectrum. Because of wage premiums that are out there for skilled work, more and more people are

pulled in that direction, at the same time as demand for low-skilled work is increasing due to the demands imposed by an aging population for things such as long-term care, entertainment, travel, and leisure activities.

So especially on the high-skilled end of this, you have an increasing global battle for talent that will intensify both within and between countries. You have a relocation of labor-intensive operations in both manufacturing and services to countries where the labor shortage is less severe. You have continued upward pressure on wages and benefits in the high-skilled labor force. You have relentless efforts, as Chairman Greenspan already alluded to, to squeeze more output from fewer workers through the application of technology. So that is the basic picture.

Part two of the equation, is that not all countries will join this battle, if you will, on a level playing field. Relatively speaking, the good news for us is that the United States starts much stronger than many other countries in the developed world.

First of all, the basic aging problem is less severe, as Paul Hewitt has already indicated. Americans especially our recent immigrants, have more children. We are still very much the preferred immigrant destination at both the high-skill and low-skill ends of the talent spectrum. Our magnetism is very strong, including our magnetism with regard to skilled workers from other developed countries. I would think that France and Germany would be concerned that they typically end up in the Top Five list of countries that are supplying workers to the United States under H1B visas, even though they have their own skill shortages.

Our higher education systems in this country are amazingly magnetic with regard to young people, which is a huge benefit to us. Just ask yourself how many Indian, or Chinese, or Polish young people dream of studying at a university in Japan—arguably very few—but millions of them dream of studying at a university in this country.

We also, I would argue, start in the United States with a culture that is more positive about the prospect of remaining in the workforce past the age of 65. A phenomenon that I think most of us have encountered—the 75-year-old or 80-year-old greeter at Wal Mart or Target is not something that I have ever seen in France or Germany or in many other parts of the developed world. It speaks well for the desire of many Americans to remain engaged in the workforce even when economic necessity does not require it.

Finally, the volunteer sector in the United States is much more developed, by an order of magnitude, than in the rest of the developed world. Again this is all to the good because it suggests that many of our older adults, even if they are not in paid work, will still be engaged in some type of quasi-employment situation, to the good of society.

This leads us to what the question of policy levers can do to further improve the situation the United States enters into? I would suggest that you can group most of the policy responses into five areas.

First of all, benefits and entitlements. We have heard a lot about that already today. I would simply say that the challenge here, in general terms, is to blur the line between work and retirement. It

turns the last 50 years on its head. We have spent a lot of time in public and private policy coming up with all manner of benefits, programs, and rules that pivot around the magic age of 65 or some other such magic number. I think what we need to do now is to come up with all manner of benefits, programs and rules that cause people to ignore the age of 65 and move in the direction of much more flexibility, keeping all-or-nothing choices to a minimum.

Education's, similarly important in this area. Life-long learning is a cliche that we need to start turning into something more than a cliche. We do not need to come up with new curricula or course work that is directed at "old people." What we need to understand is the importance of incremental opportunities throughout one's working life to continue to upgrade skills. We have to frankly recognize that dealing with the ongoing K–12 problem is very much a part of responding to the challenge of global aging. You do not want to let anybody slip through the cracks and I would argue that "No Child Left Behind" could be understood as No Worker Left Behind.

Some of the work that this committee has already done to look at disease management, to look at the outcomes-based revolution, is very important, to re-orient ourselves away from treating the "inevitable manifestations of aging," to move away from that and more toward looking at strategies of disease management that will avoid those "inevitable" outcomes.

Finally, of course, immigration policy. A sophisticated immigration policy that links workforce needs to recruitment is very important.

In conclusion, allow me to put forward some wild cards that could vastly change this equation. First of all, there is the wild card in which the problem of global aging evaporates as a result of what some have called hyperaging. If we truly get exponential breakthroughs in medical care, such that 65 becomes middle age with life spans extending beyond 100, that would change the global aging calculus dramatically. Second, at the other end of the spectrum, the problem worsens significantly. Some type of disease-induced population decline as a result either of deliberate action or otherwise, could significantly worsen the aging problem by reducing the population that might be available for work in the developed world.

Third, we could rewrite the output equation. There is some hope that the marriage of artificial intelligence and robotics, for example, will cause labor saving on an exponential scale.

Finally, I think it is worth referencing that the War on Terrorism potentially does have an implication here. If a backlash to further potential terrorist strikes on the order of 9/11 were to occur, that arguably would create a potential fortress mindset in this country, at the same time reducing some of the freedoms that are precisely the appeal that we have in this battle for talent globally. Thank you.

[The prepared statement of Dr. Geipel follows:]

HUDSON INSTITUTE

IDEAS INITIATIVE IMPACT

The Aging / Workforce Equation:
A Framework for Understanding the Impact of Global Aging on the Supply of Labor in the More Developed World

Prepared for the
United States Senate – Special Committee on Aging
February 27, 2003

Hudson Institute
Indianapolis, Indiana

Presented by Gary L. Geipel, Ph.D. [1]
Vice President and Chief Operating Officer

Introduction

The rapid aging of populations in the industrialized countries, and resulting population declines in many cases, will have a profound impact on the size, composition, and cost of the available labor force in the developed world during the coming decades. The precise implications of global aging for the workforce will vary widely between countries, regions, and specific industry clusters, however, due to a variety of important factors. As policymakers and business decision-makers alike begin to grapple with the impact of aging on the workforce, a simple framework can be helpful in envisioning both the magnitude of the challenge and the range of potential responses. This paper offers such a framework.

What might be called the Aging / Workforce Equation has four components. First, there is a set of general conditions and trends that together constitute the challenge of global aging as seen from the workforce perspective. Second, there are a number of current conditions that vary from country to country and region to region, which either exacerbate or mitigate the workforce challenge arising from global aging. Third, there is a set of policy levers that political and business leaders can manipulate to improve the ability of a particular country or sector to navigate the workforce challenge of global aging. Fourth, a small group of "wildcard" factors have the potential to significantly improve or worsen the assumed problems of aging on a global scale. A solid body of data collection and analysis has occurred to illuminate the various components of this equation, but policy researchers only are beginning to consider how the pieces fit together. Hudson Institute's forthcoming study, *Beyond Workforce 2020* (to be published in 2004) will examine the Aging / Workforce Equation in detail.

Figure 1: **The Aging / Workforce Equation**

Global Aging + Country/Region Factors + Policy Levers + Wildcards
= Workforce Outcomes

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Part I of the Equation:
The Mega-Phenomenon of Global Aging and its Implications for the Workforce

The story here is becoming familiar. Contrary to widespread assumptions of only a few years ago, the rate of world population growth is slowing markedly, and total world population now is expected to peak between 2040 and 2050 at between 8 and 9 billion persons before beginning to decline. Of course, many countries in the developed world already have reached the peak of this curve and are beginning to "depopulate." One quarter of the 211 designated regions making up the European Union now have declining populations and Europe as a whole will experience increasing *negative* rates of population change from now through at least mid-century according to United Nations (UN) projections.[2] Logically in this situation, the only age cohorts that will grow in size in the depopulating countries during the coming decades are the older cohorts, consisting of people who have left or soon will leave the active workforce (see Table 1 in the Appendix).

At least seven general implications for the workforce can be assumed to result from the aging of indigenous populations across most of the developed world. Some of these remain hypotheses, though the evidence for them is mounting:

a) **"Domestic supplies" of labor will decline** in many developed countries or grow at very small rates compared with previous decades (see Table 2 in the Appendix).

b) **Aging will exert a "double whammy" effect on supplies of high-skilled workers** – removing large numbers of the most experienced workers from labor force due to retirement and death, even as the cohort of young and freshly minted university graduates declines due to low birth rates.

c) As a result, **the global "Battle for Talent" will intensify**. Regions within countries will battle for dwindling supplies of indigenous high-skilled labor while a blistering seller's market will prevail globally for the talents of high-skilled workers willing to emigrate to other countries.

d) Aging will exert **another kind of "double whammy" effect on indigenous supplies of low-skilled workers**. An increasing wage premium for skilled work can be expected to lure a larger share of a shrinking pool of younger workers away from low-skilled service jobs, even as the demand for low-skilled service workers exerted by the elderly (in the entertainment, travel, nursing home, and personal-services industries, for example) increases along with their share of the population.

e) Medium- and large-sized manufacturing and services firms in the developed world can be expected to **accelerate the trend of locating/relocating labor-intensive operations in countries where labor shortages are less severe**. (Note

[2] See http://www.un.org/esa/population/publications/worldageing19502050

that not a single new automobile assembly plant has opened in Germany or Japan in the last decade.)

f) An intense Battle for Talent can be expected to exert steady upward pressure on the costs of high-skilled labor, including wages and competitive benefits packages. Increasing relocation trends (see point e) also should have the effect of reducing wage/benefits differentials between developed and developing countries (or, more precisely, between the rapidly aging and more slowly aging countries). What might be summed up as **the "Globalization of Human Resources" will continue apace in the early 21st Century**.

g) **Efforts to substitute capital/technology for labor in the larger economic-growth equation will intensify**, but the large-scale success of such efforts will depend on one or more revolutionary technology breakthroughs of a labor-saving character. While such breakthroughs are possible, they cannot be considered certain (see Wildcards).

Part II of the Equation:
National/Regional Factors

The consequences of global aging for labor supplies and costs will vary widely from country to country and region to region. Indeed, the differences are likely to be profound. By understanding such differences, we can begin to project the most severe workforce trouble spots in the developed world.

With regard to the workforce challenge of global aging, eight sets of national and regional differences are particularly significant at the present time. (It is worth reiterating that these peculiarities reflect *current conditions* and are in most cases not beyond the influence of policy levers to be discussed later.)

a) The most basic difference between countries has to do with the severity of the aging phenomenon as a result of existing demographics. **Some developed countries – especially Australia and the U.S. – will not age as rapidly due to higher birth rates**, attributable in part to existing immigrants. (The *Aging Vulnerability Index* produced by the CSIS Global Aging Initiative provides a valuable service by analyzing and ranking the developed countries based on current demographics and a variety of fiscal and political factors.[3])

b) Attractiveness to immigration clearly is another major distinguishing factor between countries. **Countries able to attract and retain large numbers of young immigrants fare better in the Battle for Talent**. The immigration-policy competition of recent years – with the proliferation of H1B-type programs in most of the developed countries – is but one element of this attractiveness. Arguably more important are a country's cultural tolerance of immigration, the existence and adequacy of institutions designed to assimilate immigrants, and the presence

[3] See http://www.csis.org/gai/aging_index.pdf

of existing immigrant communities that act as magnets to potential new arrivals. The "Anglosphere" countries of Australia, Britain, Canada, and the U.S. fare best in current international comparisons of attractiveness to immigrants. Japan, with its strong cultural hostility to immigrants, is at the opposite end of the spectrum, and the continental European nations fall in between.

c) Other factors under the heading of "success breeds success" also influence the relative talent pull of countries – or indeed regions within countries. Cities or regions with natural advantages attributable to climate, recreation, cultural diversity, and an existing youthful demography do better, particularly in the competition for skilled workers.[4] In this way, **workforce competition actually may exacerbate demographic differences between countries and regions, as "young and educated" attracts "young and educated" in the most economically successful regions while other regions bring together aging natives and low-skilled immigrants in an uneasy mix**. Already, one of the most disturbing statistics in European eyes must surely be the fact that France and Germany consistently rank among the top five countries supplying H1B visa recipients to the United States. Though they live in countries crying out for skilled workers, many young Europeans still seek to attach themselves to the Silicon Valleys of the U.S.

d) The relative attractiveness and magnetism of higher education systems deserves separate attention in this calculus. **Countries able to attract students in pursuit of their terminal degrees have a built-in advantage in the Battle for Talent** resulting from immigration. Simply put, if students come to a place because of its university, then they are more likely to become attached to the place and to remain after their studies conclude. This factor currently bestows a great advantage on the U.S., with its highly sought-after degree programs and ethnically diverse institutions of higher learning.

e) Anecdotal evidence suggests that **attitudes about retirement still vary widely between cultures and countries**, making it more acceptable for aging workers in some places to remain in the workforce. The 80-year-old WalMart greeter, for example, is a peculiarly American phenomenon. In continental Europe, meanwhile, even highly educated professional people appear to be much more focused on accelerating their retirements than on finding ways to extend their working lives.

f) Similarly, **the size and cultural acceptance of a country's voluntary sector or "civil society" can mitigate the negative consequences of an aging and shrinking workforce**. Large numbers of older volunteers engaged in social-service delivery and/or willing to make large private donations of time and treasure to the betterment of a community cannot but help to offset the workforce

[4] Recent research on the links between economic development and qualities of place includes Richard Florida, *The Rise of the Creative Class* (Basic Books, 2002).

shortfalls otherwise imposed by a large cohort of elderly, non-contributing "dependents." Again, the U.S. currently fares well in such civil society measures.

g) Putting ongoing cultural differences about retirement aside, the sheer prevalence of the so-called "knowledge economy" in a given country or region also eases the impact of an aging workforce. This is because aging – short of senility – create no barriers to employment in jobs that depend on brains rather than brawn. Indeed, a 70-year-old who has kept up her skills and "seen it all and done it all" may prove considerably more valuable in a knowledge firm than a 25-year-old with no practical experience. **The bottom line: Age does not necessarily correlate with declining productivity in a knowledge economy.**

h) It is a reasonable hypothesis that **countries, regions, and some industry sectors can ease the negative aging / workforce effects through superior application of network-enabling technologies**. The most well-known current examples of a networked workforce are the growing cadres of customer-service agents and low-end programmers/software developers in India, linked to their U.S. client/parent firms by sophisticated telephony and high-speed Internet connections. Such arrangements allow firms to tap distant, well-educated workers without requiring their emigration to another country – but the relevance, practicality, and quality of execution of networked workforces vary widely from industry to industry and country to country. Barring additional technology breakthroughs, they are unlikely to serve as a large-scale panacea.

Part III of the Equation:
Policy Levers

It has been said that "demography is destiny," and indeed there has been a tendency for policymakers to adopt fatalistic attitudes, defer responses to another generation, or otherwise shrink from efforts to accommodate or to overcome demographic trends. With regard to its fiscal and entitlement implications, the political risks of responding to global aging are indeed large. The options may be more palatable with regard to the workforce issues raised by global aging, however.

Policy – defined here to include public and private strategies – can ease the negative implications of global aging on the workforce in at least six areas.

a) The reduction or removal of financial incentives for complete disengagement from the workforce on the part of older adults constitutes a board category of important policy responses. **The countries and firms that overcome or profit from an aging workforce will be those that succeed in blurring what still remains a rigid dividing line between "work" and "retirement,"** generally centered on the magic age of 65. Examples include eliminating "use or lose it" retirement benefits, not denying certain benefits (e.g. private health insurance) to people who remain employed past "retirement age," using tax-code changes to

encourage (or at least not to discourage) older adults to remain in the labor force, and creating more flexible part-time employment arrangements.

b) Another broad category of policy levers fall under the heading of education or "lifelong learning." **Real or perceived biases against the training of older workers must be removed**, if an aging workforce is to remain current in its knowledge and skills up to, and beyond, the age of 65. Countries and regions are likely to be best served *not* by a proliferation of programs designed specifically for older adults but by more sophisticated strategies recognizing that in a knowledge economy, education must be a constant and truly lifelong undertaking. Policies and programs that make it easier for a 40-year-old worker to retrain or to gain new skills are in most cases the same policies and programs that will benefit a 60-year-old worker. Enlightened public and private policy, then, will focus on the design of new curriculum, delivery, and education-finance strategies for *all* adults – while making sure that older adults face no discrimination or discouragement in taking advantage of these lifelong-learning opportunities.

c) Health-care policy also has a large role to play in the Aging / Workforce Equation. Rates of disability among older Americans already have fallen substantially in recent years – dropping 1.6% per year from 1989 to 1994 and 2.6% per year from 1994 to 1999 – with the remarkable result that were fewer disabled Americans (about 7 million) in 1999 than there were 17 years ago, even though the number of older adults in American increased greatly during that same period.[5] **Health-care strategies aimed squarely at preventing the debilitating illnesses of "old age" will – in an aging workforce – pay disproportionate dividends in the number of people who still "feel like working" into their 70s or even 80s.** Case-management techniques and other "outcomes-based" health-care approaches now gaining currency in the medical and private-insurance sectors show early promise of reducing long-term disability even further – while at the same time easing the financial burden of treating conditions previously allowed to arise or to become chronic in older adults.

d) Immigration policy clearly will become an even more competitive arena between countries in the Battle for Talent. **Strategies that most efficiently link the workforce needs of a particular economy to the "recruitment" of matching immigrants will give successful countries an edge,** as their existing population grows older. This implies the refinement of H1B-type visa policies and a more strategic approach to immigration policy in general.

e) Policies designed to increase workforce participation by women are of less relevance to the U.S. but potentially great significance to other aging countries – in which larger numbers of women either never enter the workforce or end their working lives even earlier than men. Labor-force participation rates among women are at least 10 points lower in Europe and Japan than in the U.S.

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[5] See National Institutes of Health, "Dramatic Decline in Disability Continues for Older Americans" (May 7, 2001), www.nia.nih.gov/news/pr/2001/0507.htm

f) Similarly, the European countries in particular can reap disproportionate benefit in the Aging / Workforce Equation with policies designed to change cultural attitudes surrounding the employment of older adults.

Part IV of the Equation:
Wildcards

At least four areas of unforeseeable change – wildcards – deserve special attention in understanding the potential impact of global aging on the workforce.

a) The precise course of medical research and its resulting breakthroughs cannot be completely foreseen. Some researchers now speak openly, however, about the prospect that **"hyper-aging" may become a reality in the lifetimes of many people already born**. The potential products of research into the human genome, nano-technology, and the causes and treatment of cancer and heart disease – among other fields – could extend the *average* human lifespan by decades. If we find ourselves in a world where 65 truly is "middle age," then every global-aging calculation will be re-written – certainly including dire predictions of worker shortages.

b) Similarly, other technology revolutions as yet unforeseen may alter the requirements of human labor. One might speculate, for example, on the marriage of artificial-intelligence and robotics breakthroughs. **If revolutionary advances permit enormous productivity gains, then the traditional contributions of "labor" to the macroeconomic output equation might diminish in importance** – easing the dilemmas posed by an aging workforce.

c) Not every wildcard moves the equation in a positive direction, however. The projected aging of the population in the developed world and the slowing of population growth in the world as a whole are the result of human choices. A horrible "wildcard scenario" arises, however, if additional declines in the world's population occur as a result of factors outside human control. The AIDS epidemic in Africa already qualifies as such a calamity, and other **unforeseen outbreaks of incurable diseases could reduce the world's supply of potential workers** even further.

d) Finally, the threat posed by terrorism is not irrelevant here. **One or more additional terror attacks of the magnitude of 9-11 could lead to visa restrictions and border controls that end the "Globalization of Human Resources"** on which the more positive Aging / Workforce scenarios depend.

Appendix

Table 1: Population Change by Age Group, 2000-2030

Age ▸	0-25	25-64	65+	Total
Canada	1.7%	11.9%	122.7%	22.6%
France	-7.5	-1.3	58.0	6.2
Germany	-24.5	-15.1	60.0	-5.3
Italy	-31.8	-19.0	39.5	-11.7
Japan	-26.5	-15.8	66.4	-4.6
UK	-14.8	-8.7	78.3	3.2
USA	9.7	18.9	107.9	26.6

Source: UN data (2001), assembled by CSIS Global Aging Initiative.

Table 2: Labor Supply Growth Rates

	1960s	1970s	1980s	1990s	2000s
Australia	2.49%	1.96%	2.32%	1.34%	0.88%
Canada	2.66	3.60	1.75	1.17	0.73
France	0.94	0.93	0.57	0.57	0.10
Germany	0.15	0.43	0.86	0.69	-0.12
Italy	-0.52	0.84	0.52	0.10	-0.43
Japan	1.34	0.92	1.23	0.58	-0.26
UK	0.07	0.57	0.68	0.28	0.25
USA	1.74	2.60	1.64	1.13	0.97

Source: "The Decade of the Employee," Watson Wyatt Worldwide (15 November 2002).

The CHAIRMAN. Gary, thank you. Gentlemen, thank you very much for your testimony, both your spoken word and, of course, your full statements will become a part of the record.

Paul, I am most struck by the global aging linkage to so many policy issues and, of course, that is what we are about here. The word you used to describe these linkages was pervasive. How informed are officials in other countries regarding these linkages?

Mr. HEWITT. They are not well informed at all. We have managed to put together a fairly impressive group in the Global Aging Commission that has, I think, helped us spread the word. But for the most part, people are surprised. Prime Minister Gujral of India, former prime minister, confessed after we first had him to one of our meetings that, for the first time, he realized that India's population was not just a burden to the world. I recall sitting down with the chairman of the foreign affairs committee in the Bundestag, the German parliament, and after a fair amount of talking, he just started shaking his head, and he said, "You know, if we'd begun 10 years earlier, we would have had a chance."

So politicians, I think, have not really focussed on these questions. They need to; it is essential that they do. One of the reasons why they do not, though, is that the problem, the challenge of global aging is entirely unprecedented. Imagine a society that is beset by chronic labor shortages, that has to get used to the idea that job creation is not the best measure of economic success. In fact, it is intelligent job shrinking that we will need to be doing.

Of course, there is another new phenomenon: shrinking numbers of consumers. This is posing incredible sectoral problems throughout the global economy and in particular, national economies like Japan's where you have vast overcapacity. One out of five workers in Germany is in construction. They think this is an essential sector. Yet, the demand for construction is declining because the German population is shrinking. There are more deaths than births.

So all of these things, I think, are interconnected and it is essential that we do the education. We really do not have much time so your efforts here are very much appreciated.

The CHAIRMAN. North America appears to be in a better position. I think all of you speak with a certain degree of optimism about our opposition relative to the rest of the world, obviously with caution and making certain assumptions, but Paul, North America appears to be in a better position regarding aging pressures than other nations or regions of the world. Can you describe a likely scenario for the economic and geopolitical relationships between the United States and its neighbors, Mexico and Canada, in 10 or 20 years?

Mr. HEWITT. I think to do so with any degree of confidence would be impossible because so much depends on what happens outside of North America. Gary Geigel was mentioning that if there were another big terrorist shock that slowed down global trade it could certainly gum up the borders, as it did directly after 9/11.

The CHAIRMAN. In other words, walls built.

Mr. HEWITT. Yes. Then, of course, what are the often contingencies? Well, Japan does not look like they are going to last the decade without a default and an IMF work-out. What would that

do to China's economy and to the U.S. economy and to Southeast Asia, for which Japan is a major export market?

Then there is the larger questions of capital productivity. For example, how do we get capital to be more productive, and not just labor, so that we get higher returns on our money?

Now in this context some of the relationships between Canada and the United States and Mexico, the NAFTA countries, evolve in different directions. If you look to the end of this 20-year period, in Mexico you are going to see a great diminution of immigration. Our immigrants are going to come from different places, wherever that may be, because not just Mexico but virtually all of Latin America is going to be aging at a very, very rapid rate. Increasingly, we expect they will be capitalizing on their demographic bonuses and they will not be sending so many people abroad; there will be plenty of opportunities in their home countries.

Growth is going to slow in Canada. The birth rate there is 1.6. That is almost a quarter below replacement. So even if Canada has very robust immigration, its population will stop growing and this will dramatically slow the growth of markets and certainly the growth of productive potential. So Canada is kind of a piece of Europe on our northern border.

Of course, we can expect that Europe will become a big drag on global growth, as Japan has become. In fact, all of this has contagion potentials, too.

Managing these issues, of course, really are going to require very sensitive management, sensible management, in U.S. diplomacy.

The CHAIRMAN. Doctor, you were wishing to get into that question, I see, and certainly all of you can join in or make additional comments if you choose. Please.

Dr. SCHIEBER. To the extent that the developed world is facing the prospects over the next two or three decades of labor shortages, Mexico will be a tremendous asset for us. Today the Mexican working age population is virtually the same size as the German working age population. By 2030 the Mexican working age population is going to be twice the size of the German working age population. There is a phenomenal shift going on.

As Paul mentioned, Canada is reaching almost the point of stability in terms of their labor market. My guess is that Canada will continue to be a strategic partner because of our cultural linkages, the proximity, the length of the border——

The CHAIRMAN. Resources.

Dr. SCHIEBER. Resources, a whole variety of things, although we do discourage them bringing lumber down here.

The CHAIRMAN. Well, at the moment. Put a few of my people out of work. We're trying to balance it out.

Dr. SCHIEBER. I know. I go there frequently and they remind me about this every time I am there.

Canada, I think, will continue to be an important partner but to the extent we have labor shortages, we have a nation right here on our border where there are tremendous cultural linkages and I think there is a fantastic opportunity here, if we can get this relationship worked out, to really take a step ahead relative to the other nations, developed nations in this world.

If you think about the countries encircling Europe and the European Union—Northern Africa, the Middle East, on over into Asia—and the nature of those exploding populations the cultural differences and the reluctance on the part of the Europeans to allow them into their societies, the potential relationship we have with Mexico ought to be one that we look at very carefully and try to develop in an extremely healthy way.

The CHAIRMAN. I think that is a phenomenally astute observation. One of the questions I get asked quite often when I am out in my State or traveling the country, is what is wrong with the French as it relates to the specific issue at hand at the moment that the world is debating, and I said "You have to look at—what is wrong with the French are the French, I mean in regard to their whole history and culture and how they interact." But within that population base is a phenomenal in-migration of Muslims over a short period of time that can create great political unrest if they move in certain directions and are trying to factor that into their decisionmaking. It is the lack of the ability to assimilate them into their culture. They have literally put them into, if you will, not a ghetto but a separate suburb.

Dr. SCHIEBER. It is a ghetto.

The CHAIRMAN. Yes, all right. I did not want to use that word but you are right.

Dr. SCHIEBER. If it quacks, it is a duck.

The CHAIRMAN. Yes. Well, Doctor, your testimony highlights the mutual benefits of U.S. and European business investment flowing into developed countries. From the outside looking in, it seems as if cultural values undermine the rule of law in many of these countries. What ideas do you have for improving the free flow of business investment into the developing world?

Dr. SCHIEBER. Well, we have institutions that we sponsor here that reach out into nations all over the world and try to help them structure their economies in ways that will enhance the welfare of their people. These are organizations like the World Bank, the International Monetary Fund, and other groups like them. I believe that they have spent a lot of their energies in recent years focussing on things that should not have been a first priority.

One of the reasons that behavior is different in some of these less developed countries is that graft was the way that people get things done. These traditions do not mean that the governments cannot be reorganized and business processes cannot be carried on in a different fashion. I believe we ought to devote more of our energies to helping these countries establish legal frameworks, to establish regulatory frameworks, help them get their capital markets created so there is an infrastructure that will take our capital and allocate it across the market efficiently.

I think in some regards we have made tremendous progress in places like China over the last decade. There is still a great way to go. There is a natural tendency when capital goes into China to try to link that capital up with state-owned enterprises, and then it does not become an investment; it simply becomes a way to hide the true cost of the rotting industries that are a remnant of the old communistic system.

We really need to work directly, government to government and through these other entities, to try and put in place true market structures that will allow us to take capital and invest it there and have it be used efficiently. If that happens, we have tremendous opportunities to raise the productivity and the standard of living of workers there. Then we can repatriate the returns on that capital to help finance the consumption of a larger aging population without having to do it purely on the backs of our own workers. We really do need to think about this.

Mr. HEWITT. If I could just add one short point: it is that a lot of this investment that is happening in China is coming from companies in the form of foreign direct investments. Watson Wyatt is over there. Citigroup is there. General Electric is becoming a major employer. Volkswagen regards China as its second-largest market in the world, larger than the United States.

So some of this process is going to be accomplished through multi-nationals. That leaves a substantial role for the multilateral institutions to focus on institutional reform.

The CHAIRMAN. Doctor, one last question to you. I guess the thing that intrigues me now, during my college years and younger years one of the things to talk about was the dynamics of the great Japanese economy and all that was going on over there and we were trying to search out why we could not have some of our institutions interrelate more like theirs did and all of that. Yet now, of course, we have seen almost a decade of stagnation or flat economy in Japan.

You talked a bit about Japan's economic situation. Are there policy changes that Japan can make to improve their economy now? How do they work their way out of where they are?

Dr. SCHIEBER. Frankly, the bottom line is I am not sure they can work their way out of where they are right now.

The CHAIRMAN. Somebody referenced a default. Maybe it was you, Doctor.

Dr. SCHIEBER. No.

The CHAIRMAN. Oh, it was you, Paul. That is why I thought that question fit most appropriately now.

Dr. SCHIEBER. First of all, they do have tremendous structural problems, the way their corporate sector works, the interrelationship of the corporate sector with the banking sector, and so forth. Beyond that, they are an extremely old society, even relative to most of the rest of the developed world. They are way ahead of us. Their fertility rates are very low, around 1.25, 1.3, and my guess is they are going to fall. They have virtually no immigration. It is just a closed society.

They have very high rates of saving, personal saving. There is a table in my presentation that shows almost an astronomical one, but they have totally squandered that over the last decade and I think this is the lesson we really need to focus on because in so many other ways we are very different.

We do have dynamic regulatory structures that allow our industries to change and for there to be a true creative/destructive process. We have the highest immigration rates in the developed world. We have high fertility. Many of their problems we do not have.

But what they have done over the last decade is to have taken a very high rate of personal savings, and for all practical purposes they have squandered it. They have squandered it largely through fantastic government deficits that they have run. They have gone from one of the lowest government debts in the developed world to the highest. It is around 1.5 times GDP now?

Mr. HEWITT. It will be 160 percent this year.

Dr. SCHIEBER. A fantastic, fantastic debt that they have run up. They built the big airport out in Osaka that is now sinking into the sea and these massive infrastructure projects that are not going to provide any rate of return to the Japanese society over the long term.

The thing we have to be very careful about is spending our resources through government regulation or government investment that are not going to net us a return. We have to be very careful about protecting dying industries. For example, we need to think very seriously about what we are doing with the steel industry.

We also need to be very careful about sucking out the savings that does go on in the personal sector of our economy. We should not use personal savings for deficit financing at the government level to support consumption for a relatively young, healthy elderly population. If we squander our savings they will not add to the value of our overall welfare.

So I think that the waste of the resources they have is something we should pay very close attention to. I do not think they can work their way out of most of the other things.

The CHAIRMAN. Well, you have answered—the follow up was going to be lessons learned from them that we ought to apply.

Dr. Geipel, in your testimony you touch on the strength of the voluntary sector. The folks who engage in these activities contribute greatly to the vibrancy of our society. This is, I think, clearly an opportunity. Do you have any policy recommendations at the Federal level to better enable the voluntary sector?

Dr. GEIPEL. You are right to highlight that as an opportunity and something that really sets the United States apart. At the risk of straying into Euro-bashing, I have spent a lot of time on the continent and I am struck by the retirement patterns that seem to take people in one of two directions, either toward a very inward focus tending to the garden or to whatever few of grandchildren might exist, or to the other extreme, a kind of manic tourism, notching off the number of countries one could conceivably visit before one's strength dissipates.

It seems to me that what is missing in that—I do not want to disparage either one of those pursuits——but what is missing is the opportunity for something in between, which is something larger than one's own home and garden but focused on the community, giving back with the opportunities that we have through our churches, through community organizations, volunteer groups, which I do believe can significantly offset labor shortages that might arise in the future with regard to care of individuals in nursing homes, dealing with indigent populations, and so forth.

So it is clearly an opportunity for us. What can Federal policy do? There I would say essentially it is looking to stay out of the way. It is one of those things that seems to be working reasonably

well in the United States, and what Federal policy can do is simply look for additional opportunities to encourage private philanthropy, which very much undergirds the voluntary sector, doing things which I think the Federal Government is already doing.

I think the approach of the so-called Faith-Based Initiative right now is appropriate, because what it does is simply look at what the Federal Government can do to remove barriers, to level the playing field between faith-based organizations, voluntary groups, and government agencies, paying attention along the way to the separation of church and state, but what can government do to simply level that playing field to engage those organizations more?

The efforts that are being made to create Federal programs for volunteering I realize are sometimes controversial, to the extent that public dollars are used, to create, in effect, paid volunteers. My attitude is that it reflects an important experiment, the Senior Corps now and so forth, that reflect an important experiment. There may be certain individuals in retirement who respond more to those types of incentivized programs for volunteering, so I see no harm in the Federal Government trying to experiment with the impact of those.

But in essence, I think the bottom line is the best thing the government can do is simply not to do anything that would constrain the health or growth of that sector.

The CHAIRMAN. If you will, I am not coining a phrase; I am reusing one that has gained attention over the last few months, Old Europe versus New Europe. I have watched and understood that countries emerging out from behind the Iron Curtain and reentering a market economy and a more democratic or representative process recognized in some instances that they could not get it all done through government, that they had to work to stimulate a voluntary sector back into their economy.

Is there a difference today between a Poland or a Czechoslovakia and let us say a France or Belgium as it relates to volunteerism and a greater support, or is this just a European phenomenon of the little garden in the back yard and I think you said checking off the countries?

Dr. GEIPEL. No, I think there are some differences. It is interesting to me to refer back to Chairman Greenspan's comment that in earlier times, the shortage of labor in the United States spurred us to look elsewhere, toward technological innovation. I would argue that the absence of the alternative of big government in some of the emerging post-Communist nations has caused more attention to be paid to private alternatives, philanthropic alternatives. The community foundation movement, for example, which has been thriving in the United States, is further along in some parts of Central and Eastern Europe than it is in the West. That is an indication.

I also think that we should not overlook the role of the church, of various churches of all faiths. Poland is an obvious example, a more religious society, religious in the sense of active participation and practice, not identification in the secular sense but active involvement, Poland clearly and other parts of Eastern Europe, as well, that is more of a role. I think that again leads people to find

opportunities through the church that perhaps they are not finding in places such as Germany and France.

The CHAIRMAN. Gentlemen, I wish I had more time. I have more questions but I am out of time and I suspect probably you are, too.

So we thank you very much for coming, being with us today and helping us build this record. We will continue to work on this issue. We think it is extremely valuable that collectively I and my colleagues know more about and look at what we do here policy-wise through some of these glasses of understanding. I think it will be helpful in the long term. Obviously in the next decade we have some very critical policy choices to make here that have long-term impact and I think you reflected on those today.

So thank you very much and the committee will stand adjourned.

[Whereupon, at 11:51 a.m., the committee was adjourned.]

APPENDIX

STATEMENT FOR THE RECORD

FOR THE HEARING ON

GLOBAL AGING: ACHIEVING ITS POTENTAL

BEFORE THE SPECIAL COMMITTEE ON AGING

UNITED STATES SENATE

FEBRUARY 27, 2003

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AARP is pleased that the Special Committee on Aging is examining the global aging issue. We are submitting the following statement for the hearing record.

Increased longevity here and abroad is one of the great successes of the 20th century that, in turn, presents challenges for the 21st century. While aging populations do not threaten world stability, they will affect virtually every sector of society in the developed world: the economy, health care, infrastructure, and social institutions. And in our interconnected global economy, fundamental changes at home will affect the situation abroad, and vice versa. Given these broad implications, population aging should be a high priority issue for governments and the public.

AARP believes a comprehensive and objective examination of all the facets of global aging is necessary to develop long-term approaches that can address its challenges. Any response should include international consultation on impact of aging on the global economy and ways to manage the impact, while, at the same time, encouraging more older citizens to lead productive lives that enrich a nation.

AARP has launched its World Aging Forum to encourage informed policymaking for the benefit of older persons everywhere. Toward that

end, our Office of International Affairs, which collaborates with experts, researchers, policymakers, and organizations throughout the world, seeks to foster the exchange of experiences, best practices, and resources on aging and aging populations.

The attached report, *Global Aging: Achieving Its Potential* (additional copies of the report can be found at www.aarp.org/international), recognizes the challenges inherent in an aging world, but also sees aging as an opportunity. An aging population should be viewed as a blessing, not a burden, and we should reject the notion that government programs that help provide a measure of economic security should be dismantled or radically reformed.

We believe that the challenges of population aging, if dealt with in a comprehensive and timely fashion, are manageable. Many nations have already taken steps to ensure the viability of their social insurance programs. The policy responses need not renege on the commitment to social programs and institutions that have enabled millions of older persons to live in dignity and without the threat of poverty. Instead, developed nations have an opportunity to share valuable lessons in creating additional pension opportunities that guarantee both the integrity and the solvency of the existing national pension and health programs.

One can get a distorted picture by viewing global aging solely through a demographic prism and focusing on the past to predict what aging will look like tomorrow. Given improved health, increasing education, and changing expectations, tomorrow's aged are likely to be active far longer than today's. We, therefore, have an opportunity to view global aging under a new assumption that an increasingly healthy and experienced source of human capital can be tapped to keep the global economy growing.

If, as projected, there are fewer younger workers, the economy will have to find new ways to reap the benefits and skills of older workers. To some extent this is occurring already. The labor force participation rate of older persons in the United States is rising and is likely to continue increasing, particularly if there is growth in part-time hours and flexible work schedules. Given slowing labor force growth, more employers will recognize the benefits of accommodating older employees who want to continue working, perhaps by transitioning out of the workforce gradually. Although many older people will remain part of the formal economy, others will remain productive through volunteer service to their community or by caring for younger and/or older relatives.

The AARP report emphasizes the opportunities global aging presents while acknowledging the need to prepare for the changes it will bring. Governments and leaders, when considering the global economic outlook, should factor the resources provided by an aging population and make thoughtful adjustments now to their health insurance and pension programs in order to help reduce future costs.

We appreciate the opportunity to present our views.

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Global Aging: Achieving Its Potential

AARP

AARP is a nonprofit, nonpartisan membership organization for people 50 and over. We provide information and resources; advocate on legislative, consumer, and legal issues; assist members to serve their communities; and offer a wide range of unique benefits, special products, and services for our members. These benefits include *AARP Webplace* at www.aarp.org, *Modern Maturity* and *My Generation* magazines, and the monthly *AARP Bulletin*. Active in every state, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands, AARP celebrates the attitude that age is just a number and life is what you make it.

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Foreword

by

The Honorable Walter F. Mondale

Aging is one of life's inescapable truths. Throughout history, we have sought ways to extend life. Some, like the ancient Egyptians, created pathways to the spiritual world. Others, like the Spanish explorer Ponce de Leon, searched for the mythical "fountain of youth" and other sources of immortality.

In the twentieth century, a revolution occurred in the quest for longevity. Advances in technology, medicine, and nutrition made dramatically increased longevity a reality for millions across the globe. In the United States alone, life expectancy increased roughly thirty years between 1900 and 2000. In just the last ten years, the number of people at least 100 years old in the United States has doubled.

That's good news. It reflects the successes that government and industry have enjoyed in solving many of the problems that plagued civilization since the dawn of time.

Yet, as with progress in any field, our new-found longevity raises questions that must be addressed. How do we care for growing numbers of older people? How do we provide reasonable economic security throughout longer retirements? How do we provide opportunities for growing numbers of older people to participate in the workforce, if they choose to do so?

These and other issues pose a significant challenge. To address this challenge, nations must assess their unique demographic circumstances and make policy choices that reflect their culture, society, and values. In some nations, immediate policy changes may be required. In other nations, like the United States, the demographic challenges are less severe.

This report provides policymakers with an important tool for assessing the aging challenge and for making balanced policy responses. It focuses on an aging population as a resource, not a burden, and suggests positive strategies to make the most out of this resource in ways that benefit the individual and society as a whole.

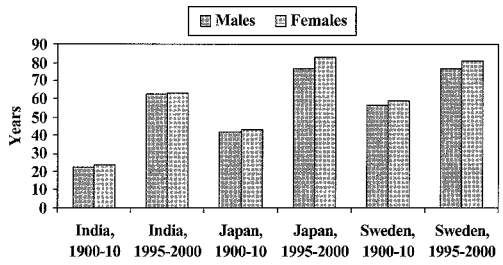
I applaud AARP for suggesting creative opportunities to enact positive policies in aging societies. Too often, aging issues are used as an excuse to promote a particular agenda, such as the privatization of important social protection programs. As shown in this report, however, valuable programs like Social Security and Medicare are sustainable in the long term, provided that we understand the challenges and take reasonable measures to address them.

I want to thank AARP for its continued leadership on aging issues. This report makes a valuable contribution to the discussion on global aging. I highly recommend it to anyone interested in seeking creative ways to meet the challenges—and multiply the blessings—of our longer lifespans.

Global Aging: Achieving Its Potential

The age-old yearning for a long life is a reality for growing numbers of men and women around the world. In the United States, life expectancy increased by almost 30 years over the past century. This enormous increase in expected lifetime is not unique to the United States (Figure 1). Nor is it only those in the developed world who are living longer. Many of the least developed countries of the world have experienced marked improvements in life expectancy in recent years.

Figure 1: Life Expectancy at Birth by Sex, Selected Countries, circa 1900 and 2000



Sources: Gelbard, Haub, and Kent, 1999; United Nations, 1999

Yet our good fortune to be the beneficiaries of a long life expectancy is taken for granted. It is even viewed as a looming crisis that could break the bank of government finances. Is increased life expectancy a demographer's dream or an economist's nightmare?

There is no simple or single answer. It depends on how we respond now and in the future. Adjustment to population aging will prove a greater challenge in some countries—especially those with rapid aging—than others. But it is a challenge we should welcome. We have the opportunity to reshape our economies and our social structures to ensure that these extra years of life are enjoyed by broad segments of our populations and are used in a productive manner for society. The sooner that all institutions—governments, enterprises, social organizations, and families—as well as individuals take on this challenge, the greater the probability of success.

This paper examines the challenges and opportunities posed by global population aging. Although it relies heavily on examples from the United States, where appropriate or available, data from other countries, especially in more developed regions of the world, are highlighted. At the end of the paper, a variety of strategies are suggested that can help societies at varying levels of development adjust to population aging.

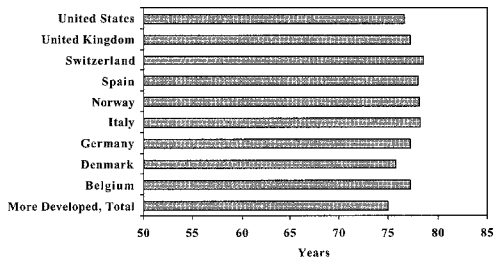
A DEMOGRAPHER'S DREAM?

In most of the developed countries of the world, people can expect to live well into their seventies (Figure 2), and many developing countries are catching up fast. New developments in medicine, technological advances, and greater knowledge about healthy life styles promise further improvements.

Not only are people living longer, they have more years of healthy life. Indicative of this trend, disability rates are declining among the older population in the United States, Japan, and a number of countries in Europe. The number of years spent without disability in Organization for Economic Cooperation and Development (OECD) countries now accounts for 45 to 80 percent of remaining life expectancy at age 65 (Jacobzone, 1999). In the United States, the percentage of chronically disabled individuals fell in age-standardized terms from 26.2 percent to 19.7 percent of Medicare beneficiaries aged 65 and older between 1982 and 1999 (Manton and Gu, 2001). In other countries, such as Australia, Germany and the United Kingdom, disability rates have also been falling at older ages (Jacobzone, 1999; Waidmann and Manton, 1998).

According to Federal Interagency Forum on Aging Related Statistics (2000) calculations for 1982 to 1994, had disability rates in the United States not dropped, population aging would have caused the chronically disabled population to grow by an estimated 1.5 million instead of the 600,000 by which it actually increased. Moreover, technological advances, such as optical character recognition to assist those with impaired eye sight, are making it possible for persons with disabilities, even severe disabilities, to live independent and productive lives.

Figure 2. Life Expectancy at Birth, Both Sexes, Selected Developed Countries, 2000*



* For the period 1995-2000
Source: United Nations, 1999

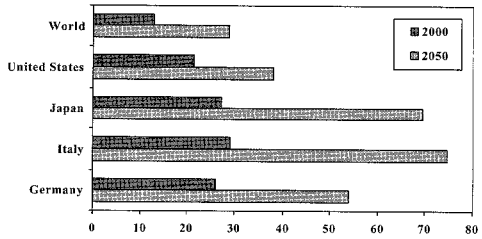
Thirty years ago, a birth explosion threatened world resources. Since then, fertility rates have declined in most countries. In many countries, fertility has fallen below the replacement rate of 2.1 children per woman, which is the level required to keep a population from declining over time. As of 1998, 61 countries had fertility rates below the population replacement rate. Those countries account for 44 percent of the world's population. Much of Europe is likely to experience population decline. Never before have birth rates fallen so low, for so long, in so many places around the world. They are expected to stay low due to the decline in infant and child mortality, the rising costs of rearing children, and improvements in the status of and economic opportunities for women.

While population aging has raised concerns about its effects on the rate of economic growth, there are many advantages of slowing population growth. Congestion and pollution will be lessened. As a result, such problems as global warming, the depletion of the earth's protective ozone layer, damage to crops and other plant life due to pollution, and the extinction of plant and animal species due to the loss of their habitat may be reduced. The strain on world nonrenewable resources will be diminished. The demand for social services for the young, such as providing them

education and health care, will be reduced, and competition on the part of youthful job entrants for positions will be eased.

With declining fertility, average family size is shrinking, and families can spend more time and money per child on the education of their children. The World Bank (1994) points to an explosion in productivity and wage growth in East Asia, where fertility has fallen rapidly, a decline that may be due, in part, to larger investments in education. Better schooled children are ultimately more productive workers.

Figure 3: Aged Dependency Ratios*, World Total and Selected Countries, 2000 and 2050



*Number of persons 65+ per 100 persons 20-64
Source: U.S. Bureau of the Census. International Data Base

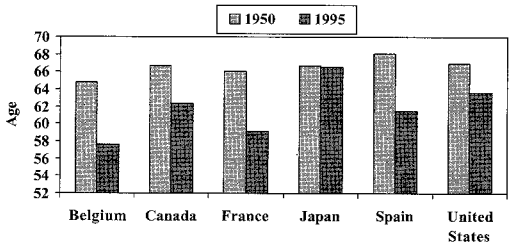
AN ECONOMIST'S NIGHTMARE?

The world is getting older. One need only look at the change in the proportion of the population that is generally considered "old," say 60 or 65 and above. By this criterion, virtually every country of the world is aging. In the more developed regions of the world, the population aged 65 and above rose from 8 percent to 14 percent of total population between 1950 and 2000. It is projected to rise to 26 percent by 2050 (United Nations, 1999).

A similar measure of aging is the aged dependency or support ratio, often defined as the ratio of people aged 65 and older relative to those of working age, e.g., 20 to 64. For the world as a whole, this ratio is projected to more than double between 2000 and 2050, increasing from 12.8 to 28.9 per 100 (Figure 3). In the more developed regions, however, that ratio already stands at 23.8 per 100 and is also projected to more than double to 49.4 by 2050. Aging in the less developed world is even more rapid, with the old-age dependency ratio nearly tripling from 9.7 to 26 per 100 between 2000 and 2050 (U.S. Bureau of the Census, 2000).

While the world is getting older, the aging of the population is only a part of the increase in the ratio of nonworkers to workers in some countries. In many industrialized countries over the past 50 years, the relatively large decline in retirement age (Figure 4) has been a more important factor. A less important but contributing factor has been postponement of entry into the labor force by young persons due to longer years of

Figure 4: Estimated Average Age of Retirement by Older Male Workers, Selected Countries, 1950 and 1995

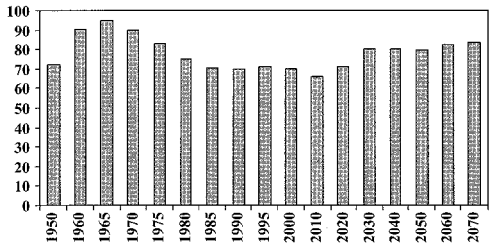


Source: Organization for Economic Cooperation and Development, 1998

education and high youth unemployment.

The number of children also affects the demographic burden on workers. When children are added to the dependency ratio, dependency is greater but its growth is smaller because the population of children is projected to grow more slowly. In the United States, the total dependency ratio, which includes both young and old "dependents," does rise over the next several decades, but at no time does it exceed the level for 1965 (Figure 5).

Figure 5: Total Support Ratios*, United States, 1950 to 2070



*Sum of the number of persons under age 20 and the number 65 and over per 100 persons ages 20-64
Source: Board of Trustees, 2001

This point should be kept in mind: While older dependents are more costly than younger ones, the U.S. did survive higher dependency ratios in the not-so-distant past. In the future, the lower costs of supporting the young, whose share of the population is projected to drop, will partially offset the higher costs of supporting retirees (Rogers, Toder, and Jones, 2000).

The dependency ratio is an easily understood measure of how populations change over time, but it also gives the impression that all persons above a certain age are dependents and all adults below that age, supporters. Nothing could be further from the truth. In the United States in recent years, for example, about 4 million persons aged 65 and older have been in the labor force, working either full or part time. In addition, over 30 million men and women between the ages of 20 and 64 have been out of the labor force, raising children, going to school, retired at young ages, or sick or disabled. Adjusting dependency ratios to include older workers as supporters and younger nonworkers as dependents paints a more accurate picture of the age of the so-called "dependents" in society: Many are prime-age adults.

Population Aging's Impact on the Economy

Whatever the ratio or age cutoff used to describe population aging, it cannot obscure the likelihood that aging will affect the economy. Much of the literature on aging populations focuses on aging's economic effects and concludes that soaring demands on pension, health care, and long-term care will place an unsustainable burden on national coffers. Some observers argue that age cohort "warfare" will ensue, with the young refusing to pay the high taxes required to support the old.

Population aging does slow the growth rate of the labor force, and in some countries the labor force is projected to shrink. The changes in labor markets, reducing the number of working taxpayers, may strain government budgets as well as the financing of social security benefits and delivery of health care. All else equal, population aging may require a rising tax burden to meet rising costs of benefits and services to the older population. It may reduce the savings rate, as retirees spend down their savings. Asked "Can we afford to grow old?," many writers, analysts, and policymakers answer an unequivocal "No."

True, government spending in the developed world is projected to

rise sharply in coming decades as populations age. In the United States, federal government spending on older persons, through Social Security, Medicare and Medicaid, is projected to increase from 7.5 percent of GDP in 2000 to 12.4 percent in 2030 and 13.3 percent in 2060 (Elmendorf and Sheiner, 2000). As a percent of GDP, Social Security expenditures increase by about 50 percent, while Medicaid and Medicare expenditures for older persons nearly double. Under recent "best estimate" projections, the Social Security Old-Age and Survivors Insurance and Disability Insurance (OASDI) trust funds will be exhausted in 2038. Does this mean an aging crisis is in the offing?

Avoiding a Crisis

While government costs will rise as more people live to advanced ages, an aging "crisis" is by no means inevitable. The demographic changes that affect the dependency ratio are only one factor in the ability of the economy to support an aging population. Equally, if not more, important is the growth in the level of income per capita. A country's ability to support a nonworking population of any age is affected not only by the number of workers but also by its income. Economic growth, however, also raises some government expenditures. For instance, with more rapid growth, social security benefits, which are based on wages, will also be higher. But even taking this into account, economic growth eases the burden of social security financing by raising the tax base relative to the level of benefits.

Population aging most likely will slow the growth rate of per capita income. This slowdown will probably occur because there will be more older nonworkers per worker. It will also raise government expenditures and taxes needed to support those nonworkers. Aging alone, however, will not be the only contributor to rising expenditures for nonworkers.

For example, the more rapidly increasing spending on health care for the aged, when compared to Social Security, demonstrates that the total increase in spending on the elderly in the United States is due to more than an increase in the size of the older population. It is partly due to societal decisions that led to rising health expenditures per older person, which may reflect in part a willingness as we grow wealthier to spend relatively more of our income on our health. The rising costs for health care are also due to advances in medical technology, as well as to the growing availability of services and medical inflation in excess of general inflation, factors that increase the cost of care for younger age groups as well.

Concern also has arisen about the negative impact of aging on savings. Some experts caution, however, that looking only at the aged paints a distorted picture of overall savings and dissavings, at least in the United States. A decline in the share of young nonsavers over the next 40 years, coupled with an increase in the share of high-saving middle-aged persons, may actually push aggregate saving upward (Rogers, Toder, and Jones, 2000), despite an increase in older dissavers.

Moreover, older persons will not necessarily spend down their assets at the rate expected under the primary economic theory of savings, the life cycle hypothesis (Haider et al., 2000). Fears that all retirees will divest themselves of their savings at about the same time are unwarranted, in part because of the possible importance of bequests. Retirees may also want to maintain a reserve as a precaution against outliving their resources.

Population aging is not likely to cause a fall in the standard of living. One study found that population aging would reduce the annual growth rate of per capita income by less than two-tenths of a percentage point (Cutler, et al., 1990). Other studies have shown greater reductions in the growth rate, but there is little convincing evidence that actual levels will decline. Productivity growth is the key.

Even with population aging, the real standard of living is projected to be considerably higher in the future. The National Academy on an Aging Society observes that the aged population of the United States has actually doubled since

1960 and living standards have still risen, "in good part [because of] general economic growth" (Friedland and Summer, 1999). Indeed, a study by OECD indicates that even with annual growth rates well below recent historical trends, living standards could be at least 80 percent higher in the United States, Japan, and the European Union in 2050 than in 2000 (Turner et al., 1998).

With this increased wealth, taxpayers individually and countries collectively would be able to afford the retirement of large cohorts. But even lower productivity growth rates than projected by OECD could, especially if coupled with changes in retirement programs, retirement age, and health care systems, make the retirement of even large cohorts affordable.

Moreover, we should also keep in mind that the "resource pie" is not fixed, as some scenarios of the future might have us believe. As long as economic growth continues, societies can still spend more on their growing older population and more on young persons as well. Thus, when placed in the proper perspective of productivity growth, the potential social and economic problems associated with population aging are not nearly as ominous as would appear when only examining changes in the ratio of the older population to the working age population.

Workers and Employers Respond to Population Aging

While the speed of aging differs considerably across countries, and some economies will need to adjust soon to a declining number of workers, populations are not aging overnight. Economies can cope with population aging.

Especially in the developed world, the modern free market economy is flexible and can adjust to large changes in population age structure, just as the United States did when the huge baby boom generation populated schools and then entered the labor market. That population boom was far larger and more sustained than had been predicted (Teitelbaum, 2000). With planning, the U.S. should be able to cope as the boomers —whose numbers are well known—move into retirement. The same should be true of other developed countries with aged populations.

However, population aging will require labor market changes. Workers and employers can make adjustments that will enhance the ability of labor markets to cope with population aging.

Longer life expectancy and improved health and vitality at older ages result in longer years in which people are able to work. This, combined with an increase in "knowledge" jobs that require intellectual rather than physical vigor and higher levels of educational attainment, makes work both more feasible and more attractive to older workers. Workers will be more likely to want to continue working at older ages.

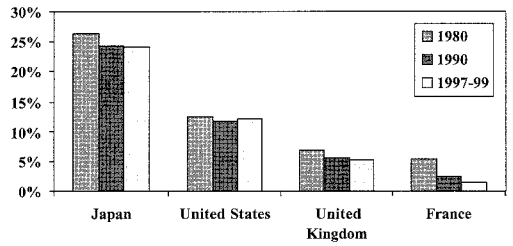
While most Americans may be physically and mentally capable of working until age 70 or beyond, only a minority currently remain in the labor force after 65. Yet, 80 percent of boomers report that they expect to work at least part time in retirement (AARP, 1998). Other public opinion polls show similar expectations among boomers as well as other age groups (Yakoboski and Dickemper, 1997). According to one, "most workers see their 'retirement' not as a time for leisure and travel, but as an opportunity to do fulfilling work" (John J. Heldrich Center, 2000).

In the United States, the trend toward ever earlier retirement that characterized much of the post-World War II years appears to have come to an end. Since the mid-1980s, participation rates for older Americans have been inching upward. Rates are still well below what they were in the immediate post-war years, suggesting that there is room for considerable increases in labor force participation at older ages.

As workers reach retirement age, many factors —ill health, job loss, a difficult supervisor—may temper enthusiasm for continued employment. Still, it seems likely that greater interest in working longer will characterize the boomers. It also seems reasonable to assume some continued increase in labor force participation at older ages, especially if current labor shortages are aggravated by a

slowing growth rate of the labor force. Most developed countries have very low labor force participation rates at upper ages, but in Japan, the labor force participation rate for persons 65 and older in 1999 was over 23 percent, nearly double what it was in the United States. This figure was about 4.5 times what it was in the United Kingdom and 15 times what it was in France (Figure 6).

Figure 6: Labor Force Participation Rates of Persons Aged 65+, Selected Countries, 1980, 1990, and 1997-99



Source: Government of Japan, 1999; International Labour Office, 1999; U.S. Bureau of Labor Statistics, 2000

Is it unreasonable to expect further increases in participation rates, especially if public and private sector policies encourage them? Would delayed retirement have a significant impact on the projected costs of supporting an aged population?

If People Work Longer

What impact would delayed retirement have on the projected costs of supporting an aged population? Simulations done for the European Commission (EC) led to the conclusion that the economic impact of population aging could be "almost entirely" eliminated by raising the total labor force participation rate in the countries of the EC by 10 percentage points (from 65 percent to 75 percent) over the next 50 years (McMorrow and Roeger, 1999 as cited in England, 2000). While this might seem like an unreasonably steep increase, the annual rise would be modest. Moreover, a participation rate of 75 percent would still be below the actual labor force participation rate for persons ages 16 to 64 in the United States.

The U.S. Social Security Administration's Office of the Chief Actuary has estimated that accelerating the increase in the age of eligibility for full Social Security benefits, which is rising to 67, so that it is fully in effect by 2016 instead of 2027 would eliminate 5 percent of the long-term Social Security deficit projected as of 1998. If the full benefit age were also increased to 68 by raising it by one month every two years, about 18 percent of the deficit would be eliminated. A rise to 70, coupled with a more rapid implementation of the current increase, would eliminate 22 percent of the deficit (Social Security Advisory Board, 1998).

The Bureau of Labor Statistics projects that only 14 percent of the population aged 65 and older will be in the labor force in 2025 (the latest year for which projections are available [Fullerton, 1999b]), a figure that we think underestimates the likely participation. Too many signs point to greater interest in and need for older persons to remain at work longer. Indeed, the actual 2000 labor force participation rate of 12.8 percent for persons 65 and older was almost identical to BLS's projection for 2008: 12.9 percent (Fullerton, 1999a).

Using the Regional Economic Models, Inc. and Macroeconomic Advisers, LLC econometric models,[1] we simulated the impact through 2029 (the latest year in the Macroeconomic Advisors model) of a number of potential increases in the labor force participation rate of older persons on such outcomes as the personal savings rate, real disposable income, the number of Social Security beneficiaries, Social Security benefits, and the Social Security trust funds. The scenario discussed here assumes a return

to a level of labor force participation comparable to what it was for the 65-plus population in 1950.

While no one can know with any certainty what will happen over the next three decades, a return to the 1950 labor force participation rate for the 65-plus population seems possible, especially in the face of declining physical demands in jobs, slowing labor force growth, rising age of eligibility for Social Security benefits, and the increasing education and better health of this age group. That level could be reached by an annual increase in the participation rate for this age group of less than one half of a percentage point.

Under this scenario, the steady increase in the labor force participation rate of older persons yields a total of nearly 18 million labor force participants by 2029 (vs. 4.2 million in 2000) and a labor force participation rate of 26.7 percent, as in 1950. Assuming no other changes, the labor force itself would be some 5 percent larger in 2029 than it would otherwise.

The impact on the economy and the Social Security system from this increased participation depends to a considerable extent on when Social Security benefits would be paid. At present, workers in the United States have relatively little incentive to postpone receipt of Social Security benefits after age of eligibility for full Social Security benefits. By 2008, however, workers who do delay receipt of Social Security will receive a more actuarially fair benefit increase.

If the projected additional labor force participants aged 65 and older were to postpone receipt of benefits, they would, of course, be subtracted from the "dependent" population and added to the supporters. When this happens, the number of Social Security beneficiaries would fall by 6 percent. Social Security expenditures for benefits would be about 21 percent less than otherwise. Personal savings and real disposable income would rise by more than 4 percent; GDP would be 9 percent higher in 2029.

Consequently, by 2029, the Old-Age and Survivors Insurance and Disability Insurance (OASDI) Trust Funds would be about 21 percent larger than they would be without this increase in workers delaying. At more than 41 percent of GDP, the trust funds would be more than 9 percentage points above baseline.

Other Adjustments

Countries may respond to population aging and shrinking labor forces in a number of ways. In countries in Europe with high unemployment rates, such as France, the effect of population aging on the ratio of workers to beneficiaries could be partially offset by a decline in unemployment, with employers hiring more of those currently unemployed. These countries are not concerned currently about worker shortages but about workers who cannot find jobs.

In countries such as Ireland and Italy, the effect of population aging will likely be offset to some extent over the next few decades by increases in female labor force participation. Younger females in birth cohorts with high labor force participation rates will replace older females with lower rates. In other words, there will be more actual workers in the population of working age, due to lower unemployment rates and higher female labor force participation rates.

In some countries, such as the United States, immigration reduces the effects of population aging. Continued immigration over the next 50 years may help ensure that the United States and its labor force, in contrast to many European countries, will continue to grow (United Nations, 2000).

Faced with a slowing growth of the labor force, older workers will be more in demand. During the boom economy of the late 1990s in the U.S., a number of labor market adjustments occurred as a response to labor market shortages. Some of those changes may also occur in the twenty-first century as a response to labor market shortages resulting from population aging. Workers may work longer hours. This increase could occur as a result of full-time workers working more hours and part-time workers changing to full time. People who have been out of the labor force may be drawn into the labor force due to higher

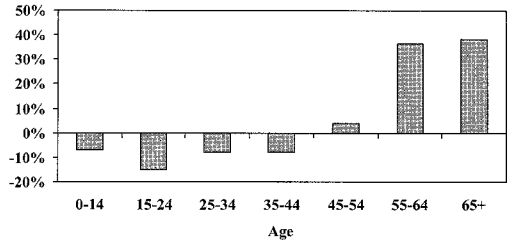
wages.

In the developed world as a whole, the population pool from which workers will be drawn will be largely older (Figure 7). Employers may be induced by the short supply of younger workers to develop policies to make continued work more attractive to older workers. Employers seeking to attract older workers may offer alternative work options, such as working at home, and variable schedules. Private sector policies such as phased retirement, flexible work schedules, job redesign, and attractive part-time work options may become very important in encouraging workers to postpone retirement voluntarily.

Some of the adjustment to an aging population may come through greater investment by employers. If there is a shortage of workers, employers may respond by investing more in the human capital of their workers and the physical capital of their businesses. One study suggests that slower labor force growth induces more rapid technological change as a response to the relative scarcity of labor (Cutler et al., 1990). According to this study, the reduction in labor force growth projected in the United States from 1990 to 2030 may raise productivity growth enough due to increased investments per worker to offset fully the consequences of an increased old-age dependency ratio.

An increase in the education level of the work force will naturally occur as younger, better educated cohorts replace older cohorts with less education. The increase in experience associated with an older workforce should also raise the average productivity per worker. Nonetheless, governments, employers, and workers themselves will have to invest in training and retraining to ensure that workers of all ages have the skills needed to remain productive in a changing economy.

Figure 7: Percent Change in Number of Persons in Age Group, Developed Countries, 2000-2020



Source: U.S. Census Bureau, International Data Base, 2000

Older Persons as a Resource, Not a Burden

Much of the discussion about population aging has a heavy focus on older persons as dependents or burdens. Yet the term "dependent" is often inappropriate. Many older persons, especially in Japan and the United States, continue in the paid labor force.

Often overlooked are the many positive contributions made by older men and women who are not in the paid labor force, contributions that will become even more common given the increased vitality of the older population. Many retirees who are not counted as working in official labor force statistics are in fact doing unpaid labor as volunteers in hospitals, museums, churches and other nonprofit organizations. Older persons are also active in civic affairs, such as political campaigns.

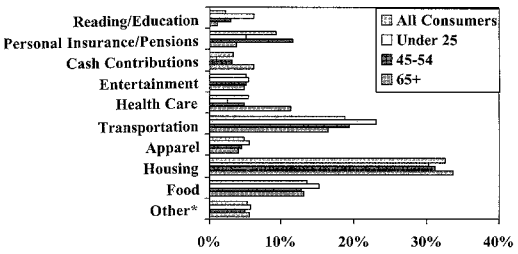
Many others not counted in official labor force statistics are engaged in unpaid family work such as caring for grandchildren, assisting sick relatives, or providing informal long-term care to family members. In the United States, nearly four million grandchildren are living in grandparent-maintained families; in many of these families, no parent is present (Bryson and Casper, 1999), and the

grandparents have primary responsibility for the upbringing of these children.

The role of grandparent as caregivers is a common and critical one in the less developed world, where such care frequently frees the parents, often mothers, to enter the workforce. And who can dispute the enormous contribution that grandparents are making in AIDS-afflicted Africa? Grandparents not only provide hands-on care to their sons and daughters who have contracted the disease, but are often the surviving carers of children whose parents have died of it.

A recent study of civic involvement by AARP (1997) reveals that some forms of volunteer work and civic involvement are as common at advanced ages—70 and older—as at younger ages. An earlier survey by the Commonwealth Fund in the United States reported that "more than 70 percent of all Americans age 55 and over . . . are actively contributing to society, their families and communities—working, volunteering, caring for sick or disabled spouses, friends, and neighbors, as well as their own children and grandchildren" (Commonwealth Fund, 1992). Another study reports that nearly 6 out of 10 retirees interviewed in 1999 had volunteered or done community service work in the past year (Civic Ventures, 1999). Clearly, these older persons are continuing to be productive in ways that are vital to the well-being of their communities and families.

Figure 8: Share of Average Annual Expenditures by Age, United States, 1999



*Includes alcoholic beverages, tobacco products, personal care products and services, and "miscellaneous"
Source: U.S. Bureau of Labor Statistics, 1999

While there appear to be few recent efforts to place a dollar value on volunteer work, the Commonwealth Fund (1992) estimated that the volunteer efforts of these older Americans were the equivalent of 1.1 million full-time workers, and their caregiving alone, the equivalent of 7.1 million full-time workers. The Fund also noted that one in five Americans aged 55 and older contributed "a sizable part of their children's or grandchildren's household income" but that only one in 20 received a sizable part of their own income from children or grandchildren.

Older Persons as Consumers

Older persons are consumers very much like other age groups. Their incomes and expenditures may be lower than those of other adults, but what they spend their money on is, for the most part, comparable (Figure 8). They devote a greater share of their income to health care and less to pensions and insurance, but differences for other expenditures are less pronounced. Judging from the percentage spent on "cash contributions," older consumers tend to be more charitable.

Older people also buy goods and services that result in job creation. The vast expansion of the leisure industry—including travel—has been fueled in part by a healthy older population with money and time to spend it in. Similarly, the growth of the health care industry has been stimulated in part by an aging population with growing health care needs.

THE HEALTH AND LONG-TERM CARE CHALLENGES OF AN AGING POPULATION

The most vexing problems likely to result from aging populations are those associated with providing and paying for health care and long-term care. For that reason, those issues warrant special attention. Ensuring the delivery of appropriate services to maximize the health and functional independence of older persons is a major challenge. In the United States, public programs that play a large role in financing the health and long-term care of the older persons—Medicare and Medicaid—will be under particular pressure.

After Demographics: The Rest of the Story

Demographic change is certainly important when it comes to health and long-term care costs, but demographics alone do not determine future health status and needs of an aging population. Other dynamic factors that are important include the epidemiology of diseases, how health and long-term care services are delivered, public policies, and private sector activities. Each of these factors has the potential to moderate the financial impact of an aging society on public health and long-term care programs.

Epidemiology

On average, the greatest use and cost of health and long-term care services are associated with advanced age. Important exceptions to this pattern, however, illustrate that factors other than the increase in the number of older persons contribute to higher costs. For example, of the 12 million people in the United States who need some kind of long-term care, nearly half are under age 65, including children (Feder, Komisar, and Niefeld, 2000). Within various age groups of Medicare beneficiaries, the health status of and cost of care for individuals vary tremendously; in fact, spending is concentrated in the last years of an individual's life, regardless of age.

Studies have demonstrated that the biological effects of aging are "extremely variable from person to person" (International Longevity Center, 1999). Increasingly, there are 80-, 90-, and 100-year-olds who defy generalizations about loss of physical function and mental capacity. A better understanding of why they do can perhaps lead to overall improvements in the functioning for others.

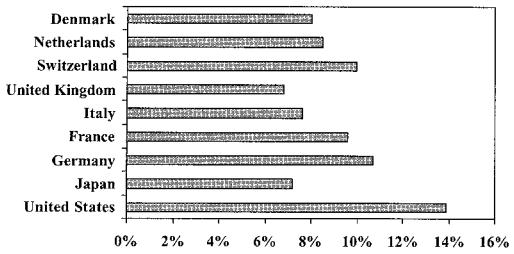
There is little debate among older persons or policy experts about the value in finding ways to reduce dependence and the need for care. Reductions can occur by promoting healthy aging, giving greater priority to prevention, and reducing the debilitating effects of chronic illness. Lifestyle changes as simple as regular aerobic exercise have many cardiovascular benefits (Maron, 2000). Appropriate and timely management of chronic conditions is essential. Wider acceptance of rehabilitation services for the chronically ill and assistive technologies help people cope with disability.

In addition, biomedical research may unlock the secrets of age-related impairment, such as arthritis, vision loss, hip fracture, and cognitive decline. Interventions unknown only a few years ago are already dramatically altering the course of medical conditions and the ability of older persons to lead fulfilling, continuously productive lives. With increased numbers of older persons, it will become financially more attractive for medical researchers to focus on the problems of aging and seek new drugs and therapies to deal with those diseases.

Service Delivery

Changes in how care is provided to older men and women also affect cost trends. Past examples include the shift to the outpatient setting for many procedures for which patients previously were hospitalized, the introduction of new techniques such as laparoscopy, the ability to deliver post-acute care services in the home setting, and adoption of utilization review techniques pioneered by managed care.

Figure 9: Total Health Care Expenditures as a Percent of GDP, Selected Countries, 1997



Source: World Health Organization, 2000

Increasingly, long-term care services are provided in people's homes and other non-nursing home settings. This trend for people who otherwise would have required or sought nursing home care is particularly important as a potential moderator of the economic impact of the demographic and disability trends previously discussed (Jacobzone, 1999; Jacobzone et al., 1998).

A key issue for any health or long-term care system is to ensure that resources are being used to support the efficient delivery of effective services. For example, the United States spends substantially more per capita on health care than other OECD countries (Figure 9). While the U.S. has one of the most technologically advanced systems in the world and one that is generally considered of high quality, its shortcomings are significant: One in six Americans is without health care coverage, and services are not available to millions who need them.

Although most older persons have Medicare coverage, large out-of-pocket costs are a burden to many older people and their families due to critical gaps in Medicare coverage, such as outpatient prescription drugs. In fact, the U.S. health care system ranks 37th out of 191 countries based on overall performance, according to the World Health Organization (2000). Understanding how other nations are dealing with common issues could benefit the United States in its efforts to better use valuable resources for improving the health status and quality of life of its citizens.

THE GOVERNMENT RESPONSE TO POPULATION AGING

Just as workers and employers can adjust to population aging, so can governments. Population aging is a long-anticipated societal change that lends itself to advance planning.

Public Policy and Retirement Income

The adjustment in the United States will be easier than in other countries because the projected change is less rapid than in some countries, because the U.S. is projected to have a relatively young population, and because the total population is projected to continue growing. It will be more difficult in some developing countries because their aging is occurring very rapidly and in a much shorter period of time than was the case in developed countries (See box). It will also be more difficult in some developed countries such as Italy and Japan because their projected populations will be, and in some cases already are, relatively old.

The problem of aging as it strains social security systems is to a large extent not an inevitable outcome of demographics but reflects decisions that societies and individuals have made concerning the age of retirement. Work disincentives that may have been appropriate in an earlier period still persist in some social security systems, causing workers to retire at younger ages than they otherwise would. Part of the adjustment to population aging will likely be that workers retire at older ages.

One of the great success stories of

the twentieth century involved the ability of older persons to retire with a reasonably secure source of income. This has, however, helped create a "retirement culture" (Treas, 2000) that may not be easy to change.

A number of countries have already raised the social security retirement age. In the United States, the age of eligibility for full retired worker benefits is slowly being raised from age 65 to 67. Several analysts have calculated that if the U.S. were to keep the ratio of life expectancy at retirement to working life expectancy at the level it was when the first Social Security checks were paid, American workers would be retiring at 70 or 71 today (Chen, 1987; Social Security Advisory Board, 1998).

Many countries have labor market policies that discourage work by older workers. In some countries, mandatory retirement ages are legal and common in practice. Social security programs contain work disincentives, making early retirement financially attractive and working after normal retirement age financially unattractive.

Age discrimination in employment is not illegal in many countries. Elsewhere, laws against age discrimination may not be adequately enforced. Instituting policies that remove barriers to work on the part of older workers and that discourage age discrimination is an approach toward dealing with problems caused by an aging population.

Just as public policy in many countries played a key role in fostering the trend toward early retirement, public policy can be instrumental in prolonging the worklife. Tax penalties for working in retirement can give way to policies that reward continued employment. Eliminating age discrimination in employment will be critical.

Public Policy in the Health Care Field

In comparing across countries, the finding that total health expenditures are not associated with the size of the elderly population has led to suggestions that countries with older populations will not necessarily experience an explosion in health care expenditures. As concluded by OECD, "there is nothing

Population Aging—Not Just a Developed World Issue

Most of the focus in this paper is on the more developed countries of the world, where aging is most pronounced. But the less developed world—Africa, Latin America and the Caribbean, Asia (excluding Japan), and Melanesia, Micronesia, and Polynesia—is aging rapidly. China's 65-plus population, now 7 percent of the total population, is projected to rise to 13 percent by 2025 and to 23 percent by 2050. Other Asian countries have experienced less dramatic fertility declines than China but are nonetheless aging rapidly as well. Nearly 5 percent of Indians are 65 or older, a figure that is projected to rise to 8 percent in 2025 and 15 percent in 2050. Even in countries where the share of the aged population increases less markedly, the numerical increase will be sizable. The aged in Uganda are projected to account for little more than 5 percent of the populatior in 2050, up from about 2 percent today. Yet the number of persons aged 65 and older may rise to 3.3 million, a nearly sevenfold increase over 2000 (United Nations, 1999, medium variant projections). Nearly 80 percent of the world's older population will live in what are now less developed nations in 2050, compared to just under 60 percent today. The number of persons who are very old and more likely to need assistance with the tasks of daily living is also on the rise in these countries.

Population aging is occurring more rapidly in much of the developing world than in the developed world. It took France 140 years for the proportion of the population aged 60 and over to double from 9 to 18 percent; it will take Venezuela just 22 years (World Bank, 1994). The speed with which many countries of the developing world are aging suggests that the challenges of aging may prove much more difficult to deal with in some of those countries than in more developed ones. As economist Yung-Ping Chen (2000) has put it, the developed countries got rich before they got old; the less developed countries are getting old before they have a chance to get rich. Lacking comprehensive formal income-support and health care systems for their growing populations, these countries rely heavily on the informal network, mainly the family, to provide for the aged. Urbanization, migration, and emigration are placing strains on informalcare systems as the need for those systems expands. Economic development may eliminate the very jobs, in both the formal and informal sectors, that enable older persons in the developing world to contribute to their own and their family's well-being.

The fact that many developing countries are for the most part still young, with problems attendant on dealing with young populations, such as education and job provision, may lull politicians into thinking that the challenge of an aging society is something that can be put off, perhaps for decades.

inevitable about the effects of population ageing . . . policy can make a difference" (Organization for Economic Cooperation and Development, 2000).

A recent example is the U.S. legislation in 1997 that, in an effort to reach a unified budget surplus by 2002, reduced the rate of growth in Medicare spending primarily through reduced payments to health care providers. As a result, total Medicare spending actually decreased slightly in nominal terms from $213.6 billion in 1998 to $212.0 billion in 1999. The impact of this reduction on Medicare beneficiaries is the subject of on-going attention.

Public policies—and their absence—can also contribute to higher health care spending and adverse health outcomes. Actions by the U.S. Food and Drug Administration to speed up the approval of new drugs so that they would be available sooner also accelerates the entry of higher priced drugs to the market (thereby contributing to higher drug spending) and, in some cases, has led to higher rates of serious side effects in patients who use them. In other countries such as South Africa, where prescription medicines account for roughly one-third of health care spending, a major factor is that physicians are allowed to dispense pharmaceuticals from their offices.

In sum, while population aging raises serious questions about how society will pay for health care and long-term care, these challenges are not insurmountable. In part, the solution will occur because the growing older population will also provide financial incentives for the development of new drugs, treatments, and institutions to deal with their problems.

An Uncertain Future

After considering the evidence as to what projections indicate for the future, there is the matter of the projections themselves. Policymakers need projections to alert them to potential problems and assist them in their planning, but it is important to keep in mind that projections are largely educated guesses.

Projections depend on assumptions—fertility, mortality, economic growth, and labor force participation, among others. Everyone who will be 80 in 2050 is alive today, so barring a sharp and unexpected rise in mortality, we can be fairly certain about estimates of the number of very old in the population in mid-century. Predicting the number of babies who are not yet born is less certain.

Even over the short-run, projections can vary substantially. Take, for example, recent projections for the U.S. Social Security Old-Age and Survivors Insurance and Disability Insurance Trust Funds. In 1997, the trust funds were projected to become insolvent in 2029, while in 2001, the projected date of insolvency was 2038 (Board of Trustees, 1997-2001).

Over a span of just four years, the projected date of insolvency was pushed back by almost a decade. Similarly, the Congressional Budget Office, which provides budget projections for the U.S. Congress, reported that the long-term budget outlook "improved dramatically" from 1996 to 2000. The improvement was due in part to faster projected growth in productivity. Numerous other examples of short-run projections that proved wildly off could be provided.

Over the long-run, it is even more difficult to envisage what might happen. Even a modest change in just one assumption can result in very different estimates. Uncertainties, unknowns, and the complexities of systems and institutions make it very difficult to figure out what a future 50 years hence might look like. Philosopher Harry R. Moody (1996) perhaps said it best when he contended that detailed quantitative forecasts deserved to be taken as seriously as weather forecasts for Christmas four years in the future. The point, perhaps, is not to dispense with projections but to appreciate that they are not predictions but tools to help policymakers and others understand what the future might look like, given many unknowns, and assess the potential impact of various public policies.

EMBRACING THE CHALLENGE

Clearly, the impacts of population aging and the outcomes for an aging population can be altered through public policy. Armed with this knowledge, the challenge confronting the United States and other countries is how to make the best use of policy to shape the future quality of life for aging societies. Embedded in this imperative is a social obligation for countries to continue addressing the health and long-term care needs of individuals throughout their lifespan. Available resources will also need to be used more equitably and effectively to promote the delivery of cost-effective care and services to older persons in the places where they actually live.

Fortunately, the aging of populations has been anticipated for quite some time, giving societies the chance to start making adjustments. Taking action sooner minimizes the burden faced by stakeholders in any given year.

Countries can cope and indeed thrive with population aging. There is no inherent reason why an older world cannot be a better world. Nor is there a sound reason for drastically scaling back the very programs, such as publicly funded retirement programs, that have made old age in the more developed world more secure. While tax rates to support government programs for the elderly may increase and the growth rate of per capita income may slow, these changes are likely to be made in the context of a considerably higher standard of living made possible by productivity growth.

Still, we cannot ignore the fact that although aging is a positive development, aging populations do require both fiscal and policy adjustments, and some of those adjustments may prove easier in some countries than others. Countries with more generous public pension systems face greater challenges in dealing with the fiscal consequences of population aging. There is a need for policymakers in the public and private sectors to act soon to moderate the adjustments that will be required. Dealing with an aging society should include:

Labor Force Strategies

- Structuring social security schemes so they do not encourage early retirement;
- Discouraging employers from including work disincentives in their pension plans;
- Eliminating work disincentives at the workplace and creating more job opportunities for older workers;
- Eliminating mandatory retirement;
- Enacting legislation banning age discrimination in employment and training;
- Better monitoring and enforcement of existing legislation banning age discrimination in employment;
- Encouraging job adaptations and redesign as well as flexible and alternative labor arrangements, such as phased retirement, flex-time, flex-place, telecommuting, and good part-time jobs, that might hold particular appeal to older workers;
- Encouraging the breakdown of rigid compartmentalism between work, education, and leisure.

Investment, Education, and Training Strategies

- Continued productivity improvement through capital investment, education, job training, and retraining;
- Expanding life-long learning opportunities.

Health Status and Health Care Strategies

- Developing policies and programs that promote healthy lifestyles across the lifespan;
- Investing in research, public education, and technological development aimed at improving health status and increasing disability-free life expectancy;
- Developing and promoting cost-effective approaches to

providing health and long-term care services across the lifespan.

Lifestyle Strategies

- Increasing opportunities for and encouraging older persons to engage in volunteer work and community service;
- Supporting informal caregiving on the part of older persons;
- Supporting the development and expansion of living arrangements that prevent or postpone institutionalization;
- Recognizing and rewarding volunteer and caregiving activities.

CONCLUSION

The advances in life expectancy over the past century represent a remarkable success story. However, it is a story that requires rethinking what old age is, when it begins, and what it involves. This already appears to be happening in the United States, where baby boomers seem poised to push old age even further back and to continue to revise and redefine the later years. Is this likely to be solely a U.S. phenomenon?

Men and women in the more developed countries around the world are also reaching old age in better health, better educated, more experienced, and more technologically adept than their parents and grandparents. There is no reason to assume that patterns of behavior that might have been appropriate for or acceptable to parents and grandparents will be suitable for coming generations of older persons, especially those who will not be retiring for another 30 or 40 years.

By then, the world, and the people in it, will look very different from how they look today, although we can hardly imagine the ways in which that will be the case. Who, except a few technology wizards in the world's computer labs—if they—had any idea of the impact the Internet would have on the lives of ordinary people around the globe? The interests, needs, and expectations of future older workers and retirees will also differ greatly from those of recent cohorts of workers and retirees, thus adding to the uncertainty about what the future might look like. About all we can say about the future with much assurance is that the present isn't a very good guide to it.

Nonetheless, we do know that the number of old—and very old—is increasing dramatically, and that policymakers will be faced with making decisions about the best way to meet the income, health, and long-term care needs of this growing population. Some of the challenges facing policymakers may prove more daunting than others, but they are by no means insurmountable. They are manageable if policies are implemented to keep the economy growing, produce more useful roles for older persons, and contain escalating health care costs. Having to meet these challenges is a reality our grandparents could only have dreamed of. Longer life expectancy—What could be better?

Endnote

[1] AARP is a licensed user of both the Regional Economic Models, Inc. (REMI), and Macroeconomic Advisers, LLC (MA).

Using REMI, we calculated the increase in the labor force participation rate of persons 65 to 70 under four different scenarios, one of which is discussed above. Having estimated that increase, we then subtracted these additional workers from the pool of Social Security beneficiaries. Because we assumed that those who are working are not receiving retirement benefits but still contributing to Social Security, three adjustments were necessary for the econometric simulation: (1) an increase in labor force, (2) a decrease in the number of beneficiaries and hence in Social Security benefits, and (3) additions to Social Security tax revenues originating from the additions to the labor force.

The macroeconomic effects of these changes were simulated by the second model, the WUMM, a Washington University Macro Model, which is a quarterly econometric system of roughly 350 equations and 140 exogenous (policy) variables. The model

explains entries from all major tables of the National Income and Product Accounts (NIPA), and provides details on labor and financial markets. The model has an income/expenditure structure in which short-term and long-term fluctuations are caused by changes in aggregate demand.

A distinguishing characteristic of the WUMM model is that the equilibrium properties of all key behavioral equations are derived from the neoclassical paradigm, imparting to the model both monetarist and supply-side characteristics in the long run. The model entails equilibrium in six sectors of the economy: aggregate demand; financial markets; productivity and employment; wages and prices; income determination; and foreign economic activity.

For more information on these simulations, contact S. Verma, AARP Public Policy Institute, 601 E Street, NW, Washington, DC 20049.

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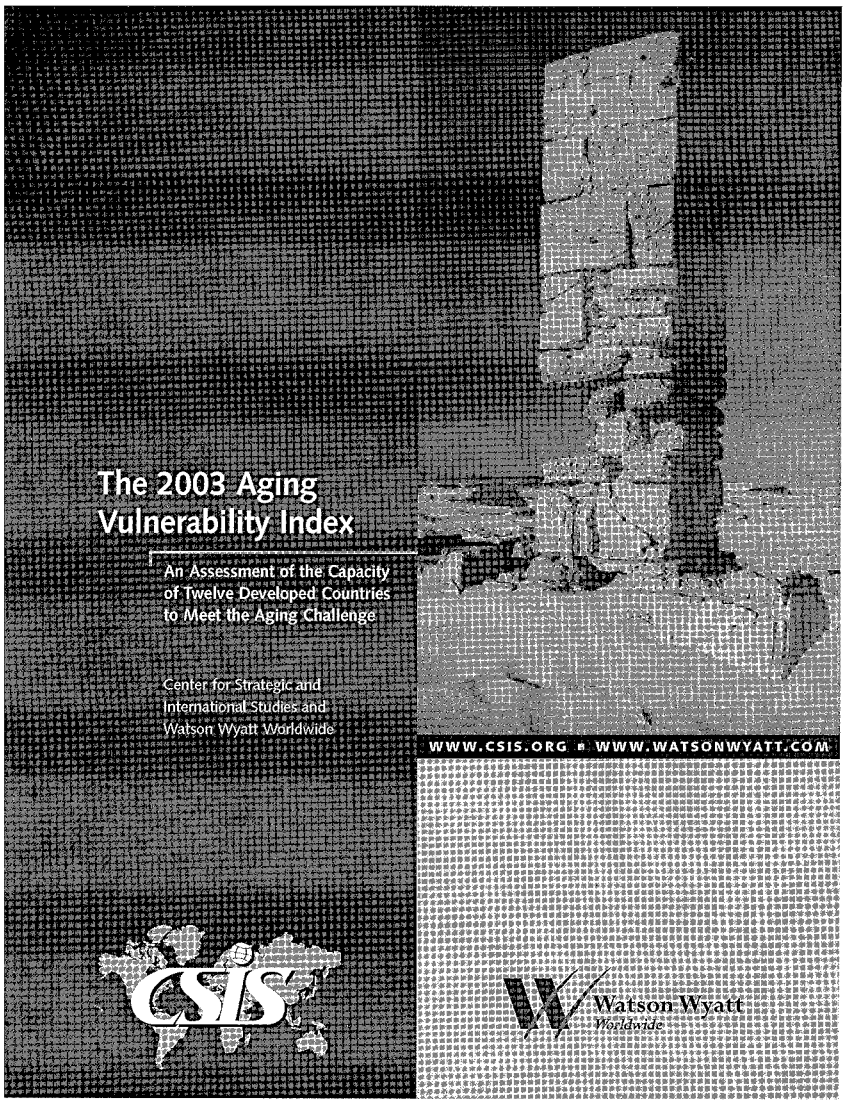
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THE 2003 AGING VULNERABILITY INDEX

An Assessment of the Capacity of Twelve Developed Countries to Meet the Aging Challenge

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by Richard Jackson and Neil Howe

The Center for Strategic and International Studies

March 2003

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EXECUTIVE SUMMARY

The rapid aging of the developed countries will pose a major challenge for global prosperity and stability during the first half of the twenty-first century.

Today, there are 30 pension-eligible elders in the developed world for every 100 working-age adults. By the year 2040, there will be 70. In Italy, Japan, and Spain, the fastest-aging countries, there will be 100. In other words, there will be as many retirees as workers. This rising old-age dependency ratio will translate into a sharply rising cost rate for pay-as-you-go retirement programs — and a heavy burden on the budget, on the economy, and on working-age adults in any country that does not take serious steps to prepare.

Ten years ago, global aging barely registered as a policy issue. Today, with the retirement of large postwar baby-boom generations looming just over the horizon, it is the focus of growing concern among political and policy leaders worldwide. From Australia to Sweden, the developed countries are beginning to debate — and enact — major reforms. Yet despite all the new attention, there exists no satisfactory measure of the magnitude of the challenge.

The CSIS *Aging Vulnerability Index* assesses the "vulnerability" of the developed countries to rising old-age dependency costs. In this first edition, the *Index* covers twelve countries — Australia, Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Spain, Sweden, the United Kingdom, and the United States. In future editions, the *Index* may be expanded to include the rest of the developed world — or, data allowing, selected developing countries.

The *Index* gives each country an overall ranking and score. The scores show that the twelve countries fall into three clear groups — a low, a medium, and a high vulnerability group.

Low Vulnerability Group

In the 2003 *Index*, the low vulnerability group includes ***Australia (1)***, the ***United Kingdom (2)***, and the ***United States (3)***. These English-speaking countries win the first three places thanks to their favorable demographics, their relatively inexpensive public benefit systems, and their well-developed private alternatives. The group does face some real challenges. The UK, for example, is finding it difficult to keep costs down without hurting elder living standards, while the United States must grapple with runaway health care spending. Still, all of these countries are in relatively good shape. Australia, in particular, is implementing a far-sighted strategy of mandatory private pension coverage that promises excellent results on all fronts.

Medium Vulnerability Group

There are six medium vulnerability countries: ***Canada (4)***, the English-speaking straggler; ***Sweden (5)*** and ***Germany (7)***, two continental

Aging Vulnerability Index
2003 Edition
Rankings from Least to Most Vulnerable

Low Vulnerability	
1	AUSTRALIA
2	UNITED KINGDOM
3	UNITED STATES
Medium Vulnerability	
4	CANADA
5	SWEDEN
6	JAPAN
7	GERMANY
8	NETHERLANDS
9	BELGIUM
High Vulnerability	
10	FRANCE
11	ITALY
12	SPAIN

European countries that have recently enacted major benefit reforms; ***Japan*** *(6)*, which ranks much higher in the *Index* than its massive age wave might indicate; and the ***Netherlands*** *(8)* and ***Belgium*** *(9)*, two countries with generous and unreformed benefit systems. All of the medium vulnerability countries, including Canada, face more serious demographic challenges than the low vulnerability countries. And despite recent reforms, all, including Sweden and Germany, face heavier old-age dependency burdens.

High Vulnerability Group

The high vulnerability group includes three major continental European countries that all face a daunting fiscal and economic future: ***France*** *(10)*, ***Italy*** *(11)*, and ***Spain*** *(12)*. Their poor scores can be attributed, in varying degrees, to severe demographics, lavish benefit formulas, early retirement, and heavy elder dependence on pay-as-you-go public support. It is unclear whether they can change course without economic and social turmoil. Italy has scheduled big reductions in future pension benefits, but only after grandfathering nearly everyone old enough to vote. France and Spain have yet to initiate major reforms of elder benefit programs.

The *Index* is compiled from indicators in four basic categories, each dealing with a crucial dimension of the challenge:

- ***Public-burden indicators***, which track the sheer magnitude of the public spending burden in each country
- ***Fiscal-room indicators***, which track each country's ability to accommodate the growth in old-age benefits via higher taxes, cuts in other spending, or public borrowing
- ***Benefit-dependence indicators***, which track how dependent the elderly are on public benefits and thus how politically difficult it may be to reduce their generosity
- ***Elder-affluence indicators***, which track the relative affluence of the old versus the young — another trend that could critically affect the future politics of benefit reform

The projections underlying the *Index* are based on a "historical trends" scenario, a no-wishful-thinking baseline that assumes a continuation of established demographic and economic trends. According to the projections, public benefits to the elderly will reach an average of 25 percent of GDP in the developed countries by 2040, double today's level. In Japan, they will reach 27 percent of GDP; in France, they will reach 29 percent; and in Italy and Spain, they will exceed 30 percent. This growth will throw into question the sustainability of today's retirement systems — and indeed, society's very ability to provide a decent standard of living for the old without overburdening the young.

The *Aging Vulnerability Index* is the first attempt to develop a comprehensive measure of the old-age dependency challenge that is comparable across the developed countries. As such, it must be regarded as experimental. We offer this first edition of the *Index* in the hope that it will stimulate debate and focus attention on the need for reform. The *Index* clearly shows that global aging is pushing much of the developed world toward fiscal and economic meltdown. There is still time to avert crisis. But time is running short, and the problem is worse than is generally supposed.

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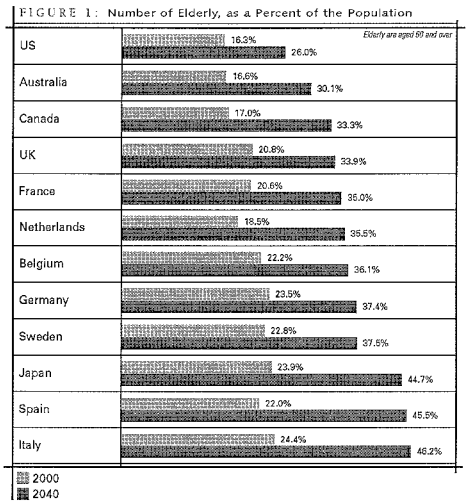
The report also benefited from discussions with numerous experts worldwide. The authors collectively acknowledge their contributions to the report while retaining responsibility for its shortcomings.

INTRODUCTION

We live in an era defined by many challenges, from global warming to global terrorism. But none is as certain as global aging. And none is as likely to have as large and enduring an effect — on the size and shape of government budgets, on the future growth in living standards, and on the stability of the global economy and even the world order.

The whole world is aging, and the developed countries are leading the way. For most of history, the elderly — here defined as adults aged 60 and over — comprised only a tiny fraction of the population, never more than five percent in any country. Today in the developed countries, they comprise 20 percent. Forty years from now, the share will reach roughly 35 percent. And that's just the average. In Japan and some of the fast-aging countries of continental Europe, where the median age is expected to exceed 50, the share will be approaching 50 percent (see Figure 1).

FIGURE 1: Number of Elderly, as a Percent of the Population



Longer lives may be a great personal boon, but they also pose a great collective challenge. Over the next half century, global aging will divert a rising share of society's economic resources from young to old. Much of this transfer will occur through public benefit systems. All of the developed countries have universal or near-universal public pension and health care benefit programs that tax current workers to pay benefits to current retirees. In many countries, the typical elder is almost entirely dependent on a government check. Global aging will throw into question the sustainability of today's pay-as-you-go retirement systems — and indeed, society's very ability to provide a decent standard of living for the old without overburdening the young.

Ten years ago, global aging barely registered as a policy issue. Today, with the retirement of large postwar baby-boom generations looming just over the horizon, it is the focus of growing concern among leaders worldwide. From Australia to Sweden, the developed countries are beginning to debate — and enact — major reforms.

Yet despite all the attention, there exists no satisfactory measure of the magnitude of the challenge to guide leaders in their policy choices. Not all national governments make long-term cost projections, and those that do rarely include all benefit programs. In any case, the national projections are not comparable across countries. Recent multi-country projections by the Organization for Economic Co-operation and Development (OECD) have begun to address the comparability problem, but they assume a variety of fiscally favorable developments — more babies, more working women, slower growth in health care spending, and slower growth in life expectancy — that may greatly understate future costs.

The CSIS *Aging Vulnerability Index* offers a more complete and realistic assessment of the "vulnerability" of the developed countries to rising old-age dependency costs. The projections underlying the *Index* are based on a "historical trends" demographic and economic scenario, a no-wishful-thinking baseline that assumes a continuation of established trends in fertility, longevity, labor-force participation, and productivity growth. The *Index*'s core indicators quantify the magnitude of the public-benefit burden. In addition to tracking total old-age benefits as a share of GDP, the *Index* calculates the after-tax cost of benefits to the elderly as a share of the income of the nonelderly. This innovative "net-transfer" indicator directly measures the impact of current social policy toward the old on the living standard of the young.

The sheer magnitude of the future public-benefit burden, of course, is not the only circumstance affecting the vulnerability of the developed countries. The overall fiscal, economic, and social environment also matters. The *Index* therefore goes a step further and looks at a variety of broader factors that may mitigate or aggravate the public burden.

These additional indicators are grouped into three categories: fiscal room, benefit dependence, and elder affluence. The fiscal-room indicators take into account the differing "room" that governments may have to raise taxes, cut other spending, or borrow in order to accommodate the growth in old-age benefits. With its small public sector, Japan, for instance, may have more room to raise taxes than Sweden — while Sweden, with its small public debt, may have more room to borrow than Japan.

The benefit-dependence indicators take into account the extent of elder reliance on public benefits, the availability of alternative means of support, including earnings and private pensions, and the strength of extended families.

The elder-affluence indicators take into account the relative economic well-being of society's elderly and nonelderly members. Trends in each of these areas will influence the ability of countries to reduce the public burden by enacting or following through with cost-cutting reforms.

The bottom line is an *Index* that ranks the major developed countries in terms of their overall vulnerability to the costs of rising old-age dependency. The *Index* now covers twelve countries: Australia, Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Spain, Sweden, the United Kingdom, and the United States. In the future, it may be expanded to include the rest of the developed world — or, data allowing, selected developing countries.

Part I of the report briefly describes the projection scenario, then discusses the individual indicators that make up the *Index* — why they were selected, how they are calculated, and what they reveal. Part II gathers together the strands of the story. It describes how the individual indicators are combined into an *Index*. It also presents the overall rankings and summarizes the country findings. A Technical Appendix contains a more complete discussion of the model, methodology, and data sources used in constructing the *Index*.

The *Aging Vulnerability Index* is the first attempt to develop a comprehensive measure of the old-age dependency challenge that is comparable across the developed countries. As such, it must be regarded as experimental. We offer this first edition of the *Index* in the hope that it will stimulate debate and focus attention on the need for reform. The *Index* clearly shows that global aging is pushing much of the developed world toward fiscal and economic meltdown. There is still time to avert crisis. But time is running short, and the problem is worse than is generally supposed.

PART I. THE INDICATORS

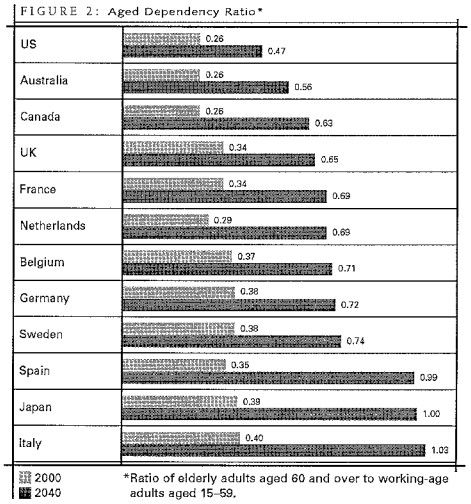
During the early postwar decades, when the developed countries greatly expanded government's role in providing old-age benefits, they decided to pay for nearly all the benefits on a pay-as-you-go basis. The pay-as-you-go model was attractive because it allowed early participants to receive benefits far in excess of their contributions. At the time, the model also appeared to be affordable. Because the number of retirees was small and the number of workers was growing rapidly, the total cost seemed easily bearable even after allowing for steady benefit hikes. What's more, everyone expected this situation to continue indefinitely.

In more recent decades — especially since the mid-1970s — these expectations have crumbled. The developed countries stand on the brink of a great demographic transformation that no one predicted when the pay-as-you-go model was adopted. It's called global aging, and it will soon be putting enormous pressure on public budgets and national economies. In a few countries, that pressure is already building.

There are two forces behind global aging. The first force is falling fertility. People are having fewer babies, which decreases the relative number of young in the population. As recently as the mid-1960s, every developed country was at or above the so-called 2.1 replacement rate needed to maintain a stable population from one generation to the next. Today every country is at or below it, some far below it. In Japan, the fertility rate is 1.4; in Germany, it is 1.3; and in Italy, Spain, and much of southern and central Europe, it is 1.2. Only the United States remains at the replacement rate — barely.

The second force behind global aging is rising life expectancy. People are living longer, and this boosts the relative number of old in the population. Over the past fifty years, life expectancy at birth has risen by roughly two and a half months per year in the developed countries, for a cumulative gain of about ten years. Few demographers expect this trend to slow — and a growing number believe that it may accelerate.

FIGURE 2: Aged Dependency Ratio*



*Ratio of elderly adults aged 60 and over to working-age adults aged 15–59.

"Demography is destiny," it is sometimes said. When it comes to public budgets, the prophecy is irrefutable. Rising longevity and falling fertility translate directly into a rising ratio of retired beneficiaries to taxpaying workers. Overall, CSIS projects that the ratio of "elderly" adults aged 60 and over to "nonelderly" adults aged 15–59 in the developed world will increase from 30 percent today to 70 percent by 2040. In Italy, Japan, and Spain, the fastest aging of the twelve *index* countries, this old-age dependency ratio will increase to 100 percent by 2040 — meaning that there will be as many adults over the age of 60 as under (see Figure 2).* A rising

*As explained below, age 60 was chosen as the threshold between elderly and nonelderly because it is much closer to the typical age of retirement on public benefits in most countries than the more conventional age 65 threshold.

old-age dependency ratio will in turn translate into a rising cost rate for pay-as-you-go retirement programs — and a growing burden on the budget, on the economy, and on working-age adults.

The purpose of the CSIS *Aging Vulnerability Index* is to measure and compare the magnitude of this burden in different countries and, by extension, the "vulnerability" of those countries to demographic aging. The *Index* is calculated by combining country scores on eleven separate indicators. The indicators are grouped into four categories, each dealing with a distinct dimension of the problem:

- The first and most important category is ***public burden.*** It contains three indicators that measure the sheer magnitude of each country's projected public old-age dependency burden.

- The second category is ***fiscal room.*** It contains three indicators that measure each country's ability to accommodate the growth in its public old-age dependency burden via higher taxes, cuts in other spending, or government borrowing.

- The third category is ***benefit dependence.*** It contains three indicators that measure how dependent the elderly in each country are on public benefits and thus how politically difficult it may be to reduce those benefits beneath current law — or even to carry out reductions in benefits that are already scheduled to take place.

- The fourth category is ***elder affluence.*** It contains two indicators that measure per capita elderly income in each country relative to nonelderly income — another factor that could critically affect the future politics of reform.

The CSIS *Aging Vulnerability Index* is constructed as follows. For each of the indicators, we generate an indicator ranking, from one (best) to twelve (worst). We also transform the indicator results into an index and generate an index score for each country. For each indicator, the mean result is set to an index value of 50; results that lie above and below the mean by one standard deviation are set, respectively, to index values of 100 and zero. The index scores thus preserve the indicator rankings while also reflecting the relative distance of each ranked country, positively or negatively, from the "center of the pack." (Countries located far from the mean can and sometimes do have index scores greater than 100 or less than zero.)

For each of the four categories, a category score is then calculated as an average of the indicator index scores. The category score determines the overall category rankings. Finally, the category scores themselves are averaged as follows: A weight of one-third is given to the first public-burden category, one-third to the second fiscal-room category, and one-third to the third and fourth "policy-climate" categories combined. A country's final combined average for the four categories determines its ranking in the overall *Index*.

Each of the indicators tells an interesting story and is worth examining in detail. Before looking at the results, however, it is essential to understand the basic scenario and assumptions that underlie all of the projections.

The Projection Scenario

The projection scenario extends from 2000, the base year, through 2040. The 2040 end year was chosen because the "demographic transition" in most countries will by then be largely complete. Even after 2040, rising longevity will continue to push the cost of retirement benefits steadily and indefinitely upward. But the era of swiftest growth, which in most countries accompanies the full retirement of a postwar

baby boom, will occur sometime between the mid-2010s and the mid-2030s. A country that can successfully navigate the fiscal rapids over the next four decades will, presumably, be quite prepared to manage the gentler current thereafter. A country that fails to meet the challenge by 2040 will be far more concerned with confronting the destructive legacy of that failure (from high tax levels to runaway debt) than with managing any new demographic developments after 2040.

All of the projections assume a continuation of historical demographic and economic trends. Fertility is assumed to remain constant, mortality to continue declining at its historical pace, and productivity and real wages to continue rising in line with their average growth rate over the last twenty-five years. Rates of labor-force participation by age group are also assumed to remain unchanged, with the two exceptions noted below. In general, so is the composition of national income by type of factor income — "asset income" from capital and "earnings income" from labor — although, as populations age, the distribution of each type between age groups will of course shift.

A few exceptions to this "historical trends" rule are permitted. The scenario allows for an increase in labor-force participation among middle-aged women as a new generation of working women now in their twenties and thirties bring new habits with them into their forties and fifties. It also allows for a modest rise in labor-force participation among the elderly in a number of countries, notably Germany and Italy, where recent pension reforms have begun to change work incentives.

As for policy, the projections assume a continuation of current old-age benefit provisions. Public pension programs continue to function according to the same benefit rules that are in place in the base year. Exceptions (important in some countries) are allowed only where future changes in benefit rules have already been explicitly enacted into law. Health care benefits are a special case, since health care spending per beneficiary typically grows rapidly yet unpredictably even with no change in benefit rules. Here, the assumption is that growth in per-beneficiary health care spending will initially follow the historical trend in each country, but that growth in all countries will gradually converge, by 2040, to the rate of growth in per capita GDP plus one percent. In most countries, this implies that cost growth will be slower in the future than it has been in the past. While there is little evidence that costs are yet slowing, all experts agree that they must do so eventually to avoid impossible outcomes — such as total health care spending crowding out every other category of consumption.

The *Index* makes two other major policy assumptions. The first is debt neutrality: In the first year of the projection, each country is assumed to move to a general government deficit which, when continued unchanged as a share of GDP in all future years, will keep net government debt unchanged as a share of GDP. While unrealistic as a short-term projection, debt neutrality is a standard assumption in long-term budget models. Year to year, the budget balance shows a great deal of variability, usually rising and falling with the business cycle. To suppose that the balance in any single base year will continue indefinitely is an arbitrary and often an unsustainable assumption. Each country is assumed to achieve its new budget balance by an increase (or decrease) in taxes combined with an equal decrease (or increase) in government spending.

We considered — but decided against — making an exception for countries that are proposing a long-term policy of budget surpluses as a partial solution to the aging challenge. The historical failure of governments throughout the developed world to validate retirement

"trust-fund" savings by running sustained general government surpluses raises serious questions about the feasibility of this approach. Among the twelve *Index* countries, only one — Canada — has announced plans to pursue such a policy. While Canada may succeed where others have failed, the projected level of "prefunding" is small relative to the projected size of its dependency burden. Even if factored into the *Index*, it would not alter Canada's overall ranking.

The other assumption is that, once debt neutrality is achieved, nonbenefit spending will remain constant as a share of GDP and taxes will be raised (or lowered) in each future year in accordance with the projected change in benefit spending. In every country in almost every year, of course, this means that taxes must be raised. This "rising tax" assumption is only relaxed for two of the fiscal-room indicators, where the object is to assess alternative means of paying for the growth in benefit costs.

Throughout the *Index*, the "elderly" are defined as persons aged 60 and over, the "nonelderly" as persons aged 15–59. The income (and taxation) of each age group refers to the income of all individuals within that age group, with the single exception of spouses of heads of households, who are considered to belong to the same age group as the head of household. Other than in the case of spouses, income to households containing both elderly and nonelderly adults is split between the two groups. The age 60 threshold between elderly and nonelderly may strike some people as a bit early, since in today's world most 60-year-olds seem relatively "young." The threshold, however, is not meant to indicate anything about health, capacity, or vigor. Age 60 was chosen because it is close to the typical age of retirement on public benefits in most countries — much closer, in fact, than age 65. Before age 60, the majority of people are net contributors. After age 60, the majority become net beneficiaries.

The data underlying the projection scenario come from a wide variety of sources, the most important of which are discussed in the Technical Appendix. The basic demographic data come from the UN. Most of the fiscal and macroeconomic data are derived from standard OECD sources, from the National Accounts to the Social Expenditure Database. The detailed household data, from income by age to living arrangements, are derived from the Luxembourg Income Study for every country except Japan, where data from the Ministry of Health, Labor, and Welfare are used.

Let us now turn to the indicators. The public-burden indicators are presented first, since they focus most directly on the core challenge — the projected magnitude of the old-age dependency burden. The fiscal-room indicators, which focus on how easily each country can accommodate the growth in that burden, are presented second. The benefit-dependence and elder-affluence indicators, which focus on how easily each country can restrain the growth, are presented last.

Category One: Public-Burden Indicators

The public-burden category includes three indicators:

- ***Public benefits to the elderly in 2040 as a percent of GDP*** (the "benefit-level" indicator)
- ***The growth from 2000 to 2040 in public benefits to the elderly as a percent of GDP*** (the "benefit-growth" indicator)
- ***Public benefits to the elderly in 2040 as a percent of the income of the nonelderly*** (the "net-transfer" indicator)

The first two indicators track the claim that old-age benefits will place on society's total economic resources. The third measures the direct transfer burden that old-age benefits

will place on the income of the working-age population. Together, they provide a comprehensive measure of the public burden of population aging.

Let's start with the benefit-level indicator. CSIS projects that public benefits to the elderly in the twelve *Index* countries will grow to an average of 24.8 percent of GDP by 2040, double today's level. Of this total, 13.5 percent of GDP will be going to pensions, 8.7 percent to health care benefits, and 2.6 percent to miscellaneous programs, from unemployment insurance to housing subsidies and food stamps.

The average projection masks a wide range of outcomes (see Figure 3). Total old-age benefits in Australia, the UK, and the United States are projected to grow to between 17 and 20 percent of GDP by 2040. In Belgium, Canada, France, Germany, Japan, the Netherlands, and Sweden, they are projected to grow to between 23 and 29 percent. And in Italy and Spain, they are projected to exceed 30 percent. The differences are due in part to demographics, and in part to the varying generosity of benefit systems, especially pensions. The lower-burden English-speaking counties both spend less per capita on old-age benefits and are due to age less. The higher-burden countries of continental Europe have the most lavish benefit formulas, the earliest retirement ages, and the fastest-aging populations. Japan is a special case. It faces a massive age wave, but has a relatively stingy benefit system — which is what keeps total Japanese benefit spending from shooting off the charts.

There are some important differences in rankings between the benefit-level and benefit-growth indicators (see Figure 4). A few countries, notably Canada and the United States, score better on level than on growth. In the case of Canada, the difference is dramatic: a ranking of four versus a ranking of nine. The reason lies mainly in Canada's demographics. With a fertility rate of only 1.6,

FIGURE 3: Public Benefits to the Elderly, as a Percent of GDP

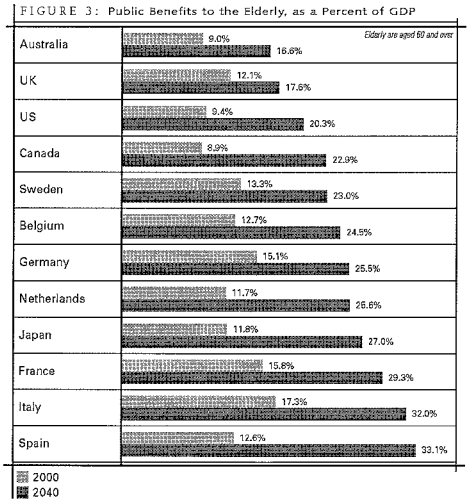


FIGURE 4: Growth in Public Benefits to the Elderly from 2000 to 2040, as a Percent of GDP

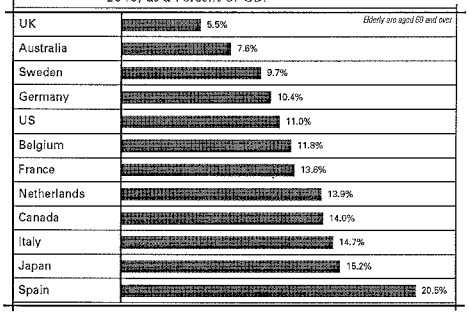
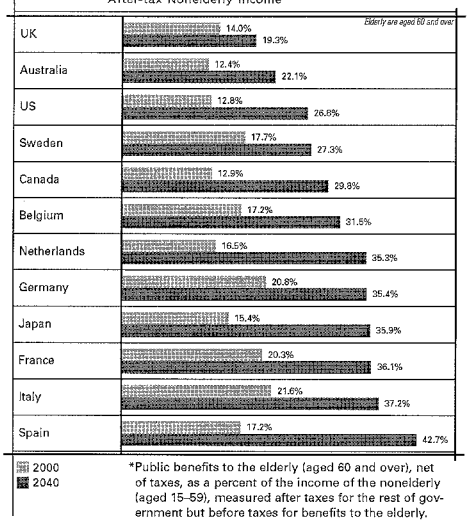


FIGURE 5: Net Public Benefits to the Elderly, as a Percent of After-tax Nonelderly Income*



*Public benefits to the elderly (aged 60 and over), net of taxes, as a percent of the income of the nonelderly (aged 15–59), measured after taxes for the rest of government but before taxes for benefits to the elderly.

its aging trajectory is much closer to that of continental Europe than to the other English-speaking countries. In the case of the United States, the reason for the poorer growth score is government health care benefit spending, which is projected to rise faster in the United States than in other countries.

There are also a number of countries that score better on growth than on level. Germany, Italy, and Sweden all enacted reforms in the 1990s that are scheduled to cut average pension benefits relative to average wages over the next few decades. These countries spend a lot on old-age benefits today and will spend even more tomorrow. But total spending will grow less than demographics alone would suggest. There is also one low-burden country — the UK — that has enacted deep cuts in pension benefits. It still faces rising elder health care benefit costs. Alone among the twelve *Index* countries, however, it faces virtually no growth in pension costs.

Most countries will begin to experience severe fiscal pressure at about the same time. Almost everywhere, old-age benefits are projected to rise relatively slowly over the next decade, a period during which large postwar baby booms will still be in the workforce. This window of opportunity closes abruptly in the early 2010s. Thereafter, benefit spending rises steeply for two decades before slowing or plateauing during the 2030s. Japan and Spain are exceptions to this pattern. In Japan, whose massive age wave is breaking early, spending is already rising rapidly. In Spain, spending doesn't begin to ramp up until the 2010s, but once it does, it continues to grow rapidly throughout the entire projection period and beyond.

So what's more important — level or growth? The question is probably unfair, since each indicator adds a different perspective to the *Index*. The absolute spending level as a share of GDP is clearly the simplest measure of the total resource burden. From this perspective, the English-speaking countries are substantially better off. Yet the rise in spending is also important, since some societies may be institutionally and culturally better equipped to handle high levels of public-benefit spending than others. From this perspective, the road ahead may not be so smooth for Canada and the United States.

Thus far, we have focused on the projected claims that public old-age benefits will place on society's total economic resources. To isolate specifically the burden on the working-age population, the third indicator tracks total public benefits to the elderly as a share of the total income of the nonelderly. Here both benefits and income are measured after taxes. Benefits to the elderly are measured "net" — that is, they are reduced by an estimate of the

FIGURE 6: Public-Burden Category*

Category Rank	Score	Benefit-Level Indicator Public Benefits to the Elderly in 2040, as a Percent of GDP		Benefit-Growth Indicator Growth in Public Benefits to the Elderly from 2000 to 2040, as a Percent of GDP		Net-Transfer Indicator Net Benefits to the Elderly in 2040, as a Percent of After-tax Nonelderly Income	
1 UK	32	1 Australia	16.8%	1 UK	5.5%	1 UK	19.3%
2 Australia	20	2 UK	17.5%	2 Australia	7.1%	2 Australia	22.1%
3 US	13	3 US	20.3%	3 Sweden	9.7%	3 US	28.5%
4 Sweden	22	4 Canada	22.9%	4 Germany	10.4%	4 Sweden	27.9%
5 Belgium	47	5 Sweden	23.0%	5 US	11.0%	5 Canada	29.8%
6 Canada	47	6 Belgium	24.5%	6 Belgium	11.8%	6 Belgium	31.5%
7 Germany	53	7 Germany	25.5%	7 France	12.6%	7 Netherlands	35.3%
8 Netherlands	68	8 Netherlands	25.6%	8 Netherlands	13.9%	8 Germany	35.4%
9 Japan	80	9 Japan	27.0%	9 Canada	14.0%	9 Japan	35.9%
10 France	83	10 France	29.5%	10 Italy	14.7%	10 France	36.1%
11 Italy	97	11 Italy	32.6%	11 Japan	15.2%	11 Italy	37.2%
12 Spain	139	12 Spain	33.3%	12 Spain	20.5%	12 Spain	42.7%

*Elderly are aged 60 and over; net transfers are public benefits to the elderly, net of taxes, as a percent of the income of the nonelderly (aged 15–59), measured after taxes for the rest of government but before taxes for benefits to the elderly.

share of benefits paid for by taxes on the elderly themselves. The income of the nonelderly is measured after all rest-of-government taxes — that is, after taking into account all taxes on the nonelderly except those required to pay for net benefits to the elderly.

By 2040, at the low end, net transfers to the elderly will be consuming 19 percent of the after-tax income of the nonelderly in the UK and 22 percent in Australia. In every other country, net transfers by 2040 will be consuming between 27 and 37 percent of nonelderly income, except for Spain, where they will weigh in at 43 percent (see Figure 5). In no country today do net transfers consume more than 22 percent of nonelderly income. Note that these shares do not refer to worker payroll, but to the total household income from all sources of all nonelderly adults.

The ranking of countries by the net-transfer indicator corresponds quite closely to the ranking by total benefit spending as a share of GDP. Since the net-transfer indicator takes into account differences in the distribution of the tax burden by age, we had expected to find more variation in the rankings. But apparently these tax differences do not play a decisive role. In a few countries like Sweden, the elderly pay for a somewhat larger share of their own transfers through taxes. Compared with other countries, Sweden relies relatively less on payroll taxation to fund old-age benefits and has relatively few senior tax breaks. It ranks better on the net-transfer indicator than on the benefit-level indicator. In a few other countries, the tax code leans the other way. In Spain, for instance, relatively heavy reliance on payroll taxation pushes up the net-transfer burden even faster than the overall benefit level.

Figure 6 summarizes the results for the public-burden category. Australia comes in first on the benefit-level indicator, the UK on the benefit-growth and net-transfer indicators. Spain comes in last on all three. Overall, the UK receives the best category score — Spain the worst.

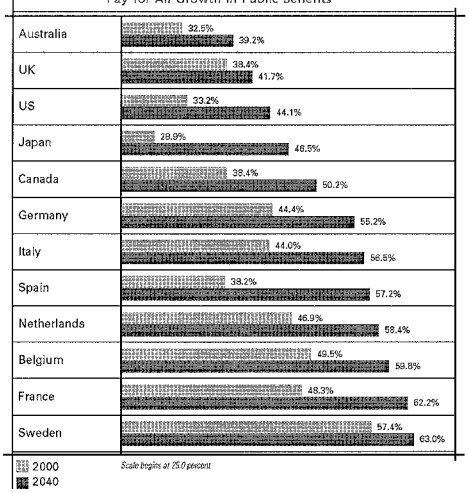
Category Two: Fiscal-Room Indicators

A country's vulnerability to rising old-age dependency costs depends not only on the magnitude of the burden, but also on the fiscal room available to accommodate the burden. There are three ways in which countries can adjust to higher old-age benefit spending: pay for the growth by raising taxes, pay for the growth by cannibalizing other public programs, or pay for the growth by borrowing.

The fiscal-room category includes three indicators that evaluate the feasibility of these strategies:

- *Total taxes as a percent of GDP in 2040* (the "tax-room" indicator, which assumes that benefit growth is paid for by raising taxes)
- *Total benefits to the elderly in 2040 as a percent of total government outlays* (the "budget-room" indicator, which assumes that benefit growth is paid for by cuts in other government spending)
- *The year that the net government debt reaches 150 percent of GDP* (the "borrowing-room" indicator, which assumes that benefit growth is paid for by government borrowing)

FIGURE 7: Total Taxes as a Percent of GDP, Assuming Tax Hikes Pay for All Growth in Public Benefits



Of the three indicators, the results for the tax-room indicator are the most straightforward. Countries with the largest projected old-age dependency burdens tend to end up with the largest tax burdens. Since the overall tax burden also depends on the overall size of the public sector, however, there are some exceptions. A few countries with outsized public sectors score much worse on tax room than they do on the public-burden indicators. Sweden, for example, ranks fourth in its public-burden category score, but twelfth on tax room; Belgium ranks fifth in public burden, but tenth on tax room. For a few other countries with large old-age dependency burdens but relatively small public sectors, the reverse is true. Spain, for example, ranks twelfth in its public-burden category score, but eighth on tax room; Japan ranks ninth in public burden, but fourth on tax room.

What's most striking, however, is that the tax option would lead to extraordinary tax burdens in almost all countries. In every country except Australia, total taxes would consume at least 40 percent of GDP by 2040; in Belgium, Canada, Germany, Italy, the Netherlands, and Spain, they would consume at least 50 percent; and in France and Sweden, they would consume more than 60 percent (see Figure 7). Some European countries may literally find it impossible to raise taxes enough to pay for the full cost of the age wave. At some point, rather than generate new revenue, higher tax rates may simply slow the economy, exacerbate unemployment, and push more workers into a growing gray economy.

The obvious alternative to letting benefits grow outward is to let them grow inward. The budget-room indicator looks at what would happen if, instead of raising taxes, governments simply allowed old-age dependency costs to crowd out other spending "dollar for dollar." By 2040, benefits to the elderly would account for over 40 percent of total spending in ten of the twelve countries, over 50 percent in six of the twelve, and over 70 percent in one: Spain. In the country with the largest share today — Italy — they account for just 38 percent (see Figure 8).

There are important differences between the budget-room and tax-room rankings. Countries with large public sectors but relatively small old-age dependency burdens — Belgium and Sweden — score much better on budget room than tax room. The presumed opportunity implied by the indicator is that such countries may have a lot of ineffective government spending that can be cut without much cost to society. Countries with relatively small public sectors but fast-growing burdens — Japan and the United States — score worse. They may be able to accommodate relatively little growth in old-age spending without crowding out vital public services.

In theory, governments could also finance the growth in old-age benefits by borrowing. The debt-room indicator tracks the number of years that they could do so before exceeding the critical net-debt-to-GDP ratio of 150 percent, roughly the highest level any modern developed country has attained in peacetime. The higher a country's initial debt and the steeper the growth in its old-age benefit spending, the sooner it will exceed the threshold. Japan, where benefits are growing steeply even in the near term, breaches it first, in 2020. Italy and Belgium, which have the highest initial net debt, breach it second and third, in 2021 and 2022. With the exception of the UK, every country breaches it by 2040 (see Figure 9).

FIGURE 8: Public Benefits to the Elderly as a Percent of Total Government Outlays, Assuming Cuts in Other Spending Pay for All Growth in Public Benefits

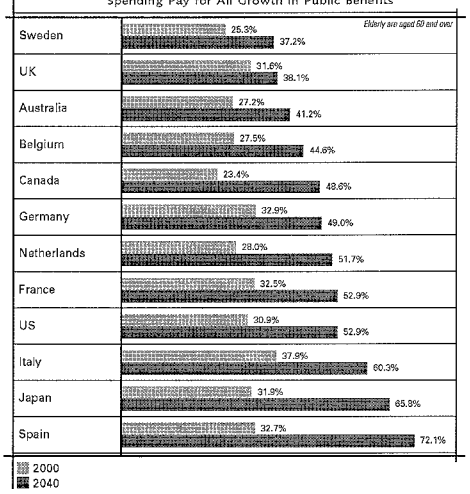


FIGURE 9: Net Government Debt in 2001 and Year Net Debt Reaches 150 Percent of GDP, Assuming Borrowing Pays for All Growth in Public Benefits

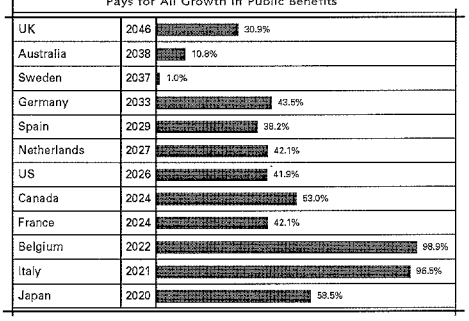


FIGURE 10: Fiscal-Room Category

Category Rank	Score	Tax-Room Indicator Total Taxes as a Percent of GDP in 2040, Assuming Tax Hikes Pay for All Growth in Public Benefits		Budget-Room Indicator Public Benefits to the Elderly as a Percent of Total Government Outlays in 2040, Assuming Cuts in Other Spending Pay for All Growth in Public Benefits		Borrowing-Room Indicator Year Net Government Debt Reaches 150 Percent of GDP, Assuming Borrowing Pays for All Growth in Public Benefits	
1 UK	26	1 Australia	39.2%	1 Sweden	37.2%	1 UK	2046
2 Australia	12	2 UK	41.7%	2 UK	38.1%	2 Australia	2038
3 Sweden	32	3 US	44.1%	3 Australia	41.2%	3 Sweden	2037
4 US	41	4 Japan	46.5%	4 Belgium	44.0%	4 Germany	2033
5 Germany	43	5 Canada	50.2%	5 Canada	48.6%	5 Spain	2029
6 Canada	51	6 Germany	55.2%	6 Germany	49.0%	6 Netherlands	2027
7 Netherlands	66	7 Italy	56.5%	7 Netherlands	51.7%	7 US	2026
8 Belgium	68	8 Spain	57.2%	8 France	52.9%	8 Canada	2024
9 Japan	78	9 Netherlands	58.4%	9 US	52.9%	9 France	2024
10 France	82	10 Belgium	59.8%	10 Italy	56.3%	10 Belgium	2022
11 Italy	88	11 France	62.2%	11 Japan	65.8%	11 Italy	2021
12 Spain	91	12 Sweden	63.0%	12 Spain	72.1%	12 Japan	2020

It's worth recalling that the borrowing-room indicator, like the other fiscal-room indicators, is designed to isolate the impact of rising benefit costs. Apart from borrowing to pay for the growth in public benefit programs, each country is still assumed to pursue a debt-neutral fiscal policy in the rest of the budget. Even so, the net-debt-to-GDP ratio in eight of the twelve countries — Belgium, Canada, France, Italy, Japan, the Netherlands, Spain, and the United States — goes on to pass 300 percent of GDP by 2040. For most countries, borrowing simply isn't a long-term option.

Figure 10 summarizes the results for the fiscal-room category. Australia comes in first on tax room, Sweden last. Sweden comes in first on budget room, Spain last. The UK comes in first on borrowing room, Japan last. Once again, the UK receives the best overall score, Spain the worst.

Category Three: Benefit-Dependence Indicators

Up to now, we have assumed that old-age benefit programs will continue to function exactly as current law dictates. Yet in reality, every country is bound to enact many policy changes over the next forty years. And in some countries, these changes may have a dramatic impact on total benefit spending — either cutting it beneath what current law now authorizes (easing the dependency burden), or hiking it above what current law now authorizes (worsening the dependency burden). In this context, hiking benefit spending does not necessarily mean making benefits more generous than they are today. In several countries, the mere failure to follow through with future benefit cuts that are already scheduled by current law would have a dramatic impact. Italy, Germany, Sweden, and the UK are all countries whose future dependency burden will be much larger than current projections indicate if scheduled benefit cuts do not materialize.

Is there any way to assess the likelihood that future policy changes will lean one way or the other? Clearly, one factor that will facilitate or obstruct reform is the degree of elder dependence on public benefits. Part of this depen-

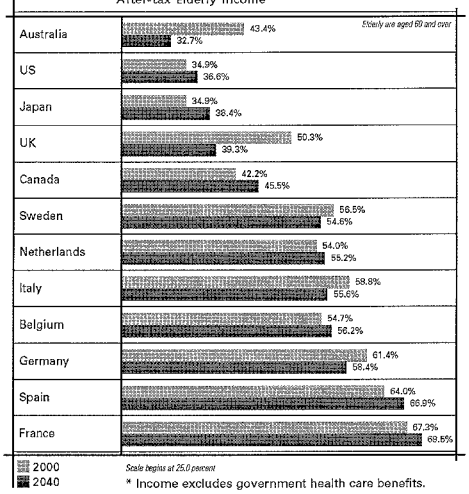
dence can be measured by looking at benefit income as a share of total household income. Another part can be measured by assessing the strength of informal sources of nonincome support, the most important of which is the extended family. A related issue is the extent to which reductions in public benefits would push elders into poverty, a concern to which most of today's developed societies appear to be very sensitive.

Accordingly, the benefit-dependence category includes three indicators:

- ***Public benefits as a percent of after-tax elderly income in 2040*** (the "benefit-share" indicator)
- ***The percent of the elderly who live with their adult children*** (the "family-ties" indicator)
- ***The percent of the elderly who would drop below the poverty line if public benefits were cut by 10 percent*** (the "poverty-impact" indicator)

Dependence on government benefits varies a great deal among the developed countries. It is relatively low in the English-speaking world, and in two countries — Australia and the UK — it is projected to drop steadily in the future. In 2040, according to CSIS projections, public benefits will make up 33 percent of the after-tax income of the elderly in Australia, 37 percent in the United States, 39 percent in the UK, and 46 percent in Canada. In every continental European country, the share exceeds 50 percent today and will still exceed 50 percent in 2040, suggesting that the countries that most need to cut benefits may find it the most difficult to do so. Japan is an exception among high-burden countries. The public benefit share there is relatively low today and will still be low in 2040: just 38 percent, about what it will be in the United States (see Figure 11).

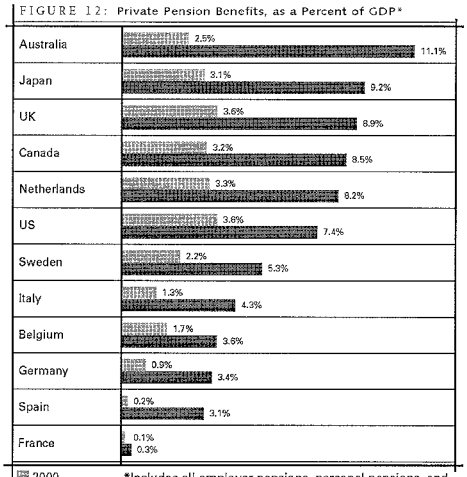
FIGURE 11: Public Benefits to the Elderly, as a Percent of After-tax Elderly Income*



* Income excludes government health care benefits.

The benefit-share indicator probably underestimates the absolute level of elder dependence. It uses a cash measure of income that excludes health care benefits. Including health care benefits, public transfers are a significantly larger share of income. The indicator results, moreover, are averages for all elders, including the affluent. Currently, public benefits make up a larger share of the income of "typical" elders in the third quintile of the income distribution than they do for the average elder — roughly 55 percent of total income in the United States and between 70 and 85 percent of total income in Europe. While we did not project public benefits by income level, it is safe to say that the much greater dependence of middle- and low-income seniors is likely to persist in most countries. Australia is a likely exception. In fact, dependence among middle-income Australian elders is due to fall dramatically as the country's new, mandatory private pension system

FIGURE 12: Private Pension Benefits, as a Percent of GDP*



*Includes all employer pensions, personal pensions, and severance pay schemes.

matures, elder incomes rise, and fewer retirees qualify for means-tested public pensions.

What about private sources of income? The *Index* tracks three broad income types: earnings income, including self-employment income; asset income other than private pensions; and private pension income. The last category includes all types of employer-provided retirement payments and personal pensions, both lump-sum and annuitized. The only restriction is that the arrangements be funded, whether externally through "autonomous" pension funds or internally through book reserves. While general asset income includes the return on much savings that is in effect retirement savings, the *Index* tracks private pension income separately because it represents a formal retirement provision that is often intended as a substitute for public benefits.

The countries with the lowest public-benefit dependence are also, of course, the countries where elders rely more heavily on private sources of income. In Japan and the English-speaking world, a significant share of elders continue to work. Earnings now make up 41 percent of elderly income in Japan, 26 percent in the United States, 23 percent in Australia, 18 percent in Canada, and 16 percent in the UK. With the exception of Sweden, continental Europe lags well behind. In Spain, earnings account for 10 percent of income; in France, 8 percent; in the Netherlands, just 7 percent.

It is also important to keep in mind that earnings among the elderly, even in the English-speaking countries, are highly skewed by income. Except in Japan, Sweden, and the United States, earnings make up less than 10 percent of the income of middle-income elders. By and large, it is affluent elders who work — or perhaps more accurately, working elders who are affluent.

Income from assets is generally more important than income from earnings, especially for middle-income elders. Even in Japan, with its tradition of working seniors, only a minority of the elderly have jobs. Most elderly everywhere, however, have at least some savings. Asset income now comprises about 20 to 25 percent of income for the average elder in most countries and about 15 to 20 percent of income for middle-income elders. The relative importance of asset income is projected to decline in the future, but not because total income from savings will be declining. Households will be saving more in the form of private pensions — and the projections assume that households will offset some of the growth in pension savings by reducing nonpension savings.

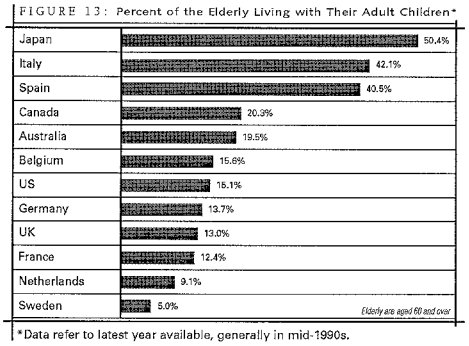
The growth in private pensions is due both to the maturation of existing systems and, in the case of Australia, Germany, Sweden, and the UK, to recent reforms that have added or expanded a second, funded "private" tier to public benefit systems. CSIS projections show

that by 2040 private pension benefits as a share of GDP will grow by at least 100 percent in every country — and by roughly 200 percent on average across all countries (see Figure 12). This is much faster than the growth in the elderly as a share of the adult population, which is roughly 70 percent on average across all countries. The relative importance of private pensions in elderly income will thus increase nearly everywhere. A few countries that now have underdeveloped private systems — Germany, Italy, and Spain — will see especially rapid growth. Since the growth is from a small base, however, private pensions in these countries will still be a small share of elderly income in 2040, about 10 percent. The only countries where private pensions will exceed 20 percent of elderly income — Australia, Canada, Japan, the Netherlands, the UK, and the United States — are countries where private provision is already relatively important today.

Along with their own income, elders may also be able to rely on the income of younger members of their extended families. Until now, all of the index measures have excluded the income of the nonelderly from calculations of elderly income, even if they live in the same household as elders. As a result, we can now look at the availability of private support from the young as a separate factor which, all other things being equal, may make it easier for some countries to cope with their rising old-age dependency burden. Ideally, the *Index* should look at all forms of family support, including cash transfers and unpaid caregiving. It would also net transfers from the old to the young, especially bequests, against transfers from the young to the old. As a first approximation of the importance of family support, the family-ties indicator simply looks at the prevalence of multigenerational living.

Specifically, the indicator measures the share of all elderly who now live in extended families with their adult children, whether the parents live in their grown children's household or — what is much more common in most countries — the grown children live in their parents' household. Japan, where fully 50 percent of all elders live with their grown children, heads the list. In Italy and Spain, the two southern European countries in the *Index*, the share of elders living in multigenerational homes is also quite large: 42 and 41 percent, respectively. In the next runner up, Canada, the share is just 20 percent. All the other countries are in the teens or single digits (see Figure 13).

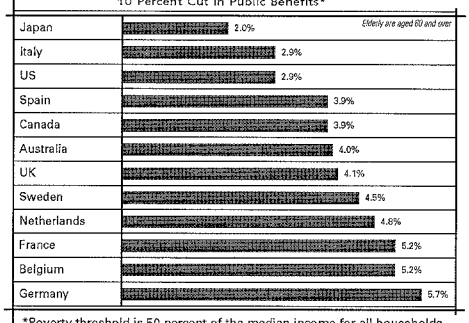
FIGURE 13: Percent of the Elderly Living with Their Adult Children*



*Data refer to latest year available, generally in mid-1990s.

Multigenerational living constitutes a compensating advantage for countries like Italy, Japan, and Spain. It not only allows relatively poor elders to live with their more affluent adult children, it also allows relatively poor young adults to live with their more affluent parents. It mitigates the old-age dependency burden not just by providing an extra source of support for the old, but by providing a form of "trickle down" support for the young as well. The share of elders living with adult children has been declining over the past few decades in all countries and may continue to do so in the future. But unless the relative propensity for multigenerational living changes, those countries that score well today will continue to enjoy an advantage.

FIGURE 14: Percent of the Elderly Pushed into Poverty by a 10 Percent Cut in Public Benefits*



*Poverty threshold is 50 percent of the median income for all households in each country; income excludes government health care benefits; data refer to latest year available, generally in mid-1990s.

The final benefit-dependence indicator looks at the percentage increase in the number of elderly beneath the poverty line that would be caused by an immediate 10 percent cut in public benefits. The standard international definition of poverty is used here: A person is "poor" if he or she lives in a household with an income that is less than 50 percent of the median income for all households in each country. Performance on this indicator is determined, first, by the distribution of elderly income around the poverty threshold and, second, by the degree of dependence on public benefits among elder households around the poverty threshold. Here income does include the income of nonelderly household members in order to get a complete household picture.

The results for this indicator are surprising — and instructive (see Figure 14). One might expect that the continental European countries, with their expansive welfare states, would score best on a poverty indicator. In fact, they score worst. One reason is the greater dependence on public benefits among elder households in these countries, which means that any given percentage cut in benefits translates into a larger percentage cut in total household income.

Another reason is precisely the success enjoyed by Europe's expansive welfare states in lifting the incomes of so many elder households above the poverty line — but often not far above the poverty line. Even a small cut in benefits could dump many of these households back into poverty, while in other countries they may never have been lifted out of poverty to begin with.

In the countries that do best on this indicator — Japan, Italy, and the United States — either the share of public benefits in elderly income is relatively low, the extent of multi-generational living is relatively high, or both. Although the poverty-impact indicator could not be projected into the future, the results for today provide a valuable indication of possible obstacles to reform.

Figure 15 summarizes the results for the benefit-dependence category. Australia comes in first on benefit share, France last. Japan comes in first on family ties, Sweden last. Japan also comes in first on the poverty-impact indicator, Germany last. Overall, Japan receives the best score, France the worst.

Category Four: Elder-Affluence Indicators

The size and direction of future policy changes may also be influenced by how societies perceive the relative affluence of the old and young. Analysis of voter attitudes toward government spending often suggests that political support for public benefits to the elderly is strongly associated with the perception that the elderly are much poorer on average than younger adults. If elder affluence is high or rising in the future, it may facilitate efforts to reduce public old-age dependency costs. If the old remain relatively poor despite a rising burden on the young, it may be harder to enact benefit cuts — or to follow through on cuts that are already scheduled but not yet implemented.

The elder-affluence category, like the benefit-dependence category, is an effort to monitor

FIGURE 15: Benefit-Dependence Category*

Category Rank	Score	Benefit-Share Indicator Public Benefits to the Elderly in 2040, as a Percent of After-tax Elderly Income		Family-Ties Indicator Percent of the Elderly Living with Their Adult Children: Most Recent Year Available		Poverty-Impact Indicator Percent of the Elderly Pushed into Poverty by a 10 Percent Cut in Public Benefits: Most Recent Year Available	
1 Japan	32	1 Australia	32.7%	1 Japan	50.4%	1 Japan	2.0%
2 Italy	14	2 US	36.6%	2 Italy	42.1%	2 Italy	2.9%
3 US	19	3 Japan	38.4%	3 Spain	40.5%	3 US	2.9%
4 Australia	26	4 UK	39.3%	4 Canada	20.5%	4 Spain	3.9%
5 Canada	42	5 Canada	45.5%	5 Australia	19.5%	5 Canada	3.9%
6 UK	45	6 Sweden	54.6%	6 Belgium	15.6%	6 Australia	4.0%
7 Spain	47	7 Netherlands	55.2%	7 US	15.1%	7 UK	4.1%
8 Sweden	80	8 Italy	55.6%	8 Germany	13.7%	8 Sweden	4.5%
9 Netherlands	81	9 Belgium	56.2%	9 UK	13.0%	9 Netherlands	4.8%
10 Belgium	82	10 Germany	58.4%	10 France	12.4%	10 France	5.2%
11 Germany	93	11 Spain	66.9%	11 Netherlands	9.1%	11 Belgium	5.2%
12 France	103	12 France	69.5%	12 Sweden	5.0%	12 Germany	5.7%

*Elderly are aged 60 and over; income excludes governement health care benefits; poverty threshold is 50 percent of the median income for all households in each country.

the social and political environment for reform. It includes two indicators:

- ***The ratio of the per capita income of the elderly to the per capita income of the nonelderly in 2040*** (the "elder-affluence-level" indicator)

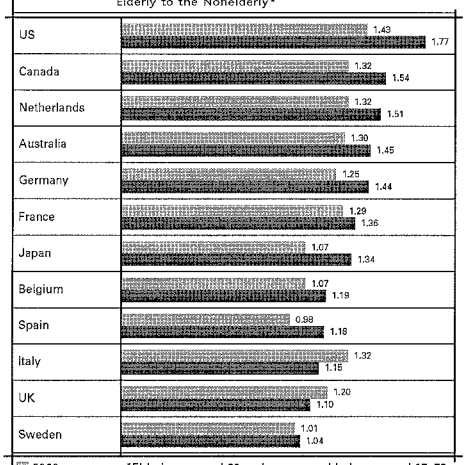
- ***The percentage change in that ratio between now and 2040*** (the "elder-affluence-trend" indicator)

The elder-affluence indicators refer to after-tax income. The income of both the elderly and nonelderly includes the average cash value of government health care benefits. For each age group, however, income excludes the income of persons of the other age group (except spouses) living in the same household.

The level and trend indicators each offer an important and independent perspective. The level indicator is critical if one assumes that society compares the living standard of the old and the young directly against each other according to an absolute dollar-value metric that translates into equivalent size of home, model of car, length of vacation, and so forth. The trend indicator is preferable, on the other hand, if one assumes that society evaluates the relative affluence of the old and young against some customary standard of generational fairness that may have nothing to do with dollar-value equivalence and may be different for every culture.

As it turns out, the rankings for the two indicators generally overlap — that is, the countries where the elderly are projected to be relatively affluent in 2040 are also the countries where elder affluence is trending upwards, and vice versa. Canada and the United States are near the top of both rankings. In both countries, the elderly start out well off relative to the young today and keep getting better off. The reason for the upward trend: minimal scheduled cuts in current-law pensions combined with large long-term increases in per capita health care benefits. These results suggest that, over the long run, worries about elder destitution are unlikely to deter cost-saving reform (see Figure 16).

FIGURE 16: Per Capita Ratio of the After-tax Income of the Elderly to the Nonelderly*



2000
2040

*Elderly are aged 60 and over; nonelderly are aged 15–59; income includes the cash value of government health care benefits.

Italy, Sweden, and the UK, on the other hand, are near the bottom of both rankings. The reason for the downward trend: large scheduled cuts in current-law pension benefits and, in the case of Sweden, relatively slow growth in health care benefits. The very low rankings of these countries suggest that they may find it politically difficult simply to follow through with already scheduled benefit cuts. The UK may shrug at such a warning, since its long-term cost outlook is so favorable. Italy and Sweden cannot afford to be complacent, since both must contemplate cost reductions beyond those already scheduled.

Figure 17 summarizes the results for the elder-affluence category. The United States comes in first on the affluence-level indicator, Sweden last. Japan comes in first on the affluence-trend indicator, Italy last. Overall, the United States receives the best score, Italy the worst.

FIGURE 17: Elder-Affluence Category*

Category Rank	Score	Affluence-Level Indicator Per Capita Ratio of the After-tax Income of the Elderly to the Nonelderly in 2040		Affluence-Trend Indicator Percentage Change in the Affluence-Level Indicator from 2000 to 2040	
1 US	29	1 US	1.77	1 Japan	25.9%
2 Canada	14	2 Canada	1.54	2 US	23.9%
3 Japan	17	3 Netherlands	1.51	3 Spain	19.7%
4 Netherlands	22	4 Australia	1.45	4 Canada	16.5%
5 Germany	28	5 Germany	1.44	5 Germany	15.3%
6 Australia	34	6 France	1.36	6 Netherlands	14.4%
7 Spain	49	7 Japan	1.34	7 Australia	12.0%
8 France	58	8 Belgium	1.19	8 Belgium	10.9%
9 Belgium	67	9 Spain	1.18	9 France	5.5%
10 Sweden	100	10 Italy	1.15	10 Sweden	3.0%
11 UK	117	11 UK	1.10	11 UK	-8.1%
12 Italy	121	12 Sweden	1.04	12 Italy	-12.9%

*Elderly are aged 60 and over; nonelderly are aged 15–59; income includes the cash value of government health care benefits.

PART II. THE INDEX RESULTS

It's time to gather together the strands of the story — and present the final results.

As already explained, the *Index* is constructed as follows. For each of the indicators, we generate an indicator ranking, from one (best) to twelve (worst). We also transform the indicator results into an index and generate an index score for each country. For each indicator, the mean result is set to an index value of 50; results that lie above and below the mean by one standard deviation are set, respectively, to index values of 100 and zero. The index scores thus preserve the indicator rankings while also reflecting the relative distance of each ranked country, positively or negatively, from the "center of the pack." (Countries located far from the mean can and sometimes do have index scores greater than 100 or less than zero.)

For each of the four categories, a category score is then calculated as an average of the indicator index scores. The category score determines the overall category rankings. Finally, the category scores themselves are averaged as follows: A weight of one-third is given to the first public-burden category, one-third to the second fiscal-room category, and one-third to the third and fourth "policy-climate" categories combined. A country's final combined average for the four categories determines its ranking in the overall *Index*.

A glance at the index scores reveals that the countries clearly sort themselves into three groups. Australia, the UK, and the United States are well ahead of the next runners-up. At the other end, France, Italy, and Spain lag the rest by an equally wide margin. The other six are clustered in the middle. This suggests a three-fold division of the *Index* into low vulnerability, medium vulnerability, and high vulnerability groups.

This three-fold division is in fact much more robust than the rankings themselves. Relatively small changes in assumptions can change the ordering of countries within the three categories. Germany, Japan, and Sweden easily change places, since their scores are virtually identical. The same is true of Belgium and the Netherlands. Large changes in several indicators, however, would be required to push a country from one group to another. Absent such changes, the three low vulnerability countries always end up on top, and the three high vulnerability countries always end up on the bottom.

Low Vulnerability Countries

Rank	Country	*Index* Score
1	Australia	–1
2	United Kingdom	+7
3	United States	+18

In the 2003 *Index*, the low vulnerability group includes ***Australia (1)***, the ***United Kingdom (2)***, and the ***United States (3)***. These English-speaking countries win the first three places thanks to their favorable demographics, their relatively inexpensive public benefit systems, and their well-developed private alternatives. The group does face some real challenges. The UK, for example, is finding it difficult to keep costs down without hurting elder living standards, while the United States must grapple with runaway health care spending. Still, all of these countries are in relatively good shape. Australia, in particular, is implementing a far-sighted strategy of mandatory private pension coverage that promises excellent results on all fronts.

Medium Vulnerability Countries

Rank	Country	*Index* Score
4	Canada	+ 42
5	Sweden	+ 48
6	Japan	+ 50
7	Germany	+ 52
8	Netherlands	+ 62
9	Belgium	+ 63

FIGURE 18: Overall Index*

OVERALL INDEX			Public Burden		Fiscal Room		Benefit Dependence		Elder Affluence	
Country	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Australia	1	1	2	20	2	12	4	26	6	34
UK	2	7	1	32	1	28	6	45	11	117
US	3	18	3	18	4	41	3	19	1	-29
Canada	4	42	6	47	6	51	5	42	2	14
Sweden	5	48	4	22	3	32	8	80	10	100
Japan	6	50	9	80	9	78	1	32	3	17
Germany	7	52	7	53	5	43	11	93	5	28
Netherlands	8	62	8	68	7	66	9	81	4	22
Belgium	9	63	5	47	8	68	10	82	9	67
France	10	81	10	91	10	82	12	103	8	58
Italy	11	84	11	97	11	58	2	14	12	121
Spain	12	93	12	139	12	91	7	47	7	49

*The public-burden and fiscal-room categories are each weighted one-third; the benefit-dependence and elder-affluence categories are weighted a combined one-third.

There are six medium vulnerability countries: ***Canada (4)***, the English-speaking straggler; ***Sweden (5)*** and ***Germany (7)***, two continental European countries that have recently enacted major benefit reforms; ***Japan (6)***, which ranks much higher in the index than its massive age wave might indicate; and the ***Netherlands (8)*** and ***Belgium (9)***, two countries with generous and unreformed benefit systems. All of the medium vulnerability countries, including Canada, face more serious demographic challenges than the low vulnerability countries. And despite recent reforms, all, including Sweden and Germany, face heavier old-age dependency burdens.

High Vulnerability Countries

Rank	Country	*Index* Score
10	France	+ 81
11	Italy	+ 84
12	Spain	+ 93

The high vulnerability group includes three major continental European countries that all face a daunting fiscal and economic future: ***France (10)***, ***Italy (11)***, and ***Spain (12)***. Their poor scores can be attributed, in varying degrees, to severe demographics, lavish benefit formulas, early retirement, and heavy elder dependence on pay-as-you-go public support. It is unclear whether they can change course without economic and social turmoil. Italy has scheduled big reductions in future pension benefits, but only after grandfathering nearly everyone old enough to vote. France and Spain have yet to initiate major reforms of elder benefit programs.

Although countries that rank near each other in the *Index* typically share key characteristics in common, they sometimes differ in critical and even surprising respects. So while the overall rankings show the basic elevation of the terrain, the individual indicators reveal plenty of cross-cutting ridges and canyons.

The UK, for example, does best overall in the public-burden category, but next-to-worst in elder affluence. Sweden scores at the bottom on tax room — but near the very top on budget and borrowing room. Japan faces as severe a demographic challenge as any country, but climbs up in the *Index* because its modest public benefits, high rates of elder

employment, and strong family ties largely insulate elders from the pain of cost-cutting reform. Italy has scheduled deep cuts in future benefits that raise its public-burden ranking — but only at the expense of impoverishing its future elderly. The Netherlands has continental Europe's largest private pension system, yet nonetheless scores poorly on both public burden and benefit dependence. Figure 18 shows all of this graphically by lining up each country's category rankings side-by-side.

Let's conclude by taking a quick look at the twelve countries — and what the *Index* reveals about where each is heading and whether it is likely to change course.

Low Vulnerability Countries

Number 1: Australia

Australia is either number one or two on six different indicators and scores especially well (number two) on the two most critical category rankings: public burden and fiscal room. Australia starts out with favorable demographics, a lean public sector, and a low-cost, largely means-tested old-age safety net. In the early 1990s, it began to phase in a very large system of mandatory and funded retirement accounts (called the Superannuation Guarantee). In the years and decades to come, the "Super" will provide increasingly generous support for elders while actually reducing the pay-as-you-go burden on working-age adults. By 2040, the payout from funded private pensions will reach 11 percent of GDP, far exceeding the payout of any other country. Australia overtakes its only close competitor, the UK, due to its higher ranking on every benefit-dependence and elderly-affluence indicator. Alone among the twelve, Australia is meeting and winning the old-age dependency challenge with a long-term strategy that has no obvious shortcomings.

Number 2: United Kingdom

The UK takes first place in both of the core public-burden and fiscal-room categories. Like Australia, the UK is helped by its relative youth and favorable demographic future. Its public pensions are not projected to grow at all as a share of GDP, due to systematic reductions in per capita benefits initiated under Prime Minister Thatcher and continued under Major and Blair. As for health care benefits, spending on elders under its famously frugal national health care system is projected to grow only modestly. The UK is trying to expand worker participation in private occupational pensions and personal accounts. But unlike Australia, the participation is not mandatory, leaving large gaps in coverage. As a result, the UK earns only an average ranking in the benefit-dependence category and a next-to-last-place ranking in elder affluence. Overall, the vulnerability outlook for the UK is excellent. Yet the *Index* also reveals some doubts about its ability to stay the course.

Number 3: United States

Of all the developed countries, the United States faces the most favorable demographic future. With the highest fertility rate and one of the highest immigration rates, it will be far and away the youngest of the twelve *Index* countries by 2040. Given this demographic advantage, together with a modest Social Security benefit formula, a relatively high rate of elder employment, and a well-developed private pension system, the United States could easily have ranked number one in the *Index*. But it did not, mostly due to the high projected growth in government health care benefits. The United States ranks third on the benefit-level and net-transfer indicators, but fifth on the benefit-growth indicator, lower than two of Europe's biggest welfare states, Sweden and Germany. Also, unlike Australia or the UK, the United States has no overall policy in place to expand its private pension coverage in the future. The growing relative affluence of US elders, however, augurs well for possible cost-cutting reforms down the road.

Medium Vulnerability Countries

Number 4: Canada

At number four, Canada comes in last among the English-speaking countries. To begin with, Canada faces a less favorable demographic future than the others. It also starts out with a larger public sector, no plans for future cuts in public pensions, and a projected rate of health care benefit growth that is nearly equal to that of the United States. As a result, the cost of Canada's public old-age benefits as a share of GDP is due to grow to two and a half times the current cost by 2040 — giving it an even worse ranking on benefit growth than the United States (ninth place, just between the Netherlands and Italy). As shown by the tax-room indicator, the Canadian public sector will weigh in at 50 percent of GDP by 2040, 6 percent more than the United States and 11 percent more than Australia. Even so, Canada does better on benefit level and tax room than any country in continental Europe. As in the United States, moreover, the rising affluence of its elders could favor future reform efforts.

Number 5: Sweden

Remarkably, it is Sweden — the very symbol of welfare state excess — that ranks highest among the countries of continental Europe. To be sure, Sweden's overall score is pulled down by the vast size of its public sector (which gives it a last-place rank on tax room). On the other hand, Sweden did enact in 1999 a major and effective program of old-age benefit reform. It scheduled significant future cuts in its pay-as-you-go public pensions and added a supplementary system of mandatory and funded personal accounts. It earns a number three rank on the benefit-growth indicator and a number four rank in the entire public-burden category. It also ranks number one on budget room and number three on borrowing room. There are caution lights. Swedish elders lack strong family ties (last place), are very vulnerable on both affluence indicators, and are projected to remain highly dependent on public benefits.

Number 6: Japan

Now aging faster than any other developed country, Japan is projected to have one of the highest old-age dependency ratios in the world. It finishes ninth on the benefit-level and net-transfer indicators, eleventh on benefit growth and budget room, and twelfth on borrowing room. So how does Japan manage to rise to the middle of the overall rankings, with an index score of exactly 50? For one thing, Japan's public pensions are relatively stingy and its public sector is relatively small. This keeps the overall cost of old-age benefits from rising even higher than it does, while allowing Japan a fourth-place finish on tax room. Over the long term, moreover, the social and political reform environment in Japan appears surprisingly favorable. Japan ranks number three in the elder-affluence category. And it ranks number one in the benefit-dependence category, with a first-place rank on family ties, a first-place rank on poverty impact, and (due to very high rates of elder employment and a broad-based private pension system) a third-place rank on benefit share. No other country with comparable demographics and a comparable public burden enjoys as many offsetting advantages.

Number 7: Germany

Like Sweden, Germany recently enacted a major reform (the so-called Riester Reform) that combines scheduled future cuts in public pension benefits with an effort to expand private pension coverage. But Germany's reform does less on both counts, a fact reflected in its poorer overall ranking. Like many older European countries, it scores better (number four) on benefit growth than it does on benefit level (number seven). It has an average ranking in the fiscal-room category (number five), doing worse than Sweden on all indicators except tax room. In the elder-affluence category, Germany is again about average. But in the benefit-dependence category, it ranks second-to-last — with a number eight ranking on family ties, a number ten ranking on benefit share, and a

dead-last ranking on poverty impact. This poor showing calls into question Germany's ability even to follow through on the modest benefit reductions it has already enacted — much less to initiate any new cost-cutting reform.

Number 8: Netherlands

The Netherlands is a prime example of an affluent and aging welfare state that lingers in a condition of policy paralysis. With remarkable uniformity, nearly every indicator for the Netherlands reflects its lackluster eighth-place overall ranking. All three of its public-burden indicators, all three of its fiscal-room indicators, and two out of three of its benefit-dependence indicators come in between number six and number nine. The Netherlands does enjoy one large economic advantage: a mature and well-funded private pension system that is the envy of the rest of continental Europe. But its public pension benefits are so generous, its retirement age so early, and its family ties so weak that elders in the Netherlands are left just as vulnerable and dependent on public benefits as elsewhere. The Netherlands' relatively high rank in the elder-affluence category reflects this unique combination of generous public and generous private benefits — and offers some hope for future reform.

Number 9: Belgium

Like the Netherlands, Belgium epitomizes the troubled outlook for the aging societies of continental Europe. Its fertility rate is low, its public sector is large, its public pensions are generous, its retirement age is early, and its elders are heavily dependent on public benefits. Unlike Germany and Sweden, Belgium has yet to enact a major retirement reform package. In some respects, it does better than average. On the benefit-level and net-transfer indicators, it actually comes out ahead of every other country in continental Europe except Sweden. But in other respects, it does worse — for example, on tax room and borrowing room, where it ranks number ten due to its long history of fiscal excess. Clearly this is a country, like most of continental Europe, that has yet to face up to its demographic future.

High Vulnerability Countries

Number 10: France

France is a curious case. Its demographics are no more severe than Germany's and Sweden's — or indeed, the UK's and Canada's. Yet France finishes in tenth place in the public-burden category, tenth place in the fiscal-room category, and twelfth place in the benefit-dependence category. Japan's stingy public benefits help to offset its demographic disadvantage. France is just the opposite. Its lavish public pensions overwhelm its milder demographics — and catapult it into the high vulnerability group. Even more serious than the sheer magnitude of projected dependency costs is the extreme degree of elder dependence on public benefits. Private pensions make up a smaller share of elder income in France (less than 1 percent) than in any other country; earnings make up a smaller share (8 percent) than in any country except the Netherlands. Its last-place ranking on benefit share suggests that cost-cutting reforms will meet with widespread resistance — as indeed, they already have in recent years. But such resistance may not be the main obstacle when, perhaps uniquely in France, it is difficult to find policy leaders who will even discuss the need for reform.

Number 11: Italy

By 2040, Italy will have one elder for every working-age adult — putting it in a dead heat with Japan and Spain for the developed world's worst demographics. On top of that, Italy's public pension spending as a share of GDP is already the highest in the *Index* countries, while the Italian elderly are among the least likely to be employed or to receive a private pension. Yet what's most worrisome is that Italy's overall eleventh-place ranking in the *Index* comes despite a series of pension reforms enacted in the 1990s (the "Amato" and "Dini"

reforms) that are scheduled to make steep cuts in future benefits. Without these reforms, Italy would surely be in last place. The open question is whether Italy is likely to make good on its reform promises. Its second-place ranking in the benefit-dependence category (with family ties second only to Japan) gives some hope. Yet Italy comes in last in the elder-affluence category, a reflection of how seriously future benefit cuts threaten elder living standards.

Number 12: Spain

Spain might be described as Italy without the reforms. These two countries face a very similar (and dire) demographic future. They both have generous public pension systems that support elders who have little employment or private pension income to fall back on. Unlike Italy, however, Spain's pension generosity is due to continue unchecked into the indefinite future. Spain finishes in last place on all three public-burden indicators, and on the net-transfer indicator it does so by a wide margin. Aside from its runaway pension projections, however, Spain hardly fits the stereotype of the bloated welfare state. Its public sector is still relatively small. Its net debt is modest. And to judge by its average rankings in the elder-affluence and public-dependence categories (it has the third-strongest family ties after Italy and Japan), reform may not be beyond its grasp.

TECHNICAL APPENDIX

The appendix describes the projection model, the methodology, and the most important data sources used in constructing the CSIS *Aging Vulnerability Index*.

1. Demographic Scenario

All of the projections underlying the *Index* assume a continuation of historical trends in fertility, longevity, and immigration. This distinguishes them from projections by the OECD, which assume a rebound in fertility, slower longevity gains, and large changes in net immigration.[1]

The CSIS demographic scenario is based on the UN's latest (2000 Revision) "constant-fertility" scenario, which assumes that rates of fertility (in all countries) and net immigration (in most countries) will continue at their 1995–2000 averages.[2] The UN scenario, however, also assumes that the historical rate of improvement in mortality will slow. We adjust the UN projections to reflect a continuation of the historical trend in mortality. Specifically, we assume that age-specific mortality rates will continue to decline at their long-term postwar (1950–94) average in each country. This assumption raises projected longevity relative to the UN scenario in every country except Germany, with the biggest adjustments in Australia, Canada, Italy, and Japan (see Table A).[3]

It's hard to find any evidence that a rebound in fertility is likely any time soon. All of the long-term trends that have depressed fertility over the past few decades, from more working women to more effective contraception, remain in force. In a number of countries, to be sure, age-specific fertility rates are now rising among women in their thirties, suggesting that some women have merely been postponing having children rather than reducing the total number they plan to have. The impact of this timing shift, however, is relatively small — and in any case, it is being offset by continuing declines in fertility among younger women. In most of today's lowest fertility countries, moreover, there is no evidence of a timing shift at all. In Italy and Spain (as well as Austria and Greece), fertility rates are declining or flat across every age bracket and have been so for decades.

The case for a longevity slowdown is no more convincing. Demographers who expect one argue that life expectancy cannot keep rising, since medical progress will eventually push everybody up against the "natural limit" to the human life span. This thesis, however, implies

TABLE A: Demographic Assumptions

	Total Fertility Rate	Longevity at Birth		
	History & Projection 1995–2050	History 2000	UN Projection 2050	CSIS Projection 2050
Australia	1.8	79.5	83.0	88.7
Belgium	1.5	78.4	83.8	85.5
Canada	1.6	78.4	82.8	88.6
France	1.7	78.8	84.0	87.0
Germany	1.3	77.8	83.4	82.9
Italy	1.2	78.8	82.5	86.5
Japan	1.4	80.8	88.0	91.9
Netherlands	1.5	78.2	82.2	85.3
Spain	1.2	78.5	82.6	85.6
Sweden	1.5	79.7	84.6	86.9
UK	1.7	77.6	83.0	84.5
US	2.0	76.8	82.6	83.2

[1] See *Fiscal Implications of Ageing: Projections of Age-Related Spending*, Economics Department Working Papers no. 305 (OECD; 2001).

[2] *World Population Prospects: The 2000 Revision*, 2 volumes and CD-ROM (UN, Population Division; 2001).

[3] These calculations are based on historical trends projections for the G-7 countries prepared by Shripad Tuljapurkar of Morning View Research and published in Paul Hewitt and Sylvester Schieber, "Demographic Risk in Industrial Societies," *World Economics*, 1:4 (October–December 2000). The adjustments for the other five countries in the *Index* are estimated based on the G-7 average.

a number of consequences that are not borne out by observation. If there is a limit to the human life span, mortality improvements for the oldest elderly age brackets should be slowing relative to those for younger elderly age brackets. At the same time, variations in life expectancy should be narrowing as more people bunch up against the limit. None of this appears to be happening. Over the last couple of decades, the data show little tendency for mortality improvements to slow at advanced ages. Nor are variations in life expectancy diminishing, whether one looks at the data by country, by region, by income, or by education. Everywhere, people are living much longer. Yet everywhere, some groups continue to live much longer than others.

What happens to immigration over the next few decades, of course, is anyone's guess. It is both more volatile than the other two demographic variables and more directly controlled by policy. In the past, immigration in many countries has risen and fallen sharply, sometimes over the span of just a few years. It may do so again. Without a crystal ball, however, the most prudent assumption is that current law and current practice will continue.

2. Economic Scenario

The projections assume a continuation of historical economic trends. In particular, age-specific rates of labor-force participation are assumed to remain constant at their 2000 levels in each country, unemployment rates are assumed to remain constant at their 1990s averages, and productivity and real wages are assumed to grow at roughly their average historical rates over the past twenty-five years.

The projections make two exceptions to the labor-force participation rule. The first allows for a "cohort effect." In three countries in the *Index* — Italy, the Netherlands, and Spain — women in their twenties and thirties now work at significantly higher rates than women in their forties and fifties. In our projections, we assume that women aged 40–55 in these countries will eventually work at the same rate as women aged 20–39. The second exception allows for a response to pension reforms that have scaled back early retirement options and improved work incentives. We base this adjustment on OECD estimates that recent policy changes will lead to a 10 to 15 percent increase in participation rates among men aged 55–64 in Australia, Belgium, Germany, and the Netherlands — and to a somewhat larger rise in Italy.[4]

A word about productivity and wage growth is in order. CSIS follows the OECD in assuming that that long-term productivity growth rates will average between 1.6 and 1.8 percent per year, roughly the historical record in most countries over the past twenty-five years. This assumption may be optimistic given the potentially negative impact of population aging on both private and public savings. Slower growth would mean a somewhat higher old-age dependency burden, whether measured as a share of GDP or of nonelderly income. The productivity growth assumption, however, is not decisive, since initial pension benefits in most countries are indexed to wages, and so grow (with or without a lag) along with per-worker GDP.

3. Projection Base and Horizon

The base for the *Index* is 2000, the latest year for which most demographic and economic data were available. Data series not available for 2000 were trended to 2000 based on series that were available. The projections are run through the year 2040. As already explained, this horizon was chosen because the demographic transition in most countries will by then be largely complete. Even after 2040,

[4] *Fiscal Implications of Ageing*, op. cit.

rising longevity will continue to push the cost of retirement benefits steadily and indefinitely upward. But the era of swiftest growth, which in most countries accompanies the full retirement of a postwar baby boom, will occur sometime between the mid-2010s and the mid-2030s.

4. Household Income and Taxes

The model uses a two-step approach to calculate household income in the base year. We first derived totals for broad categories of income from economy-wide data on the household and government sectors. We then allocated the totals to the elderly and nonelderly based on household survey data. This approach allows us to take into account society's total economic resources. It also makes our measure of income consistent with our GDP-based projections of government benefits, taxes, and outlays.

a. Income by Type

The economy-wide data on household income are mainly derived from the OECD National Accounts and OECD Social Expenditure Database.[5] The model divides all income into four broad categories: "earnings," or income from labor; "asset income," or income from capital except for private pensions; private pensions; and "public benefits." Public benefits include all government transfers, both cash and in-kind, and are divided into three subcomponents: public pensions, health care benefits, and other benefits.

Earnings are equal to total employee compensation, including the employer share of payroll taxes and employer contributions to private pension and welfare plans, plus self-employment income. Employee compensation comes directly from the national accounts; self-employment income was estimated based on national accounts employment data. Asset income includes all financial returns to households, except returns to funded private pension plans. It is equal to household property and entrepreneurial income in the national accounts, minus withdrawals from private quasi-corporate enterprises and an estimate of private pension benefits. This estimate is based on OECD and national sources (see below). A small category of miscellaneous private transfers is included in asset income.

The totals for public benefits come directly from the OECD Social Expenditure Database. Public pensions equal old-age cash benefits plus survivors benefits and include government employee pensions and special early retirement programs. Health care benefits are equal to OECD's "health" category, plus one-half of "services for elderly and disabled people." One-half is our rough estimate of the share of this benefit category that constitutes spending on nursing homes, home care, and other long-term custodial services. Other benefits include all other programs, from unemployment insurance and disability benefits to housing subsidies and food stamps.

b. Income by Age

The model divides the totals for each source of household income between two age groups: the elderly (aged 60 and over) and the nonelderly (aged 15–59). The threshold for "elderly" was set at age 60 rather than the conventional age 65 because it is much closer to the typical retirement age in most countries. The income of each age group refers to the income of all individuals within that age group, with the single exception of spouses of heads of household, who are always considered to be of the same age group as the head of household. Other than in the case of spouses, income to households containing both elderly and nonelderly adults is split between the two groups.

[5]We rely primarily on the 1999 edition of the National Accounts, the most recent to include a complete set of household accounts. The data were updated to 2000 based on broad aggregates available in the 2002 National Accounts. All data on government benefits are from the 2001 edition of the Social Expenditure Database.

The division of income by age was based on data from the Luxembourg Income Study (LIS) for all countries except Japan, where we used data from the Ministry of Health, Labor, and Welfare's *2001 Comprehensive Survey of Living Conditions*. Income ratios for the elderly and nonelderly were calculated for total income and the following components: wages, self-employment income, private pensions, asset income, public pensions, and other public benefits. Health care benefits, which are not counted in household surveys, were allocated using data on per capita spending by age from OECD's Health Data 2001 database.

Asset income presented a special problem. The national accounts concept of asset income used in the *Index* is broader than the household survey concept. In addition to interest, dividends, and rents actually received by households, it encompasses all financial returns that indirectly accrue to households in instruments such as annuities and life insurance policies. The types of asset income counted in household surveys, moreover, are more heavily skewed toward the elderly. We therefore allocated capital income as follows. We estimated, in each country, the share of total capital income accounted for by household-survey-type asset income and allocated it according to the household survey age-group shares for asset income. We then allocated the balance according to each age group's share in total income.

We also used LIS data to calculate income by source for each quintile of the elderly income distribution. (The available Ministry of Health, Labor, and Welfare data did not allow this for Japan.) The LIS quintile data were then normalized to our model's income totals. Although we could not project this quintile distribution, it provides a valuable additional perspective.

c. After-tax Income

The model calculates the total tax burden borne by the elderly and the nonelderly in the base year using the same two-step methodology employed for household income. Aggregate data for total taxes by type are first derived from the national accounts. The totals are then allocated to the elderly and nonelderly based on household survey data.

All taxes are divided into three broad categories: payroll taxes, direct taxes, and indirect taxes. We were able to allocate direct taxes between the elderly and nonelderly based on income tax data from the LIS and Japan's *Comprehensive Survey of Living Conditions*. Payroll taxes and indirect taxes were allocated based on each age group's share of earnings and total income, respectively. Note that our model makes the standard economic assumption that all taxes are ultimately borne by households. We therefore gross up pretax household income by indirect taxes and corporate taxes.

5. Pension and Health Care Benefit Projections

Excluding the impact of growth in funded private pensions, the model assumes that the composition of national income by type of factor income ("asset income" from capital and "earnings income" from labor) remains unchanged in the future. As populations age, the distribution of each type between age groups will of course shift. The ratios between age groups of per capita earnings income and per capita asset income, however, remain unchanged, as do the per capita ratios of taxes by type of income.

Within this framework, public transfers and private pension benefits are projected as follows.

TABLE B: Health Care Benefit Assumptions

	Per Capita Spending Ratio: Old to Young*	Per Capita Spending Growth in Excess of Growth in Per Capita GDP**
Australia	4.1	0.9%
Belgium	3.2	1.5%
Canada	4.9	1.1%
France	3.0	1.5%
Germany	2.7	0.7%
Italy	3.2	1.4%
Japan	4.9	1.2%
Netherlands	3.9	0.5%
Spain	4.2	1.6%
Sweden	2.8	0.1%
UK	3.4	0.9%
US	7.8	2.0%

*Ratio of public health care spending on persons aged 65 and over to persons aged 0–64 in most recent year available.

**Growth rate in total per capita health care spending (1975–1998) minus the growth in per capita GDP.

a. Public Pensions

The CSIS projections of public pension spending assume current law as of the year 2000. They are based on the latest official projections by the OECD, except for Japan, where they are based on national projections.[6] The OECD projections, which omit some programs in some countries, have been normalized to OECD Social Expenditure Database totals. More important, they have been adjusted to reflect the CSIS historical trends demographic and economic scenario described above in sections 1 and 2. On the demographic side, the OECD assumes rising fertility, slower growth in longevity, and, in some countries, significant shifts in net immigration. CSIS assumes a continuation of historical trends. On the economic side, the OECD assumes both falling unemployment and a greater rise in female labor participation than CSIS does. All adjustments to the OECD pension projections were made based on a sensitivity analysis published along with the projections.

b. Health Care Benefits

We base our health care projections on two critical assumptions. The first is that current per-beneficiary ratios of government health care benefit spending on the old to spending on the young will remain unchanged in the future. This represents a compromise between two competing models of aging and health: the "compression of morbidity" model, which assumes that rising longevity will be accompanied by a falling incidence of morbidity at older ages, and the "failure of success" model, which assumes the opposite.

The second assumption is that rates of growth in total per capita health care spending will initially follow their long-term historical trend in each country, but that they will gradually converge, by 2040, to the rate of growth in per capita GDP plus 1 percent. Per capita GDP plus 1 percent is roughly the average historical growth rate for all the developed countries over the past twenty-five years. For several countries (Belgium, France, Italy, Spain, and the United States) it represents a significant slowdown; for two countries (the Netherlands and Sweden) it represents a significant acceleration. Historical growth rates were calculated based on data from OECD's Health Data 2001 database (see Table B).

We decided against a simple projection of historical growth rates for two reasons. On the one hand, health care spending growth must eventually slow in high growth countries or else crowd all other consumption out of GDP. On the other hand, as affluence and expectations rise, governments in countries that have traditionally rationed health care are finding it harder — not easier — to control costs. The assumption of convergence at the average growth

[6]The OECD public pension projections are published in *Fiscal Implications of Ageing*, op. cit. We do not utilize the OECD projection for Japan because it includes unlegislated "fiat" savings. Our projection is based instead on the 1999 *Actuarial Valuation of the Employees' Pension Insurance and the National Pension* (Japanese Ministry of Health, Labor, and Welfare, 1999).

rate thus seems reasonable. Other assumptions, of course, are possible. We modeled an alternative scenario in which rates of per capita spending growth in all countries converge to GDP per capita by 2040, rather than to GDP plus 1 percent. Under this scenario, projected elder health care benefit spending in 2040 was roughly 1 to 2 percent of GDP lower in every country.

c. Private Pensions

The *Index* defines private pensions quite broadly. They include most types of formal private-sector retirement provision, whether they are occupational or personal, whether they result in a lump-sum severance payment or a lifetime annuity, *provided that the benefits are funded.* The definition of funding encompasses both external funding and book-reserve funding. However, we exclude all purely pay-as-you-go arrangements, such as France's ARRCO and AGIRC. If publicly mandated (which is effectively the case in France), these pay-as-you-go plans are included in public pension benefits.

Remarkably, there is no standard source for data on private pension provision in the developed countries. We base our estimates of base-year benefits on OECD data on private social welfare expenditures, adjusted to include large omissions in Japan and small omissions in France and Spain.[7] Our projections of future benefits build on the base-year numbers as follows:

(1) We make a "cohort adjustment" to reflect the fact that, even apart from policy changes, rates of participation in some countries are rising rapidly among younger workers. The adjustment affects two countries: Italy and Spain. (2) We make an "earnings maturation adjustment" to take into account the fact that, even assuming fixed participation rates, current per capita benefit levels do not reflect ultimate benefit levels because the average current retiree is receiving a benefit based on less than a full career. The adjustment affects all countries. (3) We make a "policy adjustment" to take into account important recent pension reforms in four countries: Australia (the "Super"), Germany (the "Riester" accounts), Sweden (2.5-percent-of-payroll personal accounts), and the UK (miscellaneous efforts to expand private pension coverage). (4) Finally, we make a "demographic adjustment" to reflect the changing age composition of the population. This adjustment affects all countries.

The model assumes that increases in pension savings will be partially offset by declines in other forms of household savings. The offset is assumed to be one-third. The other two-thirds of new pension savings will result in new national savings and new GDP. Since we do not use a general equilibrium model, however, we assume no further impact on national accounts or factor prices. One way to think about it is to imagine that all of the extra national savings will flow abroad, mainly to the developing countries, where it will generate income from foreign assets. A number of economists have hypothesized that a large capital flow from the developed to the developing countries would be an expected consequence of global aging.

6. Fiscal Scenario

As already explained, the model assumes that each country pursues a long-term policy of "debt neutrality." In the first year of the projection, each country is assumed to move to a general government deficit which, when continued unchanged as a share of GDP in all future years, will keep net government debt unchanged as a share of GDP at its 2001 level. Table C shows the budget balance that achieves this result. The calculations assume an inflation rate of 2 percent and a long-term real interest rate

[7] Willem Adema, *Net Social Welfare Expenditure,* 2nd edition, in Labor Market and Social Policy Occasional Papers no. 52 (OECD; 2001).

equal, in each country, to real GDP growth plus 1 percent.

Once debt neutrality is achieved, the model assumes that nonbenefit spending will remain constant as a share of GDP and that taxes will be raised (or lowered) in each future year in accordance with the projected change in benefit spending. In every country in almost every year, of course, this means that taxes must be raised. This "rising tax" assumption is only relaxed for two of the fiscal-room indicators, where the object is to assess alternative means of paying for the growth in benefit costs.

In apportioning the future tax changes between payroll taxes, direct taxes, and indirect taxes, the model follows a few simple rules. We first assume that payroll taxes will be raised such that they pay for the same proportion of total public transfers in the future that they do today. Additional taxes are then divided between direct and indirect taxes in proportion to their shares in total taxation today. We considered projecting each country's specific tax rules, but deferred any attempt to a subsequent edition of the *Index*. The reason is that the task would be very complex. Consider that just one benefit program in the United States, Medicare, is financed by a combination of payroll taxes, user premiums, and general revenues — all of which are projected to grow at different rates over time.

TABLE C: Long-term Budget Balance under Debt Neutrality*

	Long-term Budget Balance (Percent of GDP)	Net Government Debt in 2001 (Percent of GDP)	Real GDP Growth Rate: 2000–50
Australia	-0.4%	10.6%	2.0%
Belgium	-3.3%	98.9%	1.3%
Canada	-1.9%	53.0%	1.6%
France	-1.4%	42.1%	1.3%
Germany	-1.3%	43.5%	0.9%
Italy	-2.5%	96.5%	0.6%
Japan	-1.5%	58.5%	0.6%
Netherlands	-1.4%	42.1%	1.3%
Spain	-1.0%	38.2%	0.7%
Sweden	0.0%	1.0%	1.1%
UK	-1.1%	30.9%	1.5%
US	-1.8%	41.9%	2.3%

*Assumes productivity growth rate of 1.75 percent, inflation rate of 2 percent, and real interest rate equal to GDP growth plus 1 percent.

7. Indicator Definitions

Benefit Level: Total public benefits to the elderly in 2040 as a percent of GDP.

Benefit Growth: The change from 2000 to 2040 in public benefits to the elderly as a percent of GDP.

Net Transfer: Public benefits to the elderly in 2040 as a percent of the income of the nonelderly. Both benefits and income are measured after taxes. Benefits to the elderly are measured "net" — that is, they are reduced by an estimate of the share of benefits paid for by taxes on the elderly themselves. The income of the nonelderly is measured after all rest-of-government taxes — that is, after taking into account all taxes on the nonelderly except those required to pay for net benefits to the elderly. The indicator assumes that public old-age benefits are first paid for by payroll taxes, then, to the extent that payroll taxes are insufficient, that they are paid for by direct and indirect taxes in proportion to their shares in total taxation.

Tax Room: Total taxes in 2040 at all levels of government as a percent of GDP.

Budget Room: Total benefits to the elderly as a percent of total government outlays in 2040, assuming the special "budget room" scenario. Under this scenario, the rising cost of old-age benefits is paid for by cannibalizing other spending. Except for the initial debt-neutrality adjustment, this indicator assumes no change in taxes.

Debt Room: Year that the net government debt reaches 150 percent of GDP, assuming the special "debt room" scenario. Under this scenario, the rising cost of old-age benefits is paid for by government borrowing. Except for the initial debt-neutrality adjustment, this indicator assumes no change in taxes. The calculations assume an inflation rate of 2 percent and a long-term real interest rate equal, in each country, to real GDP growth plus 1 percent.

Benefit Share: Public benefits to the elderly as a share of the after-tax income of the elderly in 2040. Benefits here exclude government health care benefits. Calculating this indicator required additional assumptions about tax incidence. We assume that payroll taxes are borne by labor income and that direct and indirect taxes are borne proportionally by all other types of income. Clearly, reality is more complicated. In many countries, income taxes fall more heavily on labor than on capital. Pensions and other cash benefits are sometimes tax-favored or even entirely tax-exempt. In future editions of the *Index*, we may try to model some of this institutional complexity.

Family Ties: Percent of the elderly living with their adult children aged 18 or older, whether in the household of the elderly person or the household of the child. As throughout the *Index*, nonelderly spouses of the elderly are counted as elderly. The data on living arrangements were derived from LIS, except for Japan, where they are from the Ministry of Health, Labor, and Welfare, and Sweden, where they are from the OECD. Data refer to the most recent year available, generally in the mid-1990s.

Poverty Impact: Percent of the elderly pushed into poverty by a 10 percent cut in public benefits. Poverty is defined as 50 percent of the median for all households in each country, the standard international definition. Unlike the other indicators, elderly income here includes the income of nonelderly household members. It excludes, however, government health care benefits. For all countries except Japan, the indicator was calculated using LIS data. For Japan, it was calculated using data from the Ministry of Health, Labor, and Welfare. Data refer to the most recent year available, generally in the mid-1990s.

Affluence Level: Per capita ratio of the after-tax income of the elderly to the after-tax income of the nonelderly in 2040. Income includes the per capita cash value of government health care benefits.

Affluence Growth: Percentage change in the affluence-level indicator between 2000 and 2040.

8. Category and Overall Rankings

As already explained, the *Index* is constructed as follows. For each of the indicators, we generate an indicator ranking, from one (best) to twelve (worst). We also transform the indicator results into an index and generate an index score for each country. For each indicator, the mean result is set to an index value of 50; results that lie above and below the mean by one standard deviation are set, respectively, to index values of 100 and zero. The index scores thus preserve the indicator rankings while also reflecting the relative distance of each ranked country, positively or negatively, from the "center of the pack."

For each of the four categories, a category score is then calculated as an average of the indicator index scores. The category score determines the overall category rankings. Finally, the category scores themselves are averaged as follows: A weight of one-third is given to the first public-burden category, one-third to the second fiscal-room category, and one-third to the third and fourth "policy-climate" categories combined. A country's final combined average for the four categories determines its ranking in the overall *Index*.

DATA APPENDIX

TABLE 1: Aged Dependency Ratio*

	2000	2010	2020	2030	2040
Australia	0.26	0.32	0.41	0.50	0.56
Belgium	0.37	0.41	0.51	0.64	0.71
Canada	0.26	0.33	0.46	0.58	0.63
France	0.34	0.40	0.50	0.61	0.69
Germany	0.38	0.42	0.51	0.69	0.72
Italy	0.40	0.47	0.57	0.79	1.03
Japan	0.39	0.55	0.66	0.78	1.00
Netherlands	0.29	0.36	0.47	0.64	0.69
Spain	0.35	0.40	0.49	0.69	0.99
Sweden	0.38	0.46	0.55	0.67	0.74
UK	0.34	0.39	0.47	0.61	0.65
US	0.26	0.30	0.39	0.46	0.47

*Ratio of elderly adults aged 60 and over to working-age adults aged 15–59.

TABLE 2: Public Benefits to the Elderly (Aged 60 and Over), as a Percent of GDP

	2000	2010	2020	2030	2040
Australia					
Total Benefits	9.0%	10.2%	12.7%	14.9%	16.6%
Public Pensions	4.2%	4.3%	5.2%	5.8%	6.1%
Health Benefits	2.7%	3.4%	4.6%	5.9%	7.0%
Other Benefits	2.2%	2.5%	2.9%	3.2%	3.4%
Belgium					
Total Benefits	12.7%	13.9%	17.3%	21.9%	24.5%
Public Pensions	8.8%	9.1%	11.0%	13.7%	15.0%
Health Benefits	3.0%	3.7%	5.0%	6.6%	7.8%
Other Benefits	1.0%	1.1%	1.3%	1.6%	1.7%
Canada					
Total Benefits	8.9%	11.2%	15.5%	20.2%	22.9%
Public Pensions	4.9%	6.0%	8.0%	10.5%	11.7%
Health Benefits	3.3%	4.4%	6.4%	8.3%	9.8%
Other Benefits	0.7%	0.8%	1.1%	1.3%	1.4%
France					
Total Benefits	15.8%	18.4%	22.9%	26.9%	29.3%
Public Pensions	11.3%	12.8%	15.5%	17.5%	19.2%
Health Benefits	3.3%	4.3%	5.9%	7.6%	9.2%
Other Benefits	1.1%	1.3%	1.5%	1.8%	2.0%
Germany					
Total Benefits	15.1%	15.4%	18.1%	23.2%	25.5%
Public Pensions	10.3%	9.9%	11.2%	14.2%	15.4%
Health Benefits	3.8%	4.4%	5.5%	7.3%	8.4%
Other Benefits	1.0%	1.1%	1.3%	1.7%	1.8%
Italy					
Total Benefits	17.3%	18.4%	22.8%	26.9%	32.0%
Public Pensions	12.1%	13.1%	15.2%	18.2%	20.0%
Health Benefits	3.0%	3.9%	5.1%	7.0%	9.0%
Other Benefits	2.2%	2.4%	2.5%	2.8%	3.0%

	2000	2010	2020	2030	2040
Japan					
Total Benefits	11.8%	16.4%	19.6%	22.1%	27.0%
Public Pensions	6.9%	9.7%	11.3%	12.1%	14.5%
Health Benefits	3.8%	5.4%	6.9%	8.6%	10.9%
Other Benefits	1.1%	1.3%	1.4%	1.5%	1.6%
Netherlands					
Total Benefits	11.7%	13.1%	16.1%	22.8%	25.6%
Public Pensions	6.5%	7.7%	9.9%	12.9%	13.8%
Health Benefits	3.0%	3.9%	5.3%	6.7%	7.5%
Other Benefits	2.2%	2.6%	3.1%	3.8%	4.0%
Spain					
Total Benefits	12.6%	13.8%	17.0%	23.9%	33.1%
Public Pensions	7.7%	7.9%	9.7%	14.1%	20.3%
Health Benefits	2.7%	3.5%	4.7%	6.7%	9.3%
Other Benefits	2.2%	2.3%	2.6%	3.1%	3.6%
Sweden					
Total Benefits	13.3%	15.2%	17.8%	20.9%	23.0%
Public Pensions	7.3%	8.0%	9.3%	10.6%	11.3%
Health Benefits	3.8%	4.7%	5.6%	6.8%	8.0%
Other Benefits	2.1%	2.5%	2.9%	3.4%	3.8%
UK					
Total Benefits	12.1%	12.7%	13.9%	16.6%	17.6%
Public Pensions	6.5%	6.2%	6.1%	6.6%	6.5%
Health Benefits	2.8%	3.4%	4.3%	5.7%	6.6%
Other Benefits	2.9%	3.2%	3.6%	4.4%	4.6%
US					
Total Benefits	9.4%	11.0%	15.2%	18.8%	20.9%
Public Pensions	5.2%	5.5%	7.4%	8.8%	9.1%
Health Benefits	3.7%	4.9%	7.1%	9.2%	10.5%
Other Benefits	0.5%	0.3%	0.7%	0.9%	0.8%

All Countries*	2000	2010	2020	2030	2040
Total Benefits	12.5%	14.3%	17.6%	21.7%	24.9%
Public Pensions	7.6%	8.4%	10.0%	12.0%	13.5%
Health Benefits	3.3%	4.2%	5.5%	7.2%	8.7%
Other Benefits	1.6%	1.8%	2.1%	2.4%	2.8%

*Figures are unweighted averages.

TABLE 3: Net Public Benefits to the Elderly, as a Percent of After-tax Nonelderly Income*

	2000	2010	2020	2030	2040
Australia	12.4%	13.9%	17.2%	19.9%	22.1%
Belgium	17.2%	18.1%	22.5%	28.2%	31.5%
Canada	12.9%	15.4%	20.8%	26.5%	29.8%
France	20.3%	23.4%	28.9%	33.4%	36.1%
Germany	20.8%	21.4%	25.1%	32.2%	35.4%
Italy	21.6%	23.8%	27.8%	33.2%	37.2%
Japan	15.4%	22.3%	26.5%	29.8%	35.9%
Netherlands	16.5%	18.6%	25.0%	31.5%	35.3%
Spain	17.2%	18.5%	22.7%	31.4%	42.7%
Sweden	17.7%	19.2%	22.0%	25.1%	27.3%
UK	14.0%	14.4%	15.7%	18.3%	19.3%
US	12.8%	14.7%	20.2%	24.8%	26.8%

*Public benefits to the elderly (aged 60 and over), net of taxes, as a percent of the income of the nonelderly (aged 15–59), measured after taxes for the rest of government but before taxes for benefits to the elderly.

TABLE 4: Total Taxes as a Percent of GDP, Assuming Tax Hikes Pay for All Growth in Public Benefits

	2000	2010	2020	2030	2040
Australia	32.5%	33.3%	35.5%	37.4%	39.2%
Belgium	49.5%	49.1%	52.5%	57.0%	59.9%
Canada	38.4%	38.6%	42.7%	47.3%	50.2%
France	48.3%	51.2%	55.7%	58.7%	62.2%
Germany	44.4%	45.4%	47.9%	52.6%	55.2%
Italy	44.0%	45.4%	48.6%	53.4%	56.5%
Japan	28.9%	36.0%	39.3%	41.8%	46.5%
Netherlands	40.9%	42.1%	51.5%	55.5%	56.4%
Spain	38.2%	38.9%	42.1%	48.7%	57.2%
Sweden	57.4%	56.3%	58.4%	61.0%	59.0%
UK	38.4%	37.8%	38.7%	40.7%	41.7%
US	33.2%	33.9%	38.3%	42.4%	44.1%

TABLE 5: Public Benefits to the Elderly (Aged 60 and Over) as a Percent of Total Government Outlays, Assuming Cuts in Other Spending Pay for All Growth in Public Benefits

	2000	2010	2020	2030	2040
Australia	27.2%	29.8%	34.8%	38.7%	41.2%
Belgium	27.5%	28.2%	33.7%	44.1%	44.6%
Canada	23.4%	27.1%	35.6%	44.4%	48.6%
France	32.5%	37.0%	44.3%	50.1%	52.9%
Germany	32.9%	33.3%	37.4%	46.2%	49.0%
Italy	37.9%	41.0%	46.1%	54.5%	60.3%
Japan	31.9%	46.5%	52.6%	56.3%	65.8%
Netherlands	28.0%	32.4%	39.5%	47.9%	51.7%
Spain	32.7%	34.4%	40.3%	54.1%	72.1%
Sweden	25.3%	27.2%	30.6%	34.7%	37.2%
UK	31.6%	31.5%	32.8%	37.4%	38.1%
US	30.9%	33.7%	43.6%	51.3%	52.9%

TABLE 6: After-tax Income of the Elderly (Aged 60 and Over) by Source, as a Percent of Total After-tax Elderly Income*

	2000	2010	2020	2030	2040
Australia					
Earnings	23.3%	23.7%	23.5%	23.3%	22.9%
Private Pensions	13.2%	17.7%	23.1%	28.4%	33.1%
Asset Income	20.2%	18.8%	16.0%	13.5%	11.3%
Public Benefits	43.4%	39.9%	37.4%	34.8%	32.7%
Belgium					
Earnings	10.9%	11.4%	11.1%	10.3%	9.9%
Private Pensions	8.5%	9.2%	10.1%	10.9%	11.5%
Asset Income	25.9%	26.1%	24.9%	23.2%	22.5%
Public Benefits	54.7%	53.3%	53.9%	55.6%	56.2%
Canada					
Earnings	17.6%	17.7%	17.6%	17.0%	16.4%
Private Pensions	19.0%	20.7%	23.6%	25.5%	26.6%
Asset Income	21.3%	19.3%	15.8%	12.7%	11.4%
Public Benefits	42.2%	42.4%	42.9%	44.8%	45.5%
France					
Earnings	8.0%	7.7%	7.2%	6.7%	6.2%
Private Pensions	0.5%	0.6%	0.7%	0.8%	0.8%
Asset Income	24.1%	23.9%	23.0%	22.8%	23.1%
Public Benefits	67.9%	67.9%	69.2%	69.7%	69.9%
Germany					
Earnings	13.5%	14.1%	13.8%	12.9%	11.9%
Private Pensions	4.6%	6.1%	7.8%	9.9%	11.1%
Asset Income	20.5%	21.3%	20.8%	19.6%	18.6%
Public Benefits	61.4%	58.6%	57.7%	57.6%	58.4%
Italy					
Earnings	12.2%	12.5%	12.2%	12.3%	12.4%
Private Pensions	4.1%	4.9%	5.7%	7.4%	9.3%
Asset Income	24.9%	24.9%	24.3%	23.5%	22.7%
Public Benefits	58.8%	57.8%	58.0%	57.0%	55.6%

	2000	2010	2020	2030	2040
Japan					
Earnings	40.5%	37.2%	35.6%	35.0%	32.4%
Private Pensions	12.5%	14.7%	16.3%	18.3%	21.1%
Asset Income	12.0%	10.8%	10.0%	9.4%	8.1%
Public Benefits	34.9%	37.3%	38.2%	37.3%	38.4%
Netherlands					
Earnings	7.4%	7.4%	7.0%	8.6%	6.3%
Private Pensions	16.7%	20.4%	21.6%	23.9%	24.1%
Asset Income	19.9%	18.8%	17.1%	18.3%	14.3%
Public Benefits	54.0%	53.7%	54.4%	54.2%	55.2%
Spain					
Earnings	9.5%	9.9%	9.4%	8.0%	6.3%
Private Pensions	1.2%	2.5%	4.1%	5.8%	8.0%
Asset Income	25.2%	25.5%	24.2%	21.5%	18.7%
Public Benefits	64.0%	62.1%	62.3%	64.7%	66.9%
Sweden					
Earnings	19.7%	20.6%	20.2%	19.9%	19.4%
Private Pensions	11.0%	12.5%	14.1%	16.1%	17.6%
Asset Income	12.8%	11.9%	10.6%	9.2%	8.3%
Public Benefits	56.5%	55.0%	55.1%	54.8%	54.6%
UK					
Earnings	16.3%	17.2%	18.1%	18.9%	19.0%
Private Pensions	14.0%	16.5%	19.8%	24.1%	26.4%
Asset Income	19.4%	19.2%	18.4%	16.1%	15.2%
Public Benefits	50.3%	47.0%	43.7%	40.9%	39.3%
US					
Earnings	25.5%	25.9%	24.3%	23.6%	23.1%
Private Pensions	16.7%	18.2%	20.5%	22.3%	23.0%
Asset Income	22.9%	22.2%	19.7%	18.0%	17.6%
Public Benefits	34.9%	33.6%	35.3%	36.1%	36.2%

*Income excludes government health care benefits.

TABLE 7: Public Benefits to the Elderly (Aged 60 and Over), as a Percent of After-tax Elderly Income: With and Without Health Care Benefits

	2000	2010	2020	2030	2040
Australia					
Without	43.4%	39.9%	37.4%	34.8%	32.7%
With	52.8%	50.8%	49.4%	48.1%	47.2%
Belgium					
Without	54.7%	53.3%	53.0%	55.0%	56.2%
With	62.0%	61.9%	63.4%	65.3%	66.6%
Canada					
Without	42.2%	42.4%	42.9%	44.8%	45.5%
With	55.4%	55.6%	58.1%	60.4%	62.0%
France					
Without	67.3%	67.9%	69.2%	69.7%	69.5%
With	72.9%	74.6%	76.0%	77.2%	78.0%
Germany					
Without	61.4%	58.6%	57.7%	57.6%	58.4%
With	68.3%	66.9%	66.7%	67.1%	68.3%
Italy					
Without	58.8%	57.8%	56.0%	57.0%	55.8%
With	63.8%	63.3%	64.8%	65.1%	65.0%

	2000	2010	2020	2030	2040
Japan					
Without	34.9%	37.3%	38.2%	37.3%	38.4%
With	44.7%	47.7%	49.6%	50.3%	52.3%
Netherlands					
Without	54.0%	53.7%	54.4%	54.2%	55.2%
With	62.0%	62.2%	63.2%	63.3%	64.8%
Spain					
Without	64.0%	62.1%	62.3%	64.7%	66.9%
With	70.1%	69.6%	70.6%	72.9%	74.9%
Sweden					
Without	56.5%	55.0%	55.1%	54.3%	54.6%
With	66.9%	66.1%	66.5%	66.8%	67.0%
UK					
Without	50.3%	47.0%	43.7%	40.9%	39.3%
With	57.3%	55.4%	53.6%	52.2%	51.9%
US					
Without	34.9%	33.9%	33.3%	36.1%	36.6%
With	43.2%	49.6%	52.4%	54.7%	56.6%

TABLE 8: After-tax Income of the Elderly (Aged 60 and Over) by Source and Quintile in 2000, as a Percent of Total After-tax Elderly Income*

	1st	2nd	3rd	4th	5th
Australia					
Earnings	0.1%	1.8%	2.3%	15.3%	43.6%
Private Pensions	1.3%	4.6%	6.2%	20.5%	15.4%
Asset Income	10.4%	11.7%	9.9%	21.1%	26.6%
Public Benefits	88.1%	81.9%	81.6%	43.1%	14.3%
Belgium					
Earnings	0.5%	0.7%	4.5%	5.5%	19.5%
Private Pensions	0.0%	0.7%	5.1%	11.7%	10.5%
Asset Income	13.3%	11.2%	18.4%	21.5%	34.6%
Public Benefits	86.7%	87.4%	76.0%	61.0%	35.4%
Canada					
Earnings	0.4%	2.6%	6.6%	12.8%	30.6%
Private Pensions	2.0%	9.6%	16.0%	25.6%	21.6%
Asset Income	7.6%	11.9%	15.5%	19.7%	28.9%
Public Benefits	90.0%	75.9%	62.0%	41.9%	18.8%
France					
Earnings	1.2%	1.8%	2.4%	7.2%	14.5%
Private Pensions	0.1%	0.3%	0.4%	0.7%	0.0%
Asset Income	13.6%	16.9%	18.0%	20.9%	32.0%
Public Benefits	85.0%	81.0%	79.2%	71.2%	54.5%
Germany					
Earnings	1.1%	2.2%	3.0%	7.1%	26.4%
Private Pensions	3.9%	2.6%	2.5%	3.7%	6.7%
Asset Income	3.7%	5.5%	10.2%	21.4%	30.1%
Public Benefits	91.4%	89.7%	84.3%	67.8%	36.9%
Italy					
Earnings	0.5%	1.6%	4.3%	10.7%	18.9%
Private Pensions	0.6%	2.2%	3.7%	2.8%	5.8%
Asset Income	8.1%	8.5%	10.8%	18.9%	38.4%
Public Benefits	90.7%	87.7%	82.7%	67.5%	38.8%

	1st	2nd	3rd	4th	5th
Japan					
Earnings	NA	NA	NA	NA	NA
Private Pensions	NA	NA	NA	NA	NA
Asset Income	NA	NA	NA	NA	NA
Public Benefits	NA	NA	NA	NA	NA
Netherlands					
Earnings	0.8%	0.5%	1.9%	6.2%	14.1%
Private Pensions	2.9%	6.4%	12.3%	22.6%	26.3%
Asset Income	3.0%	6.6%	11.5%	17.9%	33.0%
Public Benefits	93.4%	86.5%	74.2%	53.3%	25.7%
Spain					
Earnings	0.8%	1.7%	3.7%	9.5%	16.1%
Private Pensions	0.3%	0.5%	0.8%	1.4%	1.7%
Asset Income	11.5%	15.1%	18.8%	25.9%	33.1%
Public Benefits	87.4%	82.7%	76.7%	63.1%	49.2%
Sweden					
Earnings	1.5%	1.8%	9.8%	13.2%	36.4%
Private Pensions	3.4%	5.2%	8.8%	11.4%	14.7%
Asset Income	11.7%	9.0%	11.1%	11.9%	15.2%
Public Benefits	83.4%	83.9%	70.2%	63.5%	33.6%
UK					
Earnings	0.3%	1.3%	3.1%	12.7%	31.0%
Private Pensions	3.0%	7.0%	11.3%	18.6%	17.1%
Asset Income	5.2%	6.9%	10.8%	18.0%	30.3%
Public Benefits	91.5%	84.8%	74.8%	50.7%	21.6%
US					
Earnings	2.4%	5.7%	10.6%	22.2%	36.0%
Private Pensions	1.2%	12.6%	20.9%	22.1%	14.4%
Asset Income	6.1%	11.2%	14.3%	17.9%	30.9%
Public Benefits	90.3%	70.5%	54.2%	37.5%	18.5%

*Income excludes government health care benefits.

TABLE 9: Private Pension Benefits, as a Percent of GDP*

	2000	2010	2020	2030	2040
Australia	2.5%	3.8%	6.0%	8.6%	11.1%
Belgium	1.7%	1.9%	2.5%	3.2%	3.8%
Canada	3.2%	4.0%	5.8%	7.6%	8.5%
France	0.1%	0.1%	0.2%	0.2%	0.3%
Germany	0.9%	1.2%	1.8%	2.9%	3.4%
Italy	1.3%	1.7%	2.1%	3.2%	4.3%
Japan	3.1%	4.6%	5.7%	7.0%	9.2%
Netherlands	3.3%	4.1%	5.4%	7.4%	8.2%
Spain	0.2%	0.5%	0.9%	1.7%	3.1%
Sweden	2.2%	2.7%	3.5%	4.5%	5.3%
UK	3.6%	4.3%	5.6%	7.8%	8.9%
US	3.6%	4.2%	5.8%	7.0%	7.4%

*Includes all employer pensions, personal pensions, and severance pay schemes.

TABLE 10: Per Capita Ratio of the After-tax Income of the Elderly to the Nonelderly*

	2000	2010	2020	2030	2040
Australia	1.30	1.29	1.33	1.38	1.45
Belgium	1.07	1.04	1.07	1.13	1.19
Canada	1.32	1.33	1.36	1.45	1.54
France	1.29	1.31	1.35	1.36	1.36
Germany	1.25	1.22	1.25	1.33	1.44
Italy	1.32	1.26	1.25	1.19	1.15
Japan	1.07	1.15	1.21	1.24	1.34
Netherlands	1.32	1.31	1.36	1.41	1.53
Spain	0.98	0.95	0.97	1.05	1.18
Sweden	1.01	0.99	1.00	1.01	1.04
UK	1.20	1.15	1.11	1.09	1.10
US	1.43	1.46	1.56	1.67	1.77

*Elderly are aged 60 and over; nonelderly are aged 15–59; income includes the cash value of government health care benefits.

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