

PROCEEDINGS

WORKSHOP ON GLOBAL AGING

Organized by the University of Michigan Retirement Research Center

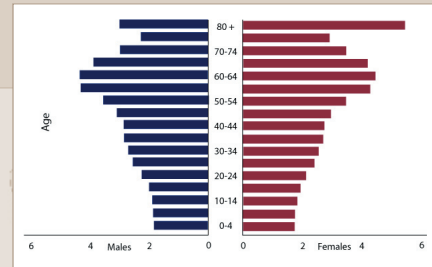




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The aims of the Michigan Retirement Research Center are to foster research on retirement issues, to convey findings to the academic and policy communities and to the public, to support the training of a new generation of scholars, and to facilitate access to relevant data and information.

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Agenda

- 12: 30 p.m.** Welcome
John Laitner, Director, University of Michigan Retirement Research Center

Paul Hewitt, Deputy Commissioner for Policy, Social Security Administration
- SESSION I:** **Presentation of World Economic Forum Report on Global Aging**
- 12:40 p.m.** **Living Happily Ever After: The Economic Implications of Aging Societies**
Sylvester Scheiber, Watson Wyatt Worldwide
- Discussants:
Edward Gramlich, Federal Reserve Board
Alan Gustman, Dartmouth College
Richard Jackson, Center for Strategic and International Studies
John Shoven, Stanford University
- SESSION II:** **Topics for Future Research on Global Aging: Discussion of Two Reports**
- 3:00 p.m.** Moderator:
Peter Heller, International Monetary Fund
- Global Aging: Issues, Answers, More Questions**
Axel Börsch-Supan, University of Mannheim
- The Impact of Aging on Financial Markets and the Economy: A Survey**
Barry Bosworth, Ralph Bryant, and Gary Burtless
Brookings Institution
- Discussants:
Marilyn Moon, American Institutes for Research
Moritz Kraemer, Standard & Poor's
Andrew Abel, University of Pennsylvania
- 4:55 p.m.** Closing

Foreword

On May 17, 2004, I had the pleasure of co-organizing, with Paul Hewitt, on behalf of the Michigan Retirement Research Center and the Social Security Administration, a Workshop on global aging. The write-up below, containing excellent summaries by Amanda Sonnega, reviews highlights from the event. The MRRC web site contains copies of the original papers.¹ Although the documents speak for themselves, the Workshop is one step in an ongoing research agenda, and I would like to use the present introduction to begin to address the following overall question: What is the role of government in coping with the challenges and likely consequences of global aging, and what facets are best left to private-sector markets to deal with alone?

In a market system, prices are supposed to adjust constantly to maintain the balance of supply and demand. If demographic forces influence saving more or less than investment, interest rates should move to re-equate the two. If labor supplies diminish, the price of labor—the wage rate—should rise. The latter should encourage older workers to postpone retirement, younger workers to join the

workforce more promptly, and firms to use labor more frugally. If we foresee that the price of new capital goods will fall in the near future as global aging perhaps reduces the need for investment expenditures, prices of common stocks should begin a gradual decline now, in anticipation. In the end, it seems that markets by themselves may be able to cope well with some of the outcomes of global aging identified in the summaries below.

Looking beyond markets, one role for government is to enhance the development and diffusion of information about coming changes. Small as well as large businesses should be aware, for instance, of predictable changes in the size and composition of the labor force in coming years – so that markets can generate efficient responses. Publications, public discussion, and sponsored research are, of course, tried and true mechanisms for obtaining and spreading knowledge.

One possible gap in knowledge, it seems to me, relates to the inevitability and time path of global aging itself. Global aging results from declining fertility and increasing longevity. Historical data enable us to predict trend lines for each of these two forces, and the

¹ See www.mrrc.isr.umich.edu.

analyses in the Workshop extrapolate these trends. However, fertility is a complicated topic. Presumably children are a luxury good, so that households tend to want more as incomes rise; yet, children are also expensive in terms of parental time, so that as wages rise, households will tend to want less. Professor Gary Becker of the University of Chicago has provided a general model in which parental concern with child quality can lead to changes in fertility. Additional time series and international cross-sectional data sources are increasingly available. If discussions of global aging can be grounded in a quantitative, theoretical model of fertility, we can better predict which factors will mitigate, or exacerbate, projected trends in the future. For example, if global aging causes wages to rise in the future, might fertility decline even further?

A second role for government is to prepare its own budget for the changes that demographic trends will bring. The report of the President's Commission to Strengthen Social Security about two years ago warned that the pay-as-you-go U.S. Social Security System will encounter serious solvency troubles within 30-35 years as Baby Boomers retire. The *Economic Report of*

the President 2004, ch.6, for example, highlights solvency problems from an even longer-term perspective. The Workshop presentations, beginning with Sylvester Schieber's, emphasize this looming crisis.

The Workshop had, on the other hand, less chance to consider related budgetary challenges from aging. A number of presenters noted that private pension plans of the defined benefit nature face pressures from rising ratios of retirees to workers analogous to those confronting Social Security; however, we could go further to worry about the Federal Government's role, and potential liabilities through the Pension Benefit Guarantee Corporation, in protecting the integrity of these pensions.²

Perhaps even more important, with the exception of Marilyn Moon's discussion, the Workshop tended not to dwell on budgetary challenges stemming from rising medical costs. Medical expenditures in the U.S. were less than 5% of GDP 25 years ago; today they are 10-15%. Their future course is risky to predict. The federal government has had a direct financial responsibility in this

²www.mrrc.isr.umich.edu/conferences/past/rrc04-belt.pdf

area since the advent of Medicare and Medicaid in the 1960s. The *Economic Report of the President 2004*, Chart 6-5 (ch.6), shows that Medicare and Medicaid together today account for about the same slice of the federal budget as Social Security benefits; however, the Chart shows that by 2080, Medicare and Medicaid may well have over twice as large a budget share as Social Security. Parts of Medicare have exactly the same pay—as—you—go structure as Social Security. It is difficult to see how the federal government can control its budget deficits, and stabilize or reduce the national debt, without reforming medical spending as well as Social Security. This would be a challenge without global aging; with global aging, the challenge will surely be greater.

A third role of government lies in the provision of human capital. In the U.S., we entrust government, primarily state and local government, to finance much of our education system. In an era of falling ratios of workers to retirees, enhancing the productivity of remaining workers is vital. As part of its response to global aging, perhaps government should be reassessing its planning in this area.

Fourth, government sets the legal and regulatory environment for market actions, and through taxes and budgetary commitments it tries to compensate for forces external to market-price incentives. One area of special concern in this sphere is the age at which workers choose to retire. As advances in health care lengthen life spans, one might expect people to choose later and later ages for retirement. This does not seem to be happening – in fact, the contrary seems to be occurring, especially in parts of Europe. If existing Social Security and tax statutes tend to encourage retirement at earlier ages than would otherwise prevail, global aging increases the urgency for consideration of reform.


Another issue is private pensions. Many companies are changing from defined benefit to defined contribution plans. Private pensions are an important resource for retirees; given the concerns of this Workshop, the integrity of private pension systems is likely to assume even more significance in coming years. Government, through the Pension Benefit Guarantee Corporation, for example, shouldered some responsibility for defined benefit pensions in the private sector; it may want to

take a corresponding role for defined contribution plans. A new concern is that some workers have little experience in the management of a financial portfolio that a defined contribution plan requires.

International capital flows might raise additional worries for investors and regulators. Although several Workshop presentations noted the potential of foreign financial investment in less developed countries to preserve high rates of return in the face of aging OECD populations, investments in “emerging markets” have proven risky in the past. It is also true that countries undergoing rapid growth may not (perhaps recalling a colonial status in the past) welcome foreign owners, and they may generate surprisingly high domestic savings rates – even rates high enough to exceed their extraordinary rates of physical investment (e.g., China). Prudent planning for retirement entails portfolio diversification, and in determining portfolio allocations, we must be careful not to underestimate risks that foreign securities carry.

Given all of the factors that need to be considered, including private-sector behavioral responses, it seems that much

interesting analysis remains to be done. The Centers that comprise the Retirement Research Consortium will continue to conduct research and engage in the policy analysis that this task requires.



John Laitner, Director MRRC

Proceedings

MRRC/SSA Workshop on Global Aging

As part of on-going efforts to promote discussion and awareness of long as well as short-run factors affecting the demand for and demands on social insurance programs, the Michigan Retirement Research Center (MRRC) and the Office of Policy at the Social Security Administration (SSA) jointly sponsored a half-day workshop on May 17, 2004 that examined the present and future impacts of global aging. The workshop's primary goal was to gather subject area experts to bring into focus important issues which policy-makers will need to address in coming years.

Welcome

John Laitner, Director of the MRRC, began the proceedings by noting that global aging is the result of two forces: increasing longevity and declining birthrates. The first is unambiguously "good news"; the second is arguably positive as well since it will lead to reduced pressure on limited natural resources, potentially reduce congestion and pollution, and perhaps allow more investment per capita on education and health. Nevertheless, global aging trends exert increasing pressure on social insurance programs world-wide. He then introduced Paul Hewitt, Associate Commissioner for Policy of the SSA.

Mr. Hewitt suggested that, as policy makers consider reform options, the President has clearly indicated that some sort of funded approach to Social Security is most consistent with creating stability for retirement finances in the long run. Mr. Hewitt also pointed out that aging trends are occurring at a time when the world economy is highly globalized. This creates some problems but many opportunities. For example, as multinational companies begin to invest in a rapidly growing economy like China, the prospect emerges for such companies to trade securities on Chinese exchanges. This could ease pressures on U.S. exchanges as baby boomers liquidate retirement holdings. He underscored the importance of international cooperation.

Session I: Presentation of World Economic Forum Report on Global Aging

Living Happily Ever After: The Economic Implications of Aging Societies

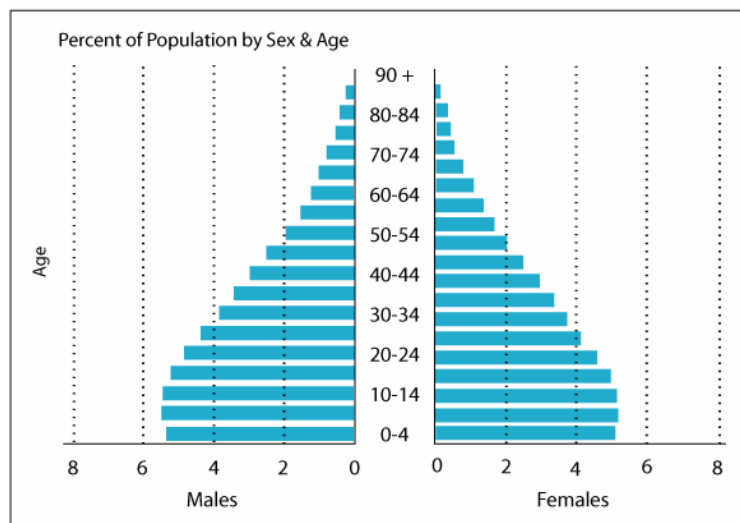
Sylvester Scheiber, Vice President of Research and Information at Wyatt Watson Worldwide, provided an executive summary of his report to the World Economic Forum with **Steven Nyce**. The report examines the impact of shrinking labor forces on economic growth prospects in the European Union (EU) and other industrialized countries and explores various options for influencing current trajectories. Dr. Scheiber began by reviewing various global demographic trends, describing

several characteristic population growth patterns that are evolving in the world. He then explored some of the implications of this on economic performance for developed countries. Finally, he turned to the challenges to fulfilling the economic aspirations that many societies hold given this background.

Most countries fall into one of four evolving population structures, which are highly correlated with their stage of economic development.

Most countries fall into one of four evolving population structures, which are highly correlated with their stage of economic development. The graph below depicts a traditional structure, with more young people and decreasing numbers of people in each age category as age increases. This is the classic pyramidal structure. Developing countries fall into this category, with relatively high fertility rates and shorter life expectancy.

Figure 1: Pakistan's Population Structure in 2030



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

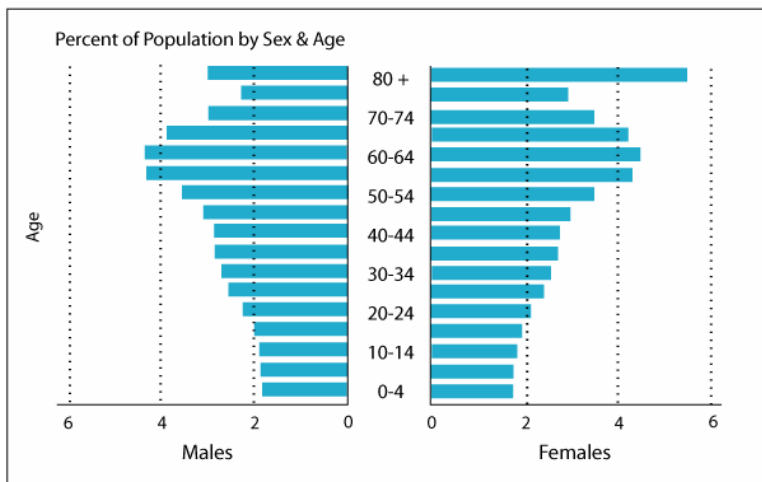
A second category of countries, which are at an intermediate stage of economic development, such as Mexico, shows a narrowing of the bottom of the graph as fertility rates begin to fall and improved public health leads to increasing life expectancy. The shape of the distribution is still pyramidal toward the top at the oldest ages but becomes more rectangular from birth to age 55. We can expect that developing countries will move in this direction, and their population structure will begin to assume this shape within the next three decades.

A third form represents the world's developed countries, where fertility rates have fallen below replacement levels of 2.1 children to 1.8 or 1.6, and where longevity has increased

substantially. In some cases immigration rates continue to contribute to population growth. Canada is a good example of a country in this category where the population distribution assumes a nearly completely rectangular shape.

The fourth population age structure is represented by countries like Italy and Japan where fertility rates have fallen to dramatically low levels and life expectancy has increased substantially. In Italy and Spain the fertility rate is below 1.2. In Germany and Japan, it is 1.1 to 1.4. The age structure in these countries is evolving to an inverted pyramidal shape. The shape projected for Italy in 2030 is depicted in Figure 2.

Figure 2: Italy's Population Structure in 2030



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

There are some exceptions that include countries like the United States where very high levels of immigration and fertility rates that are at replacement have helped to maintain a younger and growing population. China is an outlier in the opposite direction with a less developed economy but very low fertility, so that the evolving age structure resembles more developed countries.

One implication of these trends is that many countries will experience an increase in the aged and dependent population, while simultaneously seeing a decline in the working age population. Although pension systems around the world are organized in numerous ways, all constitute mechanisms whereby a portion of the goods and services produced by workers find their way to older people who have completed their working careers. With fewer workers, there will be increasing financial stress on pension systems within aging countries. Although pressure on pension systems is a concern, Dr. Scheiber also suggested that the aging phenomenon goes beyond the structure and financing of government pension programs to larger concerns about falling productivity and standards of living.

Focusing concerns about aging costs more broadly—on sustaining economic growth and improving living standards—recasts the problem of aging as a labor supply issue. Indeed, over the coming decade, the slowdown in labor supply growth will become a significant drag on economic growth, especially in countries like France, Germany, and Spain. Dr. Scheiber highlighted the conclusion of a European Commission report of a long-term analysis of the evolution of various world economies. Whereas, in 2000 the European Union accounted for about 18% of world gross domestic product (GDP), by 2050 that is expected to fall to around 10%. Japan accounted for 8 percent in 2000, and that is expected to be halved by 2050. The U.S. is expected to continue to grow somewhat over that period, so our situation is quite different from that of other developing countries.

In simple terms, GDP growth rate depends on labor growth rate and productivity. Using GDP per capita as an indicator of living standard, historically most countries have had steadily increasing standards of living along with growing labor force participation rates. The question emerges: with a potentially shrinking labor supply, how much productivity is needed to

maintain and to continue to improve standards of living for the combined population of workers and retirees? Scheiber noted that if we do not experience significant increases in productivity, we may eventually see an effect on living standards.

The way that pension systems in most countries are structured may insulate retirees from the effects of economic slowdown, leaving workers to bear the costs. With the shrinkage in labor supply, the primary factor driving economic growth will be worker productivity. However, workers may become less motivated to increase productivity when they see themselves losing ground in their own living standard compared to retirees. Several countries have sought to protect workers to some degree by indexing benefit levels to prices instead of wages. In that context, real concerns emerge about decreasing living standards for the elderly. Dr. Scheiber offered a more optimistic vision of the future. He proposed that nations pursue policies that sustain economic growth, which would benefit all sectors of the population.

Besides declining fertility, there are other trends that affect labor supply that may prove more

tractable. One such trend is the decreasing age of retirement around the world. The average age at retirement varies across countries from as low as 58 in Belgium. The average in the U.S. is 62. Dr. Scheiber noted “the most significant reason for these variations in retirement patterns is the structure of the retirement systems.” Policies can be pursued that encourage older workers to remain in the workforce longer.

Another trend is increasing female participation in the labor force. Where these rates have leveled off, policies could be pursued that focus on attracting more women into the labor force. An important point, as well, is that women who are in the labor force tend to retire at younger ages than men, so another focus could be on closing the gap between male and female retirement ages. A third option is to focus on increasing the labor supply of young adults. Obviously, these policy options are likely to work most efficiently in concert.

Dr. Scheiber also emphasized the potential role of increasing immigration as a means to expand labor supply in countries where it is shrinking. Again, as a stand-alone, this is not likely to solve global aging problems.

Over the coming decade, the slowdown in labor supply growth will become a significant drag on economic growth.

If countries cannot achieve the labor force growth needed to offset the effects of aging populations, another alternative is to find ways to enhance productivity. Dr. Scheiber contended that there are a number of ways to work toward this end. One way is to seek to promote capital investment. However, in the case of Japan, as the capital stock has increased, net rates of return have fallen. We can also make investments in human capital. There are opportunities to better manage human capital to maximize productivity—for example, building incentives for workers. Technological advance holds promise, as well, but is less predictable. In addition, industrialized economies have the opportunity to export capital to countries where there is a growing supply of workers. Scheiber noted that these countries could also bring back returns to their own economy in terms of goods and services that will be needed to meet the consumer demands of an aging population.

It is important to focus attention on the structure of pension systems, especially when they may be contributing to the problem. In particular, the designs of pay-go pension systems often include perverse incentives.

For example, public retirement programs in many countries actually impose significant tax penalties on workers who continue working past the normal retirement age. In addition, pay-as-you-go systems may create efficiency losses. Dr. Scheiber suggested that this is partly due to the widening gap between the contributions workers pay into these programs and the benefits they can expect to receive. As a result, many countries are shifting to funded schemes. Funding public pension plans and privately investing the assets would increase saving and investment and likely boost productivity.

In various reform proposals, the burden of the cost of the reform is born differentially. In their report, Scheiber and Nyce conduct a series of policy experiments where they test various scenarios to see who is made relatively better off. In one scenario, they assume that retirees are given benefits that are increased at the rate of growth of productivity. They are protected relative to what workers can produce. The residual is distributed to workers. What they find is that in a number of countries, workers will begin to fall short of realizing the benefits of their own productivity.

When the reverse is enacted, so that workers are protected for their own productivity, Scheiber and Nyce find that the elderly's standard of living may actually decline relative to absolute levels that have already been achieved.

They then turn to alternative scenarios that combine strategies to balance the burden of reform across generations. They pose the question: "What would happen to some of these base improvements in our economic productivity if we could get people across these developed economies to at least work at the rate of work achieved in the top five economies?"

To test this, Scheiber and Nyce developed a scenario in which the labor force participation rates of women, the elderly, and younger individuals would rise to the equivalent of the average rates across the five countries in the Organization for Economic Cooperation and Development (OECD) with the highest rates. They found that this would create an ample labor supply to maintain living standards into the future.

Conclusion

As a result of population aging, the industrialized nations face a considerable economic challenge. The macroeconomic challenge will be to carry forward the improving standards of living achieved so far and to allocate improvements equitably across various segments of the population. Scheiber and Nyce propound an approach that focuses on promoting and sustaining economic growth. While policies that promote economic growth in their own right help support rising living standards, higher productivity can also increase the scope of public budgets to finance public pension benefits. Policies that entice higher labor force participation can help as well to offset potential deterioration in retirees' living standards without placing an undue tax burden on workers.

"What would happen to some of these base improvements in our economic productivity if we could get people across developed economies to at least work at the rate of work achieved in the top five economies?"

One thing to do when there are fewer workers relative to retirees is to equip the workers with more capital, which a funded system would do.

Discussants

Edward Gramlich, a member of the Board of Governors of the Federal Reserve, was the first to offer commentary on Scheiber and Nyce’s report. Dr. Gramlich first commented that one implication of the report is that it highlights that a sensible pension system depends on many factors, most of which are discussed in great depth in Scheiber and Nyce’s report. Unfortunately, pros and cons of various pension systems are hotly debated on ideological grounds and in practice. The report, constructively, encourages policymakers to focus on empirical and analytical issues in considering the merits of one or another approach.

A second point is that, because of the myriad of economic and demographic factors affecting pension systems, the ideal pension system would be some sort of “mixed system” that would be robust to many different forces.

Dr Gramlich underscored the importance of international capital flows and the virtue of international trade. The report makes a contribution by encouraging policymakers worldwide to consider the merits of immigration in rectifying labor shortages.

Finally, Dr. Gramlich suggested that the move toward more funded pension systems makes sense—that one thing to do when there are fewer workers relative to retirees is to equip the workers with more capital, which a funded system would do. He also endorsed the value of encouraging older workers to remain in the labor force, especially as average life expectancies continue to increase.

Alan Gustman, Loren M. Berry Professor of Economics at Dartmouth College and a member of the Executive Committee for the MRRC, stated that the analytical accounting framework presented by Scheiber and Nyce is extremely important for establishing baseline information about where we stand as we look across countries. Dr. Gustman suggested that we can use this baseline to go forward to include behavioral responses and policy rules. Data limitations have hindered this effort in the past. However, with several datasets coming on-line now across a number of countries, this may become feasible. Dr. Gustman stressed the importance of structural modeling, which allows researchers to capture deeper structural parameters in predicting retirement outcomes.

Richard Jackson, Senior Fellow at the Center for Strategic and International Studies (CSIS) and Director of the Global Aging Initiative, noted that, as the speaker and other discussants suggest, a combination of several sensible adjustments in the U.S. makes the outlook for pension financing quite good but that the situation in Europe and Japan is far more dire. Maintaining the status quo in these countries in the coming decades would virtually erase any real growth in living standards.

Dr. Jackson agreed that in themselves no one of the reforms mentioned by Dr. Scheiber would be enough. Certainly extending working lives is an obvious and necessary reform. He supported the report's emphasis on prefunding social insurance and suggested that the success of pay-as-you-go systems in the past is not likely to continue into the future, even in the U.S. where labor and productivity growth are reasonably robust.

John Shoven, Professor of Economics at Stanford University and Senior Fellow at the Hoover Institute, pointed out that, as we encourage greater labor force participation of the young, elderly, and women, it may be valuable to take into

account in some way what these groups are doing outside of the paid labor force, how productive those activities are, and how they may contribute to standards of living. For example, some retired grandparents may be providing unpaid childcare that allows both parents, or a single parent, to be in the paid labor force.

Dr. Shoven sought to broaden the discussion by raising the question of how we define old age and who is elderly. He introduced into the discussion the concept of remaining life expectancy as a potentially better measure of age than mere chronological age. Comparing 65 year-olds today and 65 year-olds in 2050 is like comparing older and younger people. Therefore, a better accounting method might be to count only those people as old who have a short remaining life expectancy. This way of accounting may ultimately lead to policy conclusions similar to those reached by Dr. Scheiber. Anticipating later presentations,

Dr. Shoven also raised the issue of potential asset meltdown that could occur as populations age. In simple terms, as retirees liquidate their private pension retirement assets, there may not be enough buyers and asset values will depreciate.

Session II: Topics for Future Research on Global Aging: Discussion of Two Reports

Global Aging: Issues, Answers, and More Questions

Axel Börsch-Supan, Director of the Mannheim Research Institute for the Economics of Aging and Professor of Economics, Macroeconomics, and Public Policy at the University of Mannheim, provided a review of reforms underway in Germany to address problems that arise from aging. He also reviewed several research areas of relevance, and he identified topics that merit further research.

Dr. Börsch-Supan characterized the problems posed by global aging in much the same way as Dr. Scheiber. He noted that understanding the evolution of the labor force in the coming decades is crucial for any analysis of global aging because long-run macroeconomic development is dominated by fundamentals such as the relative scarcity of labor and the relative abundance of capital. The essential macroeconomic effects of population aging are a changing balance between capital and labor, and between labor supply and demand for

consumption. An aging society has relatively few workers for the existing capital stock that produces consumption goods for a still relatively large number of consumers.

Labor Supply

Labor supply is determined by demographic factors and labor force participation rates, which is one factor affected by government policy. Dr. Börsch-Supan noted that most countries have produced projections of labor supply, but these projections depend on different assumptions and there are no good compilations that allow cross-country comparison. Analysis of the impact of global aging would benefit from a more systematic approach to this fundamental input.

Employment also depends on labor demand. Börsch-Supan contends that aging economies must maintain an elastic labor supply. Aging creates changes in the types of products demanded and therefore in the labor needed.

He provided statistics on the economic dependency ratio, the number of pensioners relative to workers. These figures are much higher in Europe than in the U.S. For example, in Germany labor force participation will decline

dramatically. To compensate for the lack of workers, productivity would have to increase by about 40%, which is unlikely without major efforts. Dr. Börsch-Supan offered that it is important to better understand how public policy can influence labor force participation. Pension reforms and education reforms can have potentially huge effects on GDP growth through their impact on employment, rather than just on their often discussed impact on social budgets. He underscored the fact that policies affecting employment are crucial in minimizing the economic effects of population aging.

Labor Productivity

In addition to size, the structure of the labor force will also change, growing increasingly older over time before flattening out. It is not clear what affect this graying of the workforce will have on productivity. Results based on cognition measures leaving out experience are just as unconvincing as results based on a fixed job ignoring typical career paths. More research on age-specific productivity is clearly needed to better understand whether aging economies will suffer from a productivity decline, exacerbating the effects of a shrinking labor supply. Research of this kind is expensive because it requires firm data, looking at

working groups and how they interact. This is an important and open area for further research.

Interactions between Labor, Product, and Capital Markets

As mentioned above, labor supply may have to adapt to changing product demand. Dr. Börsch-Supan provided evidence that consumption behavior changes with age. For example, German data show that spending on transportation and communication falls with age, while health and hygiene account for a growing share of older household budgets. Changing product demand will create shifts in labor sector demands. Dr. Börsch-Supan estimated that overall increases and decreases in employment amount to a total of 18 percent, suggesting that a sixth of all workers will need to change their jobs due to population aging.

However, research on age-related consumption patterns is limited by cross-sectional data, which entangle age, cohort, and time effects. Such differences can be discerned with panel data now becoming available.

The essential macroeconomic effects of population aging are a changing balance between capital and labor, and between labor supply and demand for consumption.

Capital Markets

Capital markets are important for global aging for at least two reasons. First, capital moves across countries more easily than labor. The relatively easy flow of capital across countries allows the diversification of demographic risks. Second, capital markets allow the shifting of resources over time periods and even over generations. Dr. Börsch-Supan emphasized that this is one of the strengths of funded pension systems.

There are a variety of important research questions that relate to the impact of global aging on capital markets. One set of questions relates to the supply of savings. Do public pension systems, in effect, crowd out private savings, and do retirement savings affect other types of saving, for example, saving for a home?

More generally, does global aging reduce the supply of global capital? The life-cycle hypothesis predicts saving in youth and spending down in old age. Dr. Börsch-Supan reviewed findings that show relatively flat saving profiles in France, Germany, and Italy. One possible explanation is that the high replacement rates of public pension systems in these countries have made private

retirement savings largely unnecessary. And if other savings motives predominate, such as precautionary savings or the desire to leave an inheritance, there is likely to be less dissaving in old age.

In the Netherlands, however, where there are mandated savings plans and a smaller portion of retirement income comes from the pay-as-you-go public pension, we do observe spending down of private savings in old age. The implication for pension reform is that countries that move toward a multi-pillar system may revive private retirement saving motives. To estimate the impact of this type of reform Börsch-Supan conducted a simulation to project aggregate saving in Germany under a fundamental reform plan. He showed that optimal life-cycle behavior generates additional saving, and that eventually about one-third of retirement income will come from the funded pillar.

Another set of questions relates to international diversification mentioned above. In particular, we do not have reliable models of international capital market flows, so we do not know the extent of friction, such as that caused by “home bias”—the tendency of investors to hold only domestic rather than

international equities. It is not yet fully understood why households do not optimally diversify their portfolios across countries. More research on capital market frictions will help policymakers to better understand how international diversification might alleviate the negative impact of global aging.

Dr. Börsch-Supan also addressed the question of asset meltdown and suggests that because of international diversification, predictions about melt down may be as dire as is described in models of closed economies. He reviewed findings which show that there is likely to be a decrease in the rate of return, but the open economy will suffer less severely. He also showed that if fundamental pension reform were enacted in Germany, the decreased rate of return would be much less in an open economy. He noted that household saving induced by pension reform should be invested internationally, not only for risk diversification, but also for higher returns.

Dr. Börsch-Supan proposed that an open area for research is in better understanding portfolio choice behavior, in particular the equity premium puzzle—the larger than predicted rate of return differential between safe

and risky assets. As countries move toward more prefunding of pension systems, it will be important to better understand how the rates of return of safe and risky assets are affected by global aging.

Since capital markets will play an important role in global aging, it is also important to understand more about which form of corporate governance will be most likely to offset some of the negative effects of aging. For example, France, Germany, and Italy—the three largest economies in continental Europe—have large pay-as-you-go public pension systems, but very thin capital markets, meaning that only a few households own and control productive capital. In addition, they have quite poor rates of return. Börsch-Supan noted that many authors claim that an important cause for this underperformance is weak corporate governance. He cited some preliminary evidence which shows that actively managed investments by institutional investors enhances corporate governance, and through this channel increases productivity and growth.

More research on capital market frictions will help policymakers better understand how international diversification might alleviate the negative impact of global aging.

Capital markets can diversify the risks generated by labor scarcity and can thus be thought of as strategic.

Conclusion

Dr. Börsch-Supan concluded by noting that global aging will affect labor, product, and capital markets in fundamental ways, which will eventually change the wealth of nations. While we understand the basic mechanisms behind these changes, he proposed that there is much work to be done to improve our knowledge of feedback effects and to generate more precise quantifications.

Public policy can influence labor, product, and capital markets at a microeconomic level. The main policy tools, he contends, to utilize potential labor sources are retirement and education policies that would get younger people into the labor market sooner and keep older workers in longer.

Capital markets can diversify the risks generated by labor scarcity and can thus be thought of as strategic. The supply of capital is directly influenced by pension policies that foster savings. However, we do not fully understand the interactions between pension policy and economic growth. Policies such as prefunding and privatization appear to have significant beneficial effects on economic growth rates—good news in times of global aging.

Lastly, the international flow of capital is not perfectly smooth. Understanding impediments to the free flow of capital, the sources of instability in global financial markets, and the kind of policies that are appropriate to reduce friction and instability are important and highly policy relevant research areas for global aging.

The Impact of Aging on Financial Markets and the Economy: A Survey

Barry P. Bosworth, Senior Fellow in Economic Studies at the Brookings Institution and **Ralph Bryant**, also Senior Fellow in Economic Studies at the Brookings Institution presented their work with **Gary Burtless** that addresses a number of questions about the impact of aging on financial markets and the economy. The first part of their discussion focused on the research literature on savings and investment; the second half considered these issues in the context of an open economy.

The authors emphasized two important trends that will emerge as a result of population aging. First, there will be shrinkage of the labor force in some industrialized countries and a slowdown in growth of labor supply in others. One outcome of these trends will be a

reduction in domestic investment opportunities because employers will have less need to provide new equipment and facilities for additional workers. Second, there is the potential for disruptions of asset markets as large numbers of retirees begin to liquidate their retirement assets. Dr. Bosworth offered that an important question for the global economy is: which will decline more, investment or saving? The imbalance between the two defines the current account balance. A practical upshot is that if the domestic demand for investment funds falls faster than saving in industrial economies, these funds may flow to parts of the world where demand is higher, namely, developing countries.

On the other hand, larger declines in national savings in the industrial economies, implies that these countries will need to sell assets to the rest of the world to sustain consumption. This has raised concerns that one effect of population aging will be a global shortage of capital. It may be that increasing globalization can mitigate these negative effects. In reviewing the literature in this area, the authors organized their findings around four sets of questions, which Drs. Bosworth and Bryant addressed in turn.

Saving Within a Single Nation

The first question the authors addressed is whether the literature supports the predictions of the life cycle model regarding the impact of the changing age structure on aggregate household saving. The life-cycle model posits that individuals will save during their working years and spend these savings during retirement to maintain their standard of living. Thus, the aggregate saving rate depends critically on the relative size of different age cohorts in the population. Subsequent research has expanded the model to include the influence of factors that could alter the basic prediction. Such variables include uncertainty, liquidity constraints, and the desire to leave a bequest.

Dr. Bosworth discussed their review of the empirical evidence across micro and macroeconomic analyses showing that, in general, saving rates are affected by age and by the age profile of the population. The majority of studies that evaluate the life cycle hypothesis have been based on evidence at the household or individual level. Although the empirical results largely conform to the predictions of the model, they also suggest that the overall effect of demographic shifts will

be small. The magnitude of dissaving (spending of saved assets) during retirement is small. In fact, a notable fact found across studies is that many people reach retirement with little or no savings at all.

In contrast, macroeconomic studies, which often rely on cross-national panel data, have found stronger effects of aging on aggregate saving. There are a variety of reasons for this divergence of results across micro and macroeconomic studies. One complication is that the distribution of wealth and saving across households is highly unequal. A small percentage of households account for a large share of wealth, and the behavior of these households is not captured in most individual or household surveys. If their saving behavior differs significantly from that of average households, the effect of the age distribution on aggregate saving may differ from the effect implied by the behavior of the median household. Another potential reason for the discrepancy may be that the microeconomic analyses often fail to incorporate fully pension fund saving.

They show that the results of the studies reviewed are highly sensitive to variations in model specification and to the sample

of countries included in the analysis. The question of whether population aging is going to lead to a saving surplus or shortage is highly significant for the global economy; yet the answer remains elusive. A careful study of panel data for a large sample of countries using aggregate data holds promise for improving our knowledge of the effects of population aging. Aggregate data across many countries offers more variation in age structure over time and can deal correctly with pensions. The alternative is to improve microeconomic data to incorporate defined benefit accruals as part of saving.

Domestic Investment and the Saving-Investment Balance

Relative to effects on saving, little research attention has been paid to the effects of the changing population age structure on rates of national investment. Yet the potential impact might be just as important. A standard model of economic growth posits that growth in output is determined by growth in the size of the labor force, technical change, and increase in capital per worker. Capital stock should increase with output to avoid an increase in the rate of return. Growth in output and capital stock is a

function of labor force growth and technical change. Dr. Bosworth, however, noted that little research has been done to examine the potential link between labor force growth and technical change. It may be that rapidly increasing technical change could offset the shrinkage of the labor force.

Empirical studies have used time-series or cross-national differences in the timing of demographic change to infer the effects of population aging. Dr. Bosworth cited studies which tend to show that slower labor force growth associated with population aging will reduce the demand for domestic investment. This may offset part or all-of-the decline in domestic saving. Higgins has done much of this work and has shown that the decline in investment would be greater than the decline in saving projecting out to 2025, with industrial countries ending up with current account surpluses. Bosworth and others replicated this analysis, extending it to 2050, and found that current account balances of high income countries could be negative, when the decline in national saving exceeds the drop in domestic investment. Dr. Bosworth noted that this demonstrates how sensitive findings in this area are to relatively modest changes in the

research design and data employed.

Panel data for a large sample of countries might generate more refined estimates of demographic effects. Future research in this area may also benefit from examining data for private and public-sector investment disaggregated by industry. This could be useful in assessing whether saving and investment demand are in sync or not. For example, if the elderly demand a lot of capital in the form of big houses and hospitals with high-tech equipment, then investment demand would be stronger. It is also important to further explore the linkage between labor force growth and technological change because the rate of technological change is an important determinant of the demand for capital. Some suggest that an aging labor force might be less innovative, but other studies suggest the opposite might be true. Clearly more work is needed in this area.

Asset Prices and Relative Returns

The third set of questions addressed the potential influence of the population age structure on financial markets. Specifically, Dr. Bosworth reviewed research evidence on

The effect of demographic change on asset returns depends on whether the saving-investment equilibrium produces a faster increase in the capital stock relative to labor supply.

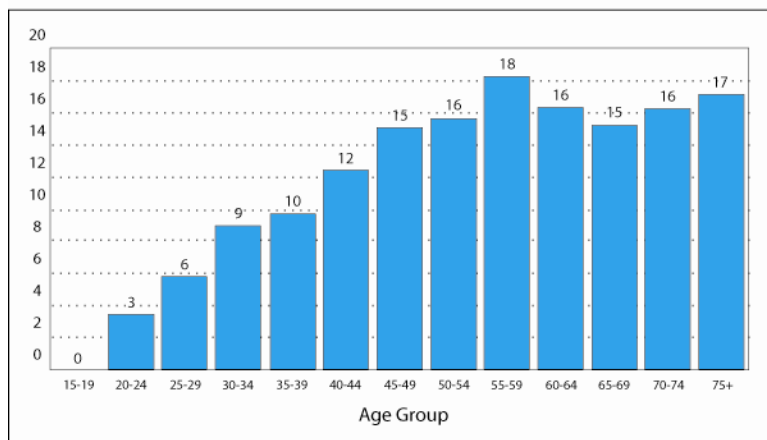
the effects of future aging on asset prices. The effect of demographic change on asset returns depends on whether the saving-investment equilibrium produces a faster increase in the capital stock relative to labor supply. If this is so, the real rate of return on capital will fall. A second mechanism through which population age structure can affect assets is through the differential relative demand. If workers systematically vary their investment portfolios as they age, and if potential age-related preferences remain steady over time, shifts in the age composition of the population could have effects on the demand for different kinds of assets.

Dr. Bosworth cited a study by Mankiw and Weil from 1989 which used housing to illustrate this point. These researchers found that most of the

measurable impact of demographic swings was reflected in home prices. The two-decade rise in home prices starting in the late 1960s was mainly driven by the entry of the baby boom generation into ages in which housing demand rises. They forecast a long-term decline in housing prices after 1980 when the population past 40 would become relatively large compared to 20 to 40 year olds. Of course, housing prices have risen steadily in the 1990s, suggesting caution in making projections of this sort.

Other empirical studies have examined portfolio allocations as a function of age, but have found that the data do not conform to either popular investment advice (which recommends investors reduce the portfolio share of risky assets as they age) or with the optimal portfolio path suggested by the Merton-

Figure 3: Common Stocks as a percent of net worth



Samuelson theory (in which the optimal portfolio is independent of an investor's age). Figure 3 shows results of work by Poterba which illustrates this fact. Measured as a percentage of net worth, equity investments represent an increasing share of portfolios through age 55-59 and slightly decreasing share thereafter. This demonstrates that investors do not tend to shield themselves from risky assets at older ages. Other work by Poterba tends to support the claim that age structure is an important determinant of U.S. stock market prices, but results are inconsistent across countries studied. Dr. Bosworth also cited the work of Davis and Li, which extended Poterba's work to include a larger number of countries. It found evidence of demographic effects on asset prices, but results were extremely sensitive to model specification and in some were cases opposite to what Poterba found.

Overall, analysts have found inconsistent evidence of an effect of population age structure on asset prices and returns. The effects of demographic factors are sensitive to the start and end dates of the period analyzed and to the countries included in the sample. Researchers have found that estimated demographic effects have the opposite sign in

similar countries, like the United States and Canada.

The strongest evidence for an effect of demographic change on asset prices comes from microeconomic studies, but microeconomic surveys lack crucial information about asset demand. In particular, Dr. Bosworth asserted that assets held in employer-sponsored defined benefit pension plans should be included in the estimates, even if data imputation is required.

Open-Economy Aspects of the Saving-Investment Balance

Dr. Bryant addressed the last, but perhaps most complicated, of the three sets of questions: how should increasing global integration affect our interpretation of the effect of demographic changes on a nation's saving-investment balance? He began by offering some background which shows that increasing global integration has linked macroeconomic variables across national borders more closely today than was the case in the past. This means that more of the macroeconomic adjustment to shocks is going to occur through external sector transactions and exchange rates than was true before. According to Dr. Bryant, this suggests that

National capital
markets are far from
fully integrated.

the gap between national saving and domestic investment ought to fluctuate more than before.

Research first triggered by Feldstein and Horioka has repeatedly demonstrated that there is a high correlation in cross-country data between saving and domestic investment. Interpretation of this correlation has been controversial with some emphasizing the fact that there are still significant barriers at borders and that capital markets are imperfect. Given this, we might expect the correlation to remain high. Another interpretation is offered by Taylor, who suggests that the need for nations to satisfy inter-temporal long-run budget constraints may help explain why any one nation would exhibit this correlation.

Other research seems to confirm that national capital markets are far from fully integrated. Specifically, Dr. Bryant explained, domestic residents tend to invest a disproportionate share of their net worth in domestic assets despite potentially higher rates of return on foreign investments. However, recent evidence tends to show that this home bias is weakening somewhat as cross-border integration has continued to increase. For example, the correlation between domestic

investment and national saving has fallen sharply within the European Union as economic integration has risen. Dr. Bryant noted that demographic transitions occurring in countries vary widely in their pace and intensity. Because of this, the macroeconomic evolutions of individual countries are strongly influenced by external-sector transactions and exchange rate changes. He cited research showing that countries with faster aging have an appreciation of their currency, an improvement in their terms of trade, a current account surplus, and a build-up of a net foreign asset position. In short, investment declines more than national savings, yielding these effects. These changes partly cushion rapidly aging economies from their larger demographic shocks; the openness of their economies works to mitigate the negative consequences for domestic output and production. The obverse will likely be true for countries that are aging more slowly.

Dr. Bryant concluded his remarks by previewing his current work with colleagues in the Brookings/Australian National University (ANU) research team. Reflecting the thinking of the team of

scholars, he proposed that cross-border and global issues about the consequences of demographic change are best addressed within a general equilibrium framework that incorporates endogenous macroeconomic interactions among national economies. Without it, research studies cannot adequately capture spillover effects from one national economy to another and the net consequences for global savings and investment. He acknowledged that this is difficult and slow-moving work for a variety of reasons.

Improved empirical research on capital flows and the cross-border aspects of countries' saving-investment balances, Bryant acknowledged, is limited very significantly by the lack of appropriate data. He concluded his remarks by outlining some of the strengths and weaknesses, which are discussed in detail in their paper, of the model the team is developing.

Discussants

Marilyn Moon, Vice President and Director of Health Programs at the American Institutes of Research, offered comments from a microeconomic point of view. She began by acknowledging the difficulty of

the kinds of macro-economic analyses presented as well as emphasizing their great importance for policy. She suggested that it is important to keep in mind the question of inequality within and across countries. For example, the notion of the crowding out of savings by pension policies may make sense in the aggregate but may have important distributional impacts. Her comments emphasized the importance of keeping the discussion of how vulnerable populations will be treated in the forefront as reforms are enacted.

Dr. Moon also addressed the issue of retaining workers in the labor force longer and suggested researchers think in terms of what kinds of labor are going to be required in an aging society. She noted that health care is another aspect of global aging that is intertwined with the problems of public pension systems. She suggested that we need to deal with costs in a broader context. Health benefits are not unrelated to the question of longer work lives.

Moritz Kraemer, Director of the Sovereign Ratings Group at Standard and Poor's (S&P), pointed his comments to what aging means for public finances. Dr. Kraemer shared the results of a recent study S & P had

undertaken to project future credit ratings. The study concluded that within the next 25 years, if no reform is undertaken, aging will have such a large impact on some European countries that the triple A rating of those nations will be all but extinct. He suggests that the policy implication is for nations to improve fiscal performance as much as possible and as soon as possible. He also suggests that it is important not to overstate the role that increased exports can play in offsetting the shortfall in domestic demand

Andrew Abel, Professor of Economics at Wharton, discussed several aspects of the day's presentations, focusing especially on concerns about so-called "asset meltdown."

First, Professor Abel noted that in previous discussions of saving and investment, one could think of several different measurement approaches. The most common follows the National Income and Product Accounts (NIPA): domestic investment equals GDP less domestic consumption and net exports; domestic saving equals residents' income less their consumption. Another approach defines domestic saving as the difference between residents' end-of-period net worth and their beginning-of-

period net worth. This second measure includes capital gains. The corresponding measure of investment includes NIPA investment (i.e., production of new capital goods) plus price appreciation on existing capital. Needless to say, the empirical difference between the two approaches has been great in the last decade – which saw first large positive, then large negative, capital gains. A comprehensive model must provide an interpretation of the difference, and, in fact, the literature suggests several plausible stories.

Professor Abel bases his discussion of a possible "asset melt down" on an interpretation of capital gains in which the price of new investment goods rises when new investment is high relative to the existing capital stock. In his story, as the Baby Boomers near retirement, they save heavily. This leads to a period of high domestic investment; hence, the price of new investment goods rises. The latter rising price generates capital gains on existing capital. Soon, however, the Baby Boomers will retire in large numbers. Aggregate saving will then fall; in fact, the retirees may begin to dissave. If falling saving leads to reduced domestic investment, the price of investment goods should fall –

leading to a period of capital losses on existing capital. This would be an asset meltdown story: as Baby Boomers retire and seek to liquidate their savings, they will find their net worth lower than they had hoped because of capital losses.

Professor Abel then extended his analysis to an open economy. In particular, he asks how the recent very rapid growth in China might change the outcome predicted above. He concludes that a high rate of new investment accompanying the rapid growth of output in China may sustain a relatively high price for new investment goods worldwide. This would block the capital losses predicted in the closed-economy model of the previous paragraph, thereby conceivably preventing an asset meltdown. He concludes that many difficult and controversial elements remain in this analysis and that more research is needed.

Conclusion and Wrap-Up

John Laitner closed the proceeding by thanking the participants and emphasizing the value of this kind of interaction. The challenges and opportunities of the global economy define our common future. Research that explores the impact of the aging population on the global economy will continue to be relevant and necessary well into the future as policy makers grapple with these challenges and embrace the opportunities.

Biographies

Andrew B. Abel is the Ronald A. Rosenfeld Professor of Finance at the Wharton School, a Research Associate of the National Bureau of Economic Research, a member of the Advisory Committee of the Carnegie-Rochester Conference Series, and a member of the Panel of Economic Advisors and the Long-Term Modeling Group of the Congressional Budget Office. His major fields of interest are macroeconomics and asset pricing. His textbook, *Macroeconomics*, co-authored with Dr. Ben Bernanke of Princeton University, is widely used at colleges and universities around the world. He received an A.B. in Economics summa cum laude from Princeton University and a Ph.D. in Economics from the Massachusetts Institute of Technology.

Axel Börsch-Supan is Director of the Mannheim Research Institute for the Economics of Aging (MEA) and Professor for Macroeconomics and Public Policy at the University of Mannheim, Germany. He is chairman of the Council of Advisors to the German Economics Ministry, co-chaired the pension reform group of the German social security reform commission, coordinates the EU-financed Survey of Health, Aging and Retirement in Europe (SHARE),

and leads the special research group on behavioral economics (SFB504). He is member of the Berlin-Brandenburg Academy of Sciences and the German Academy of Sciences “Leopoldina”.

Barry Bosworth is Senior Fellow in the Economic Studies Program (the Robert V. Roosa Chair in International Economics) at the Brookings Institution in Washington D.C. where his research has involved work on the determinants of economic growth in developing countries, saving, and capital formation. In addition, his current projects include a study of the economic consequences of population aging, productivity growth in U.S. services-producing industries, and a study of policies to promote economic growth in Puerto Rico. Mr. Bosworth has been a Senior Fellow since 1979 and served as a research associate from 1971-77. He was Director of the President’s Council on Wage and Price Stability in 1977-79; Visiting Lecturer at the University of California, Berkeley, 1974-75; and Assistant Professor, Harvard University, 1969-71. He received his Ph.D. from the University of Michigan in 1969.

Ralph C. Bryant has been a Senior Fellow in the Economic

Studies program of the Brookings Institution since 1976. His primary fields of expertise are international economics, monetary economics, and macroeconomic policy. Prior to joining Brookings, Bryant was Director of the Division of International Finance at the Federal Reserve Board and the international economist for the Federal Reserve's Federal Open Market Committee. He has frequently participated in advisory groups and served as consultant to organizations such as the Federal Reserve, the U.S. Treasury, the Congressional Budget Office, the World Bank, the IMF, the OECD, and the National Science Foundation. Bryant's latest book is *Turbulent Waters: Cross-Border Finance and International Governance* (Brookings, June 2003). He is currently working on three companion essays to *Turbulent Waters*, each addressing specific aspects of pragmatic choices for international financial governance. The first volume, *Crisis Prevention and Prosperity Management for the World Economy*, will be published in June 2004. Bryant received his bachelor's degree from Yale University in 1960. As a Rhodes Scholar, he received a B. Phil degree in Economics from Oxford University in 1963. In 1966, he was awarded a Ph.D. in Economics from Yale University.

Edward Gramlich took office as a Member of the Board of

Governors of the Federal Reserve on November 5, 1997, to fill an unexpired term ending January 31, 2008. Prior to this, Dr. Gramlich served as Dean of the School of Public Policy at the University of Michigan from 1995 to 1997. He also served as Professor of Economics and Public Policy at the University of Michigan (1976-97), Chair of the Economics Department (1983-86) (1989-90), and Director of the Institute of Public Policy Studies (1979-83) (1991-95). Dr. Gramlich has extensive governmental experience. From 1994 to 1996 he served as Chair of the Quadrennial Advisory Council on Social Security, a body established to examine the actuarial finances of social security and to suggest policy changes. In 1986-87 Dr. Gramlich was both Deputy and Acting Director of the Congressional Budget Office. He also served as Director of the Policy Research Division at the Office of Economic Opportunity (1971-73), Senior Fellow at the Brookings Institution (1973-76), and in the Research Division at the Federal Reserve Board (1965-70). Dr. Gramlich also has a strong research record, on a wide range of issues. In 1992 he was the staff director for the Economic Study Commission of major league baseball. He is in his second edition of a popular text on benefit-cost analysis, and has also authored several other

books and many articles on topics such as macroeconomics, budget policy, income redistribution, fiscal federalism, social security, and the economics of professional sports.

Alan L. Gustman is the Loren M. Berry Professor of Economics at Dartmouth College, joining the faculty in 1969. He is also a Research Associate at the National Bureau of Economic Research (NBER) in their programs in Labor Studies and Aging, serves as a Co-Principal Investigator of the Health and Retirement Study (HRS) and is a member of the Executive Committee of the University of Michigan Retirement Research Center. For almost two decades, Gustman's research has focused on four central issues in labor economics and the economics of aging: retirement, pensions, Social Security and saving.

Peter S. Heller was Educated at Trinity College (USA) and received a Doctorate in Economics from Harvard University. He taught economics at the University of Michigan in Ann Arbor from 1971-77. Since then, he has worked for the IMF, working largely on fiscal policy issues in countries as diverse as China, India, Somalia, Thailand, Japan, Ethiopia, Korea, Kenya, Indonesia, Israel, Jordan, Bosnia,

Slovenia, and Russia. He has published extensively in a number of areas, relating principally to fiscal policy, economic development and poverty reduction, aging populations, public expenditure policy, health care reforms in developing countries, pension and civil service reform, climate change, privatization, and globalization. In recent years, he participated in the World Health Organization's Commission for Macroeconomics and Health and the Millennium Task Force of the United Nations. Author or *Who Will Pay? Coping with Aging Societies, Climate Change and other Long-Term Fiscal Challenges*

Richard Jackson is currently a senior fellow at the Center for Strategic and International Studies (CSIS), where he directs the Global Aging Initiative, a research and educational program devoted to exploring the long-term implications of population aging. Jackson is also an adjunct fellow at the Hudson Institute and a senior advisor to the Concord Coalition. Jackson is the author of numerous policy studies and is widely quoted in the national and overseas media. He holds a B.A. from SUNY at Albany and a Ph.D. in economic history from Yale University.

Moritz Kraemer joined Standard & Poor's in February 2001 as a Director in the Sovereign Ratings group, where his primary responsibility is the coverage of Europe. From 1996 through 2001 he was an Economist with the Inter-American Development Bank in Washington DC, working with governments in Latin America in the design and implementation of economic policy reforms (mainly fiscal reform and decentralization). He holds a Ph.D. in Economics from the University of Göttingen (Germany), where he was a researcher and lecturer at the Ibero-America Institute of Economic Research and the Faculty of Economics from 1992 through 1996. He studied Economics, Latin American Studies and Literature in Frankfurt, Southampton and San Diego.

John P. Laitner is Director of the Michigan Retirement Research Center, Senior Research Scientist at the Institute for Social Research, and Professor of Economics at the University of Michigan. His research falls primarily in the area of economic theory, in particular, factors influencing long-run growth, technological change, and the distribution of wealth. Among his recent publications are the following: "Intergenerational and Interhousehold Economic

Links," ch. 5 of Handbook of Population and Family Economics, North-Holland, 1997; "Earnings within Education Groups and Overall Productivity Growth," Journal of Political Economy, August 2000; "Secular Changes in Wealth Inequality and Inheritance," Economic Journal, October 2001; and "Technological Change and the Stock Market" (with D. Stolyarov), American Economic Review, September 2003. He received his Ph.D in economics from Harvard.

Marilyn Moon is Vice President and Director of the Health Program at the American Institutes for Research. She is a nationally-known expert on Medicare. She previously served as a Senior Fellow at the Urban Institute and as a public trustee for the Social Security and Medicare trust funds. Marilyn Moon has written extensively on health policy, both for the elderly and the population in general, and on social insurance issues. Recent publications include: "A Place at the Table: Women's Needs and Medicare Reform" and "Stretching Federal Dollars: Policy Trade-Offs in Designing a Medicare Drug Benefit with Limited Resources." Dr. Moon is the Program Director for the Commonwealth Fund's Program on Medicare's Future. Dr. Moon

earned a Ph.D. in economics from the University of Wisconsin--Madison. Previously, she was an associate professor of economics at the University of Wisconsin-Milwaukee, a senior analyst at the Congressional Budget Office, and the founding Director of the Public Policy Institute of the American Association of Retired Persons.

Sylvester J. Scheiber is vice president of research and information at Watson Wyatt Worldwide. He holds a Ph.D. in economics. He was a member of the 1994-1996 Social Security Advisory Council and has served on the U.S. Social Security Advisory Board since 1998. He has authored or edited ten books on changing demographics and retirement security. His book, written with John Shoven of Stanford University, *The Real Deal: The History and Future of Social Security*, published by Yale University Press in 1999 won a certificate of merit in the annual Paul A. Samuelson prize competition for economic writings in 2000. He recently finished the eighth edition of the *Fundamentals of Private Pensions* with co-authors Dan McGill, John Haley and Kyle Brown which is being published by Oxford University Press. In January 2004, he completed a report for the World Economic Forum on population aging in

the developed economies of the world and its economic implications that will be published later this year. Dr. Scheiber has written numerous journal articles and papers on retirement and health benefits issues. He is a frequent speaker before business and professional groups and Congressional Committees.

John Shoven is the Charles R. Schwab Professor of Economics at Stanford University. He has been at Stanford since receiving his Ph.D. from Yale in 1973.

At Stanford he has served as Chairman of the Economics Department, Director of the Center for Economic Policy Research and Dean of the School of Humanities and Sciences. He is a Research Associate of the National Bureau of Economic Research and serves as the Director of their West Coast office. He assumed the Directorship of the Stanford Institute for Economic Policy Research in November of 1999.

Professor Shoven is also on the Board of Directors of Cadence Design Systems. He is a member of the American Academy of Arts and Sciences, and has authored or co-authored more than a dozen books and over one hundred professional articles. His latest books, *The Real Deal:*

The History and Future of Social Security (Yale University Press, October 1999) and *Should the United States Privatize Social Security?* (MIT Press, 1999) were published in the summer and fall of 1999.