



Diverting The Old Age Crisis: International Projections of Living Standards

Dean Baker

February 2001

Center for Economic and Policy Research

1611 Connecticut Avenue, NW, Suite 400

Washington, D.C. 20009

202-293-5380

www.cepr.net

Contents

Introduction	2
Projections of After-tax Wages	8
The Impact of Health Care Costs.....	11
The Impact of Wage Inequality.....	14
Comparing the Impacts.....	16
Conclusion	19
Appendix.....	21
References.....	24

About the Author

Dean Baker is co-Director at the Center for Economic and Policy Research in Washington, DC.

Introduction

In recent years, a major topic of national debate has been the aging of the population. The media have presented numerous accounts of the costs associated with supporting the much larger population of retirees that the nation is projected to have in twenty or thirty years. Members of Congress have put forward numerous proposals to cut Social Security and Medicare to reduce the public sector costs of supporting a larger elderly population. The cost of these programs is likely to be a major issue in future elections.

To a lesser extent this debate is also being carried on in other industrialized nations. All of the industrialized nations face the same "problem." Improvements in living standards and medical technology are allowing people to live longer lives. Therefore all of them are looking at a future where the portion of the population over age 65 will be considerably greater than it is at present, although the exact timing of this demographic change differs across nations. Several years ago the World Bank recently devoted a volume to addressing this topic, "Averting the Old Age Crisis" (1994).

An increase in the relative size of the population of non-working elderly people will impose costs on the rest of society. But it is not evident that the size of these costs is of sufficient magnitude to warrant the attention that the issue has received. Nations have often absorbed much larger costs without viewing them as posing a "crisis." For example, in the United States, the increase in military spending associated with the Cold War was far larger measured as a share of GDP than the projected increase in spending associated with supporting a larger population of retirees. It is also worth noting that this increase took place over a just a few years rather than several decades. Furthermore, in looking forward at future living standards, it is not evident that the aging of the population will loom as such an important factor. There are other factors that will also have a major impact on the living standards of future generations.

This chapter examines the impact of three of those factors, productivity growth, health care expenditures, and inequality, and compares their relative impact on living standards across nations, to the impact of the aging of the population. This sort of cross-national comparison can help focus attention on what will actually be the most important factors determining living standards for typical families in the next century. It is also worth noting, that unlike the aging of the population, the other three factors examined in this paper can all be affected (albeit, not easily) by policy. Insofar as it can be shown that these factors will have comparable or larger impacts on future living standards, it may be appropriate to focus public attention on these areas rather than a demographic phenomenon about which little can be done.

This chapter builds on an earlier study (Baker, 1998) which constructed projections of income for families in the United States in the 21st century. This study relied on projections of wage and GDP growth from the Social Security Trustees Report to project before tax income at various dates in the next century. It used projections of the increase in Social Security costs from this report and Medicare and Medicaid costs from the Health Care Financing Administration to construct projections of after-tax income. It also used the Health Care Financing Administration's projections of health care costs to derive projections

of "after-tax after health care income," the money that families will have left over, after paying both their taxes and their health care expenses. Finally, it imposed on these growth patterns recent trends in wage inequality to determine how families at various points along the income ladder are likely to fare.

This chapter produces a similar set of projections for various OECD nations. These projections are intended only to give a general order of magnitude of the relative impact of these trends in each nation. Producing a more accurate projection of the expected impact would require a considerably greater degree of knowledge of each nation's institutional structure than is used in this paper. Nonetheless, the calculations produced here can be instructive, both since they do provide a preliminary estimate of the relative magnitudes of each of these factors across nations, and they provide a framework in which a more detailed analysis can be conducted.

The chapter has five parts. The first section constructs projections of wage growth for several OECD nations by extrapolating from past rates of productivity growth. The second section presents projections of after-tax wages that incorporate the impact of the aging of the population on national tax rates. The third section constructs projections of after-tax after health care income, which project recent trends in the growth of health care costs in both the private and public sector. The fourth section presents projections for the median family's after-tax after health care income, which is based on recent trends in wage inequality in each nation. The fifth section compares the relative importance of each of these factors and the differences in the impact across nations.

Summarizing the findings, the projections show:

* Differences in national rates of productivity growth, if they persist, will have a far larger impact on future living standards than any of the other factors examined. The impact of the variation in rates of productivity growth will on average be nearly four times as large as the higher projected tax burden associated with an aging population. This means that if the slower growing nations, such as the United States, can bring their productivity growth rates closer in line with the overall average, it will have far more impact on the living standards of future generations of workers than any savings that can be had by restructuring public pension systems.

* The impact of trends in inequality is potentially far larger for the typical family than the impact of tax increases associated with an aging population. In most OECD nations, there appears to have been some increase in wage inequality in the last two decades, with a larger share of wage income going to higher wage workers. This trend has been particularly pronounced in the case of the United States and the United Kingdom. On average, the projected impact of recent trends in inequality on the income of the median worker is approximately 50 percent greater than the projected impact of the tax burden due to an aging population. In the case of the United States the projected impact of inequality is more than three times as large as the tax burden associated with the aging of the population, and in the United Kingdom, more than four times as large.

The impact of growing health care costs on workers after-tax after-health care income may be comparable in size to the impact of the increased taxes associated with an aging

population. The trend in health care costs varies considerably across the OECD, with many nations having been quite successful in containing the share of GDP that goes to health care expenditures. In the cases where costs have not been successfully contained, the continuation of past growth rates will pose a large burden on future living standards. In the case of the United States, the burden associated with rising health care costs is projected to be more than twice as large as the burden associated with the aging of the population.

Comparative Rates of Productivity Growth

A simple examination of the data reveals large and persistent differences in the rate of productivity growth across nations. This is striking, because it might have been expected that with increasingly mobile capital, and a convergence of absolute levels of productivity, there would also be a convergence of growth rates. To date, this does not appear to have happened. The rate of productivity growth in several European nations that have largely caught up with the United States, most importantly France, Germany, and Italy, continues to be far more rapid than in the United States.¹ If this faster growth rate persists, these nations will have far higher levels of productivity than the United States by the middle of the next century.

Table 1
Trends in Productivity Growth

	OECD		Conference Board	Cumulative
	<i>GDP Per Worker, 1979-96</i>	<i>GDP Per Hour, 1979-96</i>	<i>GDP Per Hour, 1973-95</i>	<i>Productivity Growth 2030, 1995=100</i>
<i>Annual Percent Change</i>				
Australia	1.2	1.3	1.4	162.7
Austria	1.8		2.2	214.2
Belgium	1.8		2.6	245.6
Canada			1.4	162.7
Denmark	1.7		1.7	180.4
Finland	2.6	2.8	2.3	221.6
France	1.8	2.4	2.5	237.3
Germany	1.9	2.6	2.6	245.6
Ireland	3.5		3.7	356.7
Italy	2		2.4	229.3
Japan	2.1	2.8	2.7	254.1
Netherlands	1		2.1	207
New Zealand	1.3			157.2
Norway	2.3	2.8	2.9	272
Portugal	2		1.3	157.2
Spain	2.4	3	2.9	272
Sweden	1.8	1.4	1.4	162.7
United Kingdom	1.8	2.1	2.1	207
United States	0.9	0.8	1	157.2
Average				215.9

Notes: Cumulative productivity numbers use the Conference Board data, except in the case of New Zealand. The U.S. productivity projection is taken from the 1999 Social Security Trustees Report. Source: Schmitt and Mishel (1998) analysis of OECD and Conference Board data.

¹ As a result of its recent acceleration, productivity growth in United States has been more rapid than in most other OECD nations over the last five years. However, in most cases, the acceleration has not been enough to offset the relatively slow growth of the prior fifteen years. It is also worth noting that the Social Security and Medicare trustees have not raised their projections for future productivity growth as a result of this acceleration.

Table 1 presents the reported rates of productivity growth in recent years for several OECD nations. It presents data from the OECD and the Conference Board. (The projections in this and other tables are explained in more detail in the appendix.) These sources use somewhat different methodologies, so the fact that they mostly arrive at similar results should provide a considerable degree of confidence in the measurements. As can be seen from the table, several nations have managed to maintain annual rates of productivity growth at or above 2.0 percent, compared to an annual rate of approximately 1.0 percent in the United States.² For some nations, the rapid rate of productivity growth can be attributed to their low absolute level of productivity. These nations are in a process of catching up to the leaders which allows them to borrow from the technological advances already achieved elsewhere.

Table 2
Productivity Levels

	BLS	BLS	Conference Board
	GDP Per Worker,	GDP Per Hour,	GDP Per Hour,
	1996	1996	1995
Australia	NA	NA	76
Austria	74.3	NA	83
Belgium	75.9	NA	97
Canada	76.2	NA	85
Denmark	77.9	NA	74
Finland	NA	NA	74
France	71.6	100.4	102
Germany (west)	80.2	106.8	101
Ireland	NA	NA	84
Italy	70.3	NA	90
Japan	81.0	70.9	68
Netherlands	72.6	NA	98
New Zealand	NA	NA	NA
Norway	84.7	107.6	88
Portugal	NA	NA	38
Spain	NA	NA	70
Sweden	67.1	82.9	79
United Kingdom	65.1	NA	84
United States	100.0	100	100

Source: Conference Board 1998 and Bureau of Labor Statistics 1999.

But most of the nations with more rapid productivity growth can no longer be viewed as catching up. Table 2 presents data on output per worker hour from the Bureau of Labor Statistics and the Conference Board. While nations such as Ireland and Japan are clearly still in the catch up phase, many of the nations experiencing significantly more rapid productivity growth than the United States already have achieved essentially the same absolute level of

² The comprehensive revisions to GDP numbers published in October of 1999 show considerably more rapid productivity growth than the previously published numbers. However, this revision has had little impact on official projections. The Social Security Administration's 1999 Technical Panel on Assumptions and Methods, which had a general knowledge of the nature of the revisions prior to issuing its report, projected future productivity growth for the United States of 1.35 percent annually (Social Security Technical Panel, 1999).

productivity. This is clearly true for the three largest economies in Europe, France, Germany, and Italy.

TABLE 3
2030 GDP Per Worker Hour

	OECD Growth Rate	Conference Board Growth Rate
	U.S.-1995 = 100	
Australia	119.4	100.4
Austria	184.0	139.8
Belgium	194.0	200.8
Canada	120.4	108.5
Denmark	153.2	148
Finland	255.2	194.5
France	218.5	184
Germany (west)	148.1	314.7
Ireland	320.5	529.3
Italy	186.3	236.6
Japan	145.6	184.9
Netherlands	170.8	159.4
New Zealand	NA	NA
Norway	164.3	223.6
Portugal	87.2	45.2
Spain	184.0	249.7
Sweden	158.0	115.9
United Kingdom	156.8	156.8
United States	157.2	157.2

Source: Conference Board 1998, Bureau of Labor Statistics 1999, and author's calculations.

If the divergence in growth paths persist, then several OECD nations will have significantly higher absolute levels of productivity than the United States by the middle of the next century. Table 3 combines the data on productivity growth and levels to project absolute levels of productivity for 2030. As can be seen, most nations will have far surpassed the United States in absolute levels of productivity, if they maintain their recent pace of productivity growth and productivity growth in the United States follows the path projected by the Social Security Trustees.

The last column in Table 1 projects productivity levels in 2030, setting each nation's productivity level in the year 1995 at 100. This index of productivity growth can also be applied to the growth of before tax wages. In long-term projections, it is usually assumed that the shares of income going to labor and capital stays constant, which means that real wages will rise at the rate of productivity growth.³ As can be seen, in most nations, real

³The assumption that the labor share of income remains constant is made explicitly in the Social Security Trustees Report (1999, p 148-9).

wages will have doubled by 2030. In the United States, they will have risen by slightly more than half, if the trustees' projections for wage growth are correct.⁴

Projections of After-tax Wages

This section incorporates the impact of an aging population to derive projections of after-tax wages. This projection combines the earlier projections of productivity and wage growth shown in Table 1, with projections of the increase in national tax burdens due to a larger elderly population.

The projected tax burden used to calculate after tax wages assumes that the share of GDP devoted to supporting retirees will increase in proportion to the elderly population. This increase is then assumed to be passed on in the form of a higher tax burden. This additional tax burden is assumed to be borne disproportionately by labor. The reason for this assumption is that most nations fund their public pension systems at least in part from a payroll tax, which is generally assumed to be a deduction from wages. While some amount of revenue from other sources generally supplements this tax, the share of pensions benefits paid out of taxes on labor is considerably higher than for most other forms of government spending. For purposes of this analysis, it is assumed that the capital share of the incremental tax burden is only half of its share of income (which is assumed to be 30 percent of GDP). The labor share of the tax burden is therefore correspondingly larger.

These projections involve several important simplifying assumptions. First, the assumption that expenditures on the elderly will increase in proportion to their share of the population is likely to exaggerate the actual increase. Many countries, such as the United States, have already increased the age of retirement for future beneficiaries, or taken other measures to reduce future benefit levels. For this reason, the numbers in these projections are likely to lead to an overstatement of the actual tax burden that would be projected, given current law.

The second key assumption in this calculation is that the proportion of GDP going to other categories of government spending stays constant. This is also likely to lead to a considerable overstatement of the increase in the tax burden. Government spending in many areas is almost certain to fall as a share of GDP. The flip side of an increasing population of retirees, is a smaller share of children in the population. In the United States, the percentage of the population that is under 20 is projected to fall from 28.9 percent in 1990 to 24.3 percent in 2030. Other things equal, this would be expected to lead to a proportionate reduction in education, childcare, and other government expenditures associated with raising children. In 1990, government expenditures on education in the United States were equal to 5.1 percent of GDP. The projected decline in the proportion of the population under age 20 in 2030 would imply a reduction of approximately 0.8 percentage points of GDP in government spending on GDP, if per pupil spending grew at exactly the rate of GDP over this period. By failing to include the impact of the decline in spending on education on other categories

⁴ This actually overstates wage growth somewhat since a portion of productivity gains will be taken in the form of shorter working hours and non-wage benefits. However, for purposes of these comparisons, wage growth can be viewed as being equal to productivity growth.

of expenditures related to raising children, these projections substantially overstate the expected increase in the tax burden.

The assumption that the additional tax burden will be disproportionately borne by labor may also lead to an overstatement in some cases. Several nations, such as Sweden and Denmark are now partially pre-funding their retirement systems through the purchase of private equities. Other countries, including the United States, are considering pre-funding through equity ownership. This in effect amounts to a tax on capital, since a portion of future profits will be paid out to the government to support the public pension system. This will lower the return available to other holders of private equities. The United States has also partially pre-funded its system by having a payroll tax that is higher than would be needed under strict pay as you go. This has allowed a surplus to be built up in the public fund, which will be repaid from general revenue, rather than the payroll tax. The primary sources for general revenue are the individual and corporate income tax. These taxes are borne primarily by higher wage earners and owners of capital. This means that as general revenue starts to be an important source of funding for Social Security, the tax burden for most workers will not rise as fast spending on the program.

These projections also assume that public sector's share of health care spending is not affected by the aging of the population, except in the United States. The reason for this assumption is that most healthcare spending in other OECD nations is already paid by the government. In these countries, aging would only lead to increased spending insofar as an older population will have higher per person costs. While there is some evidence that this is the case, the impact of an aging population on total health care costs is ambiguous. It is not easy to disentangle the impact of an aging population from rising health care costs more generally (Getzen 1992). For purposes of the projections of after-tax income, it will be assumed that the impact of higher health care costs due to aging is zero.⁵

In the United States, the vast majority of health care spending for most of the population is private. However, most health care spending for the elderly is provided publicly through Medicare and Medicaid. This means that as the population ages, the government will incur larger health care expenses, simply because the health needs of a larger segment of the population are being paid by the government. Therefore the aging of the population will lead to a significant increase in government spending on health care.

In order to distinguish between the impact of rising per person health care costs and the aging of the population, the projected impact of aging on public sector health care expenditures is a simple extrapolation based on the percentage of the population over age 65. This projection assumes that public sector spending on health care rises in proportion to the increase in the share of the population over age 65. The base is Medicare spending in 1990 plus 60 percent of Medicaid spending (approximately the share spent on people over age 65).

⁵ The effect of an aging population on health care costs can be ambiguous for two reasons. First, as society gets wealthier and healthier, it may cost less to care for a person at the same age, because they are likely to be more healthy. Second, rising cost pressures due to an aging population may lead to more to more effective means to control costs. This appears to have been the pattern in most OECD nations.

TABLE 4
Public Pension Spending as a Share of GDP

	1990 Share (Includes public employees)	Public Employee Share of Pension Spending	SS Type Pension	Increase by 2030
Australia	3.9	19.3	3.15	2.66
Austria	14.8	29.9	10.37	7.34
Belgium	11	30.6	7.63	4.24
Canada	4.2	5.8	3.96	3.70
Denmark	9.9	11.8	8.73	5.14
Finland	10.3	19.3	8.31	5.65
France	11.8	20.5	9.38	5.56
Germany	10.8	17.7	8.89	6.57
Ireland	6.1	19.3	4.92	5.60
Italy	14.4	15.6	12.15	9.03
Japan	5	2.5	4.88	4.42
Netherlands	9.8	19.3	7.91	6.93
New Zealand	7.5	19.3	6.05	4.62
Norway	10.1	19.3	8.15	3.23
Portugal	7.7	19.3	6.21	4.04
Spain	7.5	19.3	6.05	4.06
Sweden	11.6	19.3	9.36	4.54
United Kingdom	9.5	19.3	7.67	3.24
United States	6.5	25.9	4.82	3.37
U.S. With Medicare			6.93	4.84

Source: World Bank 1994, table A-5 and author's calculations.

Table 4 shows the projected increase in government spending as percentage of GDP due to the aging of the population between 1990 and 2030. As noted above, given the appropriate simplifying assumptions, these numbers can be viewed as the additional tax burden that will be borne by workers. The unweighted average for the group is 5.0 percentage points, although this number is boosted nearly half of a percentage point by the 9.0 percentage point jump shown for Italy. The increase in spending attributable to Social Security alone places the United States near the bottom of the list. (Factoring in the impact of the scheduled increase in the retirement age would lessen the impact of aging through this period by just over 0.5 percentage points of GDP.) However, when the projected increase in public sector health spending is included, the United States is placed just about in the middle of the list.

TABLE 5
Projections of Before and After Tax Wages for 2030

	1995 = 100	Before Tax	After-tax
Australia		162.7	154.5
Austria		214.2	175.5
Belgium		245.6	220.0
Canada		162.7	150.0
Denmark		180.4	155.7
Finland		221.6	188.4
France		237.3	202.5
Germany		245.6	207.4
Ireland		356.7	318.7
Italy		229.3	178.4
Japan		254.1	233.0
Netherlands		207	172.8
New Zealand		157.2	140.9
Norway		272	252.7
Portugal		157.2	143.0
Spain		272	248.8
Sweden		162.7	138.9
United Kingdom		207	193.5
United States		157.2	147.8

Source: Author's calculations

Table 5 combines the projected increases in tax burdens shown in Table 4 with the projected increase in real wages shown in Table 1, to produce projections for increases in after-tax wages. As can be seen, the relatively slow projected rate of productivity growth for the United States dominates the impact of the aging of the population in determining after-tax income. The United States is near the bottom in the projected growth of after tax wages, with slightly more than half the projected growth of Italy and the United Kingdom, and slightly less than half of the projected growth in France and Germany.

The Impact of Health Care Costs

The OECD nations have had very different experiences with health care cost growth over the last quarter century. In 1973, the United States already topped the OECD in the portion of GDP spent on health care, spending 7.5 percent. However, there were six other OECD nations that spent at least 6.5 percent of their GDP on health care, so health care expenditures in the U.S. would not have seemed exceptional at the time. But, in the years since 1973 health care costs have grown far more rapidly in the United States than in any other OECD nation. By 1997, health care spending as a share of GDP was more than 3.0 percentage points higher than in any other OECD nation. Several OECD nations, such as Belgium, Denmark, Italy, and Japan, manage to provide health care to their populations while spending less than 60 percent as much as the United States, measured as a share of GDP.⁶

⁶ Information on health care expenditures can be found in OECD Health Data 98.

The rapid increase in the cost of health care in the United States has had a significant impact on the income that workers have left over after paying their health care expenses. To some extent, these higher costs have been reflected in tax rates, most importantly the Medicare tax on wage income. The Medicare payroll tax has gone from 1.2 percent on the first \$33,700 (in 1999 dollars) of wage income in 1970, to a 2.9 percent rate on all wage income. Higher health care costs have also pushed up the portion of labor compensation going to non-wage benefits, as employers deduct more from wages to pay for workers' health care coverage. In 1972, 5.9 percent of labor compensation went to non-wage benefits. By 1997, the share of labor compensation going to non-wage benefits had risen to 11.8 percent. Rising health care costs were the main factor fueling this growth. If the share of non-wage benefits had not risen over this period, wages would have been more than 6.0 percent higher in 1997. Of course, people are also dealing with the increase in costs by going without health care insurance altogether. More than 40 million people now lack health insurance coverage at any point in time.

Other OECD countries have had problems containing health care costs, but in no cases has the increase been of the same magnitude. In Germany, health care costs rose by 3.0 percentage points of GDP between 1973 and 1997. This is a large increase, but less than half the 6.5 percentage point rise in the United States. In France and Italy the increases were 3.7 and 1.7 percentage points, respectively. These increases in health care spending, and others throughout the OECD, clearly impose somewhat of a burden on national budgets, but in no cases is that burden comparable to the burden that the population of the United States has experienced.

It also is not clear that the United States has much to show for its expenditures in terms of the health of its population. In life expectancy at birth, the United States ranks behind most of the other OECD nations. Its standing is somewhat better in the category of life expectancy at age 65, although even in this category it is not at the top of OECD.⁷ Part of the explanation for the relatively short life expectancies of people in the United States may lie in economic factors, such as high poverty rates and high levels of income inequality, or in social factors such as crime, all of which could be expected to have negative effects on health. However, even if these factors may explain a lower level of health in the United States, it would be reasonable to expect that the extremely rapid growth of health care spending in the United States would have led to some improvement in its health care statistics relative to other nations. This also appears not to have been the case. While life expectancy at birth increased by 4.5 years between 1973 and 1995 in the United States, it increased by 5.3 years in Germany, 5.5 years in Finland, and 5.8 years in Austria over the same period, all countries with higher life expectancies than the United States. It is possible that the social environment in the United States deteriorated over this period (there was a large increase in inequality), so that its relative health statistics would have fallen even more without this increase in spending, but this would be a difficult claim to evaluate. In any case, it is at least not evident what benefit people in the United States are receiving from its extraordinary level of health care spending.⁸ Regardless of the actual benefits received from

⁷ According to OECD data, life expectancy at age 65 in the United States in 1995 was 17.4 years. This is somewhat higher than the 16.9 year life expectancy in France, but below the 17.6 and 18.3 year life expectancies in Belgium and Canada, respectively.

⁸ It appears that higher physician salaries, larger expenditures on pharmaceuticals, and greater use of expensive procedures and equipment are the main factors that explain the higher health care costs in the United States

health care spending in the United States, it is still worth examining trends in living standards net of health care spending. In other words, health care spending can be viewed as a sort of tax, which like any other tax, may or may not provide benefits for its payer. However, without passing judgement on the worthiness of the tax, it is still possible to assess trends in workers' disposable income, their income net of the tax. Similarly, it is possible to examine trends in the income workers will have left after paying their health care expenses.

To construct these projections it is assumed that, in the period from 1995 to 2030, health care expenses will increase at the same rate, measured as share of GDP, as they did in the period from 1973 to 1995. This assumption will pick up the extent to which health care costs exceed the overall rate of economic growth regardless of whether the reason is higher than average inflation in the health care sector, the increased use of medical services by all segments of the population, or an increase in medical services due to the aging of the population. In most OECD nations, there was a considerable increase in the portion of the population over age 65 in the years from 1973 to 1995. In most cases, the rate of increase in the size of the elderly population will not be very different in the years from 1995 to 2030.

TABLE 6
Growth projections for After-Tax After-Healthcare Wages

	Growth in Health Care Spending as a Share of GDP	Growth as a Share of After- Tax, After- Health Care Wages	After-tax, After- Health Care Wages, 1995 = 100	After-tax Wages, 1995 = 100	Before-tax Wages, 1995=100
Australia	3.5	7.1	143.5	154.5	162.7
Austria	3.6	11.1	156.1	175.5	214.2
Belgium	4.4	12.0	193.6	220.0	245.6
Canada	3.5	8.3	137.5	150.0	162.7
Denmark	1.7	5.4	147.3	155.7	180.4
Finland	2.0	6.4	176.4	188.4	221.6
France	5.4	17.2	167.7	202.5	237.3
Germany	4.4	12.5	181.5	207.4	245.6
Ireland	0.7	1.6	313.7	318.7	356.7
Italy	2.5	7.9	164.4	178.4	229.3
Japan	4.1	8.4	213.5	233.0	254.1
Netherlands	2.6	7.6	159.6	172.8	207
New Zealand	3.0	7.7	130.0	140.9	157.2
Norway	2.8	6.6	236.0	252.7	272
Portugal	6.2	16.2	119.8	143.0	157.2
Spain	4.5	10.5	222.8	248.8	272
Sweden	1.9	7.2	128.9	138.9	162.7
United Kingdom	3.0	6.6	180.7	193.5	207
United States	9.4	20.5	127.3	147.8	157.2

Source: OECD 1998 and author's calculations.

Table 6 shows the projected increase in health care costs measured as a share of GDP for each nation, and as a share of projected after-tax after-health income in the year 2030. The third column gives an index for the projected level of after-tax after health care income for

(Anderson and Poullier, 1999) The higher administrative costs associated with a decentralized system are also an important factor.

each country in the year 2030.⁹ The fourth column presents the index for projected after-tax income from table 5, and the fifth column shows the index for projected before-tax wage growth from table 1. As can be seen, the projected impact of rising health care costs on after-tax after-health income is substantial. For several countries it is considerably larger than the projected impact of the tax burden associated with the aging of the population and in almost every case, the impact is at least of a comparable magnitude.

It is worth noting that these projections make the same assumption about the division of taxes associated with health care costs as the earlier set of projections did about the additional taxes needed to support the pension system. In both cases, it is assumed that capital's share is half its proportion of national income.

The Impact of Wage Inequality

In projecting future living standards, it is important to consider trends in inequality, since most workers will not benefit if wage gains are concentrated at the top end of the distribution. This analysis focuses on the impact of wage inequality on the wages of the median worker, since this should provide a basis for assessing how a typical worker will be living. In principle, it is possible to do a more detailed analysis, where trends could be projected by wage quintile or decile (see Baker 1998). The projections for the median worker developed in this section should at least be an improvement over an analysis that focuses exclusively on average wages without regard to distribution.

There has been a tendency towards increasing wage inequality in several OECD nations over the last two decades. This trend has been most pronounced in the United Kingdom and the United States. In the case of the United States, the increase in inequality has been sufficiently large that real wages have actually fallen for the median worker, in spite of a cumulative rise in productivity of more than 20 percent over this period. In other OECD countries, the trend in relative wages is less clear. Italy may have also experienced a significant increase in inequality, although its starting point was a position of relative equality. There was some rise in inequality in most countries, although generally the increase was not large and may be sensitive to the endpoints chosen or the yardstick used to measure inequality. Germany and Belgium actually experienced a decline in inequality over the last twenty years.¹⁰

This analysis assumes that the trends in wage inequality from the last twenty years continue for the next thirty-five years. Using data from the United States, it assumes that the impact of changes in the level of inequality on the wages of the median worker in other nations, will be proportionate to the impact that these changes have had on the wages of the median worker in the United States. (The methodology is explained in more detail in the appendix.)

⁹ The projection for after-tax after health care income for the United States is taken from Baker 1998, p 17. (The exact procedure is explained in the study's appendix.) This projection was used in order to avoid the double counting of the impact of aging on health care expenditures which the method used in this paper would imply. The methodology used in this paper produces a substantially lower measure of after-tax after-health care income for the United States, 115.3.

¹⁰ These comments are based on the data on earning dispersion that appears in OECD 1996, pp. 61-62.

The projections of the impact of the continuation of recent trends in wage inequality are shown in Table 7. The first column shows the percentage rise in the ratio of weekly wages for workers at the 9th decile to the weekly wages of workers at the fifth decile, over the period from 1979 to 1996.¹¹ The second column shows the implied percentage point reduction in the growth rate of wages for the median worker. The third column shows the projection of before tax wages in 2030, which was developed in Table 1. These numbers effectively assume that workers all benefit equally from productivity growth. The fourth column shows the impact that the continuation of recent trends in inequality will have for the median worker. The fifth column shows projections of the after-tax wage for the median worker, applying the same methodology that was used to construct Table 5.¹² The sixth column shows projections for after-tax after-health care wages applying the methodology used to construct Table 6.

TABLE 7
Growth Projections for After-Tax After-Health Care Wages With Inequality

	Percent Increase in Inequality 1973-95	Implied Reduction in Annual Wage Growth, (percentage points)	Before-tax Wages (no inequality) 1995=100	Before-tax wages (with inequality) 1995=100	After-tax Wages (with inequality) 1995=100	After-tax, Care Wages (with inequality) 1995=100
Australia	5.98	0.40	162.7	147.2	139.8	129.8
Austria	0.78	0.05	214.2	207	169.6	150.8
Belgium	-3.3	-0.22	245.6	262.9	235.4	207.2
Canada	3.44	0.23	162.7	174.3	160.6	147.3
Denmark	5.26	0.35	180.4	157.2	135.7	128.3
Finland	3.46	0.23	221.6	207	176.0	164.8
France	2.75	0.19	237.3	221.6	189.1	156.6
Germany	-1.96	-0.13	245.6	254.1	214.5	187.8
Ireland	NA	NA	356.7	NA	NA	NA
Italy	10.67	0.72	229.3	180.4	140.4	129.3
Japan	5.45	0.37	254.1	221.6	203.2	186.2
Netherlands	4.39	0.30	207	186.7	155.8	143.9
New Zealand	5.65	0.38	157.2	136.8	122.6	113.1
Norway	2.99	0.20	272	254.1	236.1	220.5
Portugal	30.84	2.08	157.2	75.5	68.7	57.6
Spain	NA	NA	272	NA	NA	NA
Sweden	1.57	0.11	162.7	157.2	134.2	124.6
United Kingdom	13.33	0.90	207	151.8	141.9	132.5
United States	11.42	0.77	157.2	119.1	111.9	96.4

Source: Author's calculations.

¹¹ The wages for decile levels refer to workers at the cutoffs. In other words, the wage for a worker at the 9th decile is the wage received by a worker in the 90th decile of the wage distribution.

¹² Neither this projection, nor the one for impact of health care costs, takes account of the possible interaction between changes in distribution and tax rates or health care costs. This could be important. For example, if a country has a very progressive tax structure, then lower wages due to increasing inequality may be partly offset by a reduction in taxes. Similarly, the government may also pick up a larger portion of health care expenditures for the median wage earner in response to a relative decline in his or her wage.

As can be seen, for several nations the projected impact of the continuation of recent trends in inequality is quite large. In the case of the United States, the median worker would lose more than two thirds of the projected growth in the average wage, if inequality continues to grow at its recent pace. After factoring in the impact of higher taxes due to aging and projected increases in health care costs, the median worker is actually projected to have a lower after-tax after-health care wage in 2030 than at present. In the United Kingdom, projecting the continuation of recent trends in inequality will cost the median worker more than half the increase in the average wage over this period. In Portugal, the impact of growing inequality is actually projected to be larger for the median worker than the growth in the average wage, leading to a projected 24.5 percent decline in the median wage by 2030, although the data that provides the basis for this projection is not very solid.

Comparing the Impacts

The previous sections have calculated the impact on the future living standards for the typical worker, of national differences in productivity growth, aging and the generosity of public pension systems, the growth in health care costs, and trends in wage inequality. Having generated these projections, it is now possible to compare their relative importance for future living standards.

TABLE 8
Comparative Impacts on Living Standards of Median Worker

	Differences in Productivity Growth	Effect of Changing Inequality	Effect of Higher Taxes	Effect of Increased Health Care Costs
<i>Percent Change</i>				
Australia	-45.9	-13.5	-5.0	-7.1
Austria	-1.5	-0.8	-18.1	-11.1
Belgium	25.6	6.2	-10.4	-12.0
Canada	-45.9	-7.4	-7.8	-8.3
Denmark	-30.6	-10.5	-13.7	-5.4
Finland	4.9	-7.4	-15.0	-6.4
France	18.5	-7.4	-14.7	-17.2
Germany	25.6	6.2	-15.6	-12.5
Ireland	121.5	NA	-11.7	-1.6
Italy	11.6	-22.0	-22.2	-7.9
Japan	33.0	-10.5	-8.3	-8.4
Netherlands	-7.7	-10.5	-16.5	-7.6
New Zealand	-50.6	-13.5	-10.4	-7.7
Norway	48.4	-7.4	-7.1	-6.6
Portugal	-50.6	-52.0	-9.0	-16.2
Spain	48.4	NA	-8.5	-11.5
Sweden	-45.9	-4.1	-14.6	-7.2
United Kingdom	-7.7	-27.2	-6.5	-6.6
United States	-50.6	-22.0	-6.0	-13.8
Average	42.8	16.3	11.6	9.2

Source: Author's calculations.

TABLE 9
Comparative Impacts on Living Standards of Median Worker in the United States in 1999 Dollars.

<i>Median Wage,</i>	<i>Median Wage,</i>	<i>Adjusted for</i>	<i>Adjusted for</i>	<i>Adjusted for</i>	<i>Adjusted for</i>
<i>1995</i>	<i>2030</i>	<i>Productivity</i>	<i>Trend in Wage</i>	<i>Tax Increases</i>	<i>Increasing</i>
		<i>Differential</i>	<i>Inequality</i>	<i>Due to Aging</i>	<i>Medical Costs</i>
\$15,741	\$33,985	\$24,753	\$19,307	\$18,149	\$15,645
Lost After-Tax After Health Care Income Due to:					
		<i>Slower</i>	<i>Increasing</i>	<i>Tax Increases</i>	<i>Increasing</i>
		<i>Productivity</i>	<i>Wage Inequality</i>	<i>Due to Aging</i>	<i>Medical Costs</i>
		<i>Growth</i>			
		\$9,232	\$5,446	\$1,158	\$2,505

Source: Author's calculations.

Table 8 presents a comparison of the impact of the each factor on the standard of living projected for the typical worker in each nation. Table 9 provides the same information focusing specifically on the United States to make the meaning of the table clearer. The implicit counter-factual in table 8 is a world where all nations had exactly the same rate of productivity growth, no increase (or decrease) in wage inequality, no increase in taxes due to the aging of the population, and no increase in health care costs as a share of GDP. The numbers in each column are the percent that a median worker's after-tax after health care wage will be higher or lower in 2030 as a result of the country specific trends in the factor shown in each column.

The impact of productivity growth, shown in the first column, was calculated as the percent that wages will be higher or lower for the median worker in each nation in 2030 as a result of the fact that productivity growth in that nation is projected to exceed or trail the OECD average over the period from 1995 and 2030. The average of 42.8 percent shown at the bottom is the average absolute value of the difference for the 19 nations. In other words, the differences in projected productivity growth in individual nations, compared to the OECD average, will on average leave wages 42.8 percent higher or lower in 2030 compared to a scenario where productivity growth in each nation tracked the OECD average. As can be seen, differences in productivity growth are projected to have more than twice as much impact as any of the other three factors. Even if Ireland, with its extraordinary projected productivity growth, is pulled out of the sample, the average difference would be 38.4 percent. This is still more than twice as large as the impact of any of the other three factors.

This suggests that productivity growth will continue to be the key to maintaining significant growth in living standards in the future. While this conclusion should not be surprising, it is perhaps unfortunate, since the factors explaining national differences in productivity growth are still not well understood. While differences in national rates of saving and investment clearly account for part of the differences in productivity growth, there is a considerable gap that cannot be readily explained. The projections in the table imply a serious need for more research directed towards a fuller understanding in the differences in national rates of productivity growth.

Table 9 illustrates the impact of differential productivity growth in the United States. If the U.S. could maintain the average rate of productivity growth for the whole OECD over the next thirty-five years, then the median after-tax after health care annual wage would be \$33,985. However, the rate of productivity growth assumed by the Social Security trustees implies an annual wage of \$24,753, a loss of \$9,232.

The projected impact of trends in inequality is the second most important factor affecting the living standard of the typical worker, with the average absolute size of the impact being 16.3 percent. This number is driven up by the -52.0 percent projection for Portugal. However, even if Portugal is removed from the sample, the average impact is still 14.1 percent, leaving inequality firmly in second place for its relative impact.

As noted earlier, the projected impact of inequality on the living standards of the typical worker is particularly large in the United Kingdom and the United States, in both cases reducing the wage gains that would otherwise be obtained from productivity growth, by more than half. As shown in table 9, the continuation of recent trends in productivity growth will cost the median worker \$5,446 a year by 2030. The trend towards increasing inequality in these nations could perhaps be justified if it was associated with more rapid productivity growth. In fact, productivity growth in both nations is projected to be below the overall average, with the cumulative growth in the U.S. projected at less than half the average. In short, the factors that are leading to increasing inequality in the United States and the United Kingdom do not appear to be producing dividends in the form of more rapid productivity growth. This may suggest that redressing the sources of inequality can have significant payoffs for the typical worker, without leading to costs for the economy as a whole.

The impact on future living standards of tax increases associated with the aging of the population has the third most significance, averaging 11.6 percent. In other words, on average workers will have 11.6 percent less after-tax income because of tax increases attributable to the aging of the population. This is almost certainly a significant overstatement, as was noted in the construction of this projection, since the projections do not take account of many of the changes in public pension systems that have already been implemented. Most of these changes would reduce the impact of the aging of the population.

The projected impact of increases in health care costs is slightly less than the impact of aging, with an average projected reduction in after-tax after-health care income of 9.2 percent. However, for many nations, the projected impact of rising health care costs is far larger. The United States stands out in this respect, the projected impact of rising health care costs is a reduction in after-tax after-health care income of 13.8 percent. Table 9 shows that this rise in health care spending as a share of GDP will reduce the after-tax after-health care wage for the median worker by \$2,505 in the year 2030. This is more than twice as large as the 6.0 percent reduction (\$1,158 in 2030) projected as a result of the taxes needed to support a larger population of retirees.

Most nations appear to have been relatively successful in getting their health care costs under control. The projected rates of growth of health care spending are exaggerated somewhat by using the longer period from 1973 to 1996 as the basis for the projections. If a shorter period were used, such as the last decade, the projected increase in health care costs would

be considerably more modest, with several nations, such as Denmark, Ireland, and Sweden actually showing declines in the share of GDP devoted to health care expenditures over this period.

The contrasting experiences with containing health care costs suggests that this should be an important area of focus for public policy in nations that have been less successful. As noted earlier, the higher level and growth rate of expenditures in the United States are not associated with any obvious improvement in health care statistics relative to other nations. Clearly some nations are able to achieve comparable health outcomes at considerably lower costs than others. If lessons from the relatively successful nations can be transferred across national boundaries, there are potentially large payoffs for future living standards.

Conclusion

The problems of dealing with an aging population have been given considerable attention in many OECD countries in the last decade. The projections in this paper suggest that this concern may be somewhat misplaced. While paying for a proportionately larger population of retirees will place some burden on future generations of workers, in no nation will the cost be so large that it will be close to offsetting projected gains in productivity. Workers in the future should still enjoy considerably higher living standards than workers do presently, even if they face a higher tax burden to support the elderly.

Furthermore, the projections in this paper suggest that the aging of the population will not be the largest factor affecting the living standards of workers in the future. National differences in rates of productivity are projected to have an impact on future living standards that is at least three times as large on average as the impact associated with tax increases needed to support a larger population of retirees. Trends in inequality, particularly in the United States and the United Kingdom, are also projected to have a far larger impact on the living standards of the typical worker. In addition, the projected growth in health care costs will have a comparable, or in the United States far larger, impact on the income that workers have left over after paying their taxes and health care expenses.

The conclusions about the relative size of the impacts of these factors suggest that the attention focused on dealing with the problems of paying for a growing population of retirees may be better directed elsewhere. From a policy standpoint, in principle it should be possible to adopt policies that affect productivity growth, wage inequality, and health care costs. There is no obvious policy that can reverse the aging of the population, although policy can affect the distribution of costs between the portion borne publicly and privately.

Even in this respect there appears to have been considerable confusion in the debate. Many proposals for "privatizing" pension systems don't really change the extent to which retirees may pose a burden on the rest of the population, they just change the form this burden takes. For example, if workers' pension contributions are placed in funds that own private assets, such as corporate equities, this is a really just a different way to impose a claim on the earnings of capital in a future period. (This can be done either collectively through a central fund or individually, through private accounts.) A country that chose to go this route, with

no other change in tax or spending policy, would find itself with the same capital stock and GDP in the future, as if had kept an entirely public system.¹³ (In other words, the money used to buy private assets for the pension system is either borrowed by the government, or not used to pay down government debt.) In this case, it would not be necessary to fund the pension system out of taxes directly, since the money would be paid out of corporate profits. However, this would lower the returns to other holders of capital by exactly the amount paid out to retirees through such a mandated pension system.¹⁴

This approach may have some political advantages over a pay as you go system, primarily because it may allow for a redistribution of the burden from future workers to future owners of capital. It may also have the effect of providing a more solid political footing for future pension benefits, making them more immune to cutbacks. But such a system does not change the extent to which retirees will impose an economic burden on future generations.

In determining the best approach for dealing with an aging population, it is important that policy be guided by the evidence, not fear tactics. There is no “crisis” in the sense that the prospective burdens are particularly large compared to other costs imposed on society in recent decades, or other costs that may be imposed in the future. Nor is aging a new phenomenon. The industrialized nations have been substantially increasing the share of GDP going to support retirees for decades. In some cases, there is not even a pronounced acceleration of this trend projected for the future. In short, we've been here and dealt with this problem. There is no reason to believe that we will be unable to deal with it in the future.

¹³This ignores the possible incentive effects on workers willingness to work that may result from seeing a more direct link between their pension contributions and their eventual benefits. This effect may not be inconsequential (see Diamond and Genakoplos 1999, and Feldstein and Samwick 1998).

¹⁴The government would also have a larger public debt to finance in this situation. It is logically possible to eliminate this additional debt through inflation. Under such circumstances, the transfer of the tax burden to capital through a mandated saving system can be seen most clearly.

Appendix

Table 1 uses OECD data on productivity growth that appears in Schmitt and Mishel (1998) and data from the Conference Board (1998). The cumulative productivity growth calculation is based on the productivity growth rate estimated by the Conference Board.

Table 2 presents data on productivity levels that can be found in BLS (1999) and Conference Board (1998). Table 3 projects productivity levels using both the OECD and Conference Board growth rates shown in table 1, and using the levels estimated by the Conference Board, which appear in table 2.

The calculations in table 4, for the increase in the share of GDP needed to pay for public pensions, first assume that the increase in expenditures on the elderly will be proportionate to the increase in the share of the population over 60 between 1990 and 2030 (World Bank 1994, p, 349). The analysis used the World Bank data for the share of GDP being paid as pensions (1994, p, 358). (This calculation excludes any growth in the cost of pensions for public sector workers. It is assumed that this expense will be taken directly from these workers' wages.)

The after-tax wage calculations, which appear in table 5, assume that taxes (at all levels of government) are presently proportionate to the income shares of labor and capital, with a 70 percent 30 percent split assumed in all cases. It is assumed that labor will bear most of the additional taxes associated with supporting the elderly, with capital only paying a half share, or 15 percent of any additional taxes. (In other words, if the additional tax burden due to aging will be 5.0 percent of GDP, it is assumed that workers will pay additional an amount equal to 4.25 percent of GDP in taxes.) The current tax burden on workers is assumed to be proportionate to the share of GDP going to government expenditures (OECD 1998). (This will lead to a significant overstatement of tax rates, and therefore future tax burdens, in nations where government enterprises constitute a large portion of GDP.) The increase in the tax rate is then calculated as a percentage of the after tax GDP currently going to the working population. This percentage is deducted from the projected growth in the before tax hourly wage to obtain the projected after tax wage.

The calculation of the impact of the increased cost of health care on after-tax after-health care wages, shown in table 6, uses essentially the same procedure as that used to construct the impact of increasing public pension expenditures on after-tax wages. The growth rate in health expenditures as a share of GDP over the period from 1973 to 1996 is projected to continue in the years from 1995 to 2030. This additional cost is assumed to be born by workers and capital in the same proportion as the additional cost of public pension expenditures.

The calculation of the impact of the continuation of recent trends in wage inequality, which appear in Table 7, uses the U.S. experience as a base. For the United States, it uses the same methodology as Baker (1998), which assumes that the absolute size of the gap between the rate of average hourly wage growth and the rate of growth of hourly wages for the median worker will stay the same over the period from 1995 to 2030, as it was for the years 1973 to

1995. This rise in inequality created a gap of 0.77 percentage points between the annual growth rate of the hourly wage and the median wage. In the United States, this rise in inequality was associated with an increase in the ratio of the hourly wage for workers at the 9th decile to workers at the fifth decile from 1.91 in 1973 to 2.21 in 1995 (Mishel, Bernstein, and Schmitt 1996, p 143).

To calculate a comparable figure for other OECD nations, the change in the ratio of the wage for workers at the 9th decile to workers at the fifth decile was calculated for each country, over the years from 1979 to 1995, or for the years available (OECD 1996, pp. 61-62). The rate of change in this ratio was divided by the rate of change in the ratio in the U.S. over this period. This number was then multiplied by the difference between the rate of growth of median hourly wage and the average hourly wage in the U.S. to determine the projected difference in each nation. This calculation is clearly quite limited, since arguably the trends in inequality should be a multiplicative function of inequality, so that the absolute divergence between the median and average wage would be larger in a nation with more rapid wage growth and slower in a nation with less rapid wage growth. It is also important to note that the effect of the rate of divergence between the 90th percentile worker and the 50th percentile worker, on the wages of the median worker, will also depend on the absolute levels. If there is already a high degree of inequality, a further divergence will have more of an impact on the wages of the median worker (since a larger share of wage income will be siphoned away by high wage workers) than if wages were initially distributed relatively equally. This analysis ignores this difference between nations. It is worth noting, that according to the OECD data, the levels of inequality are greater in the United States than in any of the other OECD nations included in this analysis (except Portugal), so that by effectively treating all other nations as having the same initial level of inequality as the United States, this analysis will be overstating the impact of projected future increases in inequality in other nations.

The calculations of the relative impact of different factors on living standards in table 8 rely on the data from previous tables. The impact of productivity differences, which appears in the first column calculates the difference between each nation's projected cumulative productivity growth and the average for the whole set of nations. The second column shows the percentage change in the median workers wage that is projected if recent trends in inequality continue. The third column shows the projected percentage reduction in after tax wages due to the projected increase in the cost of the public pension system. The fourth column shows the projected reduction in after tax after health wages as a result of the projected growth in health care costs. The averages at the bottom are the average absolute value of the impact on individual nations.

The starting point for Table 9 is the median after-tax after health care wage in the United States in 1995. This is obtained by first calculated a median before tax annual wage, using the median hourly wage in Mishel et.al (1996) and multiplying by 2000. The ratio of the after-tax after health wage to the before tax wage is assumed to be the same as the ratio of after-tax after-health care income to before tax income for the median family in Baker (1998). This is a considerable simplification, but for purposes of this analysis, the inexactness of the procedure should not pose a problem. The second column showing the median wage for 2030 is a projection which assumes that wages rise in step with the average rate of productivity growth for all OECD nations over the period from 1995 to 2030, as calculated

in table 1. The third column shows the projected wage based on the assumption that the wage grows at the rate projected by Social Security Trustees in their 1999 report. The fourth column shows the projected median wage for 2030 after incorporating the impact of the continuation of recent trends in wage inequality as calculated in table 7. The fifth column shows the projected after-tax wage after incorporating the impact of higher taxes due to an aging population as calculated in table 5. The sixth column shows the after-tax after health care wage after incorporating the extent to which health costs rise for reasons other than aging, as calculated in table 6. The second row of numbers assigns a dollar value to the annual income lost to each of these factors.

References

- Anderson, George, and Jean Poulhier, 1999. "Health Spending, Access, and Outcomes: Trends in Industrialized Countries." *Health Affairs*, Vol. 18, no.3, pp. 178-92.
- Baker, Dean, 1998. *Defusing the Baby Boomer Time Bomb: Projections of Income In the 21st Century*. Washington, D.C.: Economic Policy Institute.
- Conference Board, 1997. "Perspectives on a Global Economy: Understanding Differences in Economic Performance." New York: The Conference Board Report Number 1187-97-RR.
- Diamond, Peter and Jean Geanakoplos, 1999. "Social Security Investment in Equities I: Linear Case." Massachusetts Institute of Technology, Department of Economics (draft manuscript).
- Feldstein, Martin and Andrew Samwick, 1998. "Potential Effect of Two Percent Personal Retirement Accounts." *Tax Notes*, May 4, 1998, pp. 615-20.
- Mishel, Larry, Jared Bernstein, and John Schmitt. 1996. *The State of Working America 1998-99*. Armonk, N.J.: M.E. Sharpe.
- Organization of Economic Cooperation and Development, 1998. *OECD Health Data 1998*. Washington, D.C.: OECD.
- Organization of Economic Cooperation and Development, 1996. *Employment Outlook*, July, 1996.
- Schmitt, John and Larry Mishel, 1998. "An Evaluation of the G7 Economies in the 1990s." Washington, D.C.: Economic Policy Institute.
- Social Security Administration, 1999. *Annual Report of the Board of Trustees, Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds, 1999*. Washington, DC: U.S. Department of Health and Human Services, Social Security Administration.
- Social Security Administration, 1999. *The 1999 Technical Panel on Assumptions and Methods: Report to the Social Security Advisory Board*. Social Security Administration.