Ronald Lee
Professor, Demography and Economics
University of California, Berkeley
Rlee@demog.berkeley.edu
February 5, 2001

The Fiscal Impact of Population Aging

Testimony prepared for the Senate Budget Committee.

Introduction

Mr. Chairman, Senator Conrad, and other distinguished members of the Committee, thank you for inviting me to testify. I am particularly pleased to testify here about the fiscal impact of population aging, which is a major focus of my research at the University of California at Berkeley's Center for the Economics and Demography of Aging. Most of this research has been supported through grants from the National Institute of Aging, with additional support from the Social Security Administration. The work is done with various collaborators, as cited in the reference list.

Forecasts of the Aging Population

During recent years, and for the next decade or so, we are blessed with a slight reversal in population aging, and demography has an unusually favorable influence on government budgets. However, we should not be lulled into complacency by this temporary situation. In the US and throughout the industrial world, the ratios of elderly to working age populations are projected to rise dramatically in the 21st century. In the US, the old age dependency ratio (population 65 and over divided by population 20 to 64) will double by 2075, according to Social Security projections. According to my own projections, shown in Figure 1, it will more than double, due to faster mortality decline. The ratio will increase because the numbers of elderly will increase rapidly, due to increasing longevity and to the

retirement of the baby boom generations. Equally important will be the slow growth of the labor force, due to low fertility, which will slow the growth of GDP and the tax base. As Figure 1 shows, aging will pause after 2040 as the baby boom generations die, but will then resume its rise as fertility stays low and mortality continues to decline. (Lee and Tuljapurkar, in press).

Forecasting even a few years ahead is very risky, and it may seem that forecasts 75 years into the future are worthless as a guide to current decision making. Isn't it possible that if we just wait, these problems will go away? I am afraid that this is very unlikely. Based on new methods, the figure shows 95 percent probability bounds (Lee and Tuljapurkar, 1994). It is almost certain that there will be substantial aging of the US population, and the up-side risk is much greater than the downside risk.

Forecasts of Mortality

All government projections show these general trends. However, in the past, official national and international projections have systematically under-predicted gains in life expectancy, leading to under-predictions of the elderly (Keilman, 1997; National Research Council, 2000). My analysis shows that forecasts made by Social Security in every decade since 1950, except for the 1980s, have under-predicted life expectancy gains (Lee and Miller, 2000). A new method to forecast mortality suggests that Social Security continues to under-predict future gains in life expectancy by several years, and that actual gains will be about 50 percent greater, over their 75-year horizon (Lee and Carter, 1992; Lee and Miller, 2000). These Social Security forecasts are also used by the Health Care Finance Administration (HCFA) for the Medicare program, and by the Congressional

Budget Office (CBO). If my new mortality forecasts are correct, then the fiscal impact of population aging will be somewhat more serious than currently projected. These new mortality forecasts are generally regarded by demographers as middle-of-the-road. They have been largely adopted by the US Census Bureau. Some other distinguished scientists, including two who recently testified here, Dr. Vaupel and Dr. Manton, believe there will be far greater gains, perhaps leading to life expectancies of a hundred years or more in this century. In this case, population aging would be far greater than foreseen in my forecasts.

Aging and Federal Expenditures under Current Program Structures

Figure 2 shows Per capita Federal expenditures by age of beneficiary, with some costs spread evenly across all ages (Lee and Miller, 1997). As you can see, expenditures on the elderly overwhelmingly dominate, due mainly to Social Security, Medicare and Medicaid outlays for nursing home care. This is why population aging will have such a powerful effect on the Federal budget in coming years. The figure also shows expenditures at the State and Local level by age. Although these are concentrated at young ages, population aging will not bring a decline in State and Local expenditures, because the child dependency ratio will not drop.

Under the current structure of Federal programs, these rising old age dependency ratios will substantially raise the costs of Federal pension and health programs, relative to GDP. I have projected Federal expenditures as a share of GDP over the next 75 years, assuming that government programs retain their current structure, with the normal age at retirement

rising to 67 as in current law. The generosity of program benefits is projected to rise with labor productivity in the future, which is assumed to rise on average at 2.3 percent annually, which is about 1 percent per year higher than is assumed by Social Security, and is slightly lower than CBO. Most other assumptions closely match those of HCFA, CBO and Social Security; only mortality differs. The forecasts do not incorporate feedback from Federal policy to rates of economic growth.

Figure 3 shows that Federal expenditures as a share of GDP, excluding interest payments on the debt, will more than double by 2075, from about 16 percent now to about 33 percent (based on an up-dated version of Lee, Tuljapurkar and Edwards, 1998; the biggest changes are the higher assumed productivity growth rate and the assumption that health care costs will continue to grow about 1 percent faster than per capita income growth after 2025 as assumed by CBO). The figure shows that expenditures on children and the working-age population will remain roughly constant relative to GDP (see the top section of the graph, labeled ‘‘non-elderly), while expenditures on the elderly will triple over the next 75 years. Expenditures on the elderly are now 8 percent of GDP, but by 2075 they will rise to 23 percent of GDP. Clearly, it is expenditures on the elderly that are responsible for the long-term budgetary pressures.

The chart also shows expenditures on the elderly for health care (mostly Medicare A and B, and the institutional component of Medicaid), and retirement (mostly OASDI, but also Federal employees etc.). Social Security and other retirement accounts for only about one fifth of the projected increase in spending for the elderly. Health spending accounts for three-quarters of the increase. Of the increase in health spending relative to GDP, roughly

half is due to population aging, and half due to cost increases per beneficiary in excess of productivity growth (Lee and Miller, 2001). The new assumption made by CBO for the rate of increase of health care costs per beneficiary, similar to a change recently recommended by the Medicare Technical Advisory Panel, has a very large effect on the projections of health costs and through these, on the overall projected expenditures on the elderly.

I am actually somewhat more optimistic than CBO regarding the growth of Medicare expenditures per beneficiary, because I expect longer life to be accompanied by better health and reduced need for health care at each age. Nonetheless, because I also project more beneficiaries due to more rapidly falling mortality, the net result is very similar to the CBO projections. In general, if mortality declines more rapidly than expected, it will likely be due to improving health of the elderly population. As a result, costs per elderly person may be lower. Longer life will impose greater costs on Social Security, but perhaps not on Medicare. For similar reasons, I also expect falling costs per beneficiary at each age for Medicaid funded long-term care, due to improved functional status of the elderly (Manton et al, 1997).

Uncertainty of Forecasts

Earlier, I discussed probabilistic demographic forecasts. Drawing on these projections, I have developed new probabilistic forecasts for government budgets. These take into account uncertainty about fertility, mortality, productivity growth, and interest rates. Figure 4 shows that despite substantial uncertainty, there is only one chance in forty that Federal spending will increase to less than 27 percent from its current 16 percent. There is also

less than one chance in forty that it will more than triple to half of GDP. Therefore, it is virtually certain that substantial increases in expenditures relative to GDP will occur under current program structures, due entirely to rising expenditures on the elderly, which in turn are attributable to a combination of population aging and rising health costs per beneficiary.

A major result of these probabilistic forecasts is that the risk of large forecasting errors in the expensive direction is about twice as big as the risk of large errors in the less expensive direction. Of course, there is additional uncertainty about how programs will change in the future, and with such changes the future outlook would be entirely different. These forecasts do not attempt to anticipate such changes, since the forecasts are intended to inform policy makers about the need for such changes.

Can Immigration Solve the Problems?

If these future fiscal pressures will remain despite unanticipated changes in the economic and demographic climate, might they be alleviated by a policy of admitting more immigrants? Of course, immigrants too get old and claim costly benefits, but before they do, they pay taxes for decades, and raise more children than the average native, which helps to sustain a younger population. My research shows that the average immigrant has a substantial beneficial impact on the Federal budget (National Research Council, 1997). However, my research also shows that based on the characteristics of the current immigrant stream, it would require an additional 5 million immigrants every year over the next 75 years to bring the budget of Social Security into balance for that period, or a total of 375 million additional immigrants. Solving the long-run fiscal problem through increased

immigration alone would not be a feasible policy. Furthermore, the average immigrant imposes important net long-run costs to state and local governments.

Nonetheless, immigration does help to ameliorate the problem somewhat. Also, a policy that selectively admitted the young and well-educated, would have a much greater positive Federal fiscal effect than would increasing the immigration stream as currently composed. However, that would represent a significant change from the philosophy and values underlying our current policy.

Can Faster Economic Growth Solve the Problems?

Some believe that we have entered a new era of more rapid growth in labor productivity, with Information Technology returning us to the growth rates of earlier decades. If so, could this trend grow us out of the fiscal problems? More rapid growth would certainly help Social Security, since the working population then has higher earnings relative to the benefit levels of the retired population. However, in line with the recommendations of the Technical Advisory Panel for Medicare, I would expect that the costs of health care would rise more rapidly when wages in general rise more rapidly, and that the same would be true of other program costs. My probabilistic forecasts allow for a wide range of uncertainty about productivity growth rates, and still indicate that the fiscal pressures are highly unlikely to go away. Experimental projections in which the rate of productivity growth is fixed at a higher level, confirm that this would not solve the problem.

International Context

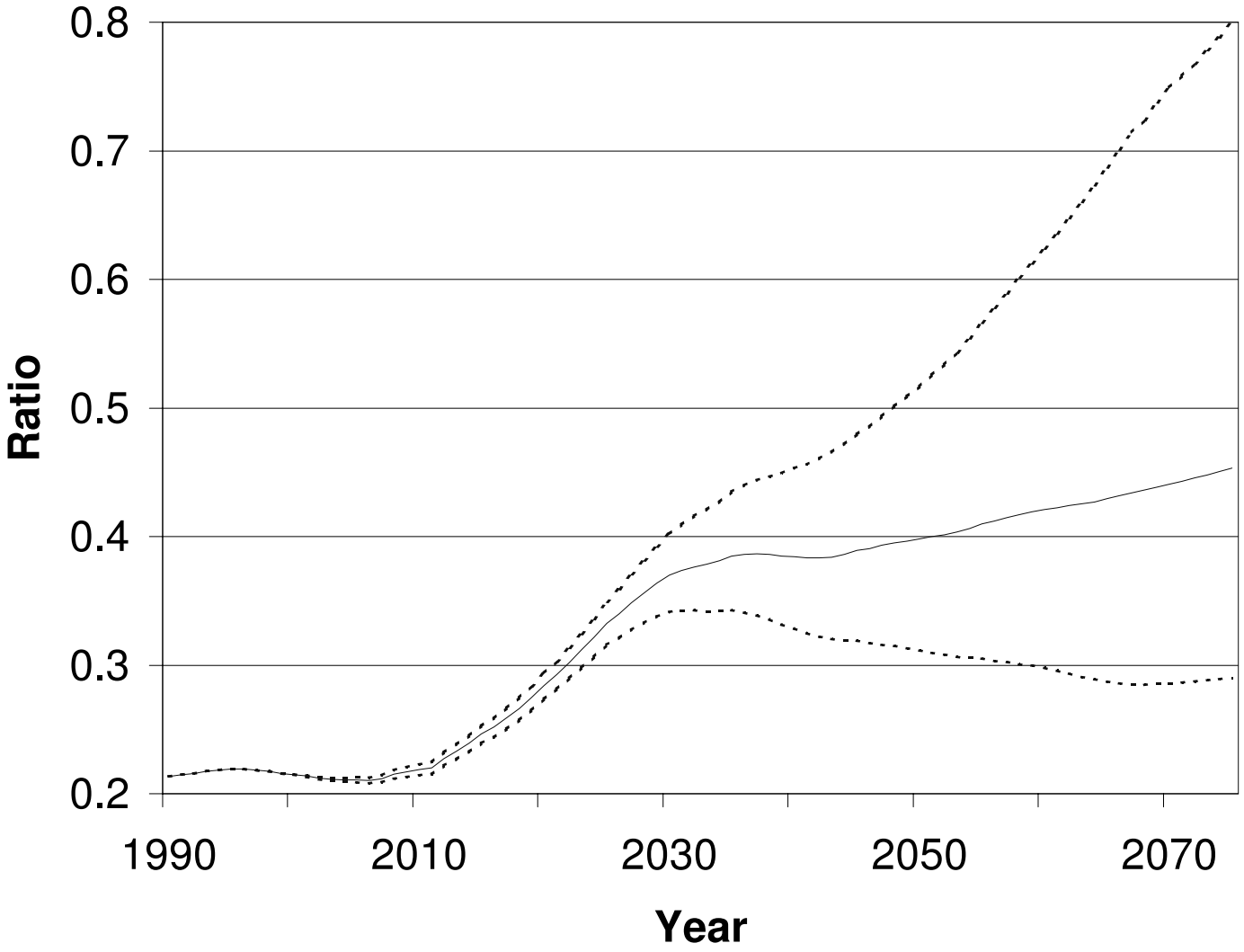
Despite this somewhat gloomy conclusion, we should keep in mind that the fiscal consequences of population aging in the United States will be far less severe than in Japan or Europe. In an OECD study of public pension programs in 23 countries (Roseveare, 1996), the long-run imbalance in the US was only about one third as great as was the median of the other countries, measured relative to GDP. There are several reasons: fertility in Europe and Japan is about 1.4 children per woman, versus around 2.0 in the US. The US has higher immigration rates than some of these countries, and lower life expectancy. The retirement age is several years later in the US than in most European countries, although earlier than in Japan. US Social Security provides lower benefits relative to earnings than in a number of other countries. Compared to these other countries, the US problem is relatively modest.

A Serious but Manageable Problem

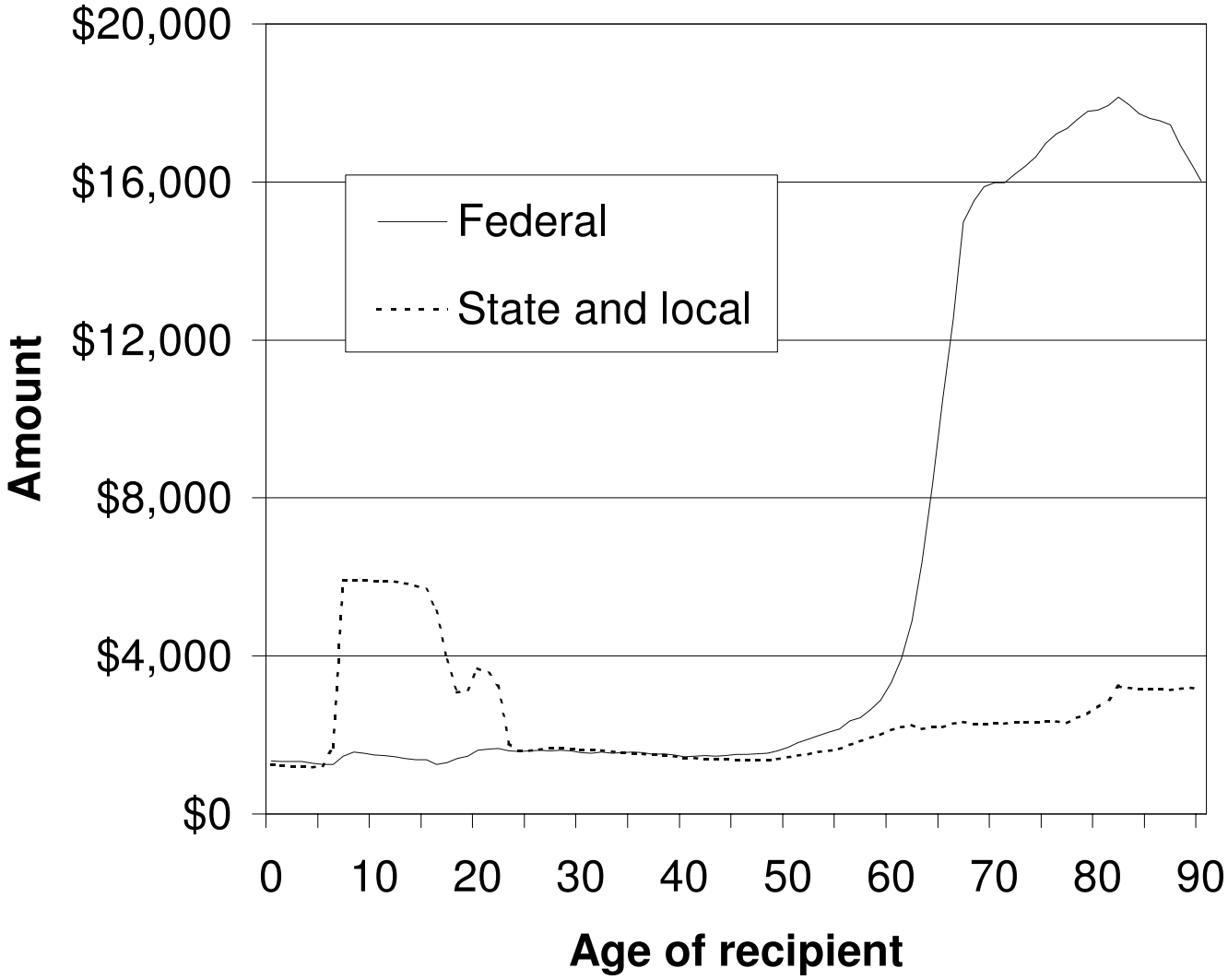
We should not be lulled by the budgetary surpluses of the recent years, and those projected over the next decade. With the baby boom still in the labor force, and the small generations born during the 1930s now entering retirement, the demographic conditions are unusually favorable from a fiscal point of view. Nonetheless, this situation is temporary. Population aging is real and inevitable, and it will have serious fiscal consequences. In the long run, given current tax rates and program structures, with benefits growing with labor productivity or faster, we can expect massive Federal deficits and dramatically growing Federal debt. The long-run fiscal problem will not disappear; it will only get larger the longer it is ignored. It must be addressed sooner or later.

However, we should also realize that for the US, at least, the costs of population aging and increasing health costs will not be impossibly large. The situation could be addressed by a wide range of possible policies. These different policies will entail different ways of sharing the costs of the elderly between current and future generations of workers and retirees. The earlier these long-term deficits are addressed, the lighter will be the burden for future generations and the greater the costs born by current ones.

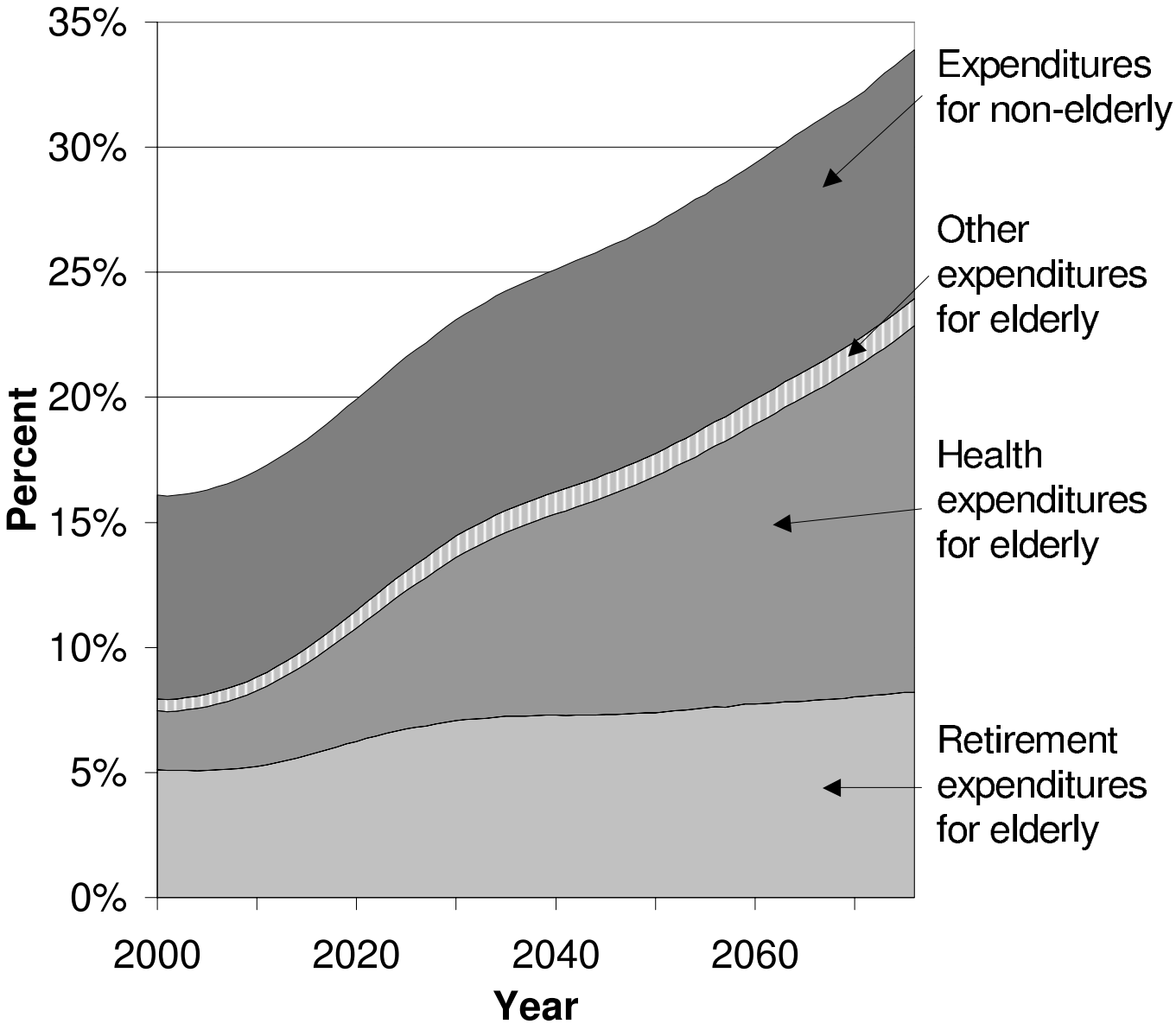
Old-age dependency ratio
(Pop 65+ / Pop 20-64).
Median forecast with 95% probability interval.



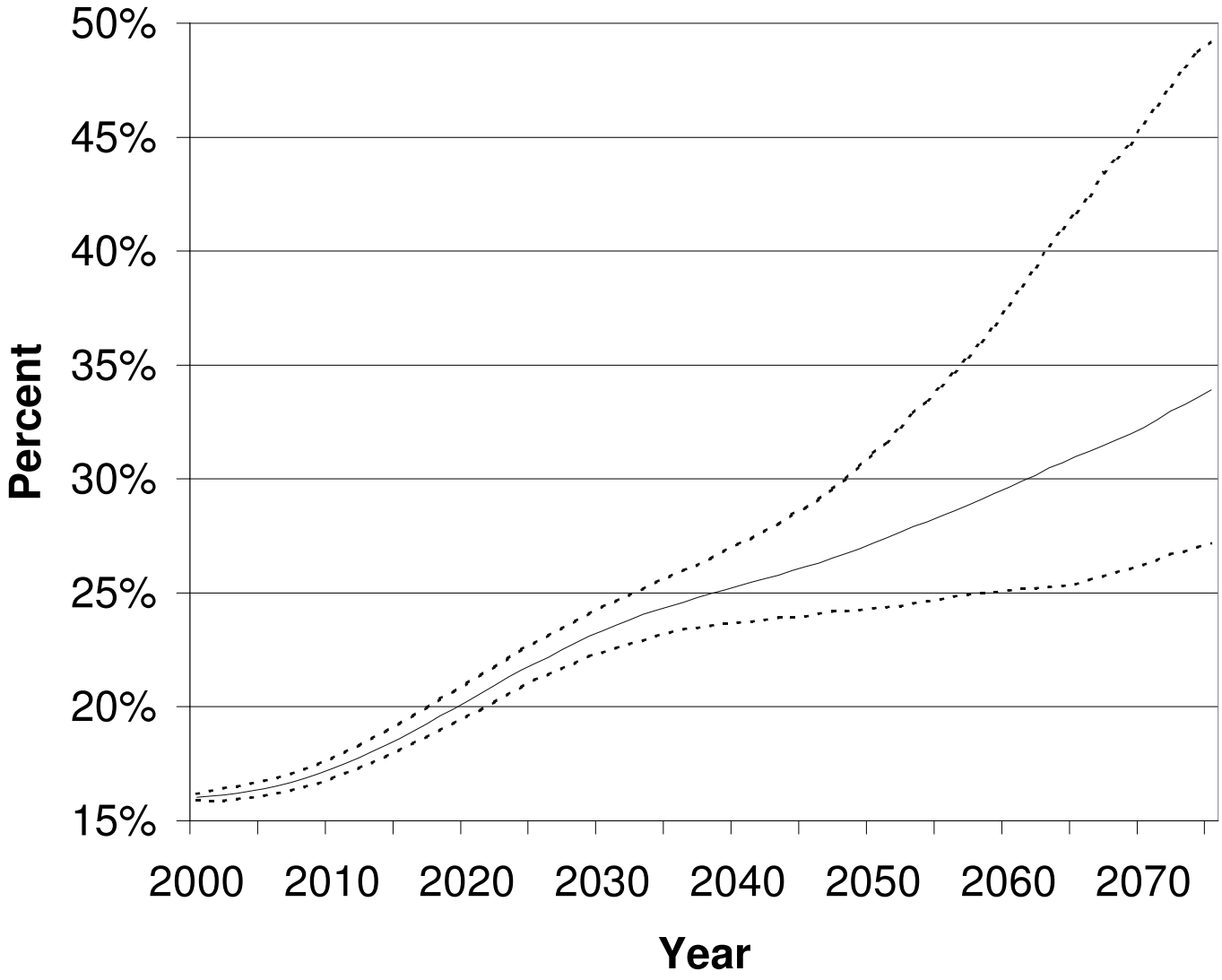
Per-capita Federal and state/local expenditures by age of recipient in 1995.



Federal spending (excluding interest on debt) as a percent of GDP.



Federal spending (excluding interest on debt) as a percent of GDP. Median forecast with 95% probability interval.



References

Keilman, Nico (1997) ‘‘Ex-Post Errors in Official Population Forecasts in Industrialized Countries’’ *Journal of Official Statistics* (Statistics Sweden) 13(3):245-277.

Lee, Ronald and Lawrence Carter (1992) "Modeling and Forecasting U.S. Mortality," *Journal of the American Statistical Association* v.87 n.419 (September), pp.659--671.

Lee, Ronald, Shripad Tuljapurkar and Ryan Edwards (1998) ‘‘Uncertain Demographic Futures and Government Budgets in the US’’, unpublished manuscript of the Department of Demography, University of California at Berkeley.

Lee, Ronald and Shripad Tuljapurkar (1994) "Stochastic Population Projections for the U.S.: Beyond High, Medium and Low," *Journal of the American Statistical Association*, v.89 n.428 (December) pp.1175-1189.

Lee, Ronald and Shripad Tuljapurkar (in press) "Population Forecasting for Fiscal Planning: Issues and Innovations" in Alan Auerbach and Ronald Lee, eds., *Demography and Fiscal Policy* (Cambridge University Press).

Lee, Ronald and Timothy Miller (1997) ‘‘The Life Time Fiscal Impacts of Immigrants and Their Descendants,’’ draft of Chapter 7 for *The New Americans*, a report of the National Academy of Sciences Panel on Economic and Demographic Consequences of Immigration, National Academy Press, 1997 (pp.297-362).

Lee, Ronald and Timothy Miller (2000) ‘‘Immigration, Social Security, and Broader Fiscal Impacts’’ *American Economic Review: Papers and Proceedings* (May) v.90 no.2.

Lee, Ronald and Timothy Miller (2000) ‘‘Assessing the Performance of the Lee-Carter Approach to Modeling and Forecasting Mortality’’ paper presented at the pre-PAA Economic Demography meetings in Los Angeles.

Lee, Ronald and Timothy Miller (2001) ‘‘An approach to forecasting health expenditures, with application to the U.S. Medicare system’’, paper presented at the workshop on Population Ageing and Health, London, January 27, 2001.

Manton, Kenneth G., Larry S. Corder, and Eric Stallard (1997) ‘‘Chronic Disability Trends in Elderly United States Populations: 1982-94,’’ *Proceedings of the National Academy of Science*, March, 94, 2593-2598.

National Research Council (2000) *Beyond Six Billion: Forecasting the World’s Population*, Panel on Population Projections, John Bongaarts and Rodolfo A. Bulatao, Editors, National Academy Press, Washington, D.C.

Roseveare, Deborah, Willi Leibfritz, Douglas Fore and Eckhard Wurzel (1996) ‘‘Ageing Populations, Pension Systems And Government Budgets: Simulations for 20 OECD Countries,’’ Economics Department Working Papers No. 168 (Organization for Economic Co-Operation And Development, Paris)