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The Sustainability of Health Spending Growth

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Abstract

We evaluate the long-run sustainability of health spending growth. Under the criterion that non-health consumption does not fall, one percent excess cost growth appears to be an upper bound for the economy as a whole when the projection horizon extends over the century, although some groups would experience declines in non-health consumption. More generally, the increase in health spending as a share of income may lead to a significant expansion of public sector financing, as has been the case historically. Extrapolation of historical trends also suggests that higher health spending will lead to insurance contracts with lower out-of-pocket payment shares, putting further upward pressure on health care expenditures.

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INTRODUCTION

Long-run federal budget projections show large imbalances in coming decades owing to two factors: the aging of the population and the assumed rapid growth in per-capita health care expenditures. For example, in its long-run projection, the Congressional Budget Office (2003) calculates that federal outlays for Social Security, Medicare, and Medicaid will rise from 6-1/2 percent of GDP in 2003 to 12-1/2 percent of GDP by 2050 if age-adjusted per capita health care costs rise with per capita GDP (reflecting a doubling of the elderly share of the population), 18 percent of GDP if health care costs rise 1 percent faster than per capita GDP growth and 28 percent of GDP if spending per enrollee rises 2-1/2 percent faster than per capita GDP.¹

Over the past fifty years health care spending rose much more rapidly than GDP. Eventually, health care spending growth will be limited to GDP growth because higher rates of growth would imply declines in investment needed to produce GDP. However, few believe that society would allow health care spending to reach this point, as it would imply that all consumption spending was devoted to health services. One criterion that has been proposed for the sustainability of health care spending growth is that increases in health care spending should not lead to absolute declines in real per capita non-health care consumption. This paper examines alternative paths for health care growth with this criterion from both a macroeconomic and a more microeconomic framework. It also addresses the types of adjustment in both the public and private provision of health insurance that will likely accompany increases in health spending.

The paper is organized as follows. First, we review the analysis of the 2000 Medicare Technical Review Panel, which first recommended that the Medicare Trustees assume that long-run age-adjusted per capita health care spending growth will exceed per capita GDP growth by 1 percentage point. This assumption is known as the 1 percent excess growth assumption. In the following section we simulate the level of consumption

¹ Similar projections are found in Office of Management and Budget (2005) and the Congressional Budget Office (2005) and Gokhale and Smetters (2003).

consistent with the Trustees' GDP projection, taking into account the reduction in investment needed when labor force growth slows and an assumed shift in the trade surplus to stabilize the current account deficit. We then project health consumption based on different rates of excess growth and determine the amount of resources remaining for non-health consumption. We find that 1 percent excess growth is sustainable, but higher rates are not sustainable because they imply real declines in non-health consumption.

The next section reports on the distribution of health spending by quintile among the elderly and non-elderly over the past thirty years. The key findings are as follows: First, health spending is relatively flat across income groups, although the elderly spend significantly more than the non-elderly. Second, despite rapid increases in health spending over time, private health spending has been relatively constant as a share of income. This is explained by the fact that the public share of health spending has increased significantly over time, particularly among those with the lowest income. Finally, out-of-pocket spending on health as a share of income has also remained relatively constant or even declined over time, as an increasing share of health expenses are covered by private insurance or the public sector.

We use these findings to project health spending over the next seventy-five years by income quintile and age group. We show that, holding the public share of spending constant, most groups will not experience absolute crowd-out of non-health consumption, in part, because of the large public component to financing. The exception is the low-income elderly who are projected to have health demands equal to 460 percent of their income in 2080, and although 80 percent is projected to be financed by the public sector the remaining portion still will consume 86 percent of their income. We also examine the likely public responses to increased health spending. If public spending continues to rise in response to the increasing burden of health spending, budgetary pressures could be significantly greater than those projected in most baselines. We also do some back-of-the-envelope calculations on the additional cost pressures that would arise if the trend toward lower out-of-pocket payments as a share of health spending were to continue. We show that, by 2080, health spending could be 12 percent higher than currently projected due to the lower cost-sharing assumption.

LONG-RUN HEALTH SPENDING PROJECTIONS

The 2000 Medicare Technical Review Panel recommended that the long-run projections for the Medicare Trust Funds be conditioned on the assumption that for the period from 25 to 75 years into the future, age- and gender-adjusted per beneficiary expenditures be assumed to grow 1 percentage point faster than per capita GDP growth.² Similar assumptions have been adopted by the Congressional Budget Office and Office of Management and Budget, but, because health care costs have generally risen more rapidly, higher projections for excess growth are also used often.³

The Technical Panel's rationale for its assumption was based on the estimated contribution that technological change has made to health care spending growth over the 1945 to 1998 period. Specifically, they attributed 50 percent of the 4.4 percent growth rate to technological change (p. 35 of the Report), generating 2.2 percent growth from technology. Subtracting off the Trustees 1.2 percent growth of real per capita GDP yields the 1 percent excess growth assumption.⁴ The Panel assumed that all other factors that have contributed to excess growth historically, except for aging, will not contribute to growth in the future.⁵

The 2000 Technical Panel also cited sustainability criteria which the 1 percent excess growth assumption met. The key sustainability criterion was whether increased health spending could occur without a reduction in real non-health spending.⁶ This definition of sustainability provides some useful guidance about the plausibility of the

² After the seventy-fifth year the projections assume that age-adjusted health spending rises with GDP.

³ The December 2003 CBO projection included simulations using zero percent, 1 percent and 2.5 percent excess cost growth. The CBO's director only cited the 2.5 excess growth results in Congressional Testimony (May 2005).

⁴ Brown and Monaco (2004) have argued that the 2000 panel's methodology is inconsistent in its treatment of GDP growth. Income growth is accounted for separately and should not be subtracted from the contribution from technology. The 2004 Panel argues that the unit elasticity with respect to income reflects both regular demand elasticity and the technology induced by the income.

⁵ Based on the research by Cutler cited in the Report, the factors explaining growth in health were technology (49 percent of growth), relative medical price inflation (19 percent), administration (13 percent), increased insurance (13 percent), income growth (5 percent), and aging (2 percent).

⁶ The 2004 Technical Panel rejected the sustainability criterion, while recommending additional research on the determinants of health care spending.

projection and the stresses on the health care system and the economy.⁷ Rather than simply pointing to the impossibility of health spending exceeding 100 percent of GDP, it provides some structure for deciding when health spending is implausibly large. While somewhat arbitrary, the assumption that society would not want to actually reduce real non-health consumption in order to finance increased health spending seems a reasonable upper bound on the amount of health spending that could be deemed reasonable or affordable. For example, models where the adoption of medical technology is endogenous, such as Jones (2004) and Hall and Jones (2004), lead to predictions that health care will not crowd out other consumption. Furthermore, the sustainability criterion provides a limited assurance that the macroeconomic and health care spending assumptions in the forecast are consistent because it ensures that health care spending will not be so large as to crowd out the investment consistent with the macroeconomic projection.

SUSTAINABILITY: A MACROECONOMIC ANALYSIS

Our first test of sustainability examines projections for non-health consumption under various assumptions of excess growth in health care consumption. We begin with the macroeconomic assumptions assumed in the 2005 Social Security and Medicare Trustees Reports. As in earlier years, the assumptions for the 2005 Trustees Reports include projections for real and nominal GDP through 2080, labor force, unemployment rates, and compensation as a percent of GDP. The latter is assumed to be constant, consistent with the historical record and with a Cobb-Douglas production function.

We construct total personal consumption expenditures to be the residual of GDP less the sum of gross investment, government purchases, and net exports. The gross investment projection assumes that the real per-worker capital stock continues to rise at the historical rate, consistent with the Trustees assumption that labor productivity would increase at near its historical trend and that depreciation rates would remain at current

⁷ See Chernew, Hirth, and Cutler (2003) for a discussion of the concept of health affordability.

values.⁸ We assume that government purchases are maintained at their 2004 share of GDP. The vast majority of nondefense government purchases of goods and services are for investment-like activities, ranging from construction of public infrastructure to education, and thus implicitly are part of the production function.⁹ For the purposes of the simulation, we also assume that net exports rise over the coming fifteen years to post a small surplus that stabilizes the current account deficit at 2 percent of GDP, which in turn allows the ratio of net foreign debt to GDP to settle in at 47 percent.¹⁰

Table 1 shows the results. The projected slowdown in labor force growth leads to a smaller share of GDP devoted to investment. However, the swing of the trade account about offsets the decline in investment and the share of GDP going to consumption is relatively constant. Nonetheless, consumption declines over the next fifteen years from 70 percent of GDP in 2004 to 68 percent of GDP by 2020 because the swing in the trade account necessary to stabilize net foreign indebtedness is assumed to be completed by that time. The swing in the trade account is greater than the decline in investment and consumption growth is below GDP growth over that period.

We project the share of consumption devoted to health spending by a two-step procedure. First, we allocate BEA's estimate of personal consumption expenditures on health in 2004 among three age groups (under twenty, aged 20 to 64, and 65 and over) using the population shares according to the Social Security Administration and the relative health spending intensities estimated by Lubitz, et. al. (2001). Then, health spending was projected forward using the Social Security Trustees' 2005 population projection, GDP per capita, and selected assumptions about excess health care growth

⁸ The Trustees assumed that annual average labor productivity growth would be 1.6 percent per year compared with 1.6 percent over the 1966-2000 periods. We assume per-worker capital stock grows 1.2 percent per year, same as the previous 30 years. The average depreciation rate has tended to rise over time as capital accumulation has shifted towards shorter-lived assets; for these simulations, we assume this stabilizes.

⁹ In 2003, 83 percent of the goods and services purchased by the government were for national defense, public order and safety, health education and economic affairs (largely transportation and other public infrastructure).

¹⁰ The Trustees assume that the nominal interest rate is greater than the growth rate of the economy. Therefore, a trade account surplus is necessary to stabilize the ratio of the current account to GDP and the ratio of net foreign debt to GDP. We assume that the current account deficit is stabilized at 2 percent of GDP; alternative assumptions about the steady-state level of the current account deficit would have only a small effect on the trade account surplus.

beginning in 2005.¹¹ Real health spending was calculated using the PCE deflator which was assumed to grow at the same rate as the GDP deflator.¹²

Our projections are summarized in Tables 2 and 3 and Figure 1. Persistent excess growth of only 1.0 percent leads to some crowd-out of non-health consumption by 2090, while higher levels of excess growth lead to crowd-out within the seventy-five year projection window used by the Trustees. Crowding out begins when the share of consumption devoted to health is greater than the ratio of the growth rate of consumption to the growth rate of health care. With excess growth of 1.0 percent and GDP growth of 1.5 percent this occurs when health care reaches 60 percent of GDP. Our projections indicate stress on non-health consumption as soon as the next decade with excess growth of as little as 2 percent. As noted earlier, consumption grows more slowly than GDP over the next fifteen years owing to the assumed current account correction. The slow growth of overall consumption leads to declines in non-health consumption as soon as 2016.¹³ Thus, projections of 2.0 percent excess health care growth for just the next two decades may imply stagnating or falling non-health consumption. Over the next seventy-five years, excess growth of 2.0 percent leaves no resources for non-health consumption and excess growth of 1.5 percent yields significant declines in per capita non-health consumption. With these results, 1 percent excess growth looks to be an upper bound for seventy-five year projections.

DISTRIBUTION OF HEALTH CARE SPENDING AND SOURCES OF FINANCING

The assumption of 1 percent excess cost growth is feasible if the appropriate criterion to use for feasibility is that the average consumption of non-health goods and services will not decline over the next century. However, it is important to also examine

¹¹ This methodology does not allow for changes in relative health care spending based on changes of the average age of the 65 and over group.

¹² By using the PCE deflator we do not take a stand on the decomposition of health spending into real and changes in relative prices. The Trustees assume that the CPI deflator will rise 0.3 percentage point faster than the GDP deflator and the CPI has historically risen 0.4 percentage point faster than the PCE deflator.

¹³ With per capita consumption growth of 1.5 percent and 2 percent excess growth of health care then crowd-out begins when health care is $1.5/(1.5+2)= 43$ percent of consumption. But during the next decade per capita consumption grows slower than per capita GDP and non-health consumption stagnates at a lower share of health.

whether such growth of non-health consumption will be feasible for different groups. As we showed above, the question of whether health spending will crowd out non-health spending depends on the initial share of health spending in consumption. If some groups have higher shares today, then, assuming that health spending growth is constant across the population, these groups will face absolute crowd-out sooner than the average.

To examine some of the microeconomic issues associated with the excess cost growth assumption, we use the various national medical expenditure surveys that have been conducted over the years. Specifically, we examine data from 1970, 1977, 1987, 1996, and 2002.¹⁴ We examine total medical spending and private medical spending for the non-institutionalized by family-size equivalent income level.¹⁵ Unfortunately, we do not have good measures of private insurance premiums by family members throughout the years. Instead, we measure total medical spending financed by private insurance (thus zero for those who do not experience any illness, even though they may have private insurance), assuming that the distribution of privately-financed medical expenditures will roughly equal the distribution of private insurance premiums.¹⁶ Similarly, we do not have measures of consumption, only income. Thus, we evaluate crowd-out relative to income rather than consumption. For the lower-income groups who do save much and pay little in taxes, this is probably not an important distinction.

Table 4 shows the distribution of health spending per household member over time across income quintiles for elderly and non-elderly households, where an elderly household is defined as one in which the household head is 65 or older. Health spending does not vary substantially with income. For the non-elderly, those in the top quintile or two do spend a bit more on average, but spending is quite flat across the bottom three quintiles. For the elderly, health spending does not vary with income quintile. Note that this does not mean that lower-income people have equal access to health care. Indeed,

¹⁴ We use the Survey of Health Services Utilization and Expenditures, 1970; the National Medical Care Expenditure Survey, 1977; the National Medical Expenditure Survey, 1987; and the Medical Expenditures Survey for 1996 and 2002.

¹⁵ The income measure we use to sort households into income quintiles divides income by the weighted number of family members, where the first adult has a weight of 1, each subsequent adult has a weight of 0.7 and each subsequent child has a weight of 0.4.

¹⁶ This procedure will understate private health spending because it does not account for the insurer's markup of insurance premium over cost, and also, for the elderly, because it does not count as private the Part B spending that is financed by the Part B premium—instead, all Part B expenditures are counted as being financed by Medicare.

those with lower-income tend to have a greater need for health care, as they tend to be in poorer health, and it has been well documented that those without insurance receive less care than the insured.¹⁷ But, on average, differences between health needs and health insurance coverage seem to balance out, leaving health spending relatively invariant to income. What is perhaps more surprising about Table 4 is that the relationship between health spending and income has been fairly constant over time. The last column of the table shows the ratio of spending in 2002 relative to spending in 1977: For the non-elderly, spending roughly doubled for all income quintiles between 1977 and 2002; for the elderly, spending growth was a bit higher.

The implications of these findings are shown in Table 5, which reports the share of health spending in income by quintile (these are mean spending by quintile divided by mean income by quintile). The relative constancy of health spending across income quintiles translates into large differences in the ratio of health spending to income and large increases over time. By 2002, health spending by low-income elderly households represented 132 percent of income, up from 35 percent in 1970; for the lowest-income non-elderly households, health spending represented 46 percent of income, up from 18 percent in 1970. These numbers suggest that excess health care cost growth will tend to cause crowd-out of non-health consumption much earlier for older and lower-income groups. But to determine crowd-out, it is important to concentrate on private health spending rather than total health spending.

Table 6 reports the shares of income represented by private health spending—that is, health spending financed by private insurance or out-of-pocket payments.¹⁸ Three important facts stand out: First, private health spending is a much smaller share of income for most groups than total health spending. For example, mean private health spending represents 16 percent of mean income for the lowest non-elderly income quintile in 2002, as opposed to 46 percent for total health spending. Second, there is much less variation across income quintiles in the share of income represented by private health spending than public health spending. For example, in 2002, the share of spending

¹⁷ See, for example, Doyle, Joseph J. 'Health Insurance, Treatment, and Outcomes: Using Auto Accidents as Health Shocks, NBER Working Paper 11099, February 2005.

¹⁸ As noted above, this definition of private health spending omits health care financed by Medicare Part B premiums, thus somewhat understating the private health spending for the elderly.

for the lowest non-elderly income quintile was almost 10 times larger than the share for the highest non-elderly quintile; for private health spending, the share was only 4 times larger for the lowest quintile. Finally, and perhaps most surprisingly, the income share of private spending has increased very slowly over time. For example, there was a 50 percent increase in the income share of total spending for the lowest non-elderly quintile between 1977 and 2002, whereas the income share of private spending barely increased at all. We use these facts to explore whether health care cost growth is sustainable across income quintiles and whether projections of the public sector health care spending are reasonable.

SIMULATION OF HEALTH CARE SPENDING BY QUINTILE

Accepting the notion that health care cost growth is sustainable if it allows for real growth in non-health consumption, is health care sustainable across income quintiles? To answer that question, we simulated the evolution of income and health spending over the next seventy-five years to determine whether 1 percent excess growth in health care spending would lead to declines in non-health spending for groups with relatively high health costs. We began with the 2002 income and health spending data described above. We projected the income of each quintile of elderly and non-elderly by increasing their income by the amount that real per capita GDP is projected to grow over the same period. This assumes that the distribution of income does not change going forward, either across quintiles or between non-elderly and elderly and that per capita factor income grows at the same pace as overall GDP.¹⁹ Our income measure also includes transfers and our methodology allows per capita transfers to the elderly to rise with GDP while under current law they would rise more slowly owing to the increase in the normal retirement age to 67 for social security benefits.

Health care spending is projected forward after making two adjustments to the 2002 data. First, we increase proportionately the health spending (maintaining the shares financed by public and private sectors) to bring the overall level up to the share in

¹⁹ Over the projection, factor income will likely grow more slowly than GDP reflecting the rising foreign indebtedness. The distribution of factor income between non-elderly and elderly may change if the relative returns to capital and labor change.

spending observed in the national accounts data. The micro data understate health spending because they do not include private or public administrative costs and profits and spending on institutionalized patients. Second, we altered the public/private spending shares for the elderly to capture the Medicare drug benefit.²⁰ By holding the public spending share of health care constant over the projection our simulation is broadly consistent with current law.²¹

Our results, displayed in Table 7, suggest that, among the non-elderly, real non-health consumption will not be crowded out over the projection period, as real income after-private health spending will continue to grow. Low-income groups now only spend a small portion of their income on health because a large share of health spending is financed by the public sector. In 2080, when health care costs are projected to be 161 percent of income on average, only 54 percent of private income will be spent on health. Among the elderly, we project a decline in real non-health income for the lowest quintile. Although the public sector finances 81 percent of health care, the other 19 percent uses up nearly all income because health care costs are 461 percent of income for this group. The second quintile also is near the point where non-health resources will decline.²²

While only one of our ten quintiles will have declining non-health resources, subgroups among the quintiles may see declines relative to earlier generations, particularly families with persistent high health expenditures. Furthermore, our analysis does not account for the taxes that will be needed to finance the increased transfers for social security and health care. If these increased taxes are broadly based, then other quintiles may also see declines in the resources available to finance non-health spending.

²⁰ Lacking good estimates on the overall impact (increased Medicare less decreased Medicaid) of the drug benefit by quintile we apportioned the drug benefit by observed drug spending. This resulted in a fairly even distribution of the benefit across quintiles with the lower two quintiles receiving 30 percent higher per capita benefit than the top two quintiles. With 90 percent take-up rates the basic benefit will be broadly distributed, we assume, in effect, that the low income subsidies will largely offset by reduced Medicaid payments.

²¹ Some features of current law, such as Medicaid income and asset tests may provide less coverage in the future while other features such as co-payments and relative shifts in demand toward covered services may provide more public coverage over time.

²² These results are similar to Johnson and Penner (2004) who project income, taxes and, medical costs through 2030.

PROJECTING PUBLIC SPENDING: IS THERE AN ENDOGENOUS RESPONSE TO HEALTH COST GROWTH?

One of the striking findings from the health spending data is that private spending on health care has not increased in tandem with total health spending. How did this happen? Table 8 shows that the public share of health spending has increased over time, particularly for the lower income quintiles. This increase may have been accomplished in a number of ways, including direct legislation that increased coverage for public health insurance, deductibles that haven't kept pace with health spending, expansions in outreach programs and reductions in stigma for low-income health programs, and increases in payments to public hospitals. Part of this increase in the share that is public may also represent higher spending growth in publicly-managed health insurance programs. Regardless of the source, these data suggest that private spending and public spending grow at very different rates over time.

Figure 2 shows how private and public spending diverged over time for the lowest income quintiles. The data suggest that as health spending increased as a share of income, the public share of spending increased to lower the burden of private health spending. This dynamic has also been apparent in the recent Medicare prescription drug bill. As reported in Table 6, the share of private health spending in income has increased significantly faster than trend since 1996 for the elderly; this increase is due almost entirely to prescription drugs. Arguably as a result, political pressures arose that led to a significant expansion in public health care financing that will lower the burden of private health care spending over the coming decade.

Figure 3 provides a slightly more formal examination of the relationship between the burden of health spending and the public financing role. It plots the income share of total health spending by quintile over time against the share of that spending that was publicly financed, for elderly and non-elderly households, for the five years studied (1970, 1977, 1987, 1996, and 2002). The relationship is clear--as health spending increases as a share of income, the public share of spending increases as well.

SIMULATING AN INCREASING PUBLIC ROLE IN HEALTH CARE FINANCING

It is unclear how to characterize the responsiveness of public health care financing. We choose two scenarios which we consider plausible. In the first scenario, we increase the public financing of health care so that the private share of income devoted to health care spending remains at its 2002 value through 2030. After 2030, we hold constant the new higher public portion of health spending and allow the private share of income devoted to health to rise. This policy is consistent with the fact that the private share of income devoted to health care spending has been roughly unchanged over the past 30 years because of increased public sector spending. We allow this to continue only to 2030 because at some point the private share of income devoted to health care will likely be allowed rise if growth of health continues to exceed that of income.

In the second scenario, we exploit the relation between the public portion of health care spending to health care as a share of income by quintile shown in Figure 3. We tried several regression strategies to capture the nonlinear response and settled on a piece-wise linear trend.²³ We use the regression results to predict the increase in the public share for each quintile as overall health spending by that quintile as a share of income rises in the future.

Table 9 shows our estimates of the effects of these two policies on government spending. We project that federal and state and local spending on Medicare and Medicaid will reach 10 percent of GDP by 2030 under the assumptions of current law, 1 percent excess growth in health care costs beginning in 2005, and the Trustees projections for Medicare beneficiaries and economic variables.²⁴ If the government boosts health care transfers to keep private health spending constant as a share of income through 2030, scenario 1, then health transfers will be 50 percent, or 5 percentage points of GDP, higher in 2030 than under the baseline. Under scenario 2, the regression-based response, health transfers will be 8 percent, or 1 percentage point of GDP, higher in 2030.

²³ A quadratic functional form also fit the data quite well but the negative coefficient on the squared term implied that the public share would begin to decline at high levels of health spending, a response that would make little sense.

²⁴ We assume that Medicaid non-elderly and elderly beneficiaries will grow at the same rate as their underlying populations.

These scenarios highlight the pressures for greater spending that may develop as health spending continues to grow. Of course, even under the current baseline, the public sector will face substantial budgetary pressures, so the actual response may be more attenuated. Nonetheless, as the recent Medicare prescription drug legislation indicates, the demand for the public sector to mitigate the burden of health spending can be substantial even in the face of large future budgetary imbalances.

PROJECTING PRIVATE SPENDING: IS THERE AN ENDOGENOUS RESPONSE TO HEALTH COST GROWTH?

Another striking trend evident in the health spending data is the change in the share of health spending that is financed by out-of-pocket payments (direct payments by households for medical expenditures). Table 10 shows how this share has declined over time for all households. To some extent, this decline the out-of-pocket share reflects the increased public provision of health care (which may substitute for direct private payments for care), but it is equally apparent for those in the upper income quintiles who have little public provision of care. The net effect of these declines on the share of income that is spent on out-of-pocket payments is reported in Table 11. The table shows that, as a share of income, out- of-pocket payments for health care have been stable or declining, even as health spending has grown as a share of income.

It does not seem unreasonable that the demand for insurance should increase as health spending becomes a larger (and hence riskier) share of income.²⁵ Projections of future spending generally assume that this trend will not continue and that out of pocket payments will remain constant as a share of health spending.²⁶ An alternative assumption is that out-of-pocket spending will remain constant as a share of income. Under this assumption, shown in Table 12, out of pocket spending will fall as a share of health expenditures, from about 20 percent on average today to 15 percent by 2020 and to 8 percent by 2080. This reduction in the out-of-pocket share acts like a reduction in the

²⁵ On the other hand, it may also be that the overconsumption of health services induced by lower out-of-pocket payments may also increase with health spending. See Cutler and Zeckhauser (1999) for an overview of the optimal health insurance policy.

²⁶ For example, the 2000 Medicare Trustees Technical Panel that first recommended the 1 percent excess cost growth assumption explicitly assumed that only technological growth would drive future health spending increases.

price of health services, since the out-of-pocket share is the price faced by consumers when they are choosing how much health care to consume. Using a demand elasticity of 0.2, these price reductions imply increased health spending of 5 percent by 2020 and 12 percent by 2080.²⁷

CONCLUSION

The Medicare Trustees now assume that age-adjusted per capita health care spending will slow to a rate of growth 1 percentage point faster than per capita GDP growth. Our analysis suggests that this rate of growth is at the upper end of the range consistent with the criterion of no decline in per capita non-health consumption as faster rates of growth for health care imply declines in non-health consumption for the population in general. Long-run budget projections using higher growth rates may overstate the probable budget pressures from health care costs. With 1 percent excess growth some subsets of the overall population may experience declines in real non-health consumption, particularly low-income elderly. Furthermore, the share of income devoted to private health spending has been remarkably stable over the past 30 years, accommodated by increased public health care financing. This finding suggests that demands for increased public sector financing will occur well before health spending reaches the level at which it crowds-out the growth of non-health spending. It remains to be seen how the competing pressures of higher taxes vs. higher private health care spending will be balanced. Similarly, induced demand from falling out-of-pocket payments may also put upward pressure on health spending and public-sector financing.

With 1 percent excess growth, the elderly may have health care expenses that average 80 percent of income (including non-health transfers) by 2055, of which 70 percent would be financed by the public sector under current law. The rise in health care as a share of consumption implies that an increasing share of lifetime consumption will be spent on health care during retirement. Policy discussions have largely focused on ways to reduce transfers to the elderly relative to current law, but should be broadened to

²⁷ Cutler and Zeckhauser (1999) review the evidence on the price elasticity of demand for health services. They conclude that the elasticity is likely in the range of .1 to .2; using the lower .1 estimate would halve the effects cited above.

include ways to increase saving during working years to finance health care during retirement.

Our analysis does not account for the changes in taxes that will be required to finance the transfers implied in our baseline projection. Further work should examine the projected evolution of after-tax income as well as modeling changes in the distribution of income among elderly and non-elderly.

REFERENCES

- Board of Trustees, Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds. *The 2005 Annual Report of the Board of Trustees, Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds*. Washington, D.C.: U.S. Government Printing Office, March, 2005.
- Brown, Jason D. and Ralph M. Monaco. "Possible Alternatives to the Medicare Trustees' Long-term Projections of Health Spending". Technical Working Paper U.S. Department of the Treasury, Office of Economic Policy. Washington, D.C., 2004.
- Chernew, Michael E., Richard A. Hirth, and David M. Cutler, "Increased Spending on Health Care: How Much Can the United States Afford?" *Health Affairs* 22 No.4 (July/August, 2003): 15-25.
- Congressional Budget Office. *The Long-Term Budget Outlook*. Washington, D.C., December, 2003.
- Congressional Budget Office. *The Budget and Economic Outlook: Fiscal Years 2006 to 2015*. Washington, D.C., January, 2005.
- Gokhale, Jagadeesh and Kent Smetters. *Fiscal and Generational Imbalances: New Budget Measures for New Budget Imbalances*. Washington, D.C.: AEI Press, 2003.
- Hall, Robert E. and Charles I. Jones. "The Value of Life and the Rise in Health Spending." NBER Working Paper No. 10737. Cambridge, MA: National Bureau of Economic Research, September, 2004.
- Holtz-Eakin, Douglas. "Implications of Demographic Changes for the Budget and the Economy" Testimony before the U.S. House of Representatives, Committee on Way and Means, Washington, D.C., May 19, 2005.
- Johnson, Richard W. and Rudolph Penner. "Will Health Care Costs Erode Retirement Security?" Issues in Brief No. 23. Chestnut Hill, MA: Center of Retirement Research at Boston College, October, 2004.
- Jones, Charles I. "Why Have Health Expenditures as a Share of GDP Risen So Much?" University of California, Berkeley, mimeo. Berkeley, CA: May 5, 2004.
- Lubitz, James, Linda G. Greenberg, Yelena Gorina, Lynne Wartzman, and David Gibson. "Three Decades of Health Care Use By The Elderly, 1965-1998." *Health Affairs* 20 No.2 (March/April, 2001): 19-32.

Medicare Trustees. 2000 Technical Review Panel on the Medicare Trustees Report. *Review of the Assumptions and Methods of the Medicare Trustees' Financial Projection*, Washington, D.C., December, 2000.

Medicare Trustees. *2005 Annual Report of the Boards of Trustees of the Federal Hospital Insurance and Federal Supplementary Medical Insurance Trust Funds*. Washington, D.C., March, 2005.

Office of Management and Budget, *Analytical Perspectives, Budget of the U.S. Government, Fiscal Year 2006*. Washington, D.C.: February, 2005.

TABLE 1
COMPOSITION OF GDP
(Percent)

| Year | Consumption | Investment | Government | Exports less imports | Memo: Net foreign assets |
|--|-------------|------------|------------|----------------------------|--------------------------------|
| 2004 | 70.1 | 16.4 | 18.6 | -5.2 | -24.1 |
| 2030 | 68.2 | 11.8 | 18.6 | 1.3 | -46.2 |
| 2055 | 69.3 | 10.7 | 18.6 | 1.3 | -46.2 |
| 2080 | 70.3 | 9.7 | 18.6 | 1.3 | -46.2 |
| 2100 | 71.0 | 9.0 | 18.6 | 1.3 | -46.2 |
| <i>Memo</i> Average, 1991- 2000 | 67.3 | 15.7 | 18.5 | -1.5 | n.a. |

Source: Author's calculations; see text for details.

TABLE 2
HEALTH SHARE OF CONSUMPTION

| Year | Excess growth | | | | |
|----------------------------------|---------------|------|-------|-------|-------|
| | 0.0 | 1.0 | 1.5 | 2.0 | 2.5 |
| 2004 | 20.6 | 20.6 | 20.6 | 20.6 | 20.6 |
| 2030 | 24.4 | 31.4 | 35.5 | 40.1 | 45.4 |
| 2055 | 25.4 | 41.5 | 52.8 | 67.2 | 85.5 |
| 2080 | 26.4 | 54.5 | 78.2 | 112.0 | 160.2 |
| 2100 | 27.0 | 67.5 | 106.5 | 167.7 | 263.3 |
| <i>Memo</i> crowd-out year | n.a. | 2090 | 2053 | 2016 | 2011 |

TABLE 3
REAL PER CAPITA NON-HEALTH CONSUMPTION

| Year | Excess growth of health | | | | |
|-----------|---|------|------|-------|--------|
| | 0.0 | 1.0 | 1.5 | 2.0 | 2.5 |
| | Thousands of 2000 dollars | | | | |
| 2004 | 20.1 | 20.1 | 20.1 | 20.1 | 20.1 |
| 2030 | 27.5 | 25.0 | 23.5 | 21.8 | 19.9 |
| 2055 | 40.3 | 31.7 | 25.5 | 17.7 | 7.8 |
| 2080 | 59.1 | 36.5 | 17.5 | -9.7 | -48.3 |
| 2100 | 80.7 | 35.9 | -7.2 | -74.7 | -180.3 |
| | Annual average percent change over period | | | | |
| 2004-2030 | 1.2 | 0.8 | 0.6 | 0.3 | 0.0 |
| 2030-2055 | 1.5 | 0.9 | 0.3 | -0.8 | -3.7 |
| 2055-2080 | 1.5 | 0.6 | -1.5 | n.a. | n.a. |
| 2080-2100 | 1.6 | -0.1 | n.a. | n.a. | n.a. |

TABLE 4
PER CAPITA HEALTH SPENDING BY EQUIVALENT INCOME QUINTILE
(2004 Dollars)

| Income Quintile | Year | | | | | Ratio of spending in 2002 to spending in 1977 |
|-------------------------------|------|------|------|------|------|---|
| | 1970 | 1977 | 1987 | 1996 | 2002 | |
| Non-elderly Households | | | | | | |
| 1 | 716 | 1087 | 1944 | 1547 | 2088 | 1.9 |
| 2 | 751 | 990 | 1587 | 1541 | 2071 | 2.1 |
| 3 | 876 | 1056 | 1554 | 1687 | 2126 | 2.0 |
| 4 | 1191 | 1069 | 1827 | 1926 | 2341 | 2.2 |
| 5 | 1001 | 1289 | 1958 | 2100 | 2640 | 2.0 |
| Elderly Households | | | | | | |
| 1 | 1190 | 2963 | 5058 | 5895 | 7525 | 2.5 |
| 2 | 1480 | 3001 | 6271 | 5005 | 7248 | 2.4 |
| 3 | 1506 | 2839 | 5402 | 4693 | 6234 | 2.2 |
| 4 | 1749 | 2388 | 5191 | 5022 | 6302 | 2.6 |
| 5 | 1378 | 2609 | 4972 | 4614 | 6337 | 2.4 |

TABLE 5**MEAN HOUSEHOLD HEALTH SPENDING BY QUINTILE**
(Share of Mean Household Income by Quintile)

| Income Quintile | 1970 | 1977 | 1987 | 1996 | 2002 |
|-------------------------------|------|------|------|------|------|
| Non-elderly Households | | | | | |
| 1 | 18% | 30% | 43% | 40% | 46% |
| 2 | 9% | 11% | 15% | 15% | 18% |
| 3 | 7% | 8% | 9% | 10% | 11% |
| 4 | 7% | 5% | 7% | 7% | 8% |
| 5 | 3% | 3% | 4% | 4% | 5% |
| Elderly Households | | | | | |
| 1 | 35% | 67% | 92% | 110% | 132% |
| 2 | 25% | 39% | 67% | 50% | 67% |
| 3 | 18% | 27% | 40% | 34% | 40% |
| 4 | 13% | 15% | 27% | 24% | 25% |
| 5 | 4% | 6% | 11% | 11% | 12% |

TABLE 6
MEAN PRIVATE HOUSEHOLD HEALTH SPENDING
 (Share of Mean Household Income)

| Income Quintile | 1970 | 1977 | 1987 | 1996 | 2002 |
|-------------------------------|------|------|------|------|------|
| Non-elderly Households | | | | | |
| 1 | 12% | 15% | 19% | 15% | 16% |
| 2 | 9% | 8% | 11% | 12% | 12% |
| 3 | 7% | 6% | 8% | 9% | 10% |
| 4 | 7% | 5% | 6% | 7% | 7% |
| 5 | 3% | 3% | 4% | 4% | 4% |
| Elderly Households | | | | | |
| 1 | 12% | 21% | 26% | 26% | 33% |
| 2 | 10% | 13% | 21% | 17% | 21% |
| 3 | 11% | 12% | 17% | 14% | 16% |
| 4 | 7% | 7% | 13% | 12% | 11% |
| 5 | 3% | 3% | 6% | 6% | 5% |

TABLE 7
BASELINE HEALTH PROJECTION
(2002 dollars)

| Quintile | Income | Health spending | | | | | | Income after health spending |
|-------------------|---------|-----------------|--------|---------|-------------------|--------------|---------------------------------|------------------------------|
| | | Total | Public | Private | Percent of income | Public share | Private spending as % of income | |
| Non-elderly, 2002 | | | | | | | | |
| 1 | 10,557 | 6,921 | 4,588 | 2,333 | 66% | 66% | 22% | 8,224 |
| 2 | 29,946 | 7,657 | 2,625 | 5,032 | 26% | 34% | 17% | 24,914 |
| 3 | 46,718 | 7,627 | 1,282 | 6,345 | 16% | 17% | 14% | 40,373 |
| 4 | 64,789 | 7,535 | 983 | 6,551 | 12% | 13% | 10% | 58,238 |
| 5 | 112,526 | 7,309 | 622 | 6,687 | 6% | 9% | 6% | 105,839 |
| all | 52,907 | 7,410 | 2,020 | 5,390 | 14% | 27% | 10% | 47,517 |
| Non-elderly, 2030 | | | | | | | | |
| 1 | 15,836 | 15,918 | 10,553 | 5,366 | 101% | 66% | 34% | 10,470 |
| 2 | 44,919 | 17,611 | 6,038 | 11,573 | 39% | 34% | 26% | 33,346 |
| 3 | 70,077 | 17,542 | 2,947 | 14,595 | 25% | 17% | 21% | 55,482 |
| 4 | 97,184 | 17,330 | 2,262 | 15,068 | 18% | 13% | 16% | 82,116 |
| 5 | 168,789 | 16,810 | 1,430 | 15,381 | 10% | 9% | 9% | 153,408 |
| all | 79,361 | 17,042 | 4,646 | 12,396 | 21% | 27% | 16% | 66,964 |
| Non-elderly, 2055 | | | | | | | | |
| 1 | 23,542 | 29,761 | 19,729 | 10,032 | 126% | 66% | 43% | 13,510 |
| 2 | 66,780 | 32,924 | 11,288 | 21,636 | 49% | 34% | 32% | 45,143 |
| 3 | 104,181 | 32,796 | 5,511 | 27,285 | 31% | 17% | 26% | 76,896 |
| 4 | 144,479 | 32,399 | 4,229 | 28,170 | 22% | 13% | 19% | 116,309 |
| 5 | 250,933 | 31,428 | 2,673 | 28,755 | 13% | 9% | 11% | 222,178 |
| all | 117,983 | 31,862 | 8,686 | 23,176 | 27% | 27% | 20% | 94,807 |
| Non-elderly, 2080 | | | | | | | | |
| 1 | 34,838 | 56,061 | 37,164 | 18,897 | 161% | 66% | 54% | 15,941 |
| 2 | 98,822 | 62,020 | 21,263 | 40,757 | 63% | 34% | 41% | 58,065 |
| 3 | 154,169 | 61,778 | 10,380 | 51,398 | 40% | 17% | 33% | 102,771 |
| 4 | 213,804 | 61,031 | 7,966 | 53,064 | 29% | 13% | 25% | 160,739 |
| 5 | 371,336 | 59,201 | 5,034 | 54,167 | 16% | 9% | 15% | 317,169 |
| All | 174,594 | 60,018 | 16,362 | 43,657 | 34% | 27% | 25% | 130,937 |

TABLE 7 (cont.)
BASELINE HEALTH PROJECTION
(2002 dollars)

| Quintile | Income | Health spending | | | | | | Income after health spending |
|---------------|---------|-----------------|---------|---------|-------------------|--------------|---------------------------------|------------------------------|
| | | Total | Public | Private | Percent of income | Public share | Private spending as % of income | |
| Elderly, 2002 | | | | | | | | |
| 1 | 8,354 | 15,704 | 12,794 | 2,910 | 188% | 81% | 35% | 5,444 |
| 2 | 15,785 | 15,027 | 11,490 | 3,536 | 95% | 76% | 22% | 12,249 |
| 3 | 25,301 | 14,284 | 9,581 | 4,703 | 56% | 67% | 19% | 20,598 |
| 4 | 41,818 | 15,128 | 9,507 | 5,621 | 36% | 63% | 13% | 36,197 |
| 5 | 87,458 | 15,213 | 9,489 | 5,724 | 17% | 62% | 7% | 81,734 |
| All | 35,743 | 15,071 | 10,572 | 4,499 | 42% | 70% | 13% | 31,244 |
| Elderly, 2030 | | | | | | | | |
| 1 | 12,531 | 36,120 | 29,426 | 6,693 | 288% | 81% | 53% | 5,838 |
| 2 | 23,678 | 34,561 | 26,427 | 8,134 | 146% | 76% | 34% | 15,544 |
| 3 | 37,952 | 32,853 | 22,036 | 10,817 | 87% | 67% | 29% | 27,135 |
| 4 | 62,727 | 34,793 | 21,866 | 12,927 | 55% | 63% | 21% | 49,800 |
| 5 | 131,187 | 34,989 | 21,824 | 13,165 | 27% | 62% | 10% | 118,022 |
| All | 53,615 | 34,663 | 24,316 | 10,347 | 65% | 70% | 19% | 43,268 |
| Elderly, 2055 | | | | | | | | |
| 1 | 18,629 | 67,528 | 55,014 | 12,514 | 362% | 81% | 67% | 6,116 |
| 2 | 35,201 | 64,615 | 49,408 | 15,207 | 184% | 76% | 43% | 19,994 |
| 3 | 56,421 | 61,421 | 41,198 | 20,223 | 109% | 67% | 36% | 36,199 |
| 4 | 93,254 | 65,048 | 40,880 | 24,168 | 70% | 63% | 26% | 69,086 |
| 5 | 195,031 | 65,415 | 40,802 | 24,613 | 34% | 62% | 13% | 170,418 |
| All | 79,707 | 64,805 | 45,460 | 19,345 | 81% | 70% | 24% | 60,362 |
| Elderly, 2080 | | | | | | | | |
| 1 | 27,568 | 127,204 | 103,631 | 23,573 | 461% | 81% | 86% | 3,996 |
| 2 | 52,091 | 121,716 | 93,071 | 28,645 | 234% | 76% | 55% | 23,445 |
| 3 | 83,493 | 115,699 | 77,606 | 38,094 | 139% | 67% | 46% | 45,400 |
| 4 | 137,999 | 122,533 | 77,006 | 45,527 | 89% | 63% | 33% | 92,473 |
| 5 | 288,611 | 123,223 | 76,859 | 46,364 | 43% | 62% | 16% | 242,247 |
| All | 117,953 | 122,075 | 85,634 | 36,440 | 103% | 70% | 31% | 81,512 |

TABLE 8**PUBLIC SHARE OF HEALTH SPENDING BY INCOME QUINTILE**

| Income Quintile | 1970 | 1977 | 1987 | 1996 | 2002 |
|-------------------------------|------|------|------|------|------|
| Non-elderly Households | | | | | |
| 1 | 35% | 48% | 55% | 62% | 65% |
| 2 | 6% | 26% | 26% | 22% | 34% |
| 3 | 4% | 16% | 12% | 9% | 17% |
| 4 | 3% | 12% | 13% | 9% | 13% |
| 5 | 2% | 13% | 9% | 7% | 8% |
| Elderly Households | | | | | |
| 1 | 66% | 69% | 72% | 76% | 75% |
| 2 | 59% | 66% | 68% | 67% | 69% |
| 3 | 40% | 54% | 59% | 59% | 60% |
| 4 | 49% | 49% | 50% | 50% | 57% |
| 5 | 31% | 52% | 48% | 46% | 57% |

TABLE 9
ALTERNATIVE PROJECTIONS FOR MEDICARE AND MEDICAID SPENDING
 (Percent of GDP, combined federal and state and local)

| Year | Baseline | Constant private share | Regression |
|------|----------|------------------------|------------|
| 2005 | 5.0 | 5.0 | 5.0 |
| 2030 | 9.9 | 14.9 | 10.7 |
| 2055 | 14.0 | 21.0 | 15.9 |
| 2080 | 18.8 | 28.2 | 22.5 |

TABLE 10
OUT-OF-POCKET SHARE OF HEALTH SPENDING BY INCOME QUINTILE

| Income Quintile | 1970 | 1977 | 1987 | 1996 | 2002 |
|-------------------------------|------|------|------|------|------|
| Non-elderly Households | | | | | |
| 1 | 36% | 26% | 17% | 13% | 15% |
| 2 | 48% | 33% | 24% | 18% | 17% |
| 3 | 47% | 33% | 29% | 19% | 20% |
| 4 | 51% | 35% | 27% | 21% | 21% |
| 5 | 61% | 38% | 29% | 24% | 26% |
| Elderly Households | | | | | |
| 1 | 29% | 19% | 16% | 11% | 14% |
| 2 | 36% | 23% | 19% | 15% | 19% |
| 3 | 38% | 24% | 23% | 17% | 18% |
| 4 | 39% | 27% | 22% | 16% | 21% |
| 5 | 51% | 29% | 28% | 21% | 19% |

TABLE 11**MEAN OUT-OF-POCKET HEALTH SPENDING BY INCOME QUINTILE****(Share of income)**

| Income Quintile | 1970 | 1977 | 1987 | 1996 | 2002 |
|-------------------------------|------|------|------|------|------|
| Non-elderly Households | | | | | |
| 1 | 6% | 8% | 7% | 5% | 7% |
| 2 | 5% | 4% | 4% | 3% | 3% |
| 3 | 3% | 3% | 3% | 2% | 2% |
| 4 | 4% | 2% | 2% | 2% | 2% |
| 5 | 2% | 1% | 1% | 1% | 1% |
| Elderly Households | | | | | |
| 1 | 10% | 5% | 15% | 12% | 19% |
| 2 | 9% | 9% | 12% | 8% | 13% |
| 3 | 7% | 5% | 9% | 6% | 7% |
| 4 | 5% | 4% | 6% | 4% | 5% |
| 5 | 2% | 2% | 3% | 2% | 2% |

TABLE 12**PROJECTED OUT-OF-POCKET SHARES OF HEALTH SPENDING ASSUMING
OUT-OF-POCKET SPENDING IS CONSTANT AS A SHARE OF INCOME**

| Income Quintile | 2002 | 2020 | 2030 | 2050 | 2080 |
|-------------------------------|------|------|------|------|------|
| Non-elderly Households | | | | | |
| 1 | 15% | 11% | 10% | 8% | 6% |
| 2 | 17% | 13% | 12% | 10% | 7% |
| 3 | 20% | 15% | 14% | 11% | 8% |
| 4 | 21% | 16% | 14% | 12% | 9% |
| 5 | 26% | 19% | 17% | 14% | 11% |
| Elderly Households | | | | | |
| 1 | 14% | 10% | 9% | 8% | 6% |
| 2 | 19% | 14% | 12% | 10% | 8% |
| 3 | 18% | 14% | 12% | 10% | 7% |
| 4 | 21% | 16% | 14% | 12% | 9% |
| 5 | 19% | 14% | 13% | 10% | 8% |

Figure 1

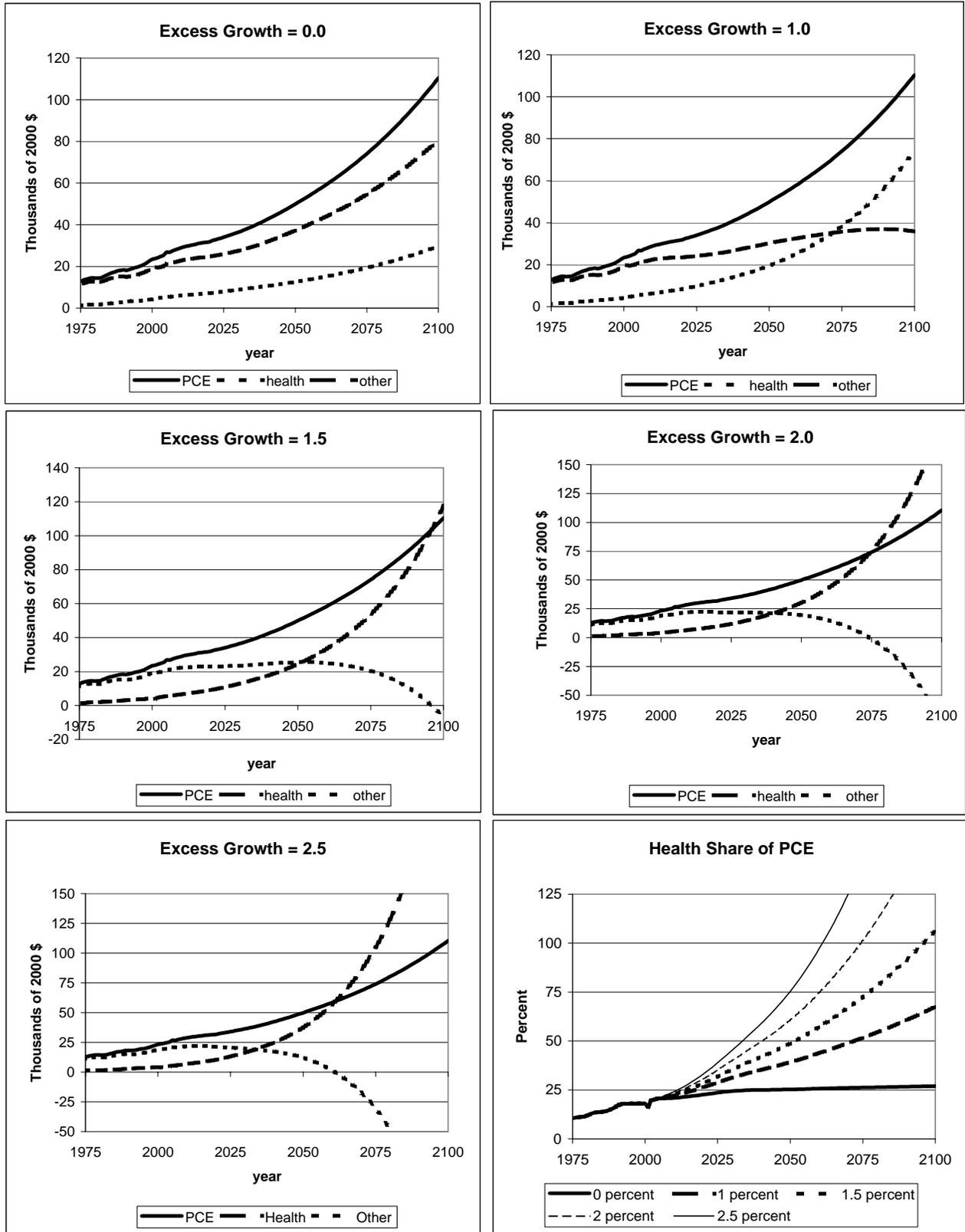


Figure 2

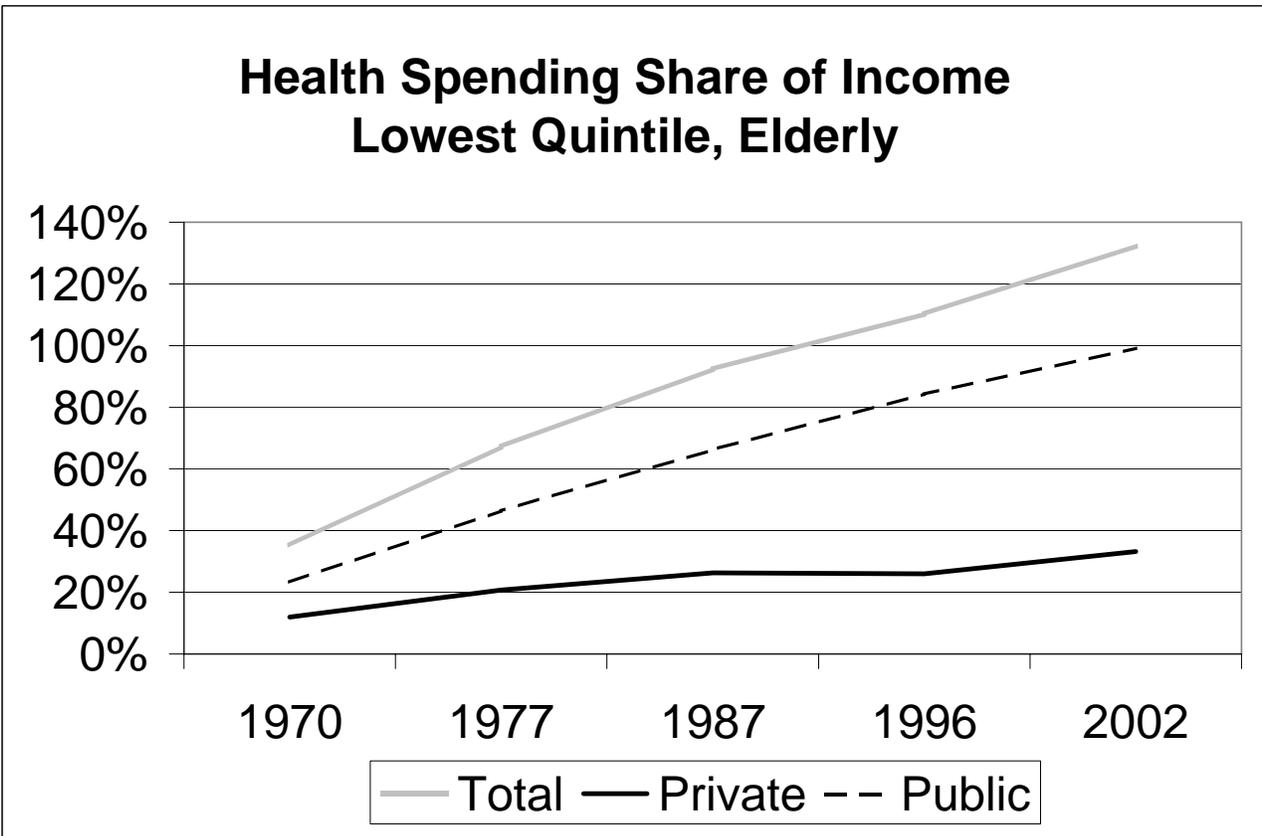
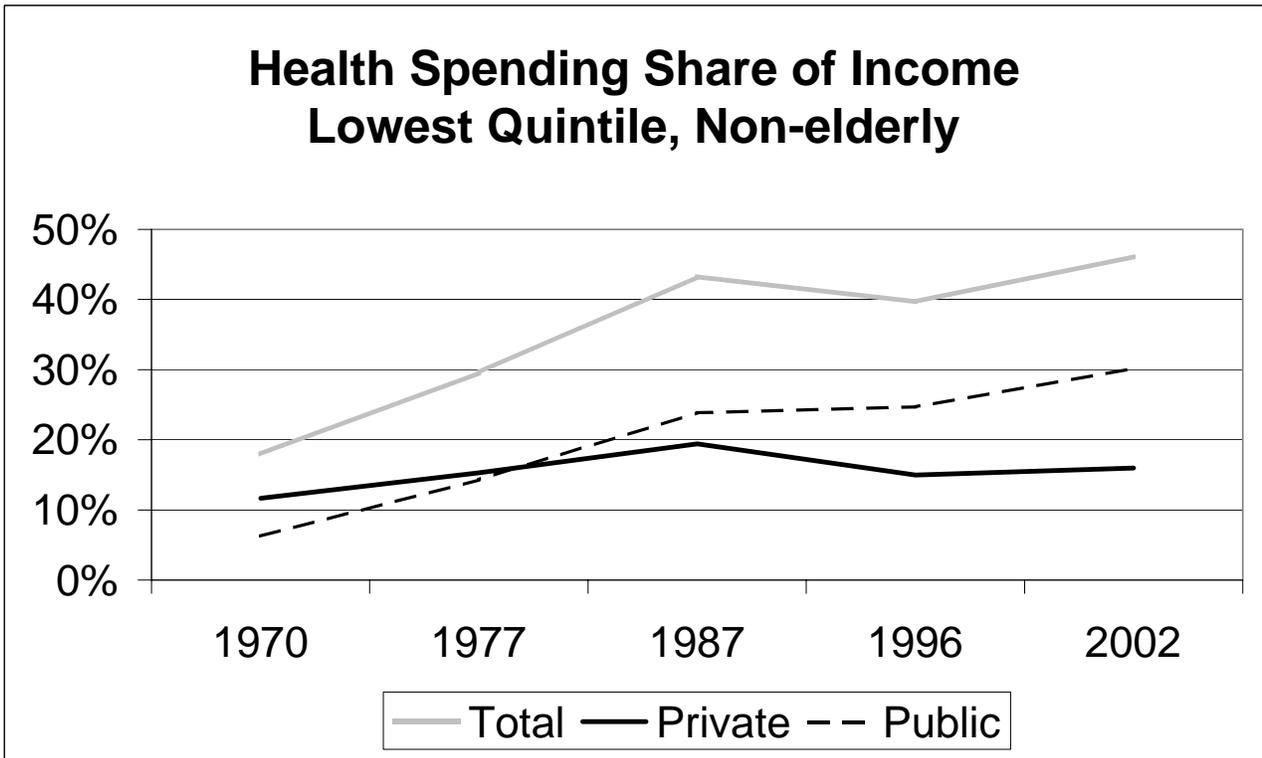


Figure 3

