# AGING OF THE US POPULATION AND ITS EFFECTS ON THE US ECONOMY

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## ABSTRACT

The increase in the percentage of the US population over the age of 65 will have varying consequences on the US economy. The percentage of Americans over the age of 65 is expected to rise from 12.4% to 20.7% by 2050. A broad scenario is portrayed, using Wicksellian and the Loanable Funds models, showing the impact of the aging of the US population upon future consumption, investment, government spending, and net exports.

## INTRODUCTION

Low birth rates, longer life spans, and the aging of the baby boom generation will lead to an increase in the fraction of the elderly population within the total US population. This increase in the fraction of elderly people within the US population will have negative consequences on the US economy. According to the US Census Bureau, in 2000 the percentage of people over the age of 65 out of the total US population was 12.4%. Within that same report the US Census Bureau states that the estimated percentage of people over the age of 65, within the whole US population, will be 20.7%.[i] This 8.3% increase in the elderly population will result in a decline of the US GDP per capita.

It is necessary to make one assumption about retirees over the age of 65, which is that people who are retired devote most, if not all of their income, as well as any savings that they have accumulated to consumption. From 2000 until 2005 the US savings rate averaged about 2%.[ii] Assuming that only people who are under 65 years of age are saving, an increase in the percentage of the US population over 65 would decrease the rate of savings. This can be illustrated by the equation: $x*.876 = .02$ with the .876 representing the 87.6% of the population that is under 65. Solving for "x" results in a value of .0228310502, which represents the actual savings rate for people under 65. With the assumption that this rate stays as the long term savings rate for the working-age population and that the percentage of people over 65 increases to 20.7%, the savings rate for the whole US population will decrease. If that same equation is applied, with the savings rate being .0228310502 and the percentage of people under the age of 65 being 79.3% ($.02283105028*.793 = x$), then the new total population savings rate would be .0181050228 ($x = .0181050228$). An 8.3% increase in the percentage of people over 65 would result in a .18949772% decrease in the overall savings rate (.02 - .0181050228 = .0018949772), assuming that all of the other external variables were held constant.

This change in the domestic savings rate can be applied in the Loanable Funds model. (Figure 1 on page 12) The Loanable Funds model portrays the market for loanable funds, with the Domestic Savings curve, the Total Savings curve and the investment curve. This model can be used to determine what effects changes in the demand for investment, the supply of total savings, and the supply of domestic savings have on each other. This model can also be used to see what changes in net exports will occur due to changes in any of those variables.

The negative change in the US saving rate leads to the Domestic Savings curve shifting left. This also shifts the Total Savings curve leftwards as a result of the Domestic Savings curve being a component of the Total Savings curve. Both curves shift by the same amount, which by the previous calculations is .18949772% (Figure 2, on page 12). The new equilibrium is the point of intersection between the new Total Savings curve and the Investment curve. The movement up the Investment curve due to a lowered supply of loanable funds results in a higher interest rate.

The interest rate also rises due to a rightward shift of the IS curve in the Wicksellian model, which shifts as a result of an increase in consumption. The Wicksellian model demonstrates the relationships between the real interest rate, the federal funds rate, the output gap and the inflation rate, illustrated in Figure 3 on page 13. As a result of a greater proportion of the US population, (notably the 65 and over retired segment that will proportionally increase), not saving, the money instead goes towards consumption leading to a rightward shift of the IS

curve. This results in the output gap going above zero, resulting in a boom in the economy. This boom in turn leads to a rise in the rate of inflation, forcing the Federal Reserve to take anti-inflationary action. In order to curb inflation the Federal Reserve must raise the federal funds rate to the point where the increase in the federal funds rate increases the real interest rate at which the output gap goes back to zero, as illustrated in Figure 4 on page 14.

GDP is comprised of four factors: Consumption, Investment, Government Spending and Net Exports. This is given by the equation: $Y = C + I + G + NX$. As shown through previous arguments with the help of the Loanable Funds model and the Wicksellian Model, the rise in consumption and the fall in savings result in a rise in the real interest rate. This rise in the real interest rate has trade ramifications for the US as a result of its effect on the currency exchange rate. A higher US interest rate results in more foreign capital coming into the United States as a result of foreign individuals' and nations' purchases of US treasuries. With a higher interest rate there are higher returns, and so the demand for US treasuries rises. In order to buy these treasuries, foreigners must obtain US Dollars with which to pay for them, leading to large purchases of US currency. This higher demand for the US dollar causes it to appreciate. In turn, the appreciation of the US Dollar causes US exports to be more expensive abroad and causes imports of foreign goods to be less expensive. This has an effect of reducing US Net Exports, creating a larger trade deficit.

The increase in the percentage of the US population over 65 from 12.4% in 2000 to 20.7% in 2050 will result in an increase in Consumption as well as a decrease in Net Exports, as has been demonstrated with the help of the Wicksellian and the Loanable Funds Models. In order to determine which occurrence would have a greater net effect on the GDP it would be necessary to have the exact figures and projections of multipliers and elasticities; figures that are not easily obtainable. One thing that can be derived from these conclusions is that US consumption will increase and that more of the products being consumed will be imported.

Aside from the increase in the percentage of people over the age of 65 out of the total US population having an effect on the savings rates and ultimately an impact on the Consumption and Net Exports, this effect will have an impact on the US budget. The increase in the percentage of people over the age of 65 will result in higher budget deficits for the US. According to the Congressional Budget

Office, by 2050 Medicare and Medicaid spending will be 20% of GDP as opposed to the near 5% that it is currently.[iii] Similarly, the CBO states that the spending on Social Security will increase from the current 4% of GDP to 6% of GDP by 2050.[iv] This increase in spending on both programs will be caused by the 8.3% increase in the percentage of the US population that is over the age of 65. Unless funding for those programs is increased through benefit cutbacks or increased taxes, the US government will have to incur debts to pay for Social Security, Medicare and Medicaid. Assuming that the US government will choose to incur debts rather than raise taxes due to political ramifications, the debts will result in large budget deficits for the US. Budget deficits will be financed by the US incurring more debt that is financed by foreigners rather than crowding out domestic consumption and savings. The increase in spending on Social Security, Medicare, and Medicaid will contribute to the increase in Government Spending within the $Y = C + I + G + NX$ equation and leading to a rightward shift in the IS curve in the Wicksellian Model. The same sequence of events occurs as was previously described with the increase in Consumption, portrayed by Figure 4. Once again, the Federal Reserve would need to increase the Federal Funds Rate to bring the output gap back to zero. As previously described, the interest rate would rise leading to an appreciation of the US Dollar and causing a decrease in Net Exports, with the culmination being a higher US trade deficit. The spending on government programs would increase due to a higher percentage of people over the age of 65. This spending would be funded through debt, leading to budget deficits which in turn lead to a higher interest rate that causes an appreciation of the dollar and ultimately an increase in the trade deficit.

The result of an 8.3% increase in the percentage of people in the US who are over the age of 65 would be an increase in Government Spending and a decrease in Net Exports due to a budget deficit. The same phenomenon would also result in an increase in Consumption and another decrease in Net Exports due to a decrease in savings. It would be necessary to have exact figures on elasticities and multipliers to determine whether the GDP increasing Consumption and Government Spending or the GDP decreasing fall in Net Exports would have a larger net impact on the GDP. Nevertheless, it was also shown that there would be a rise in the real interest rates, leading to a higher cost of borrowing. This higher cost of borrowing would result in a lower rate of Investment. The smaller amount of investment would slow down the future growth of the US GDP.

The growth in the percentage of the US population over 65 years of age from 12.4% to 20.7% would result in a slower future growth of the economy, with budget deficits, trade deficits, an increase in Consumption, an increase in Government Spending, and a decrease in Investment. Various economic policies could be used to help to decrease the negative impacts of the aging of the US population. One policy that could be implemented is the introduction of an effective consumption tax. A consumption tax would theoretically lead to a higher savings rate among the working population. Cuts in Medicare, Medicaid, and Social Security benefits would result in lower budget deficits and less Government Spending. Instead of a consumption tax, the current tax rates could be increased to fund the necessary spending on Social Security, Medicare, and Medicaid. The implementation of either the spending cuts on government programs or the increase in taxes would cause major dissatisfaction among the US population and therefore is unlikely to occur.

There are other possible political policies that would nullify the aforementioned negative consequences resulting from the aging of the US population. The first way, though unethical and therefore impractical, is to decrease the life expectancy of Americans. There could be various ways to accomplish this, for instance by limiting healthcare, but those ways would not occur due to the unethical ramifications of such policies. The other, less cruel way would be to reduce the percentage of the US population over the age of 65 by increasing the number of people under the age of 65. One way this could be done is by increasing US birth rates. This could be accomplished through higher tax rebates for larger families. This is also not practical as it would erode the tax base in the short run. The other, more practical way to increase the US population of those under the age of 65 is through immigration. The US could attempt to save itself from experiencing the economic problems of an aging population by increasing the number of immigrants that come to the country. The US could replace the retiring workers with skilled immigrants that would take the retiring persons' jobs. These new workers would then pay taxes to fund the increases in spending for government programs and would also increase the savings rate, resulting in the US economy maintaining its present growth. The simple policy of allowing more immigrants to enter and settle in the United States would help to solve America's future economic problems from an aging population.

## REFERENCES

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[i] "U.S. Interim Projections by Age, Sex, Race, and Hispanic Origin."
[ii] "Personal Saving Rate."
[iii] "The Long-Term Outlook for Medicare and Medicaid."
[iv] "The Long-Term Outlook for Social Security."

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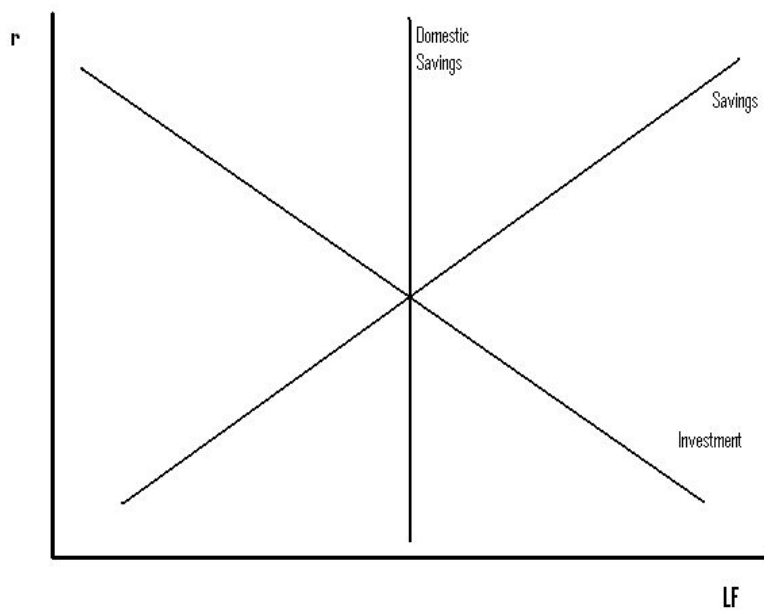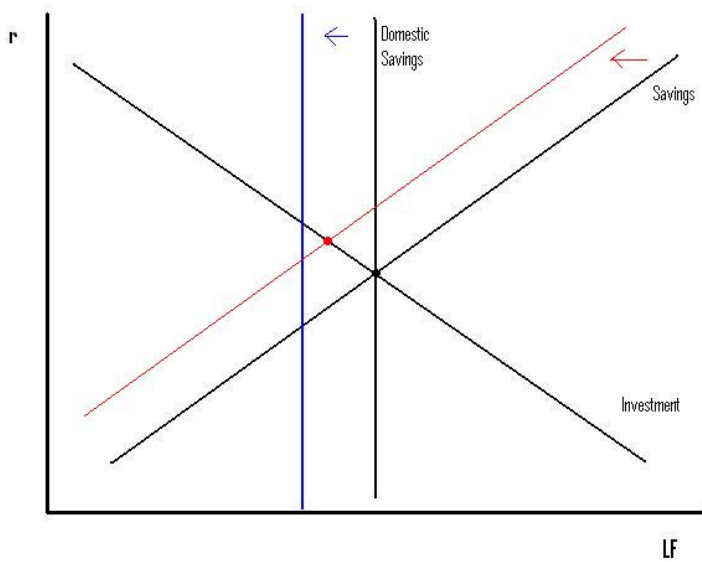
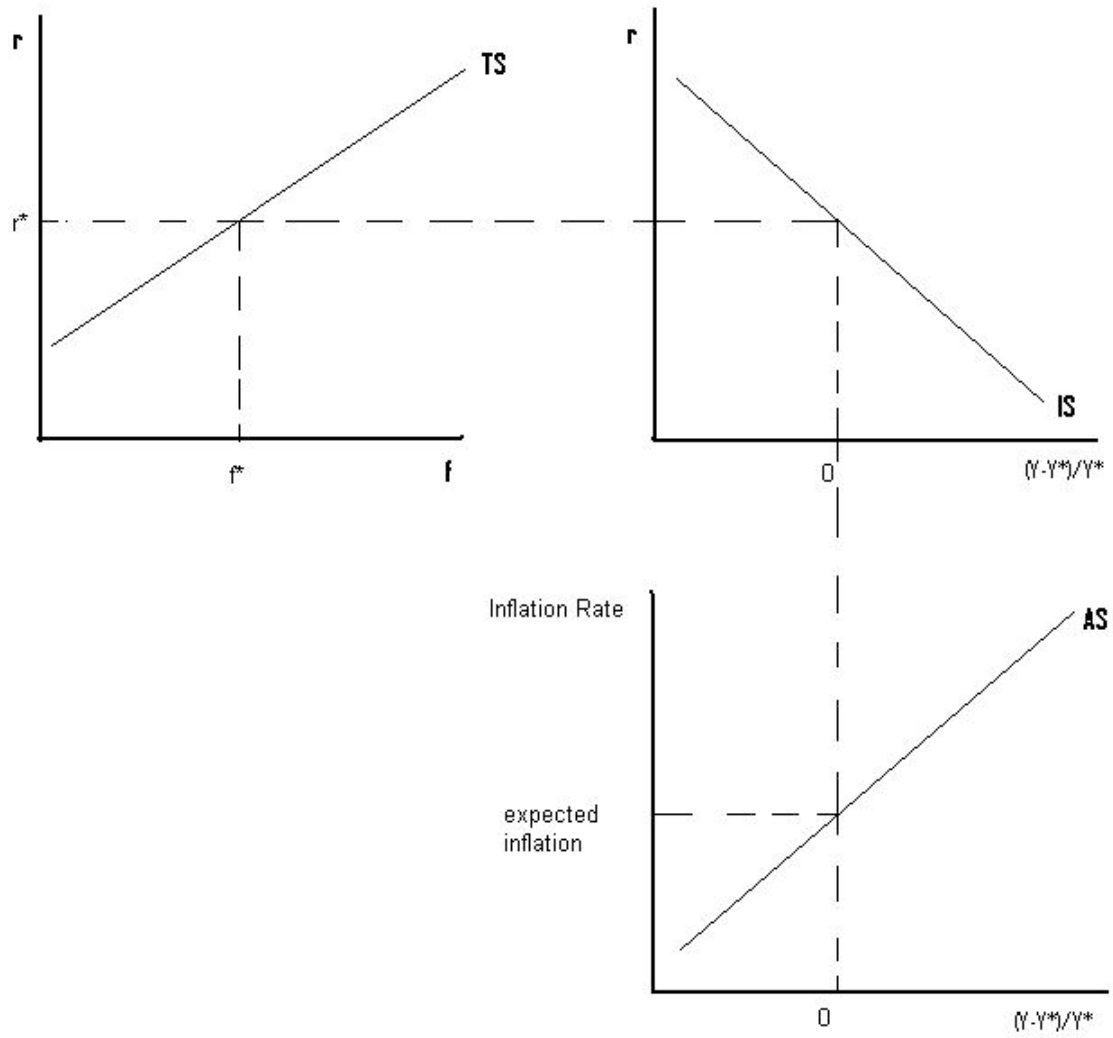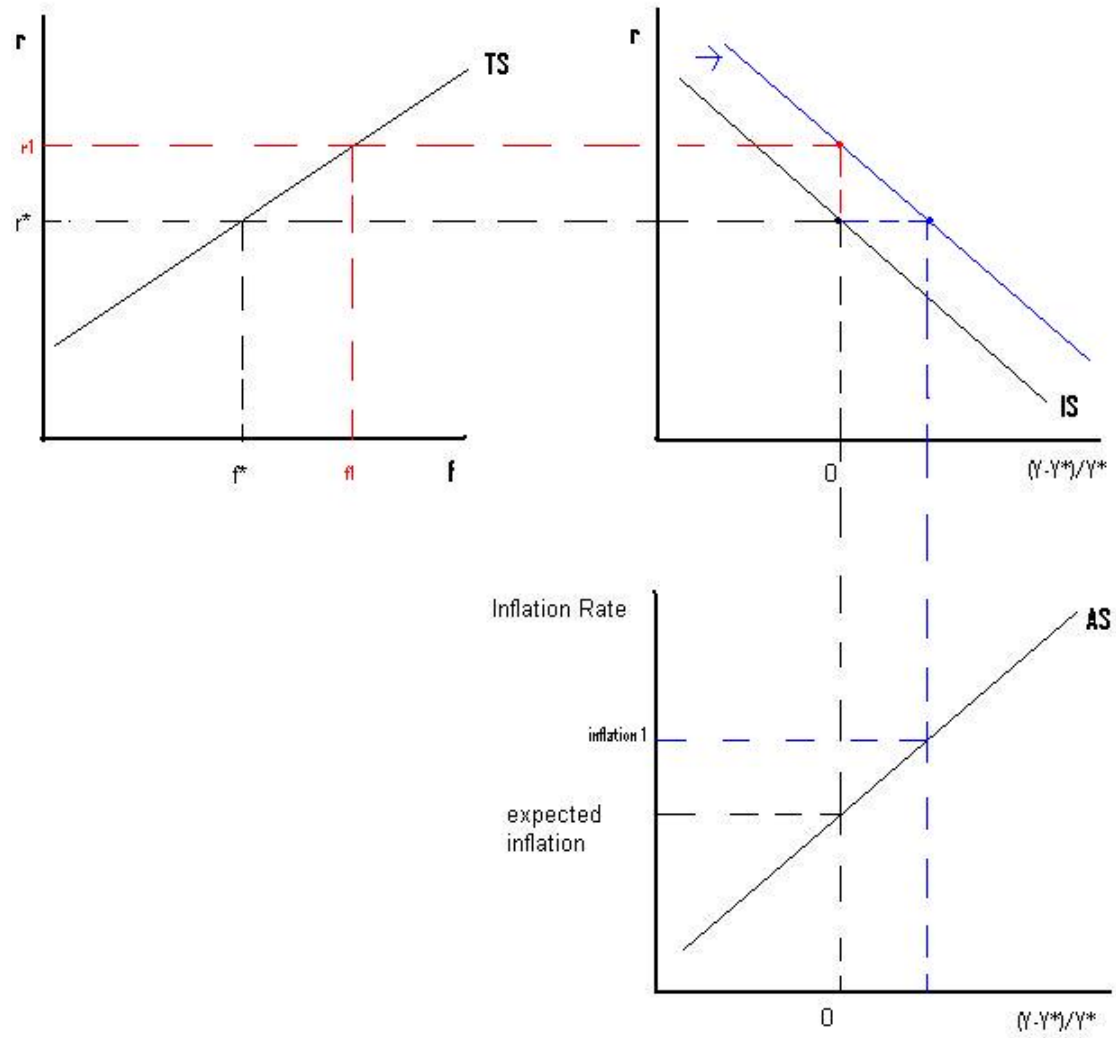**Figure 1:**



**Figure 2:**

**Figure 3:**

**Figure 4:**

**Personal Saving Rate:**



## Personal Saving Rate
*(Percent of disposable personal income)*

U.S. Bureau of Economic Analysis
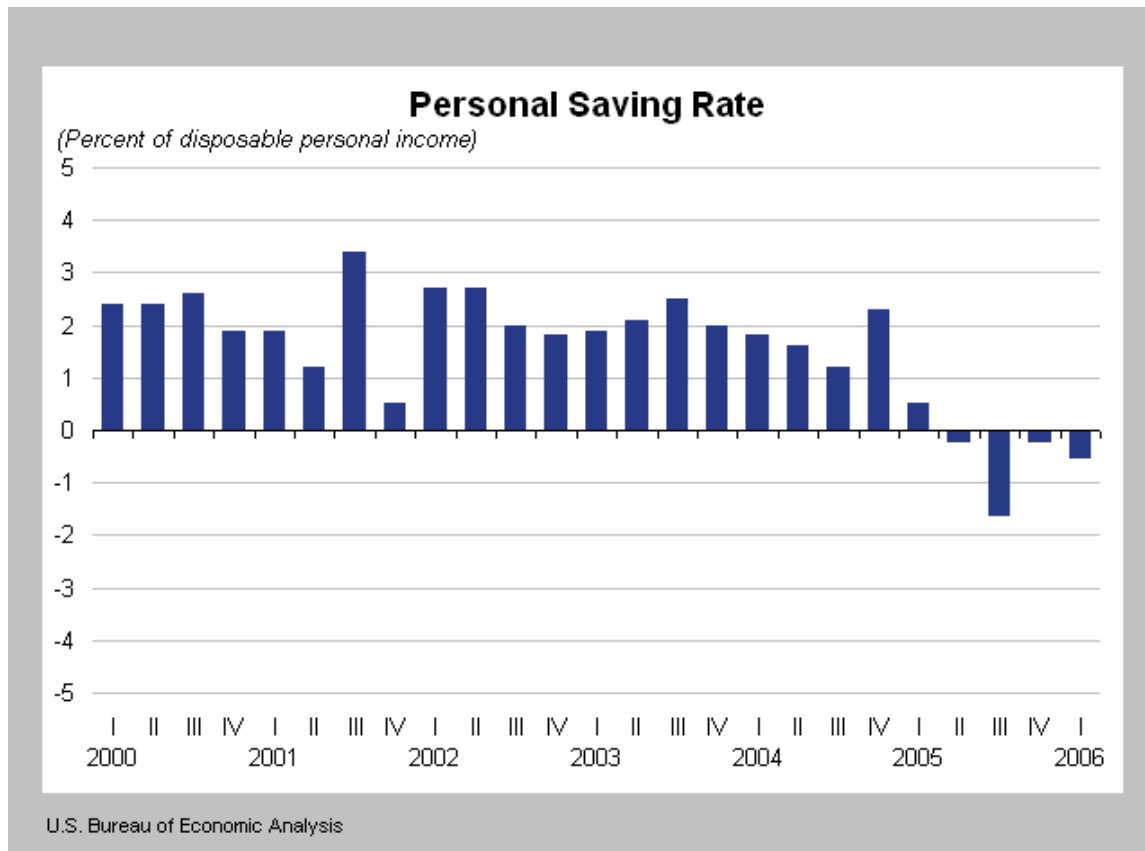
"Personal Saving Rate." http://www.bea.gov/briefrm/saving.htm. 28 April 2006. Bureau of Economic Analysis. 30 April 2006 <http://www.bea.gov/briefrm/saving.htm>.

**Spending for Social Security:**



http://www.cbo.gov/showdoc.cfm?index=4916&sequence=3
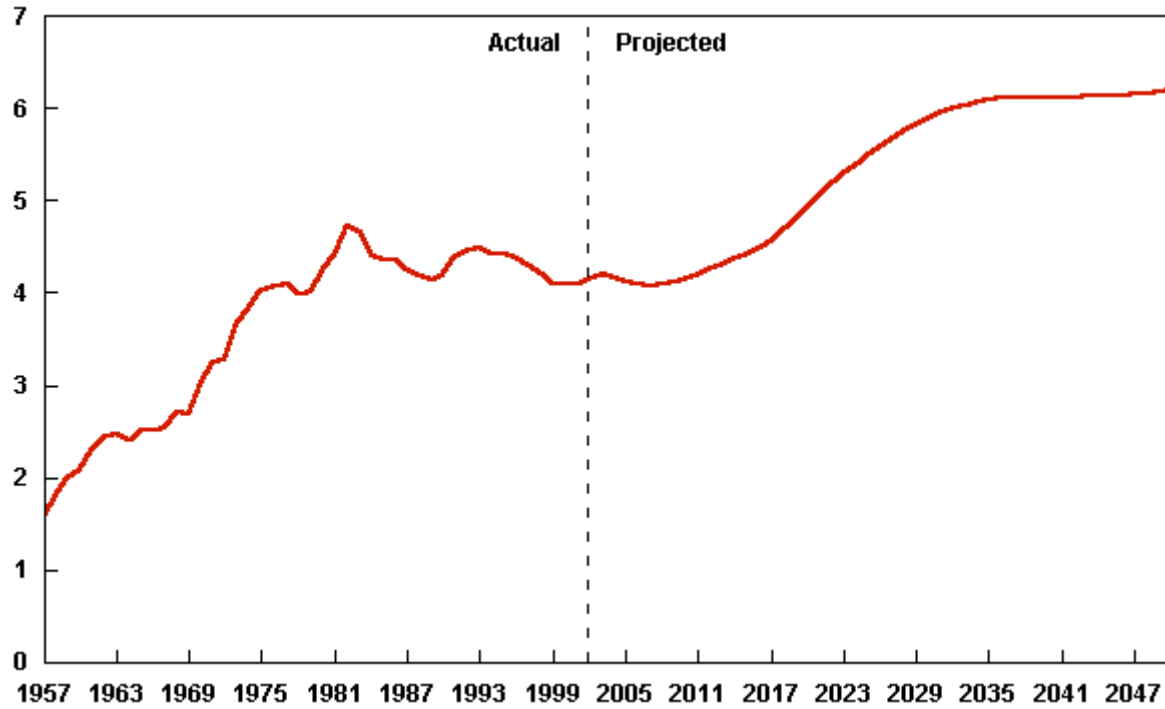
**Total Federal Spending for Medicare and Medicaid under Different Assumptions about Excess Cost Growth:**



http://www.cbo.gov/showdoc.cfm?index=4916&sequence=4