

Illustrative Projections of Government Budgets

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October 15, 2007

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Workshop Goals

1. Long-range projection of government budget.
2. List of changes needed for budget projection model which was developed for use in the U.S. context.
3. Calculations of net present value of Public Transfers by generation.

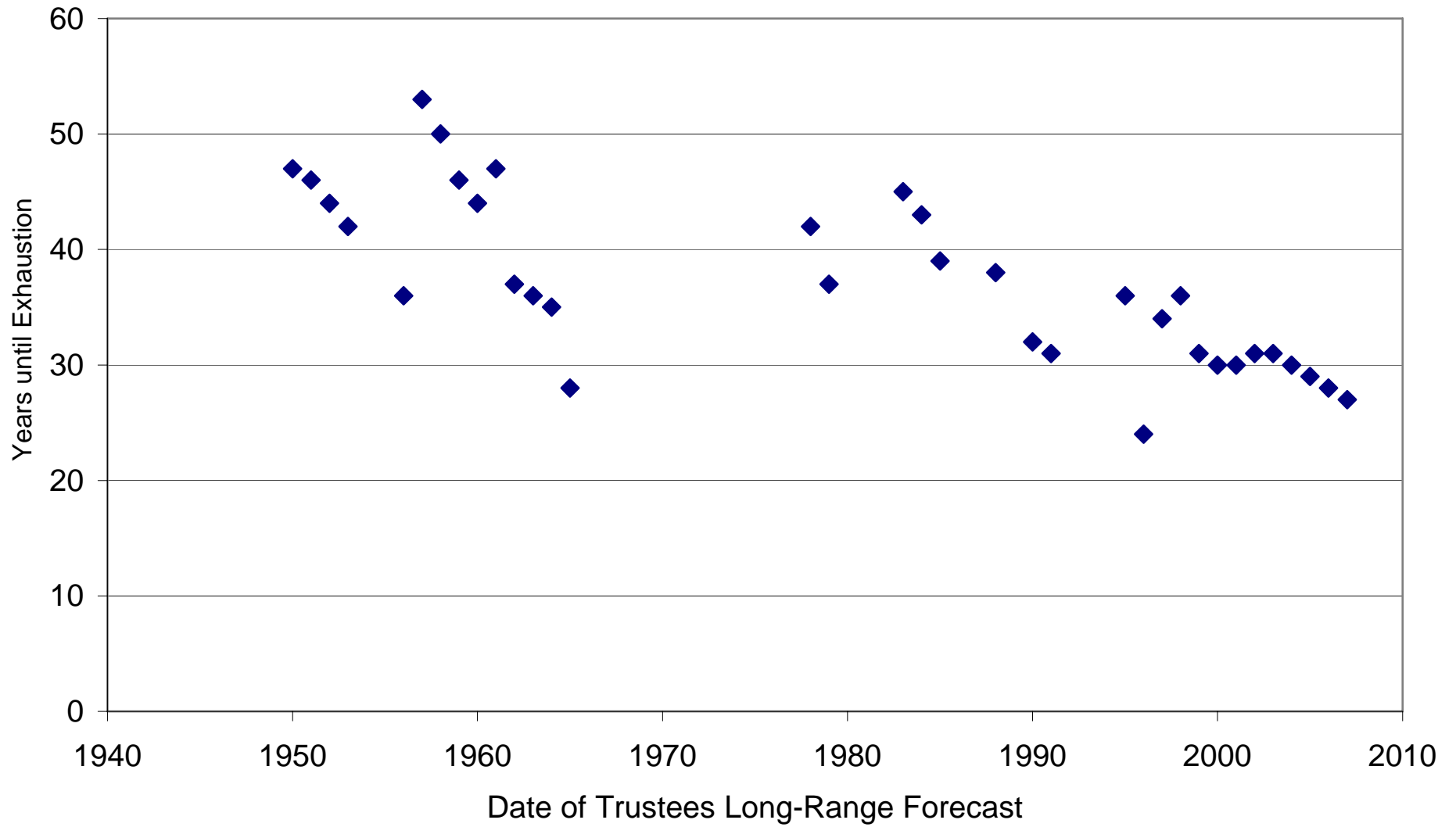
Who makes long-range US budget projections?

- **US Social Security Trustees.** Annual forecasts since 1942. Time horizon of 50-75 years.
- **US Congressional Budget Office.** First forecast issued in 1996, in response to concerns about population aging. Time horizon of 50-75 years.
- **Various academic studies.** Mainly studying the unfunded liability of transfer systems like US Social Security and Medicare.

US Social Security Projections

- Projection Horizon is 50-75 years.
- “Action Horizon” is 20-30 (?) years.
Government appears to respond when insolvency is projected to occur within 20-30 years.

Number of Years Until OASI Trust Fund is Exhausted
(Under High Cost Scenario)



Critics...

- “A fog of fundamental unknowability shrouds projections of Medicare costs beyond just a few years.”
 - Henry Aaron, *Thinking About Aging*.



Problems:

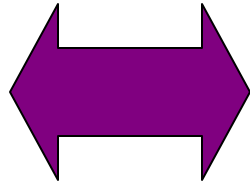
- We must use projections to evaluate impact of population aging.
- Yet, projections are unreliable.
- And projections may focus attention on the least important part of problem.
- See discussion in Aaron (2000), *Seeing through the Fog: Policymaking with Uncertain Forecasts*.

Use of long-range forecasts

- Period: Impact of population aging on public debt, tax and benefits levels. Issues of sustainability.
- Cohort: Net present value of public transfers by birth cohort. Issues of intergenerational fairness.

**Changing
Characteristics
of the
Population**

Age, Education,
Family
Networks,
Wealth, Health,
Size



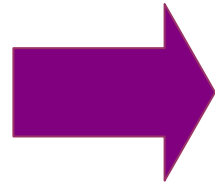
**Changes in
Government Budgets**

Demand for
Government Services
like
Education, Health Care,
Pensions & Social
Protection

Supply of Government
Revenue from
Taxes on Consumption,
Income, and Property

**Changing
Characteristics
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Age



**Changes in
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Simple Budget Forecast Model

$$B(t) = \text{sum} \{ b(x,t) * n(x,t) \}.$$

- $B(t)$ = Aggregate spending at time t .
- $b(x,t)$ = average government transfer received at age x and time t .
- $n(x,t)$ = population at age x and time t .

Add in participation rates.

$$B(t) = \text{sum} \{ c(x,t) * p(x,t) * n(x,t) \}.$$

- $c(x,t)$ = average government transfer received per participant at age x and time t .
- $p(x,t)$ = participation rate
- $n(x,t)$ = population at age x and time t .

Add in rate of growth

$$B(t) = \text{sum} \{ c(x) * \exp(r*t) * p(x,t) * n(x,t) \}.$$

- $c(x)$ = average government transfer received per participant at age x in base year.
- $r(t)$ = rate of growth (e.g., productivity growth)
- $p(x,t)$ = participation rate
- $n(x,t)$ = population at age x and time t .

Government Budget

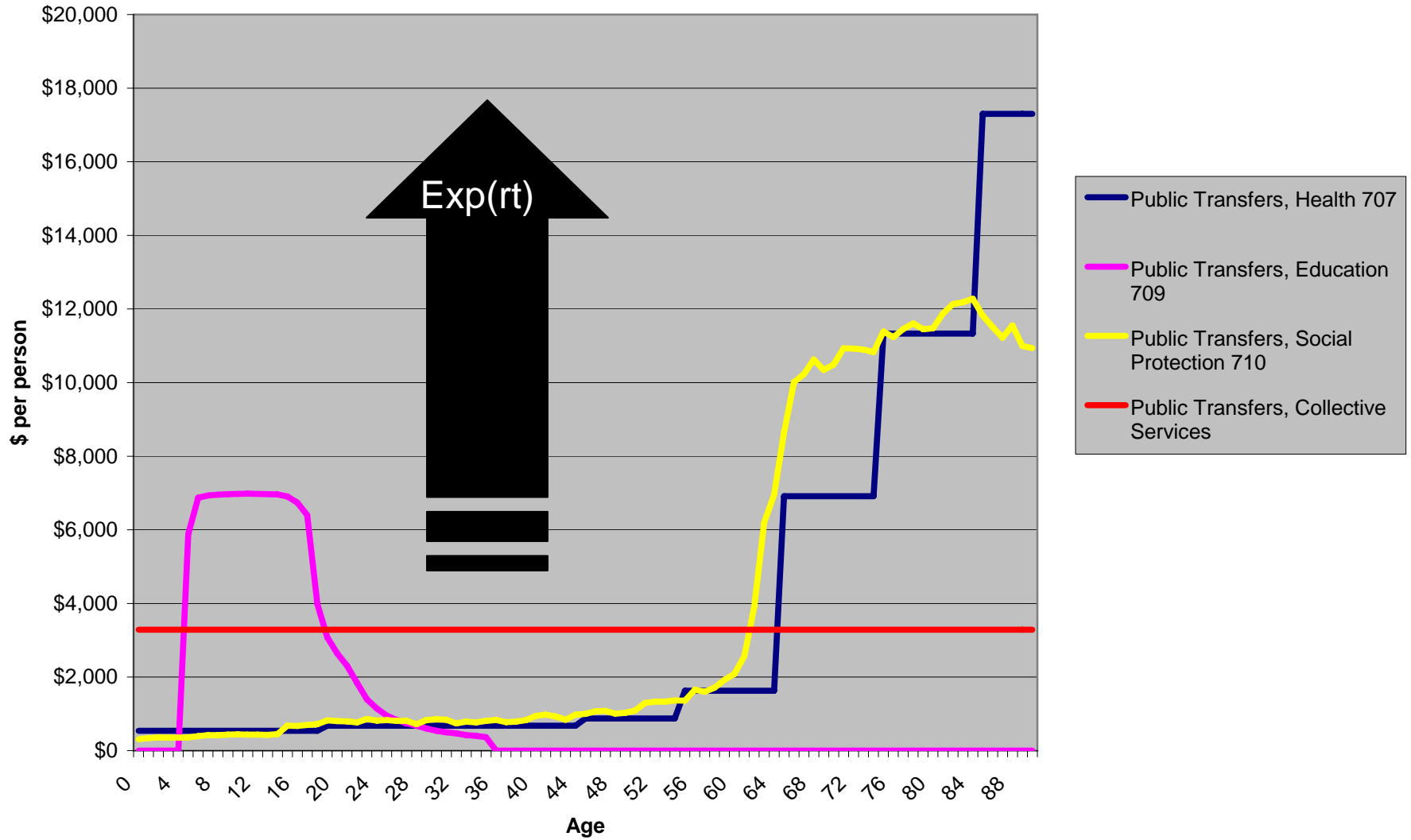
INFLOW

- Taxes
- Bond sales

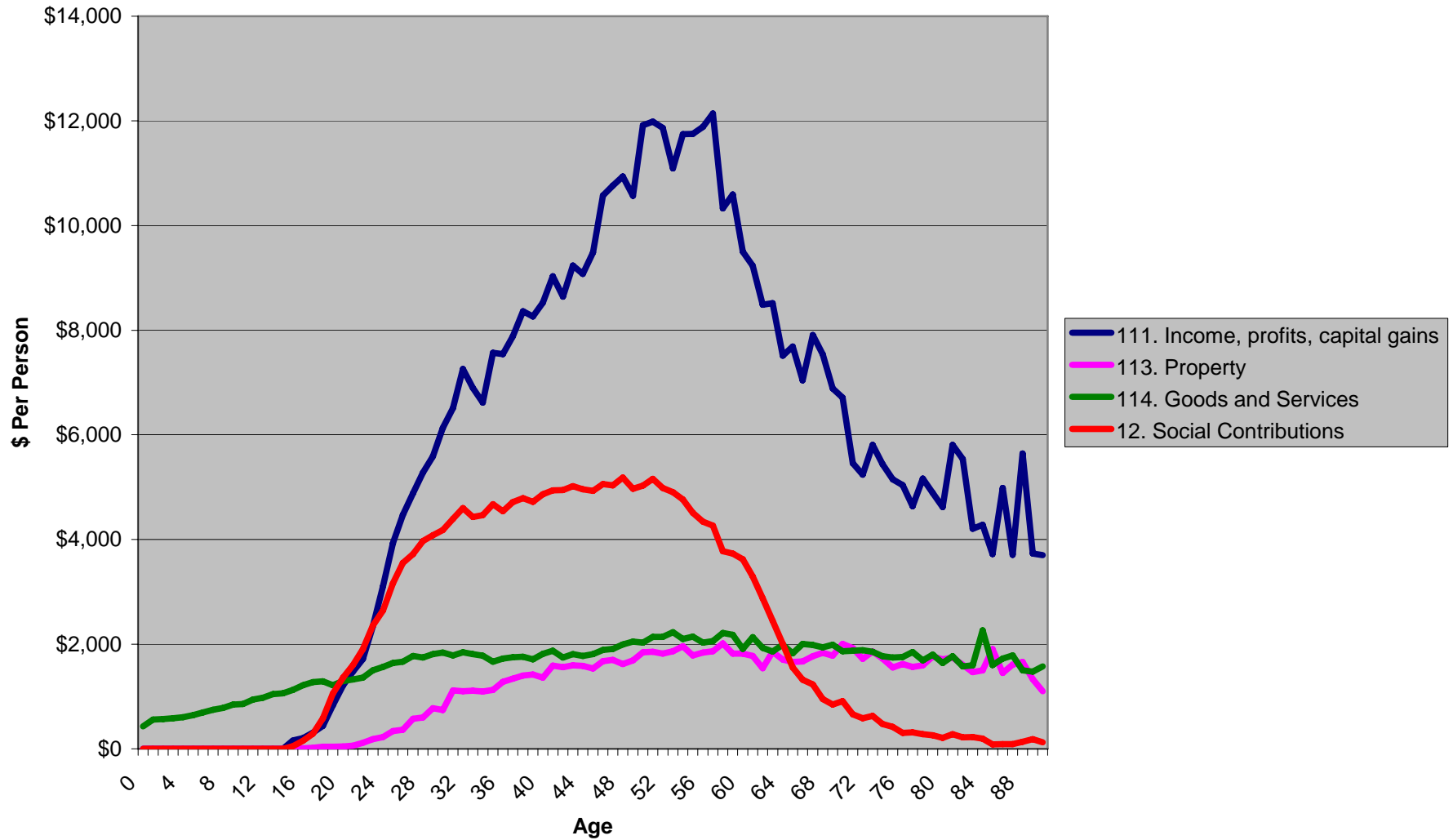
OUTFLOW

- Education
- Health
- Pensions
- Social Protection
- General Government
- Debt repayment
- (Investments)

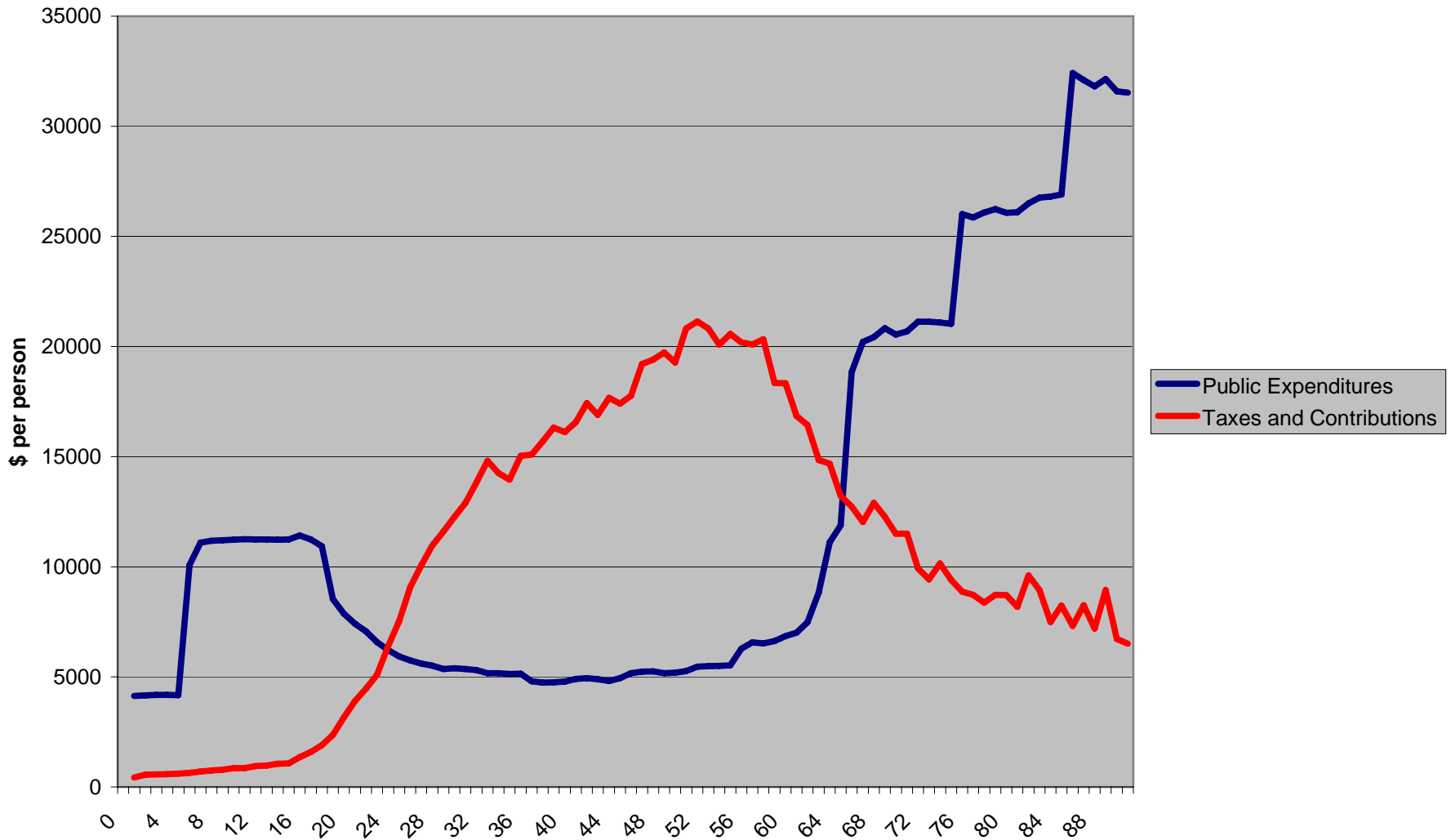
Government Expenditures (IMF Classification): US 2000
[unsmoothed, Dec 2005 dataset]



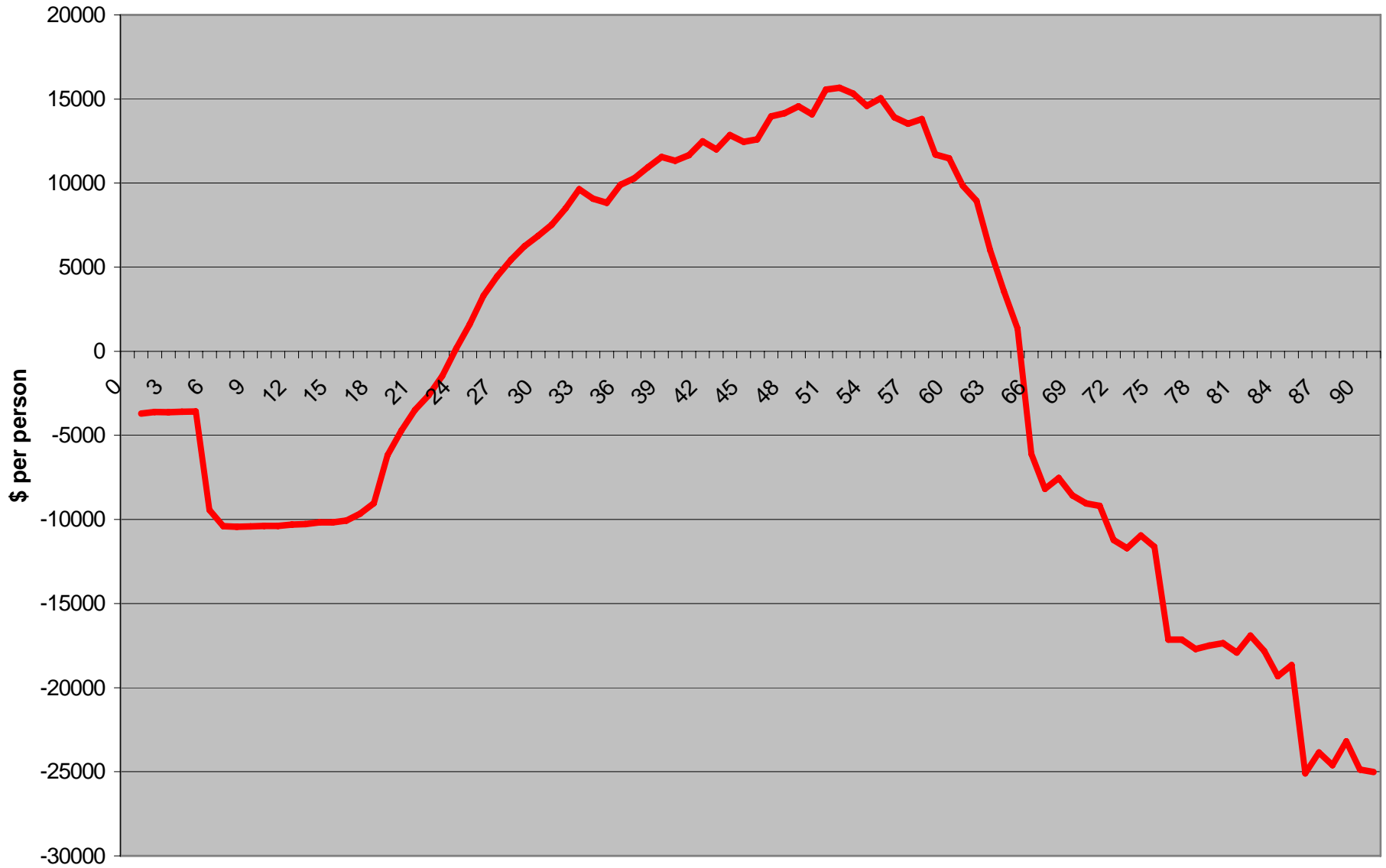
Taxes and Social Contributions (IMF Classification): US 2000.
[unsmoothed, Dec 2005 dataset].



Government Expenditures and Revenues by Age: US, 2000
[unsmoothed, Dec 2005 dataset]

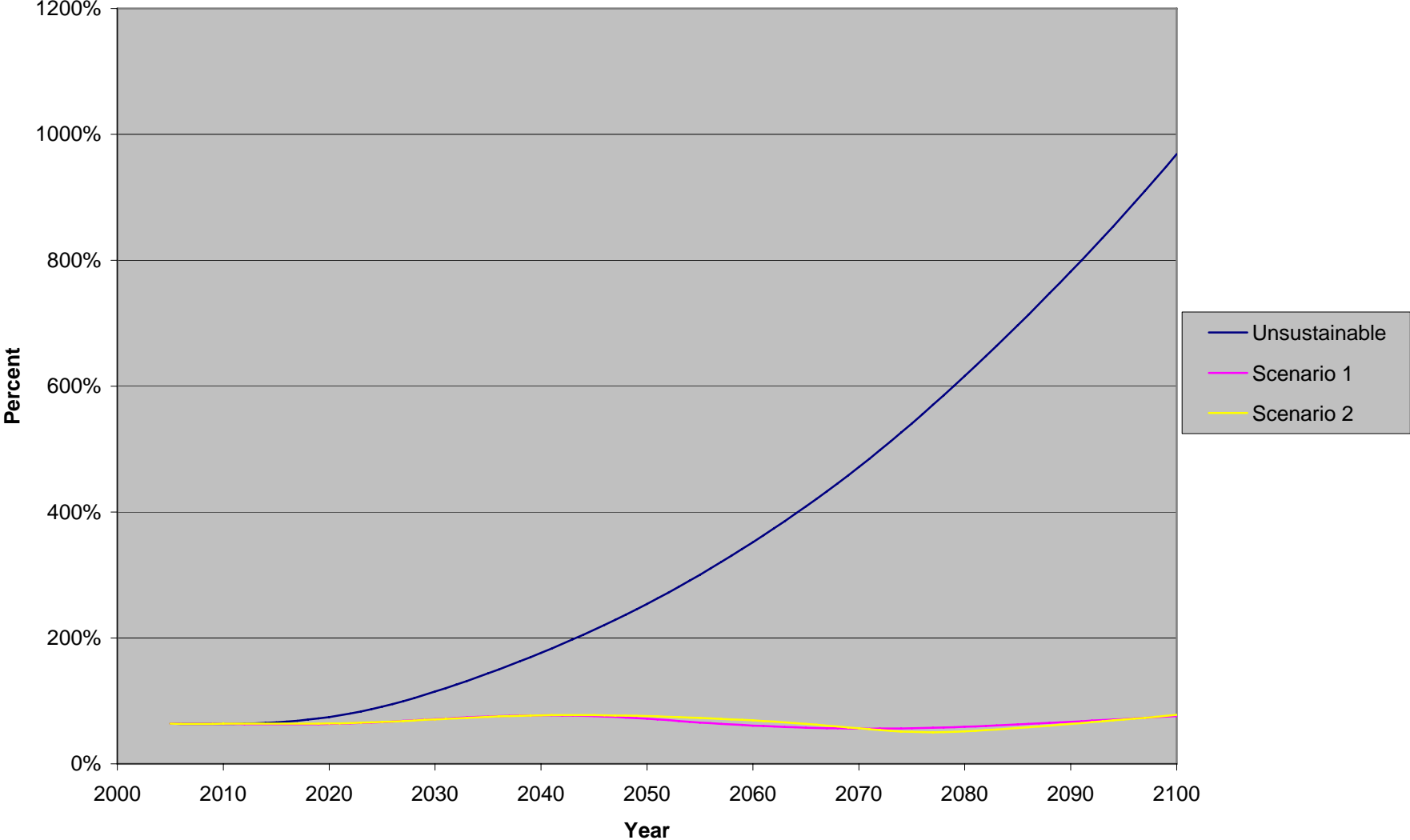


Net Government Revenues by Age: US, 2000
[unsmoothed, Dec 2005 dataset]



Current Fiscal Policy is Unsustainable

Debt as percent of GDP



4 Policy Options

- Issue debt
- Shift resources
- Raise taxes
- Reduce spending

A Debt Limit Exists.

- Debt / GDP
- External Debt / Export Revenue

When reach debt limit...

- Must raise taxes or reduce benefits.
- Three scenarios: raise taxes, reduce benefits, or 50-50 split.
- Some evidence that historical response of governments has been 50-50 split.

Workshop Goals

1. Long-range projection of government budget. Examining period effects.
2. List of changes needed for budget projection model which was developed for use in the U.S. context.
3. Calculations of net present value of Public Transfers by generation. Examining cohort effects.

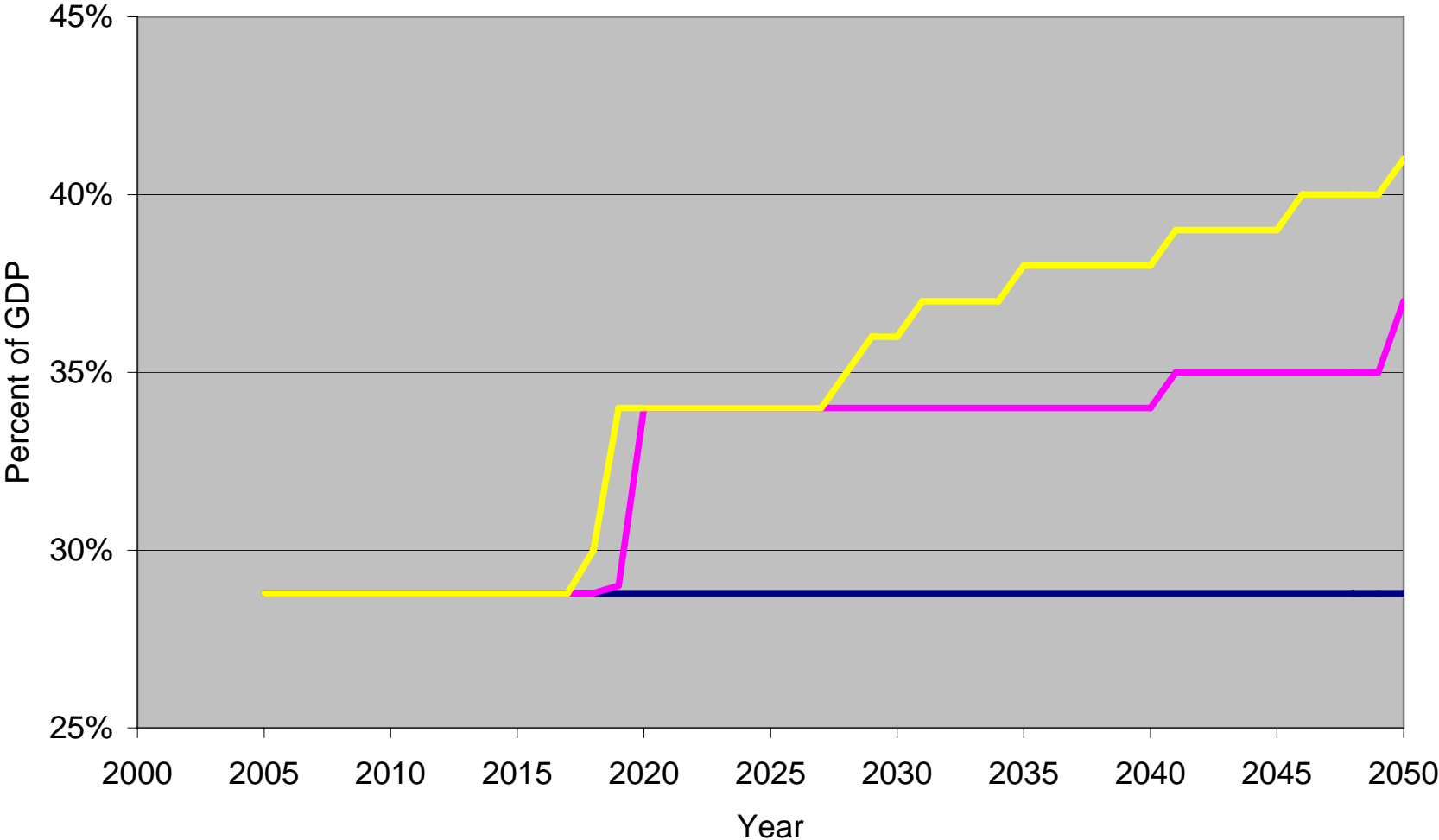
budget.forecast3.xls

This Excel workbook forecasts government budgets from 2005 through 2100 and allows the user to explore different policy scenarios to cope with the fiscal impact of population aging.

The workbook is currently configured using data for the United States, but can be adapted for any country.

Period effects of population aging

Taxes as percent of GDP



Cohort effects of population aging

Fig 8. NPV at birth of expected lifetime Education, Social Security and Medicare benefits as percent of lifetime earnings

