

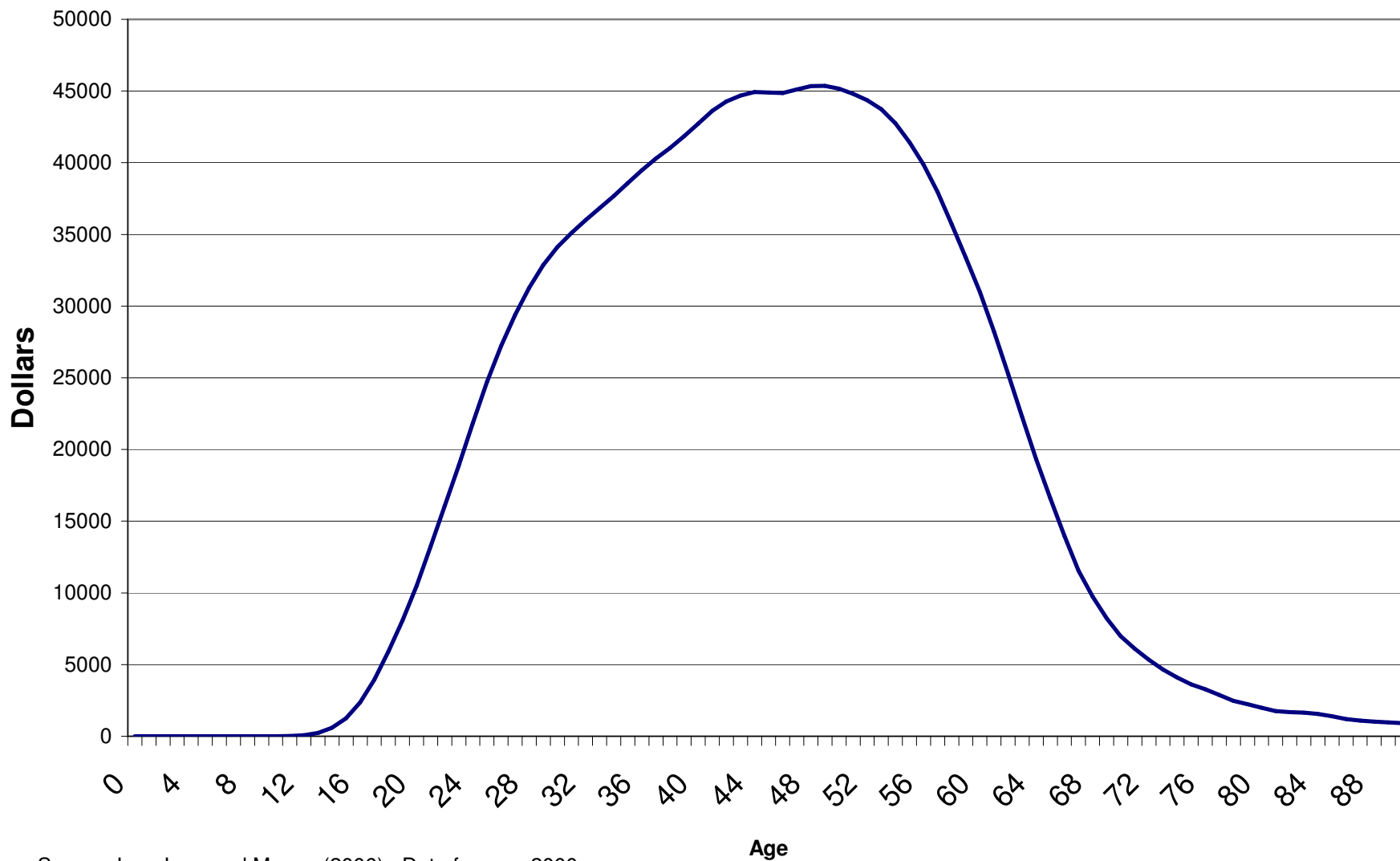
Macroeconomic and Financial Market Effects of Population Aging

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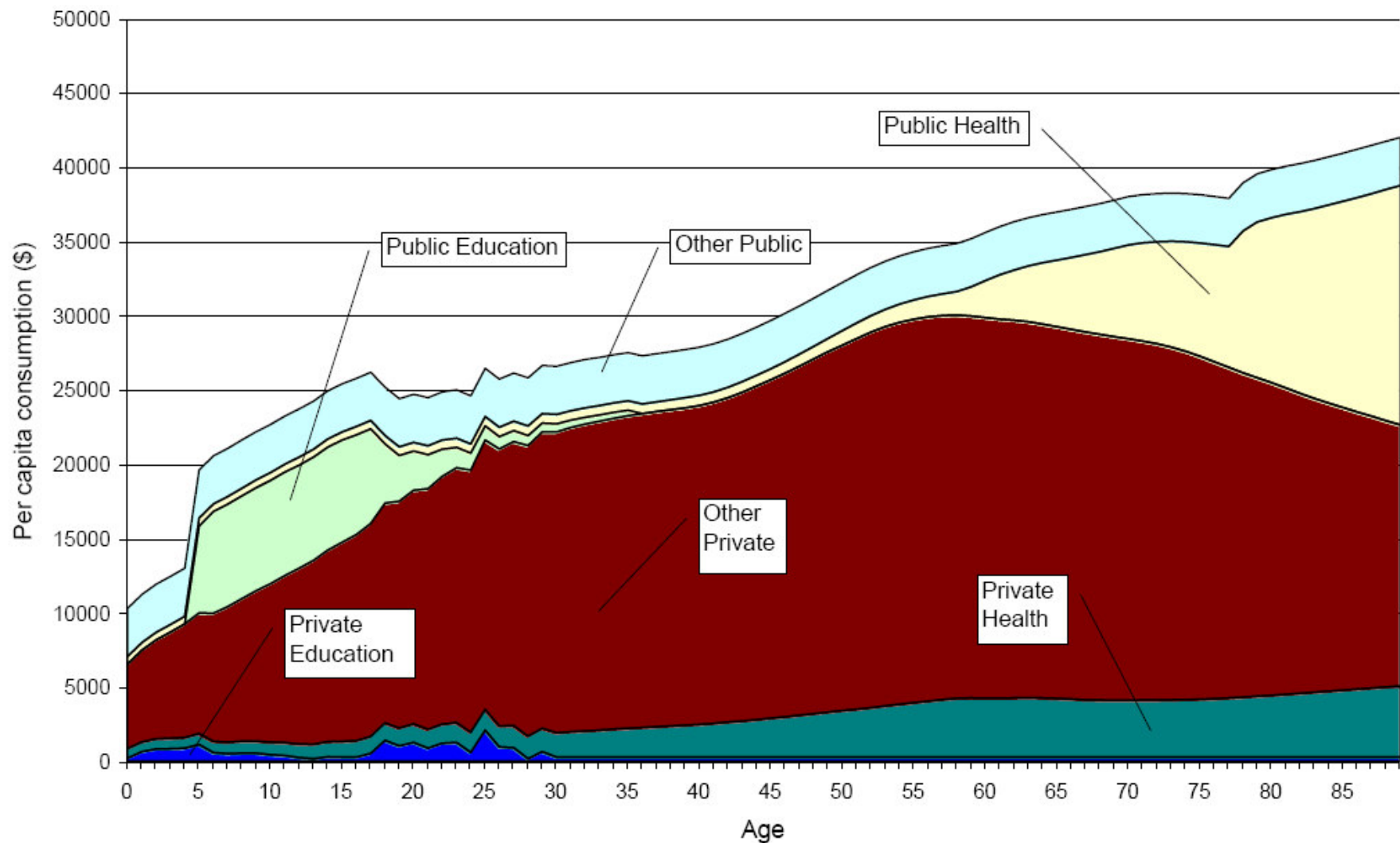
Prepared for Macroeconomic Advisers seminar on “Global Aging and Financial Markets,” Washington DC, September 7, 2006.

Lifetime Profile of Labor Income



Source: Lee, Lee, and Mason (2006). Data for year 2000.

Profile of Private and Public Consumption in US



Source: Lee, Lee, and Mason (2006). Data for year 2000.

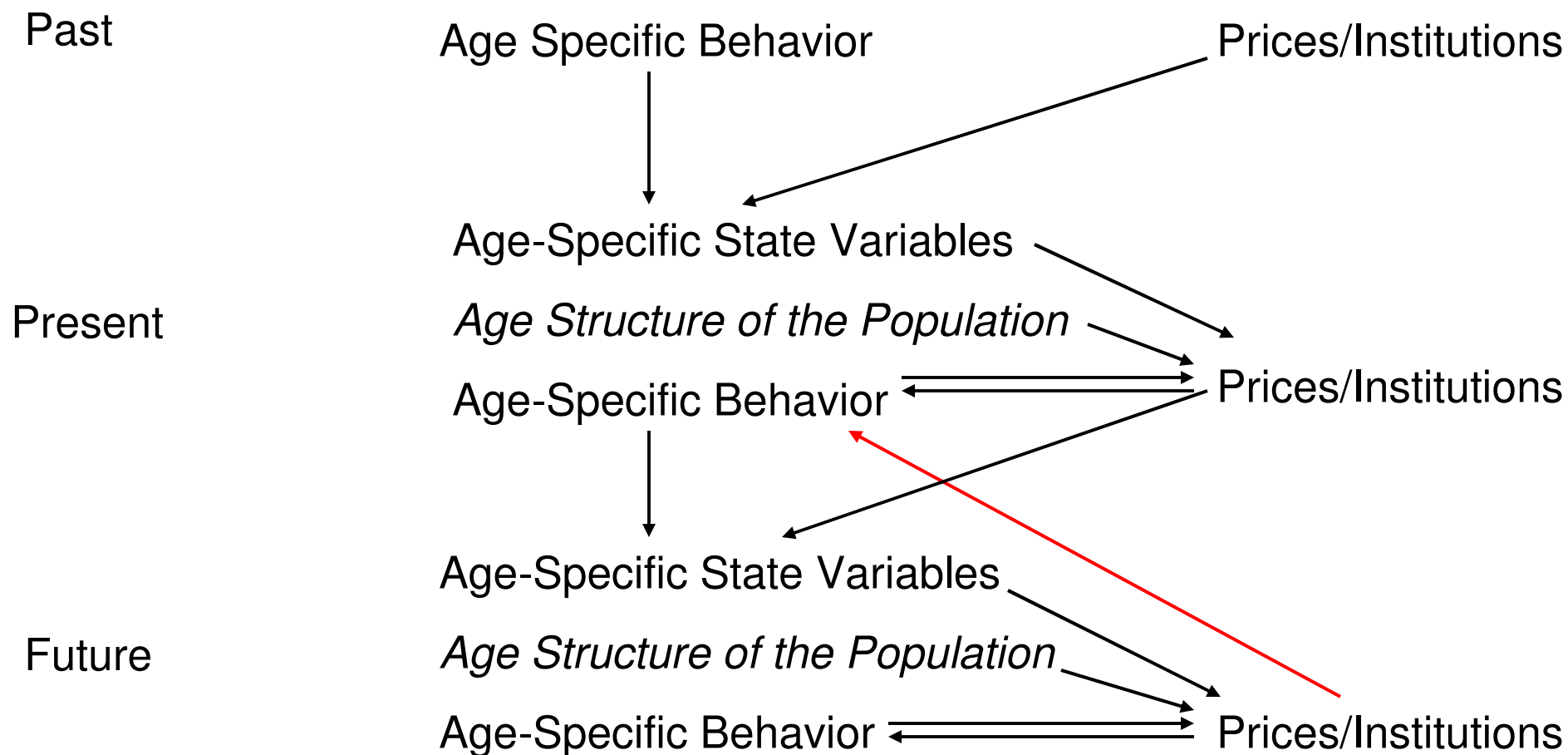
Age Breakdown of Federal Outlays

Total Federal Outlays: 18.9% of GDP

Attributable to Specific Age Groups: 10.8% of GDP

Age Group	Total Age-Specific Outlays (% of GDP)	Share in Total Population	Outlays/Capita (% GDP per % Population)
0-20	0.56%	28%	.020
21-64	3.84%	60%	.064
65+	6.39%	12%	.533

Aging and Equilibrium: Schematic View



First- Round Analysis

- Hold age-specific behavior constant at observed levels
- Change population age structure

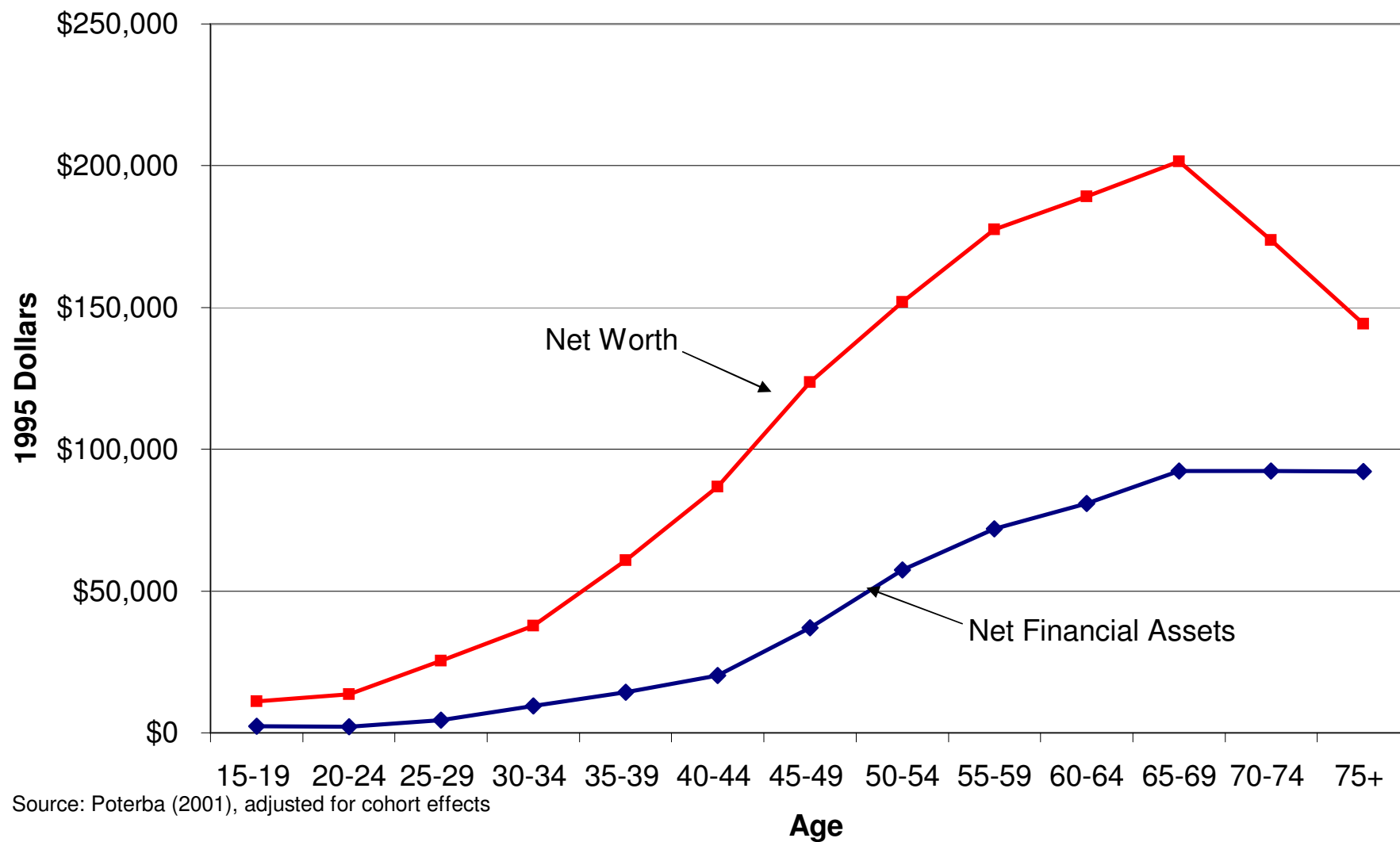
Problem: doesn't account for effect of changed prices on behavior

General Equilibrium Analysis

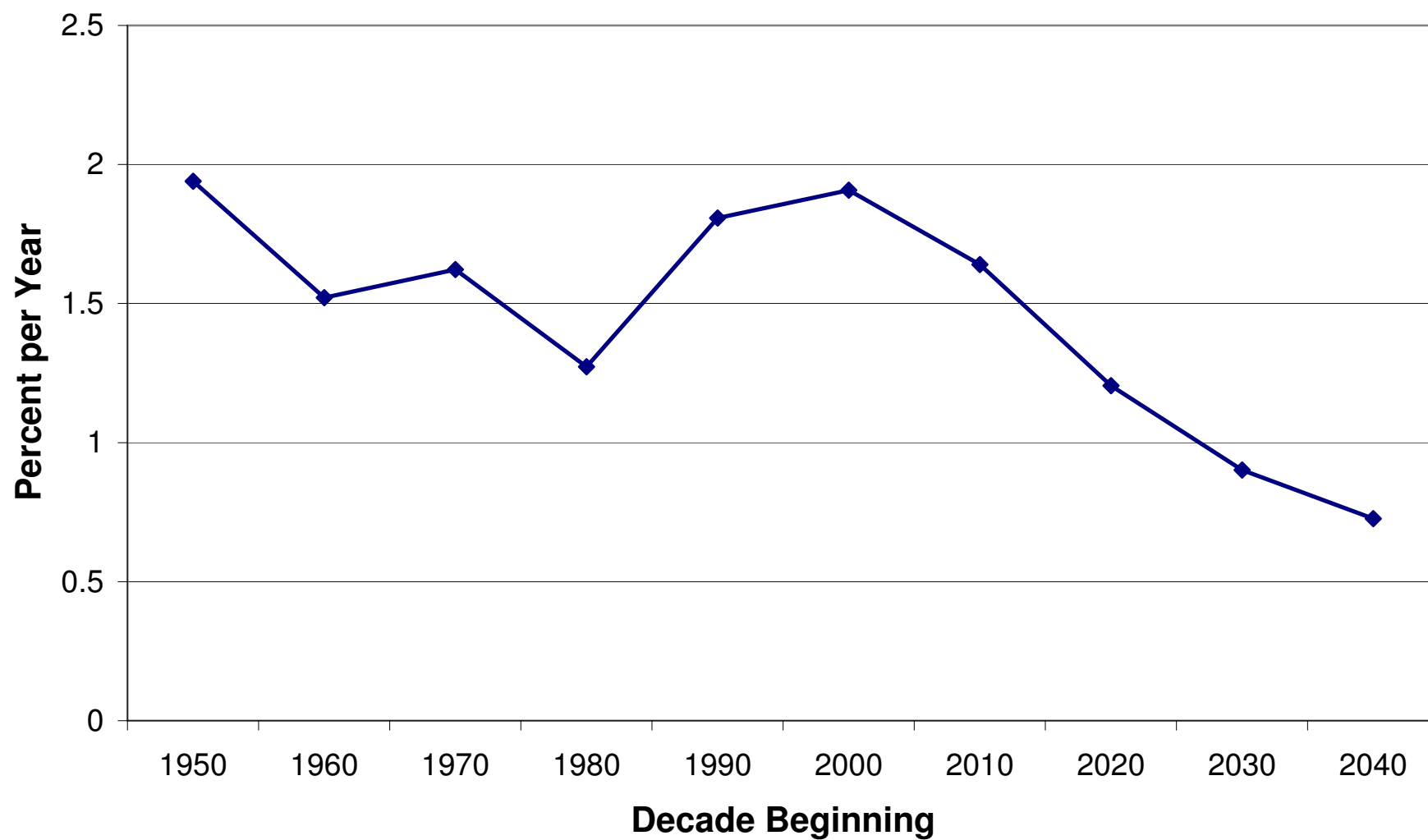
- Solve for new age specific behavior and new prices in present and future

Problem: requires correct model of tastes and technologies

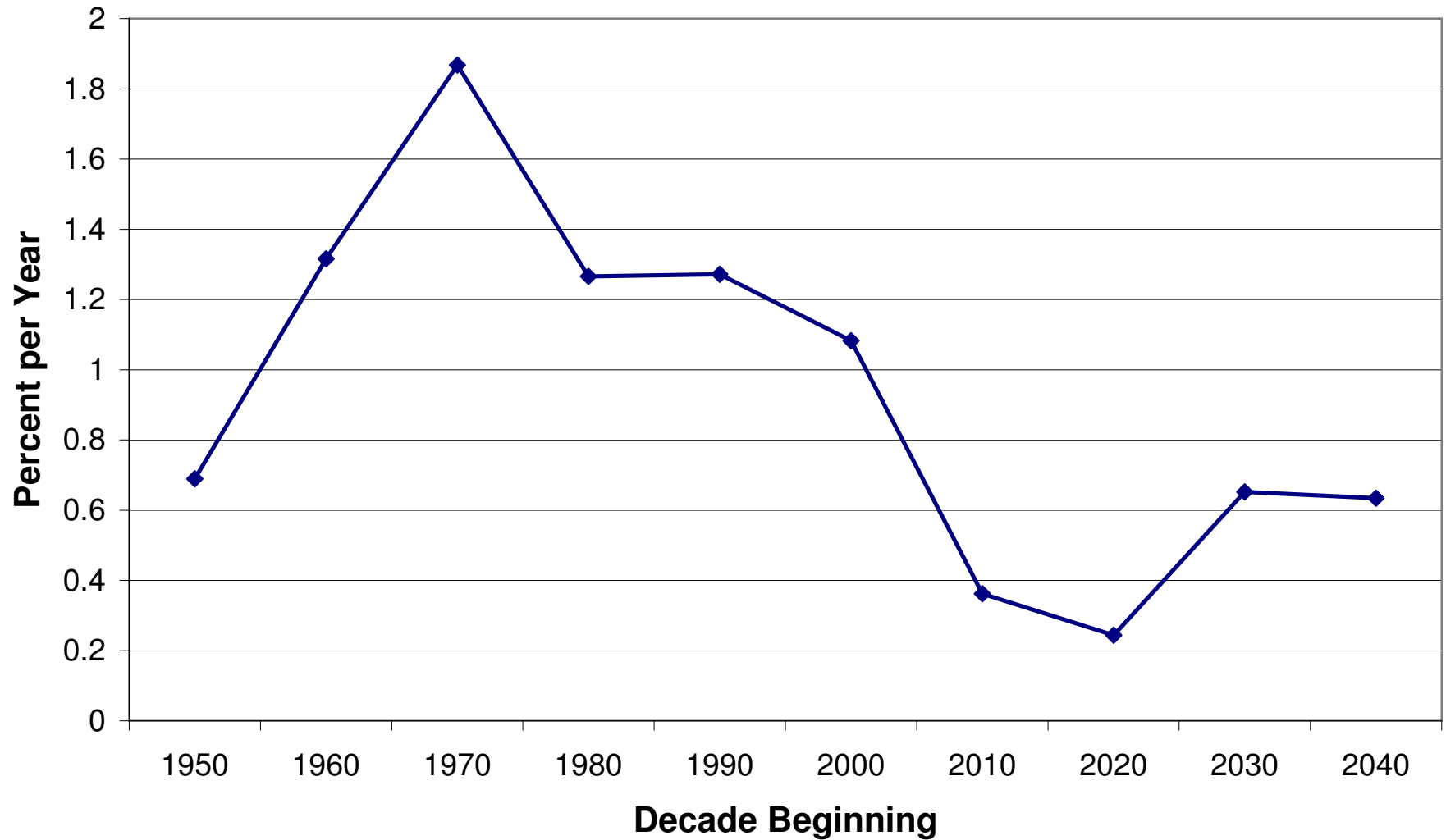
Age Profiles of Net Financial Assets and Net Worth



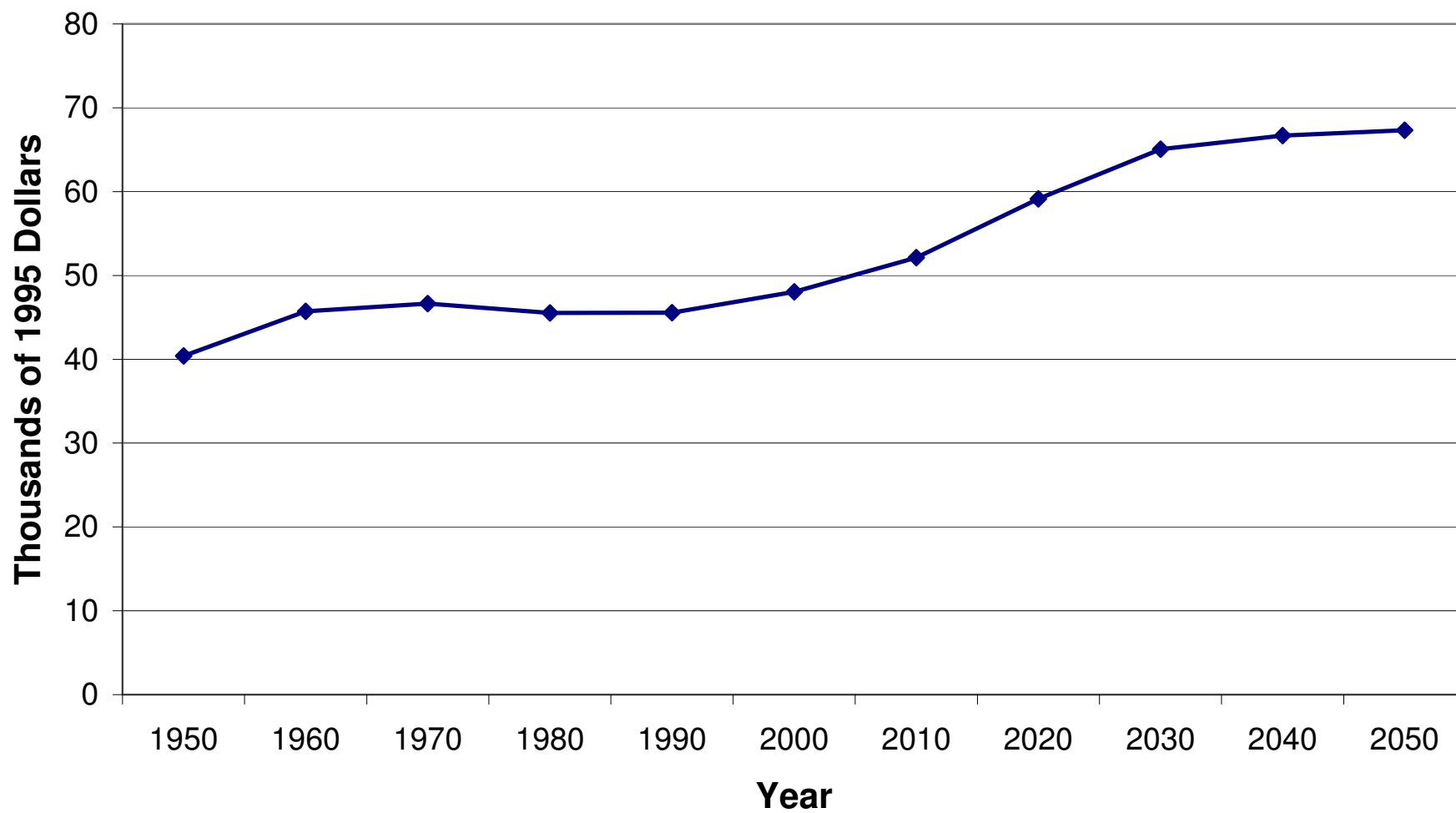
Growth Rate of Net Financial Assets



Growth Rate of the Working Age Population



Net Financial Assets / Working Age Person



The Capital Deepening Effect

➔ Rise in the capital/labor ratio lowers the marginal product of capital

y = GDP per worker

k = capital per worker

Production Function: $y = Ak^\alpha$

Marginal Product of Capital: $MPK = \alpha Ak^{\alpha-1}$

$$\frac{MPK_{2030}}{MPK_{2010}} = \left(\frac{k_{2030}}{k_{2010}} \right)^{\alpha-1} = 1.25^{-2/3} = .86$$

The Capital Growth (Q-Theory) Effect

➔ Slower growth in capital stock lowers value of installed capital

Value of Installed Capital: $q = 1 + \frac{a}{2} \frac{i}{k}$

$\frac{i}{k}$ = labor force growth + productivity growth + depreciation
(1% per year) (5% per year)

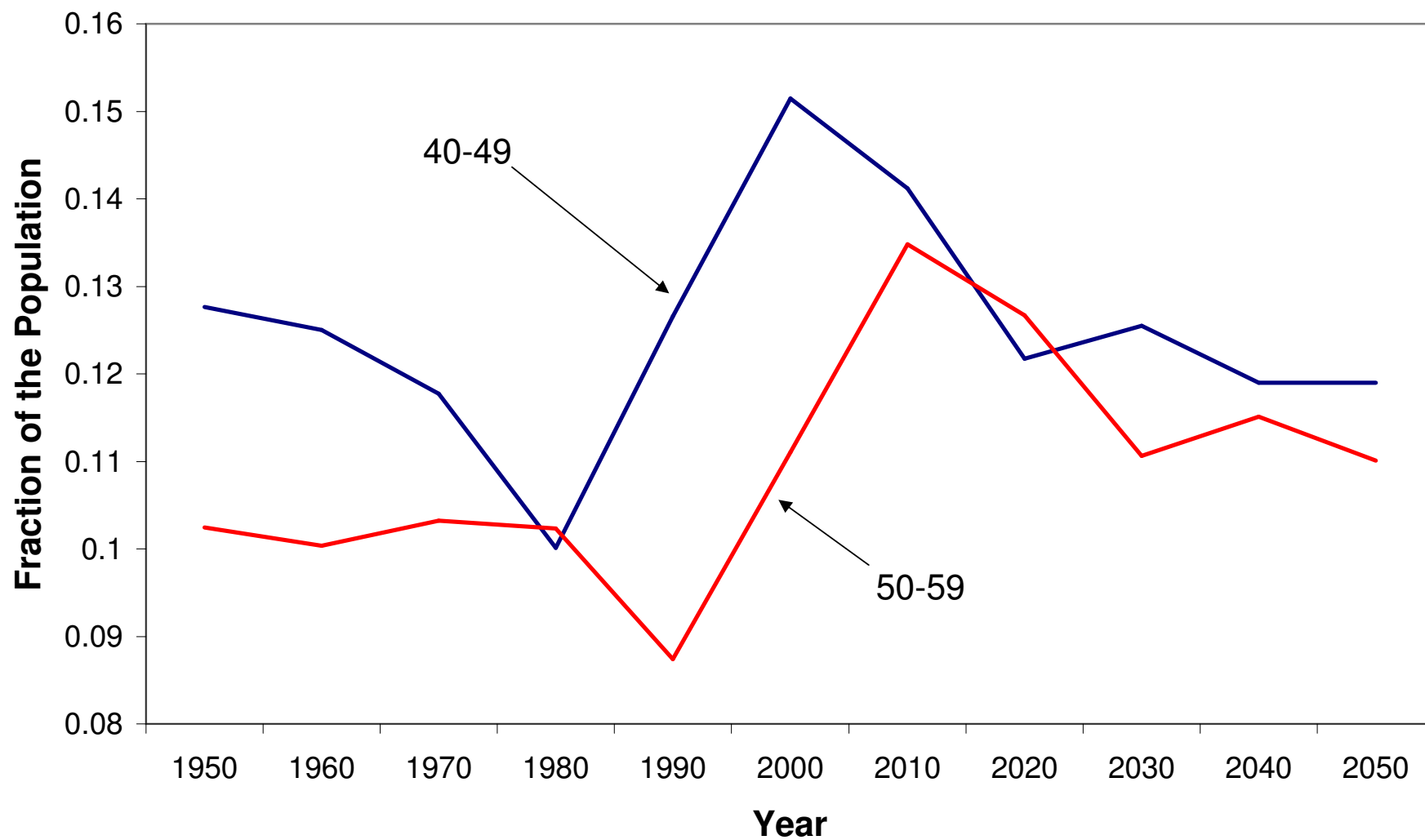
Effect of Reduced Labor Force Growth, 2000 vs. 2020		
Adjustment cost parameter (a)	1	10
Total decline in q	0.4%	3.1%
Decline in value of equity	0.8%	6.2%

Equity Shares in Financial Assets, SCF data, 1989-1998



Source: Ameriks and Zeldes (2001)

Fractions of the Population in High Productivity Age Groups



Moving Beyond First Round Effects

- higher payroll taxes → reduced labor supply
- less generous Social Security / Medicare → delayed retirement
- less generous Social Security / Medicare → higher saving by workers

The Life Cycle Model of Consumption

