Social Security and Retirement

131 Undergraduate Public Economics

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RETIREMENT PROBLEM

Life-Cycle: Individuals ability to work declines with aging and continue to live after they are unwilling/unable to work

Standard Life-Cycle Model Prediction: Absent any government program, rational individual would save while working to consume savings while retired [Modigliani life cycle graph]

Optimal saving problem is extremely complex: uncertainty in returns to saving, in life-span, in future ability/opportunities to work, in future tastes/health

In practice: When govt was small $\Rightarrow$ Many people worked till unable to (often till death) and then were taken care of by family members

Today: Govt is taxing workers to provide for retirees through social security retirement systems

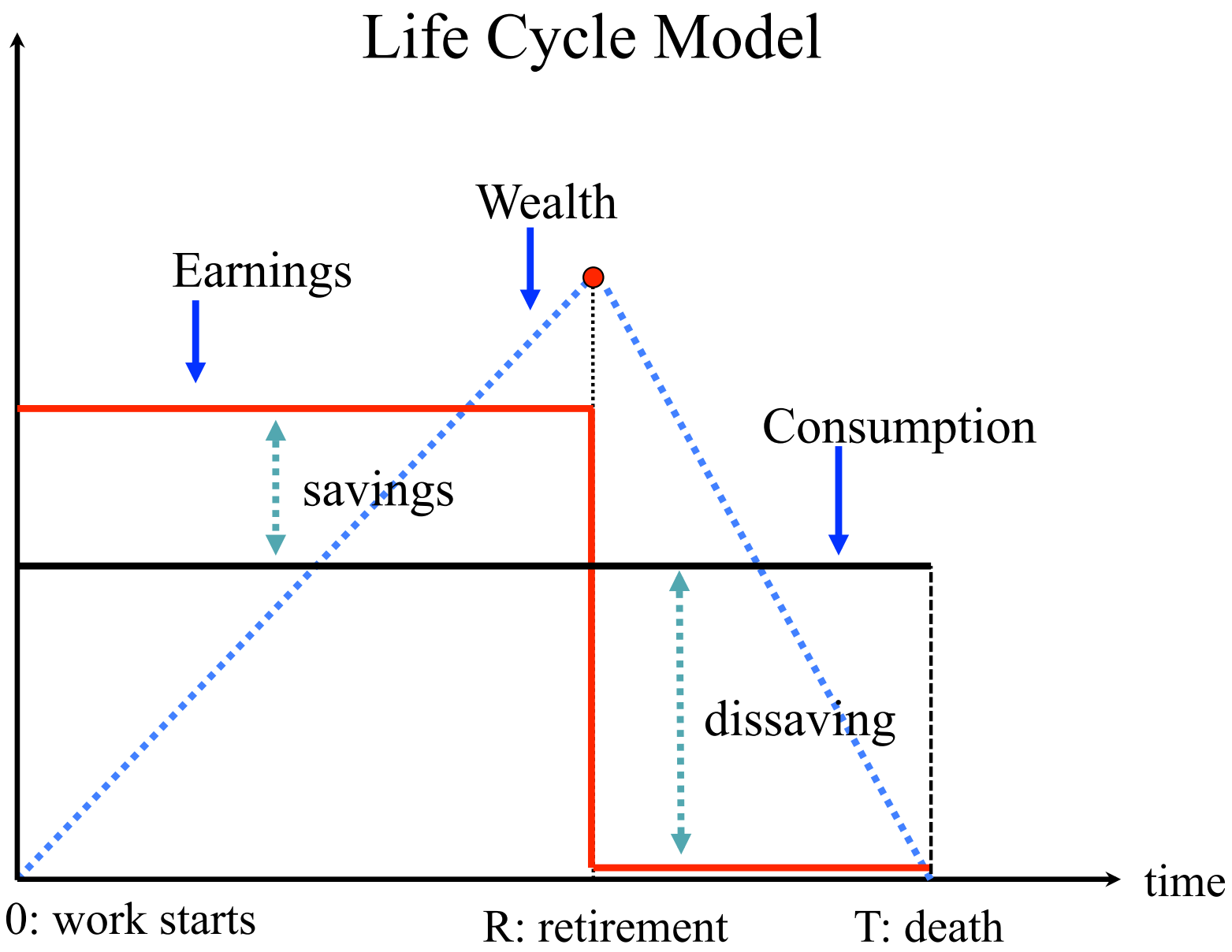
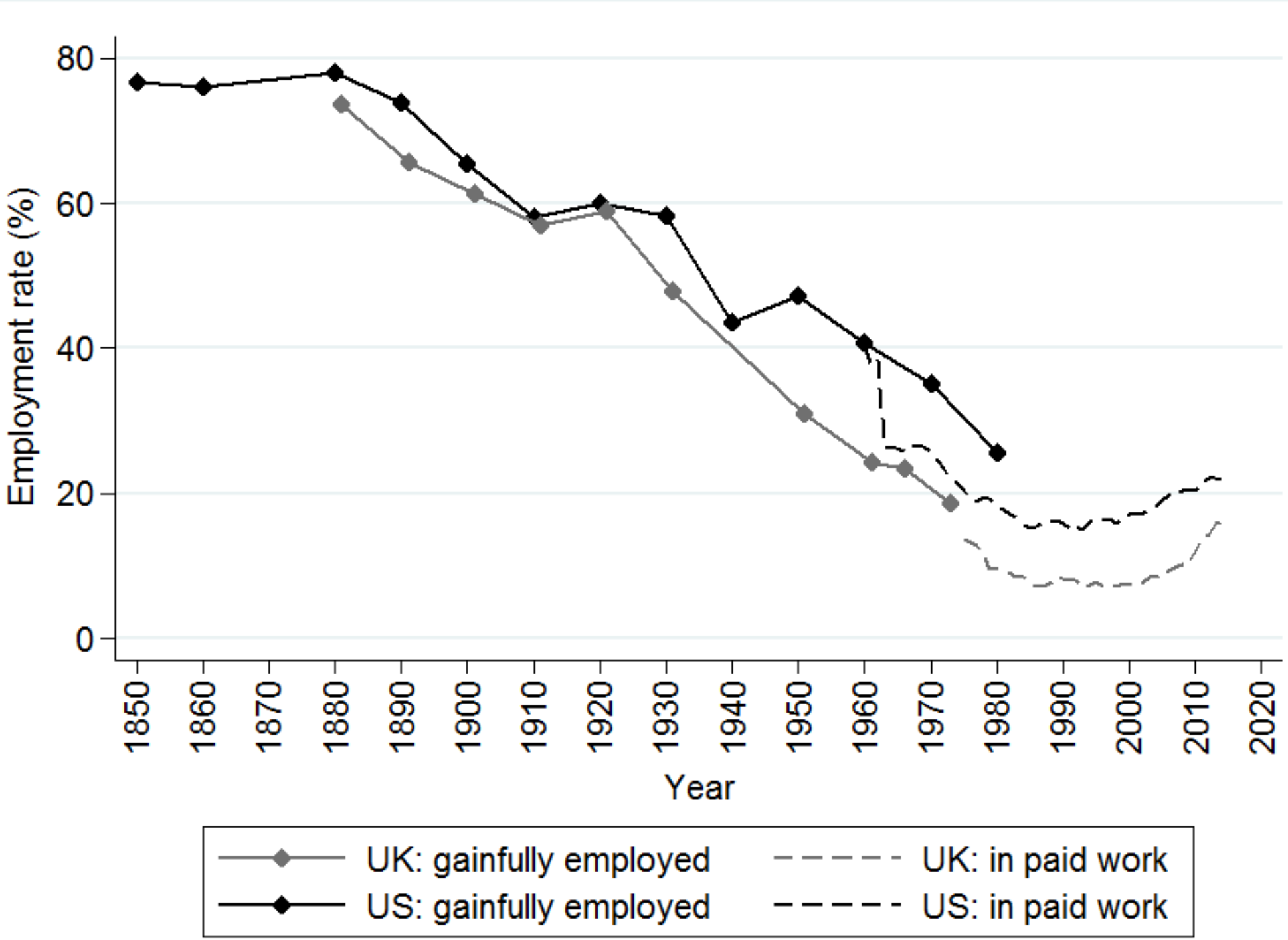
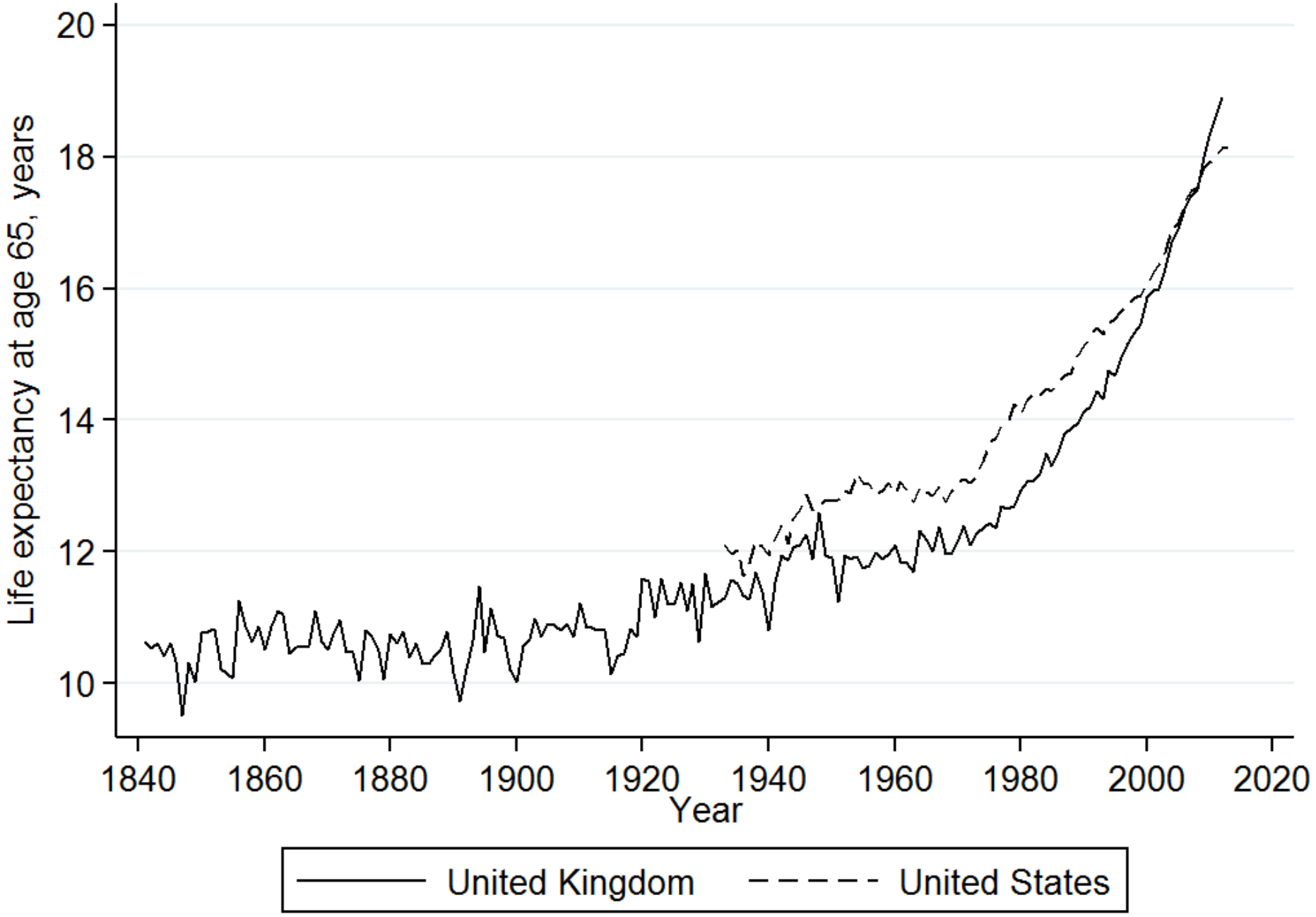

Life Cycle Model
Wealth
Earnings
Consumption
savings
dissaving
time
0: work starts
R: retirement
T: death

Figure 2.6: Employment rate of men aged 65+ in the UK and the US



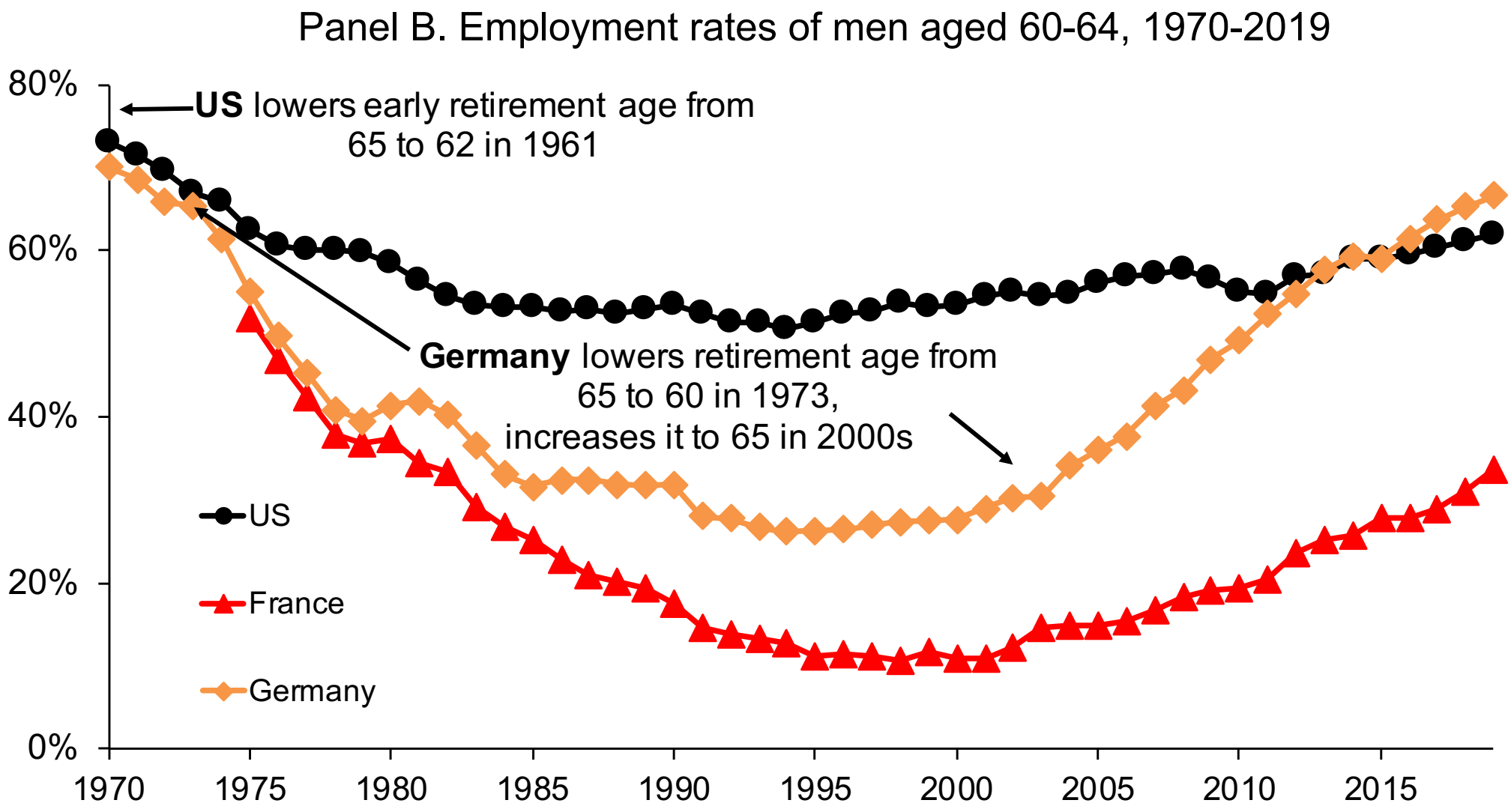
Source: Blundell, French, and Tetlow (2017)

Figure 2.7: Life expectancy of men at age 65 in the UK and the US



Source: UK data from the Office for National Statistics, US data from the Human Mortality Database.

Source: Blundell, French, and Tetlow (2017)



Source: Saez '21 using OECD database

GOVT INTERVENTION IN RETIREMENT POLICY

Actual Retirement Programs: All OECD countries implement substantial government funded retirement programs (substantial share of GDP around 6-10%, US smaller around 5%), started in first part of 20th century and have been growing.

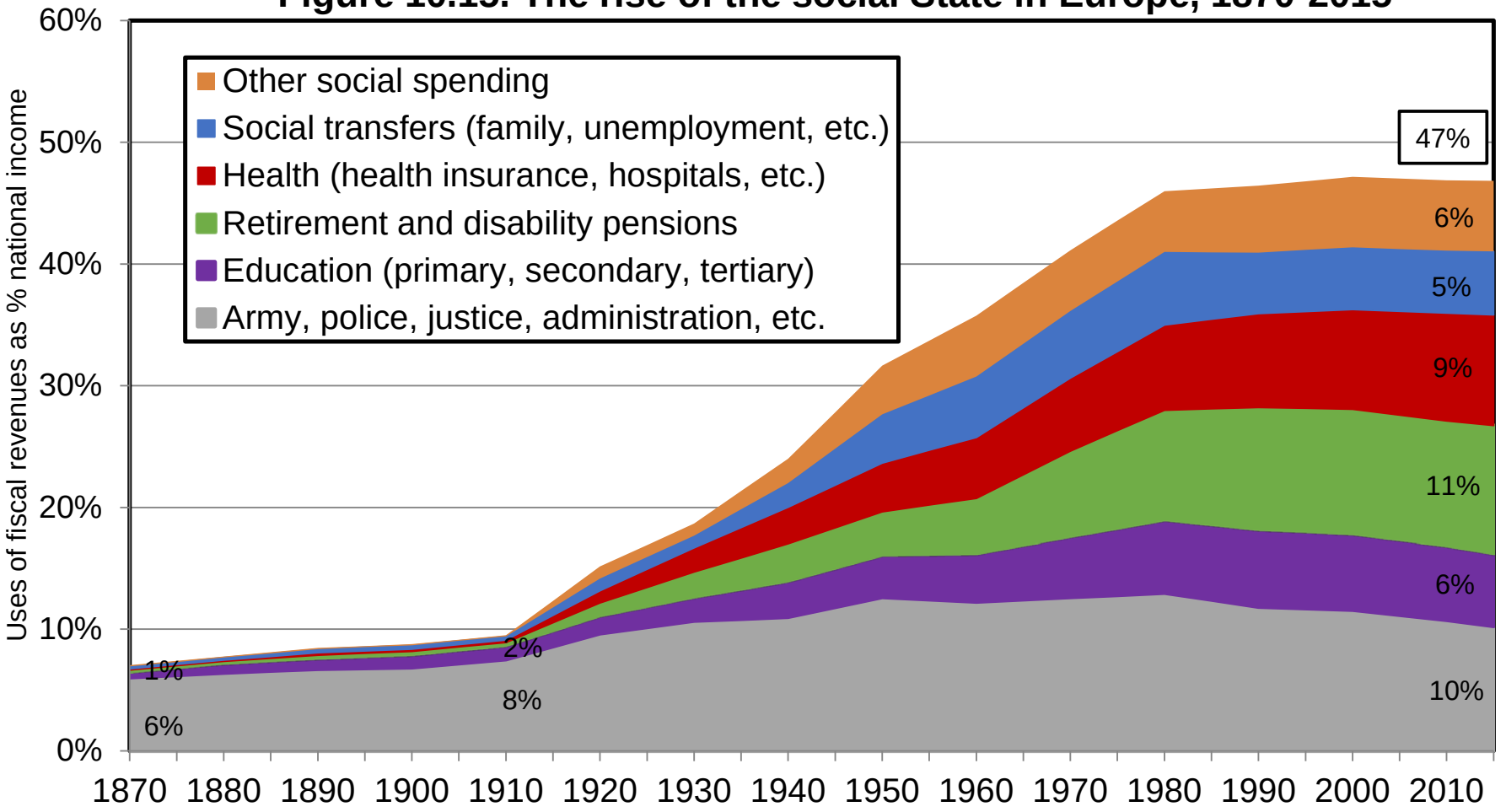
Common structure:

Individuals pay social security contributions (payroll taxes) while working and receive retirement benefits when they stop working till the end of their life (annuity)

Extension of the earlier family model: it's no longer your own working kids who take care of you in old age but all workers in the country

In the United States, the public retirement program is called **Social Security**

Figure 10.15. The rise of the social State in Europe, 1870-2015



Interpretation. In 2015, fiscal revenues represented 47% of national income on average in Western Europe et were used as follows: 10% of national income for regalian expenditure (army, police, justice, general administration, basic infrastructure: roads, etc.); 6% for education; 11% for pensions; 9% for health; 5% for social transfers (other than pensions); 6% for other social spending (housing, etc.). Before 1914, regalian expenditure absorbed almost all fiscal revenues. **Note.** The evolution depicted here is the average of Germany, France, Britain and Sweden (see figure 10.14). Sources and séries: see piketty.pse.ens.fr/ideology.

SOCIAL SECURITY: PROGRAM DETAILS

How Is Social Security Financed?

Almost all workers in the United States pay the Federal Insurance Contributions Act (FICA) tax on their earnings.

Tax is 12.4% of earnings (6.2% paid by employer, 6.2% paid by employees) up to a cap of $176,000 in 2025

Who Is Eligible to Receive Social Security?

A person must have worked and paid this payroll tax for 40 quarters (10 years) over their lifetime, and must be of age 62 or older.

SOCIAL SECURITY: PROGRAM DETAILS

How Are Social Security Benefits Calculated?

Annuity: A payment that lasts until the recipient's death.

Annuity amount is a progressive function of the recipient's average (taxable) earnings over the person's 35 highest earning years where each month's earnings are expressed in today's dollars using average wage growth
AIME = average indexed monthly earnings

Once benefits start for a given person, they are indexed to price inflation once every year ("real" annuity)

Higher earners live longer. Progressivity of benefits formula roughly offsets this (but life expectancy gap between rich and poor is increasing)

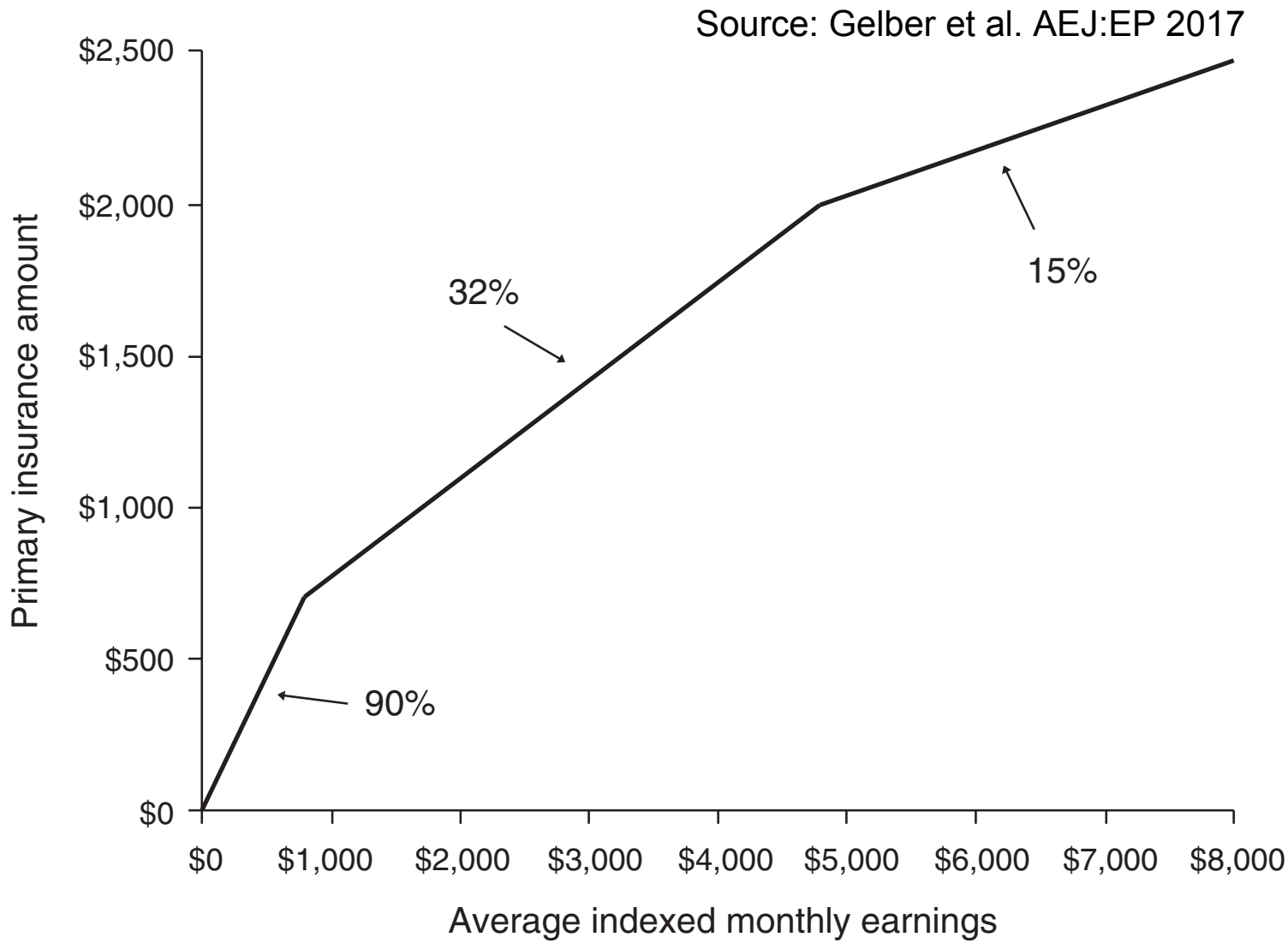


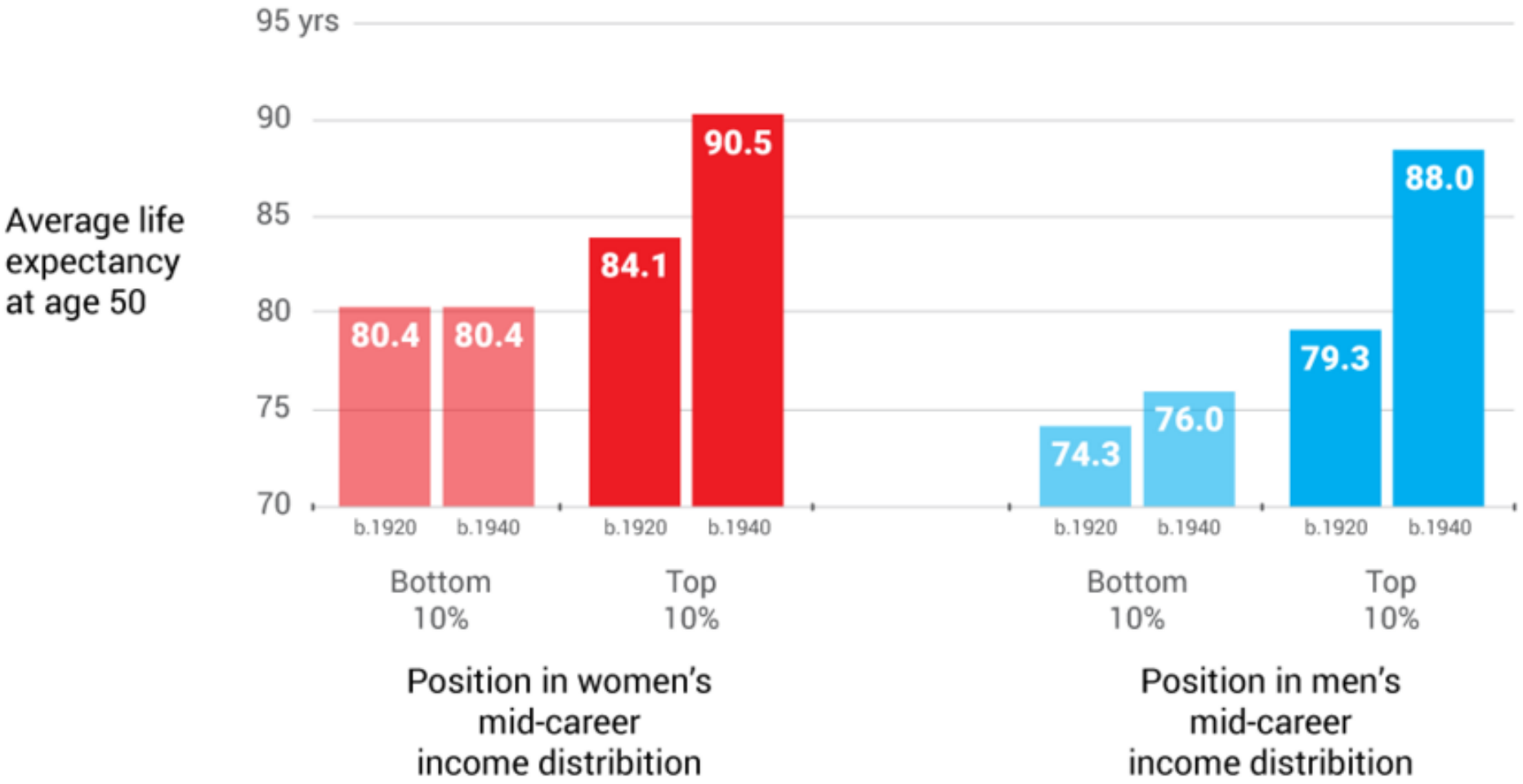
FIGURE 1. PRIMARY INSURANCE AMOUNT AS A FUNCTION OF AVERAGE INDEXED MONTHLY EARNINGS

Notes: The figure shows the primary insurance amount (PIA) as a function of average indexed monthly earnings (AIME) in 2013. The percentages are marginal replacement rates.

Source: SSA (2013)

Americans making more money are living longer than those earning less

This means gaps in life expectancy by income have grown over time.



Source: Bosworth et al. 2016

How Are Social Security Benefits Paid Out?

Full Benefits Age (FBA): The age at which a Social Security recipient receives full retirement benefits (Primary Insurance Amount): currently **67** if born 1960+ (used to be 65)

Early Entitlement Age (EEA): The earliest age at which a Social Security recipient can receive reduced benefits is **62**

If you claim benefits 1 year before FBA, you get 6% less in annual benefits (permanently), if you claim 2 years before FBA, you get 12% less in annual benefits (permanently), etc.

You get 8% more in benefits if you claim 1 year after FBA, etc. Benefits automatically paid at **70**.

Adjustments to Social Security Benefits based on claiming age

Table 1: Initial Benefits Based on Initiation Age

Age	Benefits
62	$700
63	$750
64	$800
65	$867
66	$933
67	$1,000
68	$1,080
69	$1,160
70	$1,240

Note: $1,000 is the monthly base at a full retirement age of 67.

SOCIAL SECURITY: PROGRAM DETAILS

Are There Benefits for Family Members?

-Spouses of claimants (get own benefits or 50% of primary earner benefits, whichever is biggest)

-Children of deceased workers.

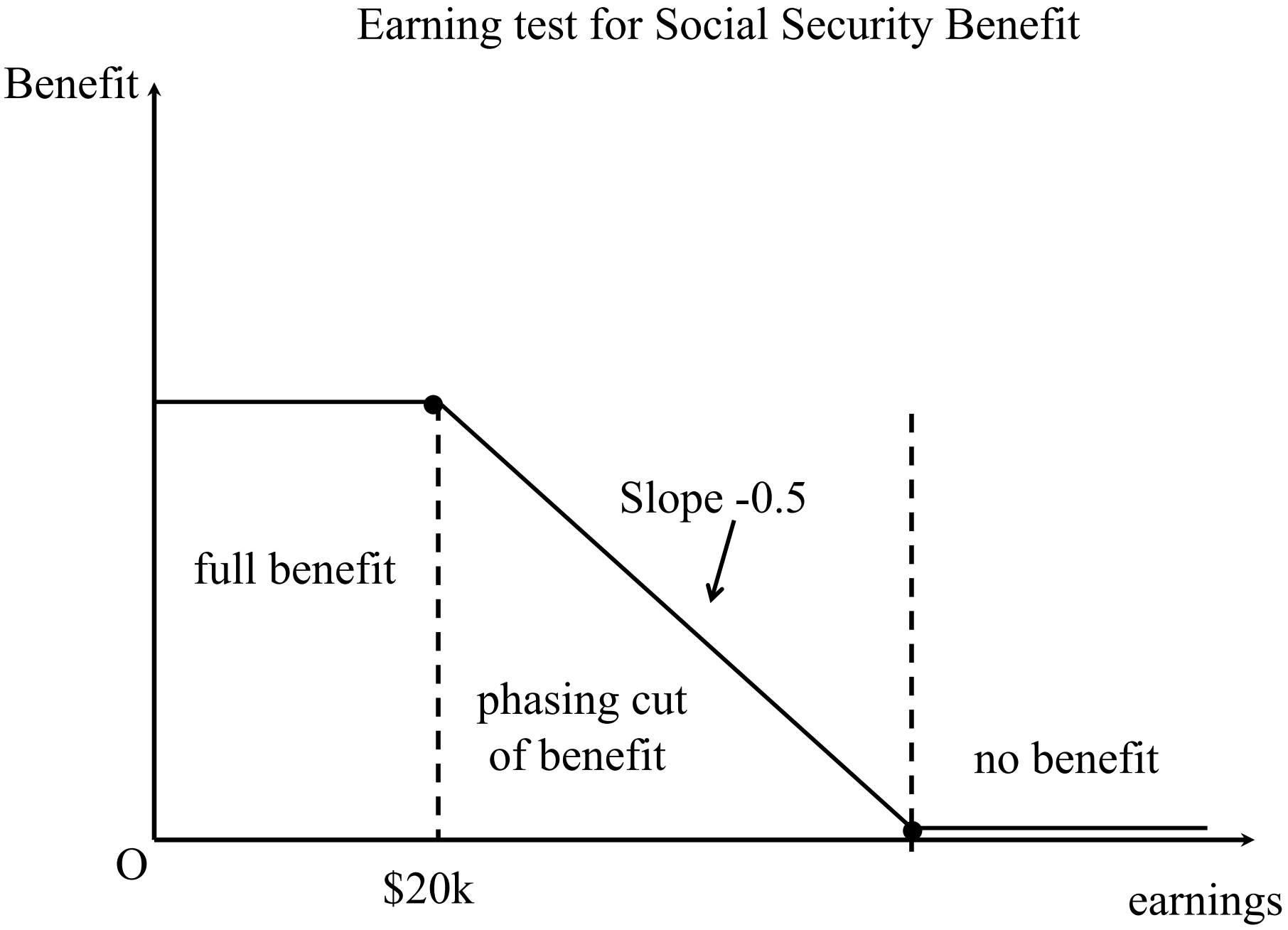
-Spouses who survive a Social Security recipient get 100% of primary earners' benefits

Can You Work and Receive Social Security?

The *earnings test* reduces benefits of the 62 to 66-year old by \$0.50 for each dollar of earnings they have above about \$20K

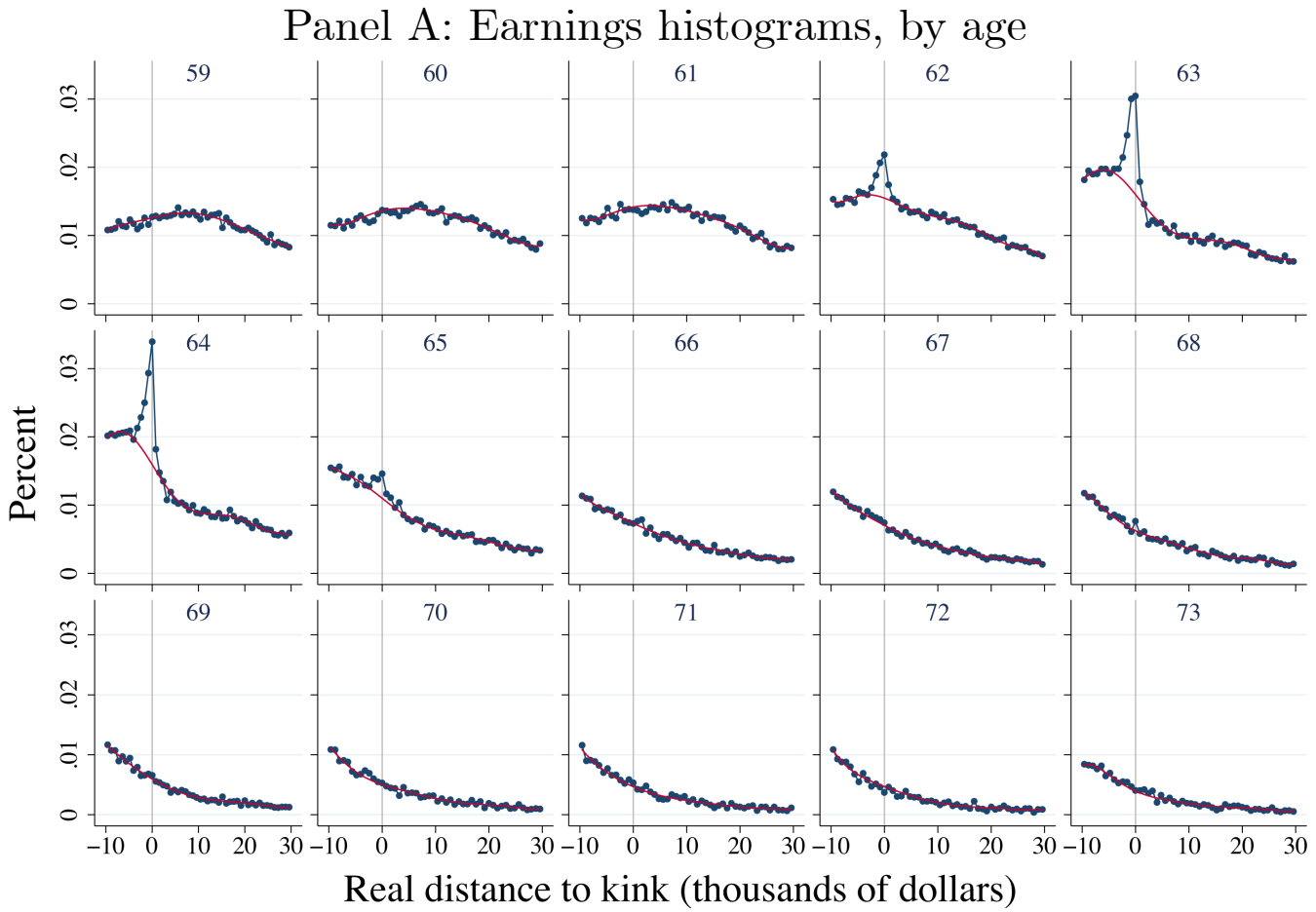
Not really a tax because later benefits are increased (as if you had retired later) but most people don't understand the system and perceive the earnings test as a pure tax

$\Rightarrow$ Bunching at earnings test kink at ages 62-64 (Gelber-Jones-Sacks '19) when normal retirement age was 65


Earning test for Social Security Benefit
Benefit
full benefit
Slope -0.5
phasing cut
of benefit
no benefit
O
$20k
earnings

Source: Gelber, Jones, Sacks (2013)

Figure E.6: Adjustment Across Ages: Histograms of Earnings and Normalized Excess Mass, 59-73-year-olds Claiming OASI by Age 65, 2000-2006



Quiz on the Earnings Test for Social Security

Which one of these about the Earnings Test is FALSE?

A. The earnings test reduces benefits by $.5 per dollar earned above the $20K earnings disregard

B. Some social security beneficiaries respond to the test by limiting their earnings to $20K to avoid losing benefits

C. The earnings test is like a tax on earnings and hence it is rational for beneficiaries to reduce their earnings to avoid losing benefits

D. If a beneficiary loses some benefits because of the earnings test, she will recoup these lost benefits in the form of slightly higher benefits for the rest of her life.

E. Actually A, B, C, D are all true

SOURCES OF RETIREMENT INCOME IN THE US

1) Govt provided retirement benefits (US Social Security): For 2/3 of retirees, SS is more than 50% of income. 1/3 of elderly households depend almost entirely on SS.

2) Home Ownership: 75% of US elderly are homeowners (home purchase with 30-year traditional mortgage is a key form of life cycle savings)

3) Employer pensions (tax favored): 40-45% of elderly US households have employer pensions. Two types:

a) Traditional: Defined Benefit (DB) and mandatory: **employer** carries full risk [in sharp decline, many in default]

b) New: Defined Contribution (DC) and elective: 401(k)s, **employee** carries full risk

4) Extra additional savings: significant only for wealthy minority [=10% of retirees]

Key lesson: Bottom 90% wealth is (a) housing (net of mortgage debt), (b) pensions, (c) minus other debts (consumer credit, student loans)

All 3 components are heavily affected by government policy (education finance), institutions (such as employers), financial regulations (mortgage refinance, credit card and loans)

Note: student loans make you start negative (instead of zero) in life-cycle model

FUNDED VS. UNFUNDED PROGRAMS

Two forms of retirement programs:

1) Unfunded (pay-as-you-go): benefits of current retirees are paid out of contributions from current workers [generational link]

current benefits = current contributions

2) Funded: workers contributions are invested in financial assets and will pay for benefits when they retire [no generational link]

current benefits = past contributions + market returns on past contributions

Social security (as most public retirement systems) is unfunded

Most private pension plans (such as 401(k)s) are funded

FUNDED VS UNFUNDED SYSTEMS

1) Funded system: each generation gets a market return r on contributions:
benefits=tax you paid $\cdot(1+r)$

2) Unfunded system: 1st generation of retirees gets free benefits when the system starts

For later generations: pay tax (for older generation) and you get benefits from younger generation

Generation t is size N_t, earns w_t, pays taxes $T_t = \tau N_t w_t$ in period t and receives benefits $B_t = \tau N_{t+1} w_{t+1}$ from gen. $t+1$

$B_t/T_t = (N_{t+1}/N_t) \cdot (w_{t+1}/w_t) = (1+n) \cdot (1+g)$

Implicit return on taxes is the sum of population growth n and real wage growth (per worker) g

FUNDED VS UNFUNDED SYSTEMS

Unfunded system is always desirable when $n+g>r$ (Diamond 1965): an economy with $n+g>r$ is called **dynamically inefficient** and introducing an unfunded system makes a Pareto improvement

US economy: Annual $n=1\%$ and $g=1\%$ [$n+g$ was higher in 1940-1970]. $r\simeq 5\%$. In general $r>n+g$ in practice.

Note that r is much more risky than $n+g$: risk adjusted market rate of return should be lower than average market rate r but still higher than $n+g$

Funded system delivers higher returns because it does not deliver a free lunch to 1st generation

Choice between funded vs. unfunded system is an **inter-generational redistribution trade-off**

MODEL: RATIONAL VS. MYOPIC SAVERS

Most important reason for social security: many people are unable to save rationally for retirement (due to myopia, self-control problems, lack of information, etc.)

Life-cycle model: work and save in period 1, retire in period 2

1) Rational individuals: [draw graph]

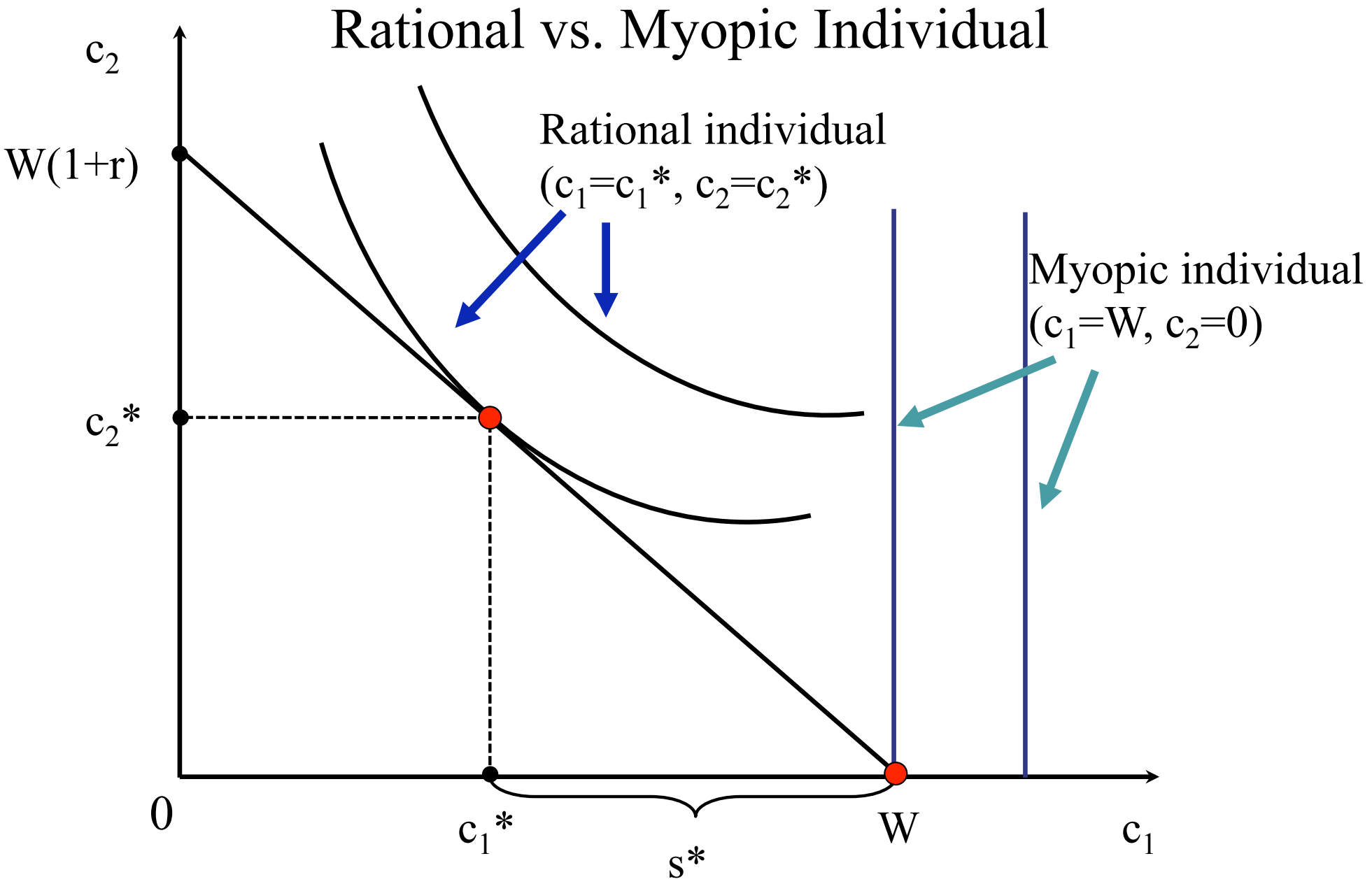
$\max_{c_1,c_2} u(c_1) + \delta u(c_2)$ st $c_1 + s = w$ and $c_2 = s \cdot (1 + r)$
$\Rightarrow c_1 + c_2/(1 + r) = w$

FOC: $u'(c_2)/u'(c_1) = 1/[(1 + r)\delta]$, let s^* be optimal saving

Example: If $\delta = 1$ and $r = 0$ then $c_1 = c_2 = w/2$ and $s^* = w/2$

2) Myopic individuals:

$\max_{c_1,c_2} u(c_1)$ st $c_1 + s = w$ and $c_2 = s \cdot (1 + r)$
$\Rightarrow c_1 = w$ and $s = c_2 = 0$


Rational vs. Myopic Individual
c2
W(1+r)
c2*
Rational individual
(c1=c1*, c2=c2*)
Myopic individual
(c1=W, c2=0)
0
c1*
s*
W
c1

MODEL: RATIONAL VS. MYOPIC SAVERS

Social welfare is always $u(c_1) + \delta u(c_2)$

Govt imposes forced saving tax τ such that $\tau = s^*$ and benefits $b = \tau \cdot (1 + r)$. Cannot borrow against b [as in current Social Security]

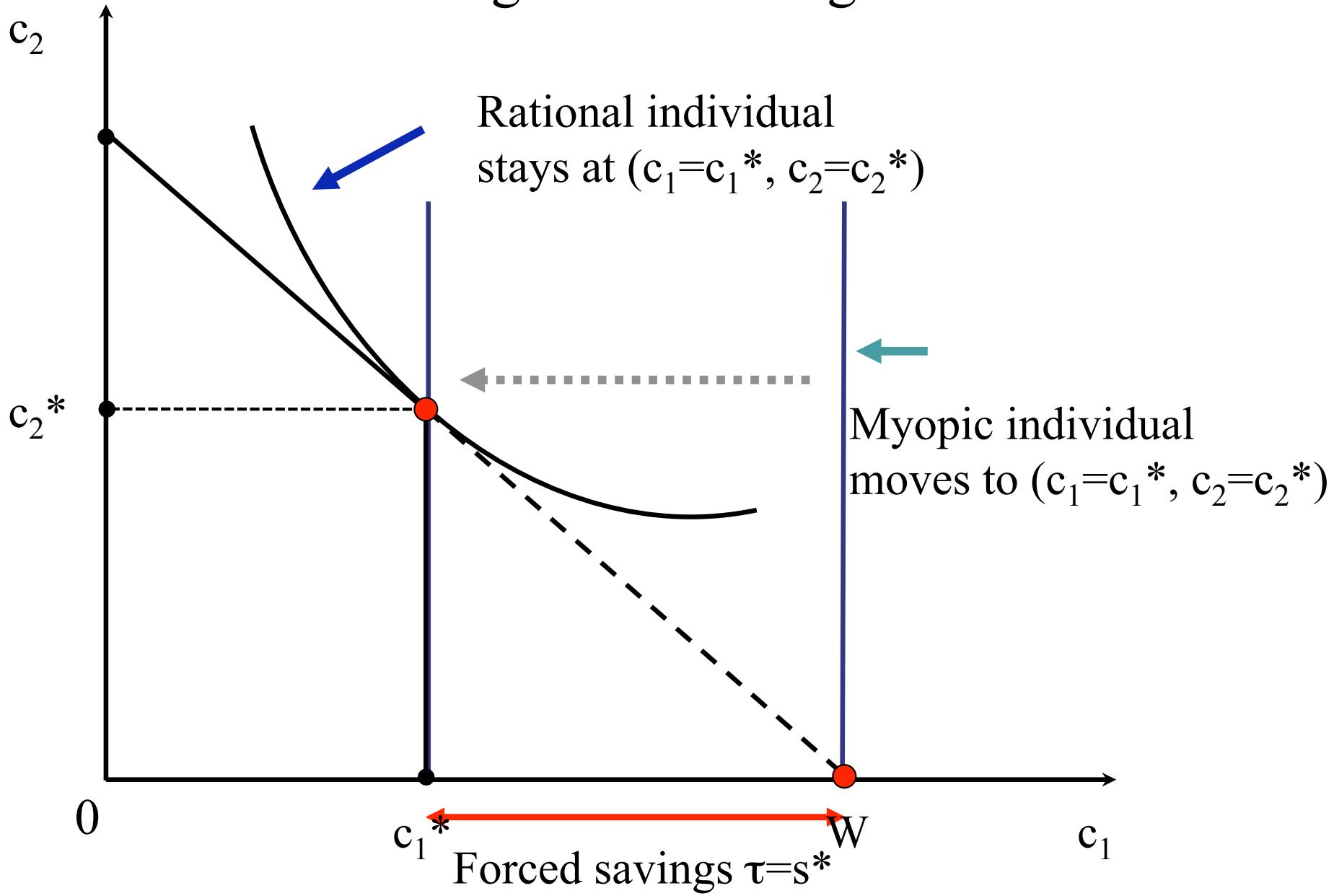
1) Rational individual unaffected: adjusts s one-to-one so that outcome unchanged [rational unaffected as long as $\tau \leq s^*$]: 100% crowding out of private savings by forced savings

$c_1 = w - (s^* + s')$ and and $c_2 = (s^* + s') \cdot (1 + r) \Rightarrow$ choosing s' is equivalent to choosing $s = s^* + s'$, rational person chooses $s' = 0$

2) Myopic individual affected (0% crowding out): new outcome maximizes Social Welfare

Forced savings is a good solution: does not affect those responsible, affects the myopic individuals in socially desired way

Adding forced savings τ=s*



Quiz on the Model with Myopic and Rational Savers

Which of A, B, C, D is FALSE?

A. Social security forces myopic individuals to save

B. Social security does not affect rational individuals

C. Social security increases consumption in old age for the myopic but not the rational

D. Social security transfers resources from rational savers toward myopic savers

E. Actually A, B, C, D are ALL true

MODEL: COMMENTS

1) Universal vs. Means-Tested Program: Universal forced savings is better than means-tested program financed by tax on everybody. With means-test program, two drawbacks:

a) Responsible individuals subsidize myopic individuals

b) Incentives to under-save to get means-tested pension

2) Heterogeneity in w: Forced saving should be proportional to w (as long as govt does not care about redistribution)

Crowd-Out Effect of Social Security on Savings

The effect of Social Security on private savings has been the subject of a large number of studies over the past 30 years

To measure the impact of Social Security on savings, there must be a way to compare people with different levels of Social Security benefits who are otherwise identical

In the United States, Social Security is a national program that applies to almost all workers; very similar people usually have very similar benefits. Recent studies have provided evidence on the impact of Social Security-like programs on private savings in Italy.

Italian Reforms in 1992 substantially reduced the benefits, and thus future SSW, for younger workers in the public sector, while reducing much less the benefits of older workers and those in the private sector.

Studies estimate that only about 1/3 of the reduction in SSW was offset by higher private savings.

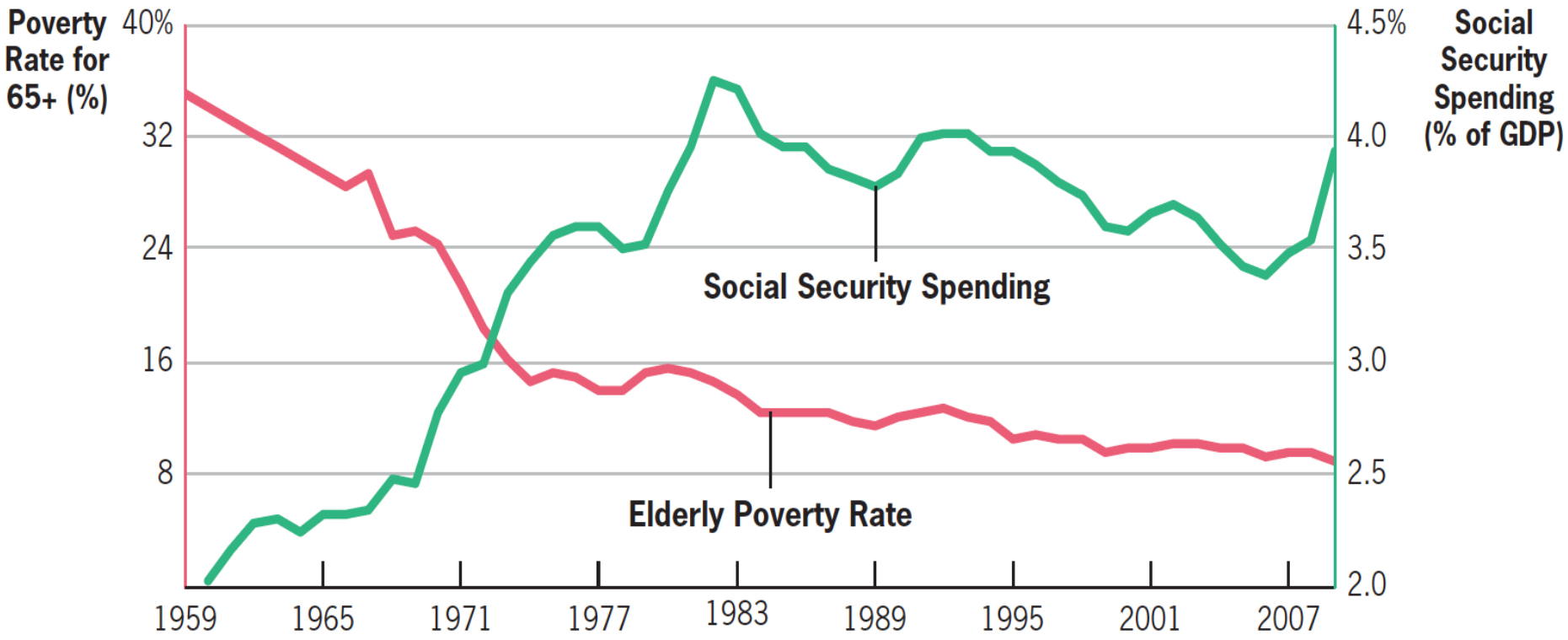
Evidence for Myopia and adequate savings

1) Diamond JpubE 1977: old age poverty has fallen as Social Security expanded. Poverty for other groups has not fallen nearly as much

2) Fall in consumption **at** retirement: Bernheim, Skinner, Weinberg (2001) show that drop in consumption is significant for all groups except the wealthiest [consistent with myopia]

13.2

Living Standards of the Elderly, 1959–2009



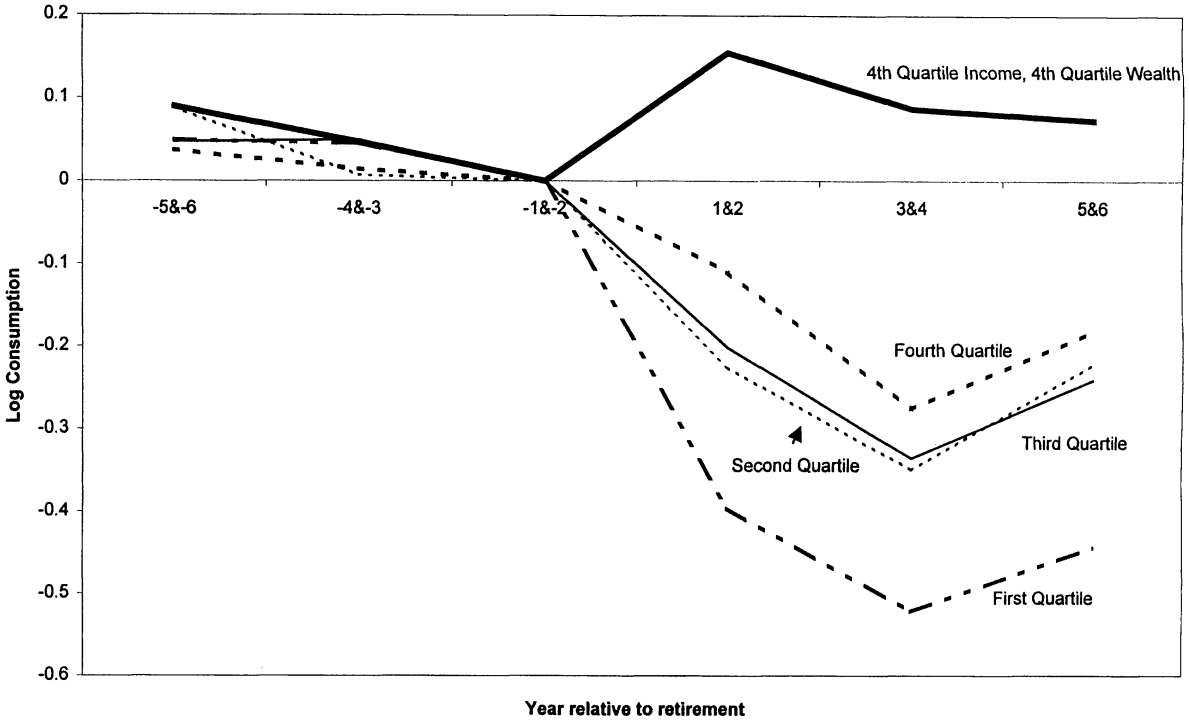


FIGURE 4. CHANGE IN CONSUMPTION AT RETIREMENT, BY WEALTH QUARTILE

Source: Bernheim et al. (2001), p. 847

SOCIAL SECURITY AND RETIREMENT: THEORY

If a 62-year-old worker works until 63, instead of retiring at 62 and claiming her Social Security benefits, three things happen through the Social Security system:

1) She pays an extra year of payroll taxes on her earnings.

2) She receives one year less of Social Security benefits.

3) She gets a higher Social Security benefit level through the actuarial adjustment ($\simeq$ 6-8% extra permanently per year of delay)

Adjustment is called **actuarially fair** if those 3 effects cancel out in Present Discounted Value (US system has been reformed decades ago to be close to fair on average)

SOCIAL SECURITY AND RETIREMENT: THEORY

Three key elements of a social security system may affect retirement behavior:

1) Availability of benefits at **Early Retirement Age** (EEA): (62 in US)

Those effects arise because of myopia or lack of information [a rational individual is not affected by EEA because he/she can use own savings while retired till he/she reaches age 62]

2) Non-actuarially fair adjustments of benefits for those retiring after the EEA:

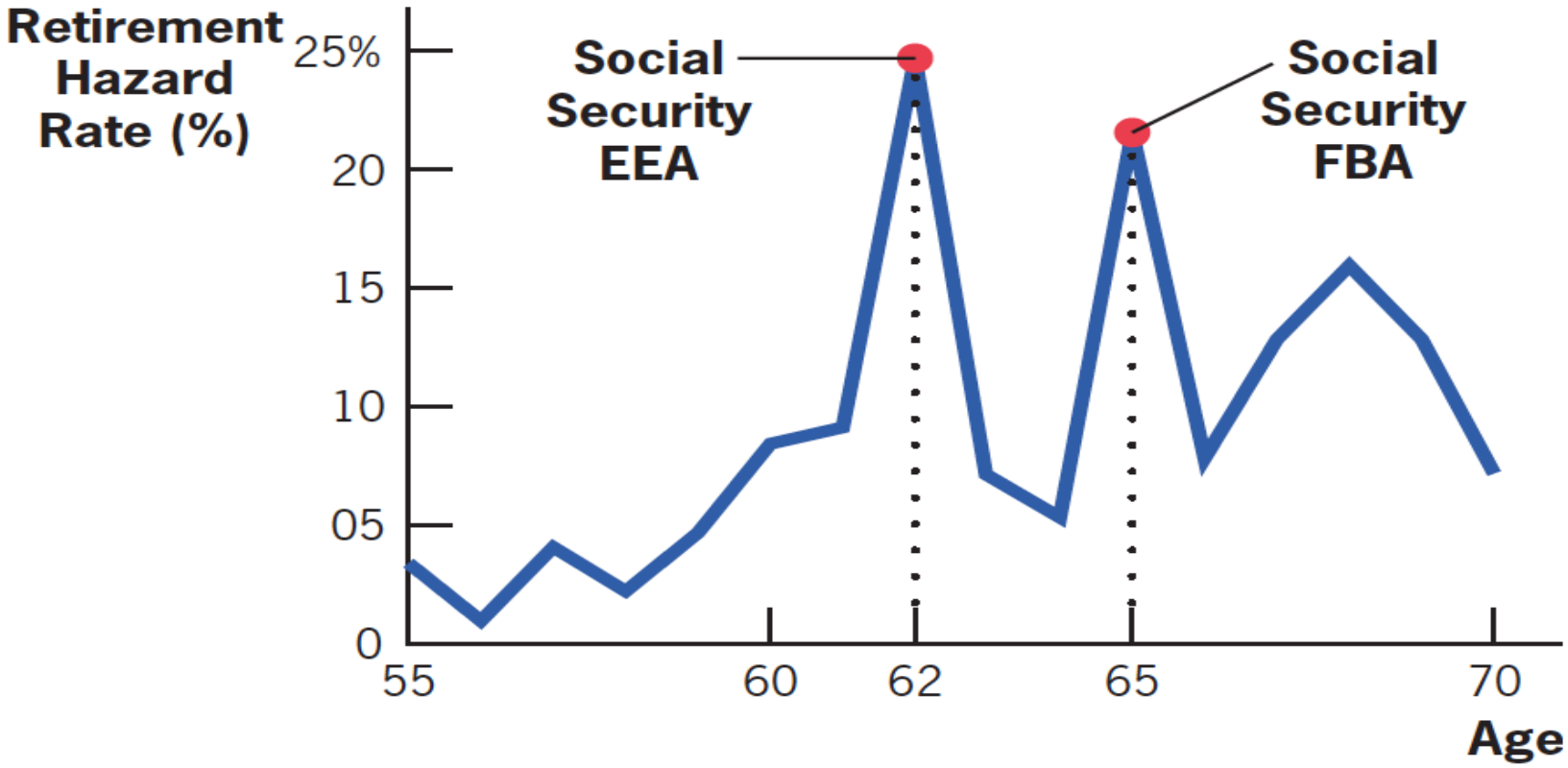
If benefits are not adjusted in a fair way, they can create a huge implicit tax on work (US used to have very little adjustment)

3) Social norm created by retirement benefits: govt calling some age the "Normal Retirement Age" (NRA) can affect decisions in spite of no underlying economic incentives (see Seibold '21 for such effects in Germany)

13.3

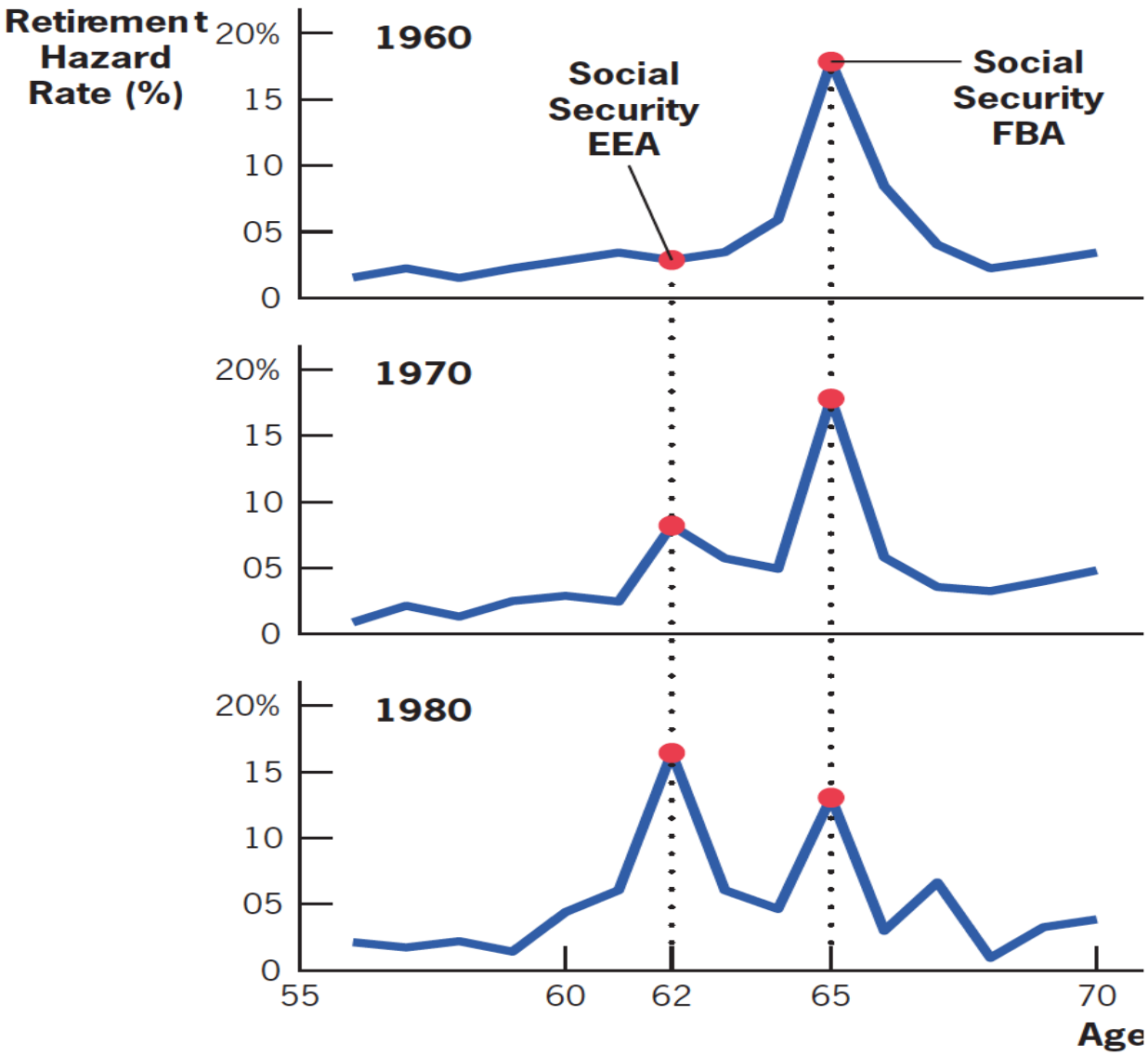
Spike in Retirement Hazard at EEA

- **Retirement hazard rate:** The percentage of workers retiring at a certain age.



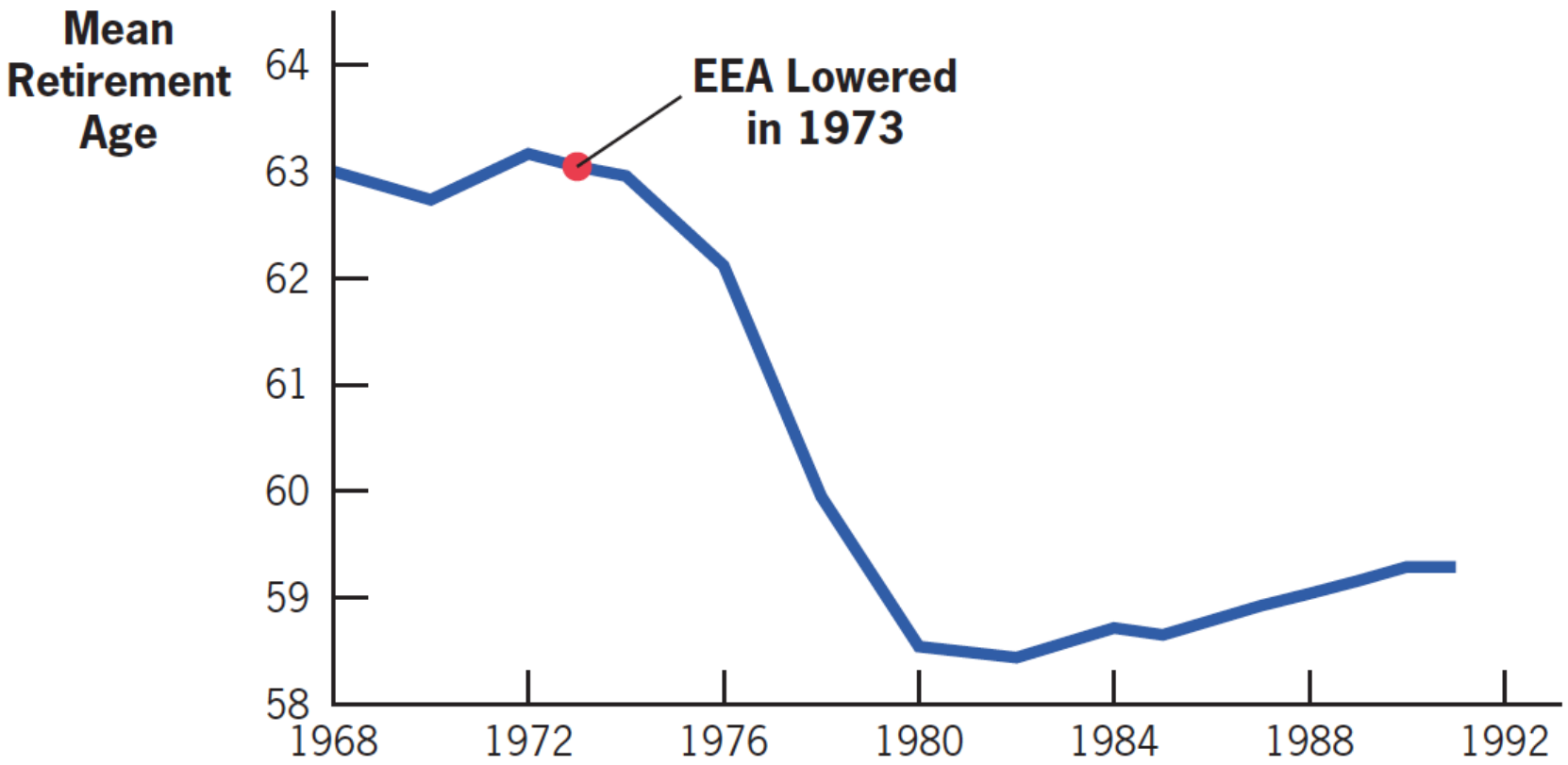
13.3

Spike in Retirement Hazard at EEA



13.3

Evidence: Retirement Age in Germany, 1968–1992



- Retirement age lowed from 65 to 60 in 1973.

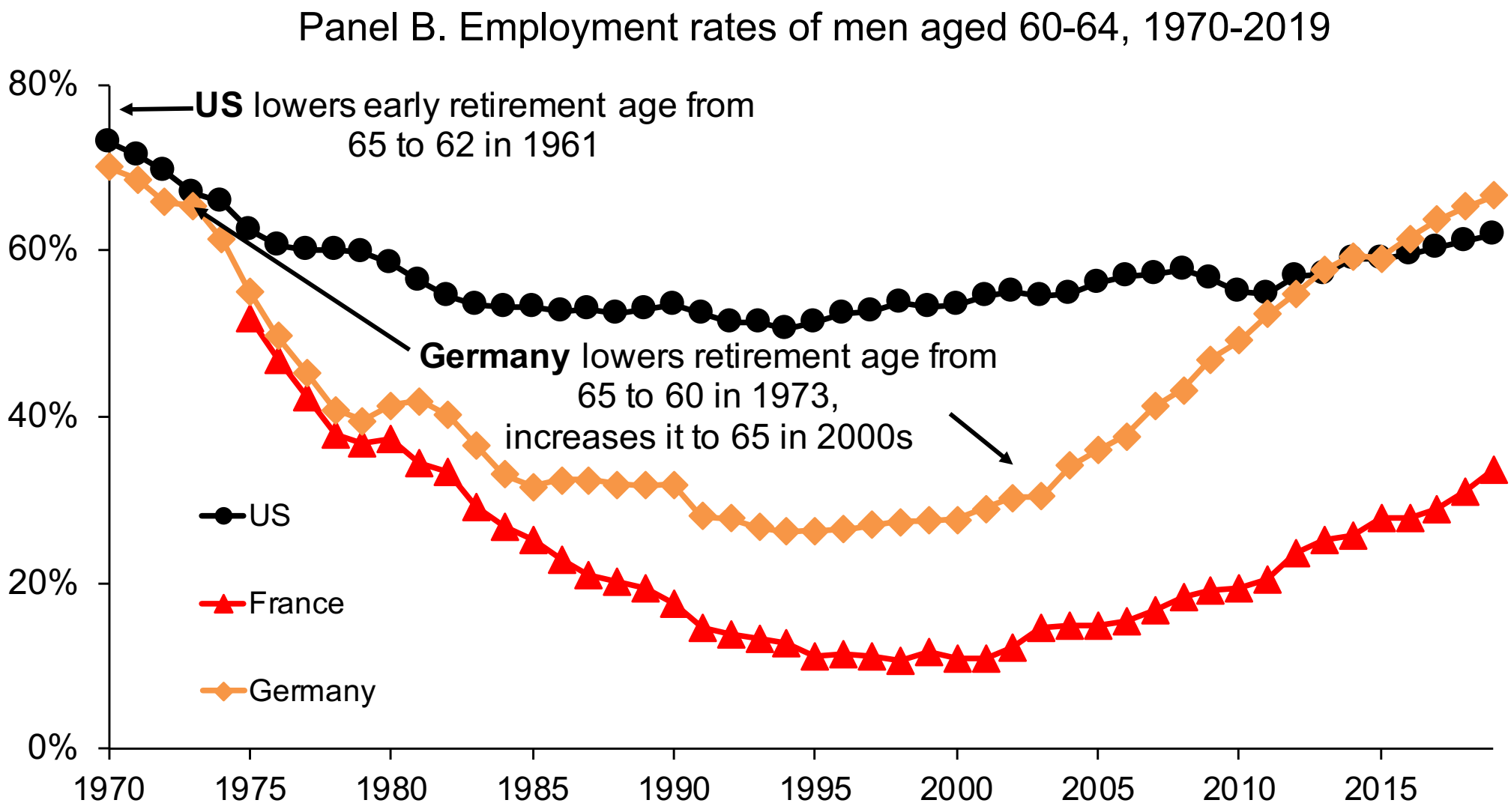
Social Security and Retirement: Implications

Evidence suggests that it is potentially very costly to design Social Security systems that allow very early retirement and/or penalize additional work beyond the retirement age.

Adjusting systems to more fairly reward work at old ages can increase labor supply of elderly

It seems better to have an early retirement age that is not too low and provide disability benefits to those who truly cannot work and haven't yet reached the early retirement age

"Normal retirement age" labelling can also have an impact through social norms and focal points (as in Germany as shown in Seibold '21)



Source: Saez '21 using OECD database

Social Security Reform: Problems with Current System

Rate of return $n + g$ has declined from over 3% to about 2% due to:

1) n: Retirement of baby boom large cohorts born 1945-1965:

2) Increase in life expectancy at retirement age

Note: top half of individuals (in terms of lifetime earnings) has seen large life expectancy gains while bottom half life expectancy has stagnated in recent decades

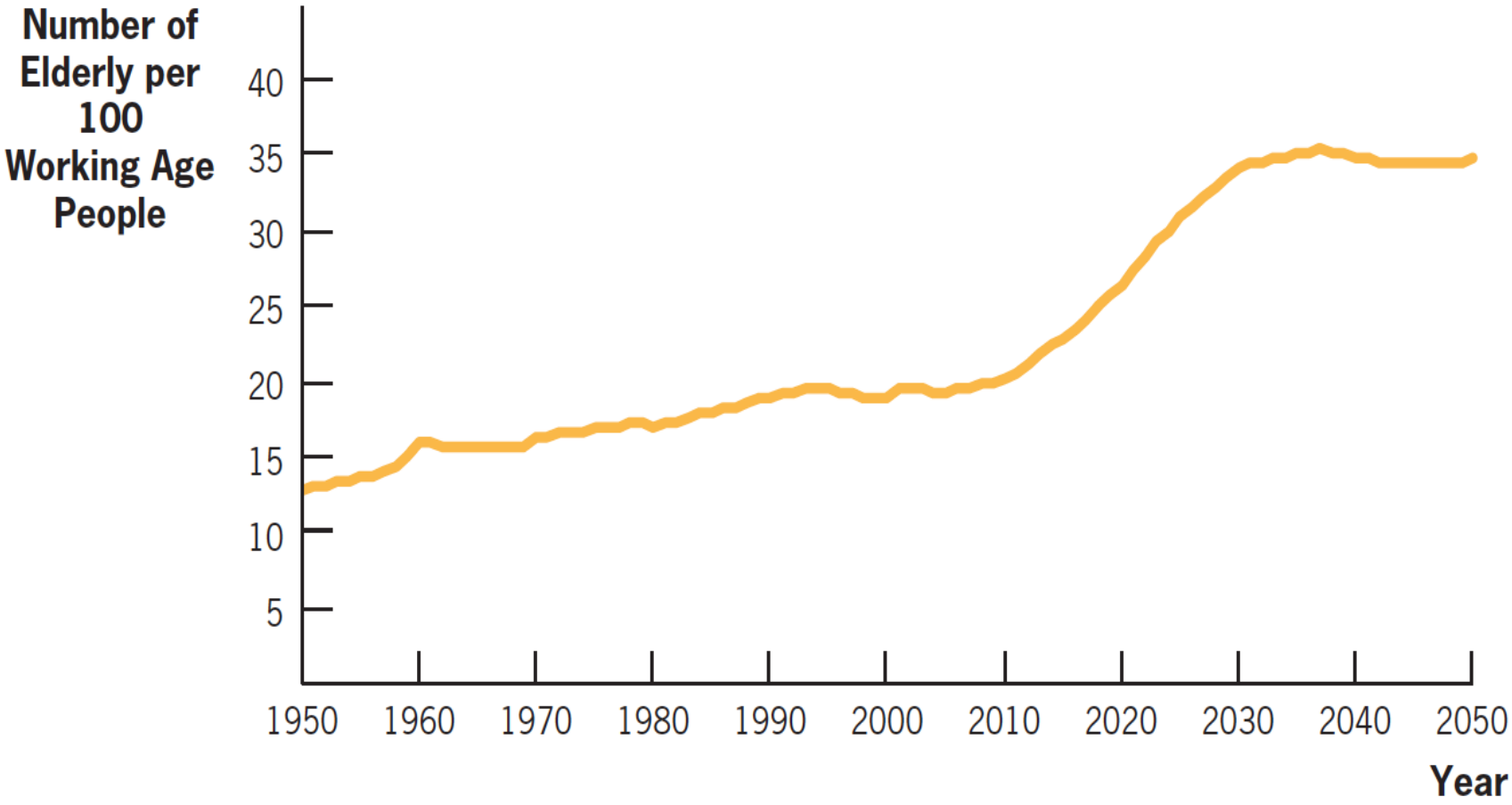
1)+2) imply number of elderly per working age person increases from .15 in 1960 to .35 in 2030

3) g: Slower productivity growth since 1975 (from 2% to 1%)

Requires adjusting taxes or benefits to remain in balance

13.4

Social Security Reform



1983 GREENSPAN COMMISSION

Demographic changes are predictable, so 1st reform was implemented in 1983 (designed to solve budget problems over next 75 years)

1) Increased payroll taxes to build a trust-fund

2) Increased retirement age in the future (from age 65 to 67)

Trust fund invested in Treasury Bills (Fed gov debt):

$$TF_{t+1} = TF_t \cdot (1 + i) + SSTax_t - SSBen_t$$

Trust fund peaked at \$2.8T in 2013 and will be exhausted by 2033, taxes will then cover about 75% of promised benefits

Requires additional adjustment: increasing payroll tax rate by 3.5 pp (from 12.4% to 15.9%, not huge)

13.4

APPLICATION: The Social Security Trust Fund and National Savings

- In theory, one benefit of the partial funding of Social Security through the build-up of the trust fund is an increase in national savings.
- The trust fund is "off budget," not supposed to be part of budget discussion.
- But typically the government reports the deficit/surplus from the "unified budget," which incorporates off-budget categories.
- Makes it easy to treat trust fund as an asset, avoid fixing the deficit.

Social Security Small Reform Options

1) Increase contributions: increase tax rate or earnings cap

2) Reduce benefits: straight cut not politically feasible: a) Index retirement age to life expectancy, b) Index benefits to chained-Consumer Price Index instead of regular CPI after retirement, c) Make benefits fully taxable for income tax

3) Means-tested benefits: bad for savings incentives and could make program politically unstable [a program for the poor is a poor program]. Explains conservatives support.

Key issue is distributional: low income earners have seen income and life expectancy stagnate but they have increased for high income earners

SOCIAL SECURITY PRIVATIZATION

This is the more radical reform option. Two components:

1) Funding the system

2) Replace DB by DC:

benefits = past contributions + market return

Main arguments in favor:

(a) Micro: get higher return on contributions $r > n + g$ for individuals

(b) Macro: higher savings and hence will increase the capital stock and wages

Some countries such as Chile, Mexico, Uruguay, UK have privatized (partly) their systems

SOCIAL SECURITY PRIVATIZATION ACCOUNTING

Exactly the reverse of pay-as-you-go calculations:

1) First generation loses as they need to fund current retirees and own contributions. All future generations gain [generational redistribution]

2) If govt increases debt to pay for current retirees: future generations get higher return on contributions but need to re-pay higher govt debt $\Rightarrow$ Complete wash for all generations

$\Rightarrow$ Only way funding generates real changes is by hurting some transitional generations which have to double pay

ADDITIONAL PRIVATIZATION ISSUES

1) Risk: individuals bear investment risk (stock market fluctuates too much relative to economy) and cannot count on defined level of benefits [Privatization needs to include minimum pension provision]

2) Annuitization: hard to impose in privatized system because of political constraints [hard to force sick person to annuitize her wealth] $\Rightarrow$ Some people will exhaust benefits before death and be poor in very old age [looming problem with 401(k)s]

3) Lack of financial literacy: Individuals do not know how to invest. Complicated choice, govt can do it for people more efficiently

4) Administrative costs: privatized systems (Chile, UK) admin costs very high (1% of assets = 10 times more than Social Security) due to wasteful advertisement by mutual funds because of lack of financial literacy

Evidence on Lack of Financial Literacy

401(k) private pensions in the US offer strong evidence of lack of financial literacy

1) $1/N$ investment choices of 401(k) contributions: many people invest contributions by dividing them equally into investment options (regardless of the options)

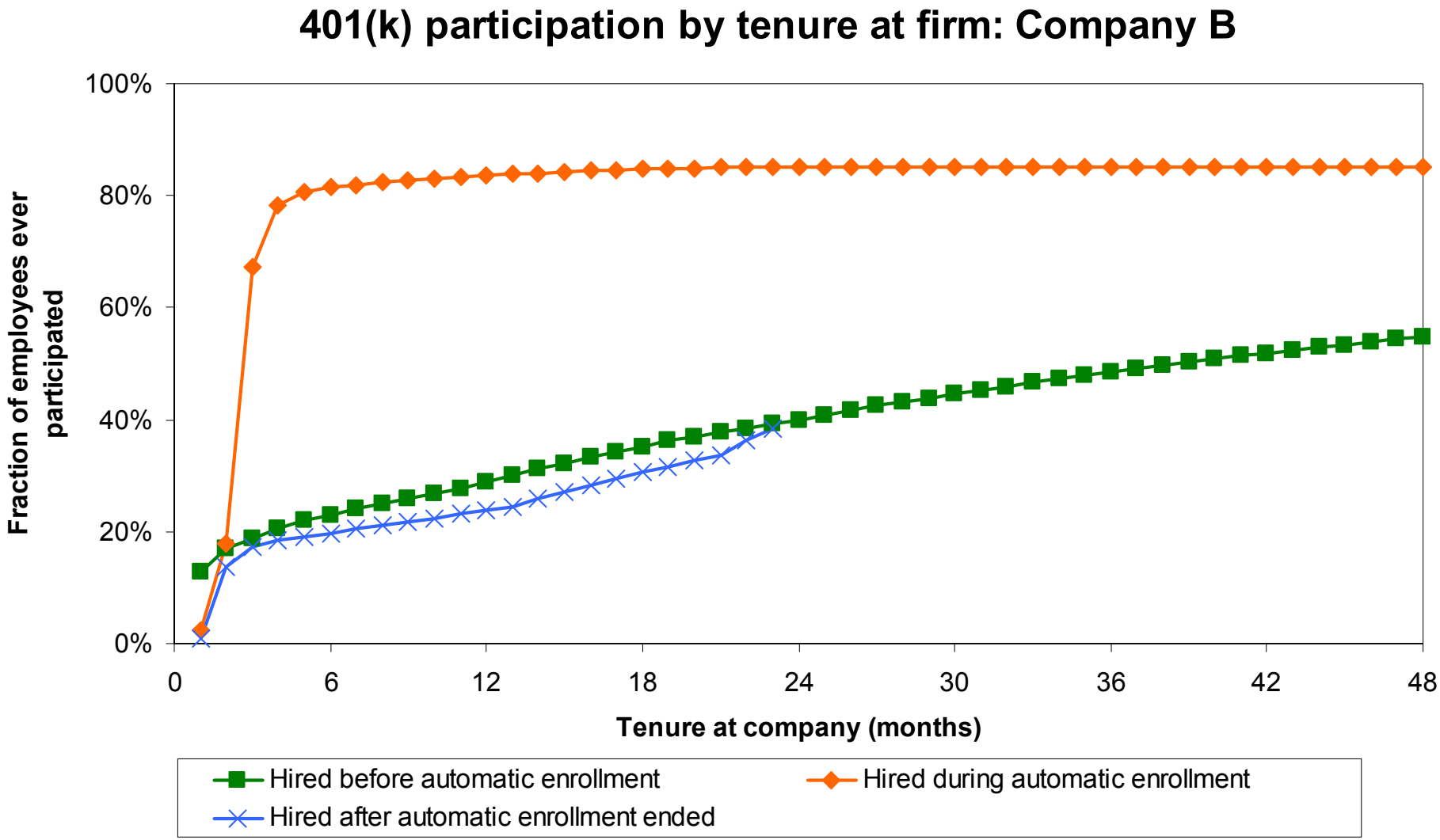
2) Default effects: opt-in vs. opt-out have enormous effects on 401(k) enrollment [Madrian and Shea QJE'01]

3) People often invest 401(k) in company stock which is extremely risky (Enron). Strong evidence of default effects in investment choices as well

$\Rightarrow$ Much better to force people to save via mandatory social security system than rely on individual rationality

Automatic enrollment effect

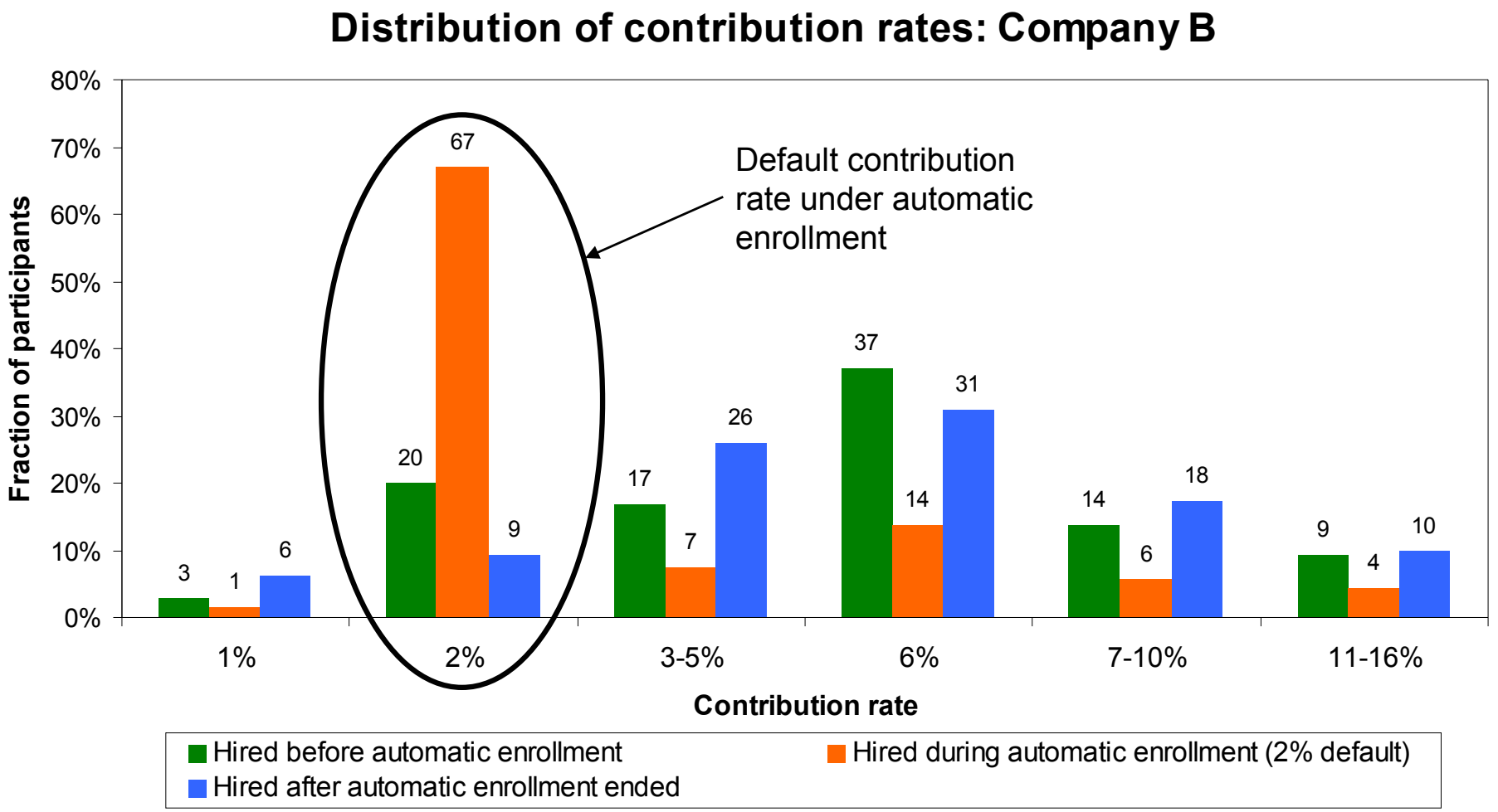
Automatic enrollment dramatically increases participation.



Source: Madrian and Shea (2001)

Automatic enrollment effect

Employees enrolled under automatic enrollment cluster at the default contribution rate.



Source: Madrian and Shea (2001)

The Flypaper Effect in Individual Investor Asset Allocation (Choi, Laibson, Madrian 2007)

Studied a firm that used several different match systems in their 401(k) plan.

I'll discuss two of those regimes today:

Match allocated to employer stock and workers can reallocate

- Call this "default" case (default is employer stock)

Match allocated to an asset actively chosen by workers; workers *required* to make an active designation.

- Call this "no default" case (workers must choose)

Economically, these two systems are identical.

They both allow workers to do whatever the worker wants.

Source: courtesy of David Laibson

Consequences of the two regimes

	Balances in employer stock	
	Default ES	No Default
Own Balance in Employer Stock	24%	20%
Matching Balance in Employer Stock	94%	27%
Total Balance in Employer Stock	56%	22%

Source: courtesy of David Laibson

CONCLUSION

Social Security is the largest social insurance program in the United States, and the largest single expenditure item of the federal government

Key reason for existence of social security programs is the inability of individuals to save adequately for retirement on their own

Social Security faces a long-run financing problem requiring to increase taxes or cut benefits in the long-run

This will be a big policy debate in the coming decade (as some adjustment needed after 2033 when trust fund runs out)

Most other rich countries face even bigger challenges (more generous programs, lower fertility than the US)

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