The Future of Fiscal Policy: American Economic Policy Debates in the 21st Century

Taxation of Wealth and Investment Income

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Week 2

Thanks to Emmanuel Saez and Gabriel Zucman for posting notes/slides, some of which are reproduced here.

Outline

Capital income taxation, equity, and efficiency

- **Equity**
  - Distribution of capital income is much more unequal than labor income
  - Capital income inequality is due to differences in savings behavior but also inheritances received
  - $\Rightarrow$ Equity suggests it should be taxed more than labor
- **Efficiency**
  - Capital Accumulation correlates strongly with growth
  - Capital accumulation might be sensitive to the net-of-tax return.
  - $\Rightarrow$ Efficiency cost of capital taxation might be high

Outline

Macro framework

Constant return to scale aggregate production:

- $Y = F(K, L) = rK + wL$ = output = income
- rK = capital income, wL = labor income
- r = rate of return on capital, w is wage rate
- K = capital stock (wealth), L = labor input

How large is capital income and wealth as a share of national income?

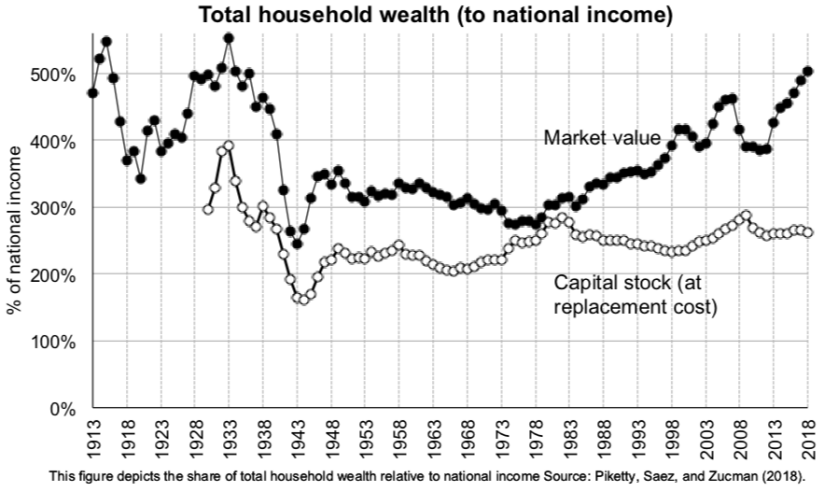
- $\alpha = rK/Y$ = capital income share (constant α when $F(K, L) = K^{\alpha}L^{1-\alpha}$ Cobb-Douglas), $\alpha \simeq 30\%$
- $\beta = K/Y$ = wealth to annual income ratio, $\beta \simeq 5 - 6$
- $r = (rK/Y) \cdot (Y/K) = \alpha/\beta$, $r = 5 - 6\%$

Types of wealth and capital income

Definition: Capital Income = Returns from Wealth Holdings

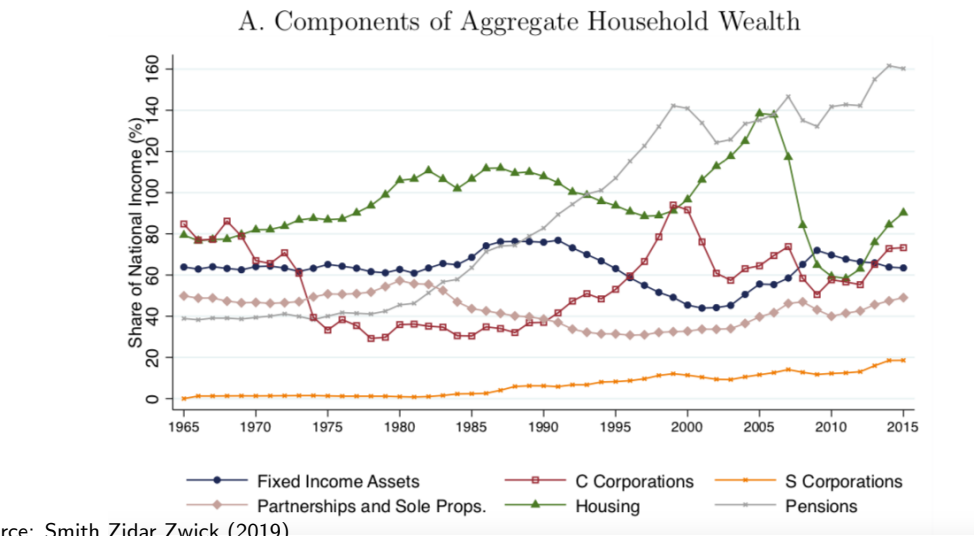
- Aggregate US **Private** Wealth $\simeq$ 4*Annual National Income
- **Housing:** residential real estate (land+buildings) [income = rents] net of mortgage debt
- **Unincorporated business assets:** value of sole proprietorships and partnerships [income = individual business profits]
- **Corporate equities:** Value of corporate stock [income = dividends + retained earnings]
- **Fixed claim assets:** Currency, deposits, bonds [income = interest income] minus debts [credit card, student loans]
- **Pension funds:** Substantial amount of equities and fixed claim assets held indirectly through pension funds

Aggregate Household Wealth



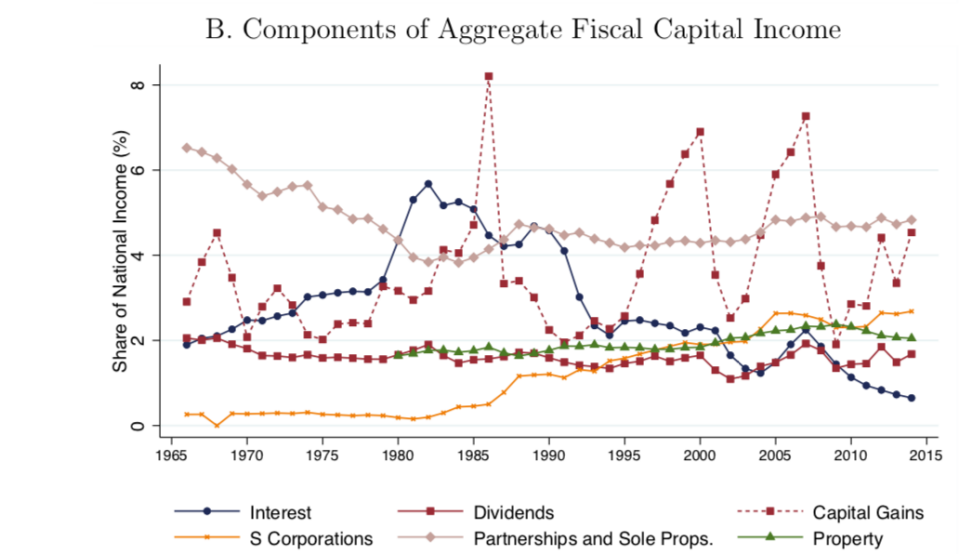
Source: Saez Zucman (2019)

Components of Aggregate Household Wealth

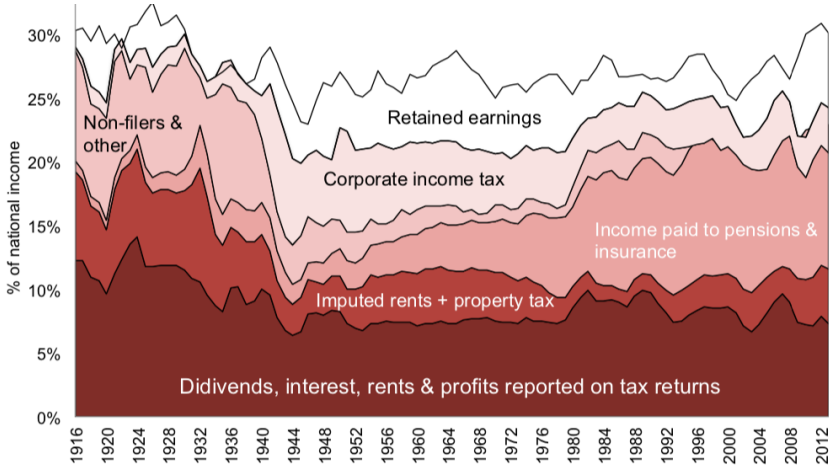


Source: Smith Zidar Zwick (2019)

Components of Aggregate Fiscal Capital Income

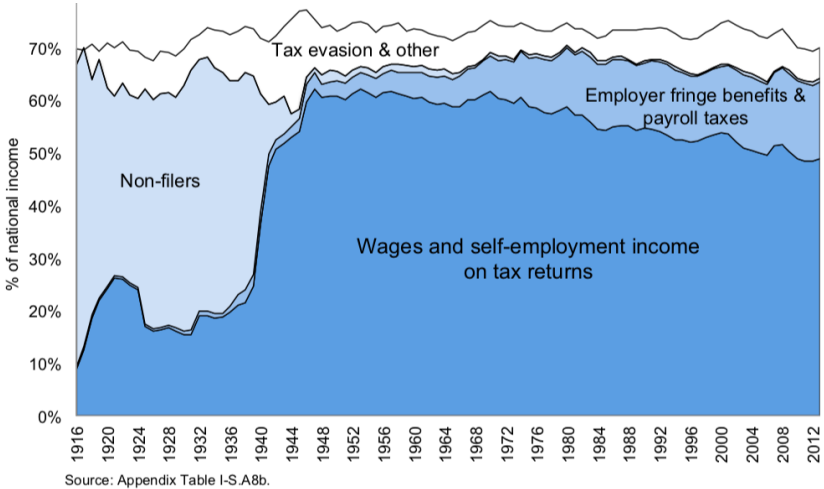


Piketty Saez Zucman (2018)'s capital income by type



Source: Piketty Saez Zucman (2018)

Piketty Saez Zucman (2018)'s labor income by type



Source: Piketty Saez Zucman (2018)

Distribution of wealth and capital income

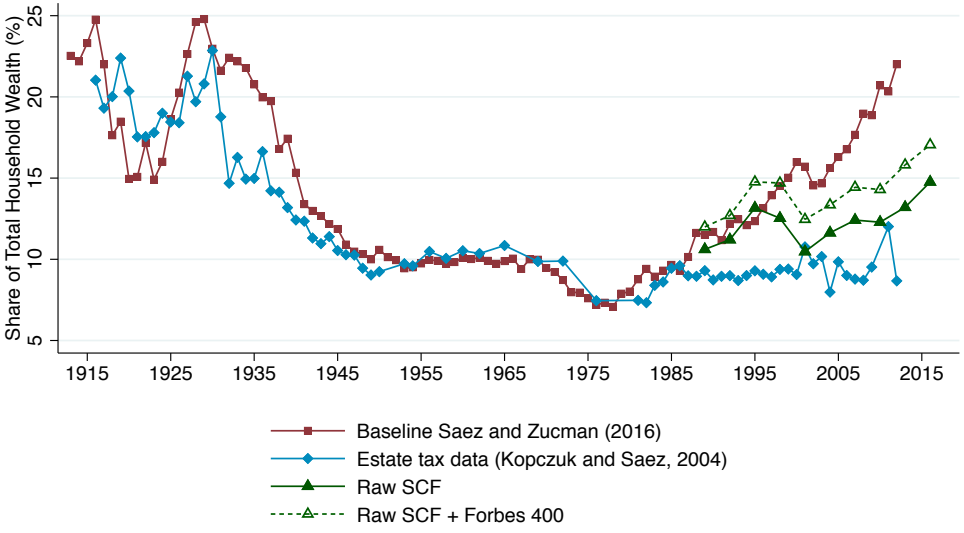
Methods to estimate wealth distribution

In the US, wealth distribution much less well measured than income distribution because no systematic administrative source (no federal wealth tax).

1. **Surveys:** US Survey of Consumer Finances (SCF)
   - Problems: small sample size, measurement error, only every 3 years, starts in 1989
2. **Estate multiplier method:** use annual estate tax statistics and re-weights individual estates by inverse of death probability [based on age×gender×social class]
   - Kopczuk-Saez NTJ'04 create series 1916-2000
   - Problems: social class effect on mortality not well known, significant estate tax avoidance, noisy measure of "young wealth", estates cover only the super rich (top .1% in recent years)
3. **Capitalization method:** use capital income from individuals tax statistics and estimates rates of returns by asset class to infer wealth
   - Saez Zucman (2016) and indirectly Piketty Saez Zucman (2018)
   - Smith Zidar Zwick (2019)

How concentrated is wealth in the United States?

Top 0.1% Share of Total Household Wealth



Capitalizing Income to Measure Top Wealth

Overview of capitalization method

Goal: Use observed income y to estimate wealth W

$$y = rW$$
$$\Rightarrow W = y \times \underbrace{\frac{1}{r}}_{\text{cap factor}}$$

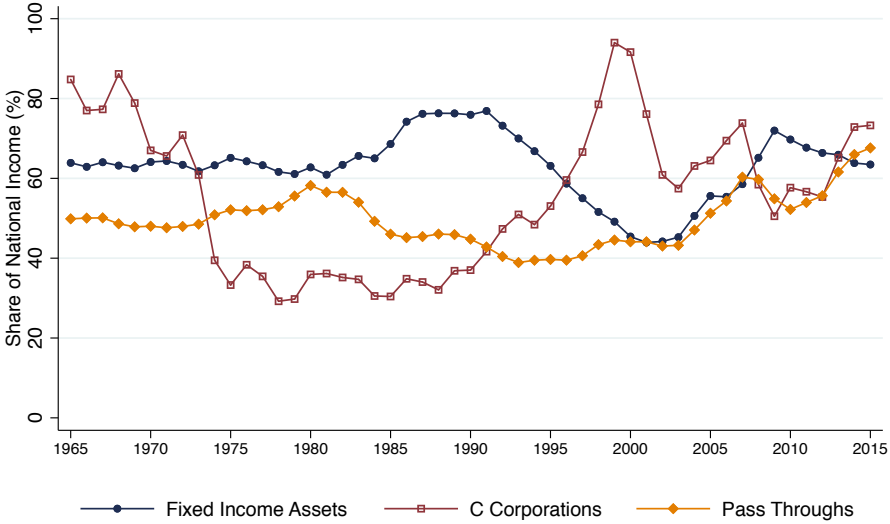
Need: Rate of return r

Definitions and measurement for aggregate rate of return

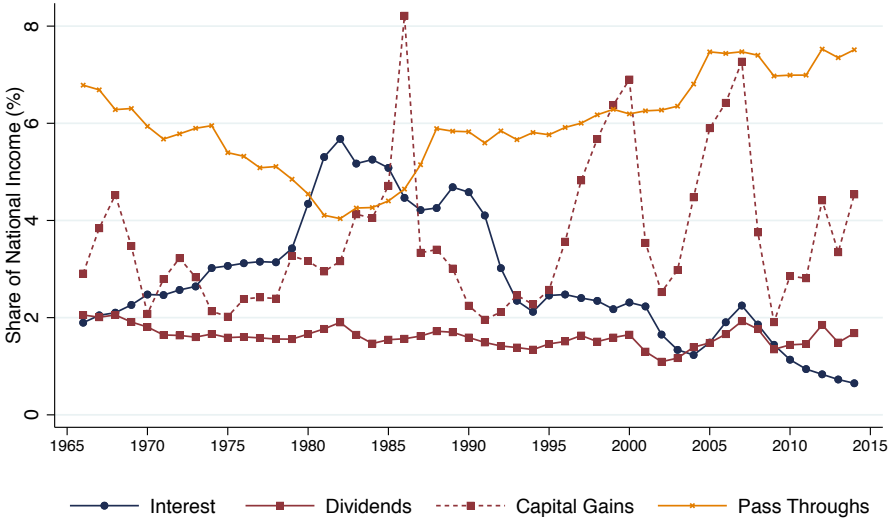
Baseline approach: Compute aggregate return as ratio of y to W by component

1. **Income** (y) by component from de-identified Treasury tax files
   - Stratified samples used in Piketty Saez (2003), SZ, PSZ (2018)
2. **Wealth** (W) by component from US Financial Accounts
   - Total assets minus liabilities of households at market value
   - Follow SZ in excluding durables, unfunded DB pensions, and non-profits
   - Cf. measures from Survey of Consumer Finances

Main Categories of Aggregate Household Wealth



Components of Aggregate Fiscal Capital Income



Using the capitalization method to estimate wealth components by group

Goal: Estimate fixed income wealth for top W_{fix}^T and bottom W_{fix}^B

$$y_{fix}^T = r_{fix}^T \times W_{fix}^T \quad (1)$$

$$y_{fix}^B = r_{fix}^B \times W_{fix}^B \quad (2)$$

$$W_{fix} = W_{fix}^T + W_{fix}^B \quad (3)$$

where

- y_{fix}^T, y_{fix}^B interest income of T and B
- W_{fix} total fixed income wealth

Need: r_{fix}^T and r_{fix}^B

Comparing alternative approaches

Equal returns

Assumption: Aggregate yield for all

$$r_{fix}^T = r_{fix}^B = \bar{r}_{fix}$$

where

$$\bar{r}_{fix} = \frac{y_{fix}}{W_{fix}}$$

Results:

$$\hat{W}_{fix}^T = y_{fix}^T \times \frac{1}{\bar{r}_{fix}}$$

$$\hat{W}_{fix}^B = y_{fix}^B \times \frac{1}{\bar{r}_{fix}}$$

Heterogeneous returns

Assumption: Top get higher yield

$$r_{fix}^T = r_{high}$$

where

$$r_{high} \in \{r_{UST}, r_{Aaa}, r_{Baa}, r_{SCF}\}$$

Results:

$$\hat{W}_{fix}^T = y_{fix}^T \times \frac{1}{r_{UST10}}$$

$$\hat{W}_{fix}^B = W_{fix} - y_{fix}^T \times \frac{1}{r_{UST10}}$$

Comparing alternative approaches

Example with 2014 data, where T denotes top 0.1%

Equal returns

Assumption: Aggregate yield for all

$$r_{fix}^{T} = r_{fix}^{B} = \left(\frac{\$98B}{\$11.1T} \right) = 0.89\%$$

Results:

$$\hat{W}_{fix}^{T} = \$42B \times \underbrace{\left(\frac{1}{0.89\%} \right)}_{\text{Cap factor=113}} = \$4.7T$$

$$\hat{W}_{fix}^{B} = \$56B \times \left(\frac{1}{0.89\%} \right) = \$6.4T$$

Heterogeneous returns

Assumption: Top get higher yield

$$r_{fix}^{T} = r_{Aaa} = 4.16\%$$

Results:

$$\hat{W}_{fix}^{T} = \$42B \times \underbrace{\left(\frac{1}{4.16\%} \right)}_{\text{Cap factor=24}} = \$1.0T$$

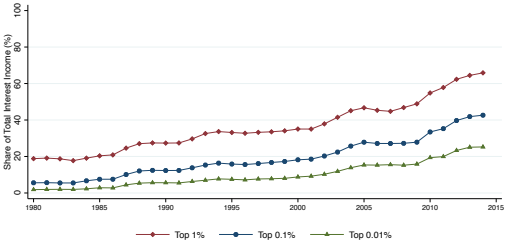
$$\hat{W}_{fix}^{B} = \$11.1T - \$1.0T = \$10.1T$$

Under equal returns, wealth estimate is proportional to income share

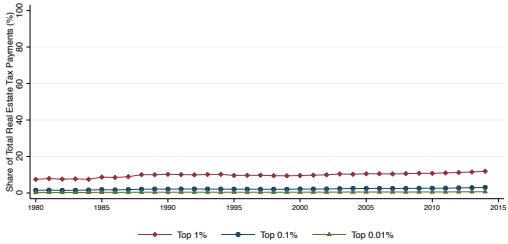
$$\begin{aligned}
\hat{W}_{fix}^{T} &= y_{fix}^{T} \times \frac{1}{\bar{r}_{fix}} \\
&= y_{fix}^{T} \times \frac{1}{\frac{y_{fix}}{W_{fix}}} \\
&= \underbrace{\frac{y_{fix}^{T}}{y_{fix}}}_{\text{Income share}} \times \underbrace{W_{fix}}_{\text{Total fixed income wealth}}
\end{aligned}$$

Concentration of fiscal capital income over time

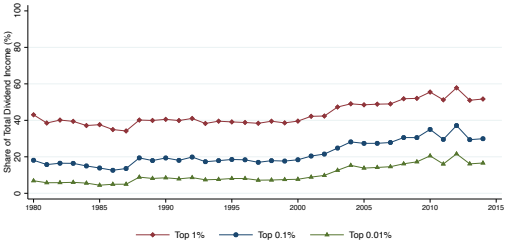
Top Interest Income Shares (%)



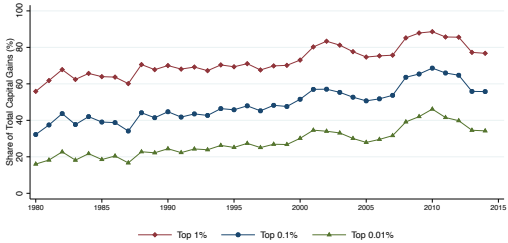
Top Property Tax Shares (%)



Top Dividend Share (%)



Capital Gains Income Share (%)



1. Fixed Income Wealth with Heterogeneous Returns

IRS Instructions for Interest Income Form 1099-INT

- Box 1 is to:

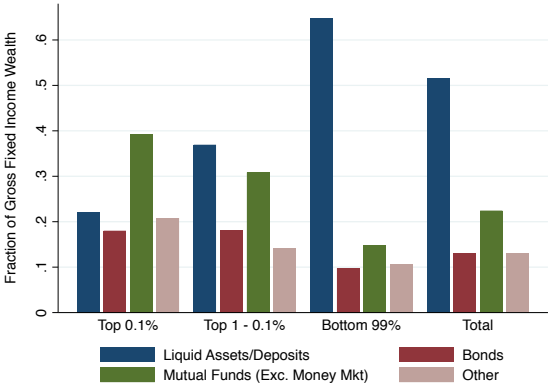
  include interest on bank deposits, accumulated dividends paid by a life insurance company, indebtedness (including bonds, debentures, notes, and certificates other than those of the U.S. Treasury)

- **Main point:** Taxable interest income is a broad bucket that comprises many different categories of assets delivering fixed income to owners.

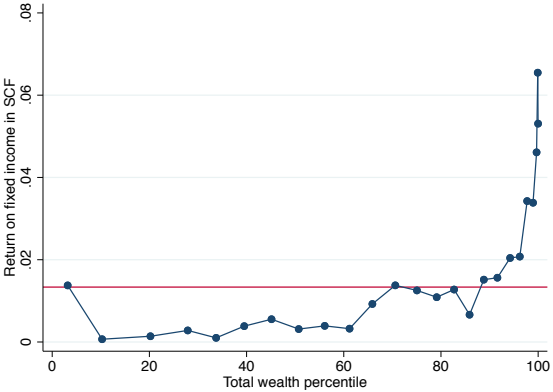
Evaluating the equal returns assumption for fixed income

See also Kopczuk (2015), BHKS (2016), FGMP (2016), BHH (2018)

Fixed Income Portfolio Composition in the SCF

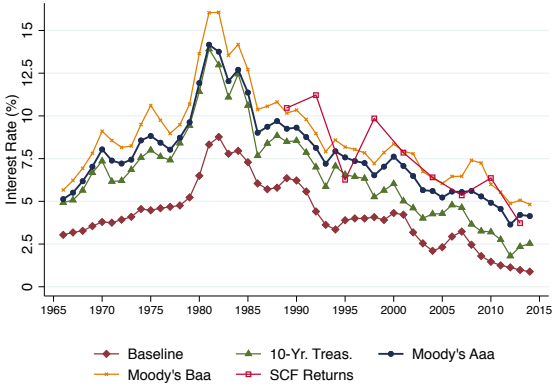


Rates of Return for Fixed Income Assets

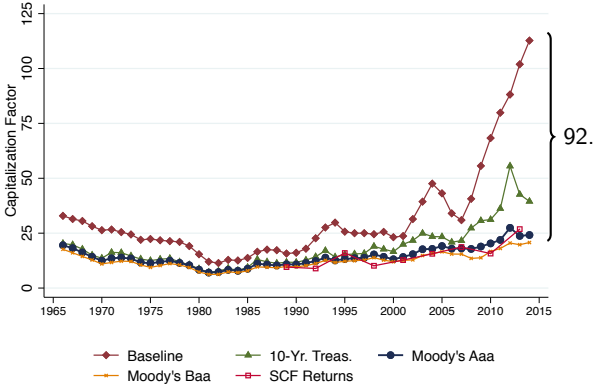


Alternative capitalization factors over time

Fixed income rates of return, r_{fix}

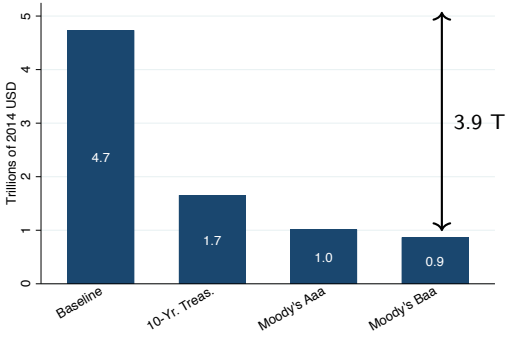


Capitalization factor, $1/r_{fix}$

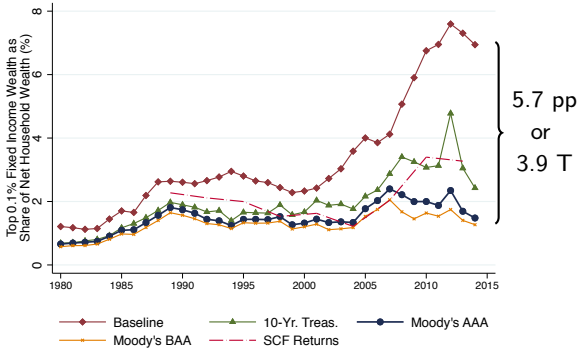


Top 0.1% fixed income wealth under alternative assumptions

Levels in 2014



Relative to Total Wealth (1980–2014)



2. Public Equity Wealth with Less Weight on Capital Gains

Generalized C-corporation equity wealth estimate

$$\hat{W}^T_{c-corp} = \underbrace{\frac{y^T_{divs} + \alpha y^T_{capgains}}{y_{divs} + \alpha y_{capgains}}}_{\text{Top C-corp income share}} \times \quad W_{c-corp}$$

where

- $\alpha \in [0, 1]$ is the share of cap gains used to allocate ownership
- $\hat{W}^T_{c-corp}$ is estimated top C-corporation equity wealth
- $y_{divs}, y_{capgains}$ are fiscal dividends and realized capital gains income, respectively
- W_{c-corp} is aggregate household C-corporation equity wealth

Generalized C-corporation equity wealth estimate

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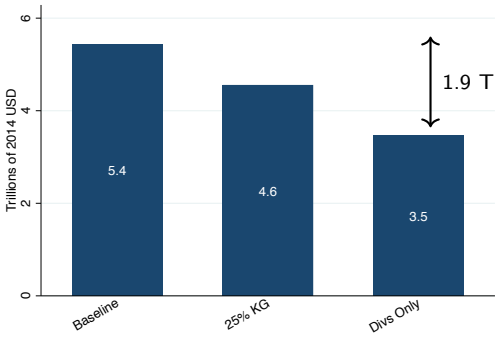
Motivating facts:

1. Capital gains is a broad category, only 20–30% from C-corporation stock sales
2. \$50–100B ($\approx 1/3$ top gains) per year in 2012–2016 is "carried interest"
   - Correlated with wealth rank $\rightarrow$ bias in estimated concentration
   - 25% of top cap gains recipients recorded as general partners

Top 0.1% C-corporation wealth under alternative assumptions

Levels in 2014



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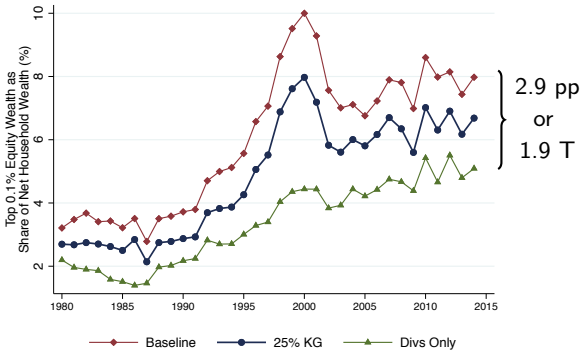

Fact: Rise of top wealth shares in 1990s driven by stocks, specifically capital gains

3. Pass-Through Equity Wealth with Unequal Returns

Adjusting private business for heterogeneous returns and mismeasurement

Motivation:

1. Private biz largest source of disagreement between Financial Accounts and SCF
2. Getting valuations right is critical for enforcement of wealth and estate tax
3. Financial Account aggregates likely understated due to incomplete data
4. Inconsistent role of pass-through income for top income vs. wealth

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How?

1. Market-based models akin to capitalization and what practitioners do
2. Correct for avoidance/accounting issues through model averaging

Adjusting private business for heterogeneous returns and mismeasurement

How?

1. Market-based models akin to capitalization and what practitioners do
2. Correct for avoidance/accounting issues through model averaging

$$\hat{W}^T_{Pthru} = \sum_I 1/3 \left(M_{Sales,I} \times y^T_{Sales,I} + M_{Assets,I} \times y^T_{Assets,I} + M_{Profits,I} \times y^T_{Profits,I} \right)$$

- I denotes NAICS 4-digit industry
- $M_{X,I}$ denotes the valuation multiple from Compustat for factor $X \in \{Sales, Assets, Profits\}$ for industry I
- $y^T_{X,I}$ is the top wealth group's aggregate pass-through factor X for industry I

Adjusting private business for heterogeneous returns and mismeasurement

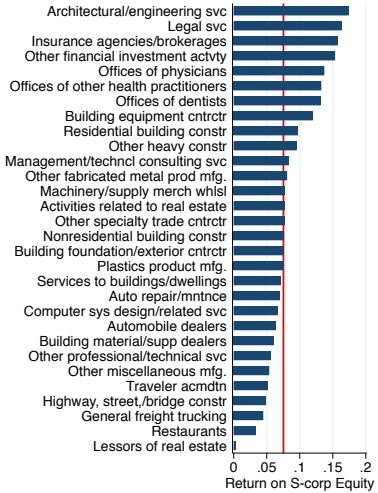
Example: All S-corporation auto dealers (NAICS 4411)

- Using sales, capital, and EBITD multiples, respectively

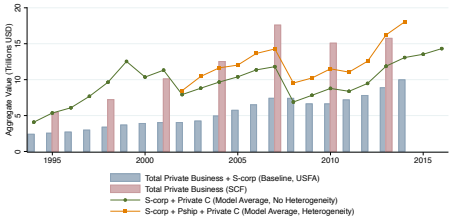
$$\hat{W}^{T}_{Pthru} = \sum_{I} 1/3\,(0.4 \times \$580B + 3.5 \times \$13B + 8.7 \times \$12B)$$
$$= \$130B \quad \text{or} \quad \$4M \quad \text{per firm}$$

Industry variation in the returns to private business equity

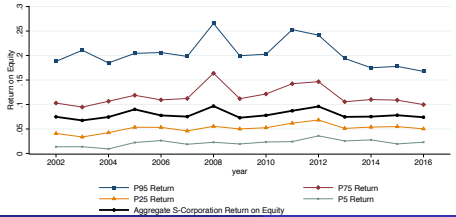
Industry Return Heterogeneity (2014)



Aggregate Private Business across Data Source



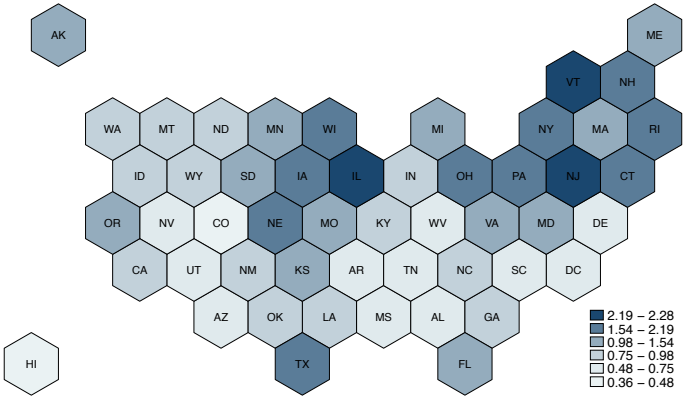
S-corporation Return Distribution by Year



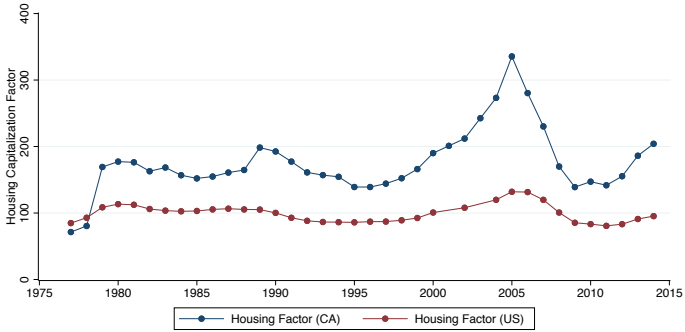
4. Housing Wealth with Unequal Property Tax Rates

Property Tax Rates Vary Substantially ($\mu = 1.14$, $\sigma = 0.53$)

Median state property tax rate in 2012 is 0.98, P05=0.48, P10=0.58, P90=2.02, P95=2.19



Going to California

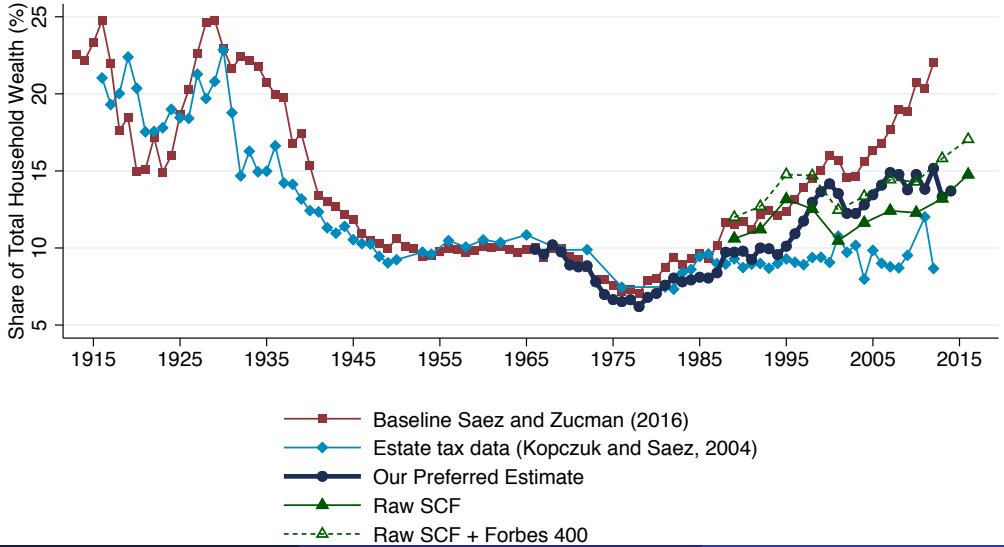


Key results:

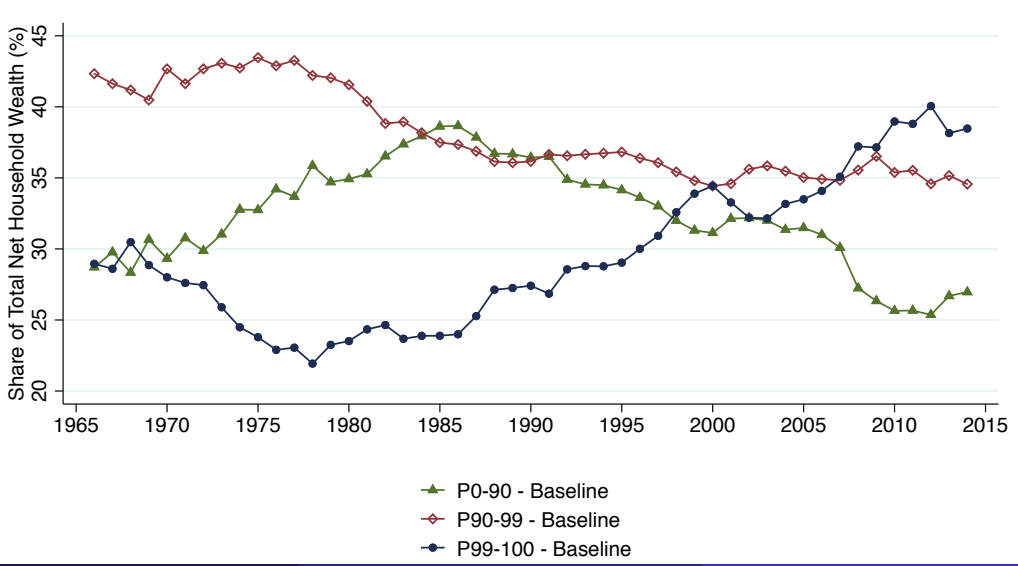
1. California goes from 10% to 25% of total housing wealth
2. High tax states have less wealth (e.g., NY, IL, NJ)

New Wealth Estimates: Level, Composition, and Growth

Comparison of estimates of top 0.1% wealth share



Wealth shares of the bottom 90%, P90-99%, and top 1%



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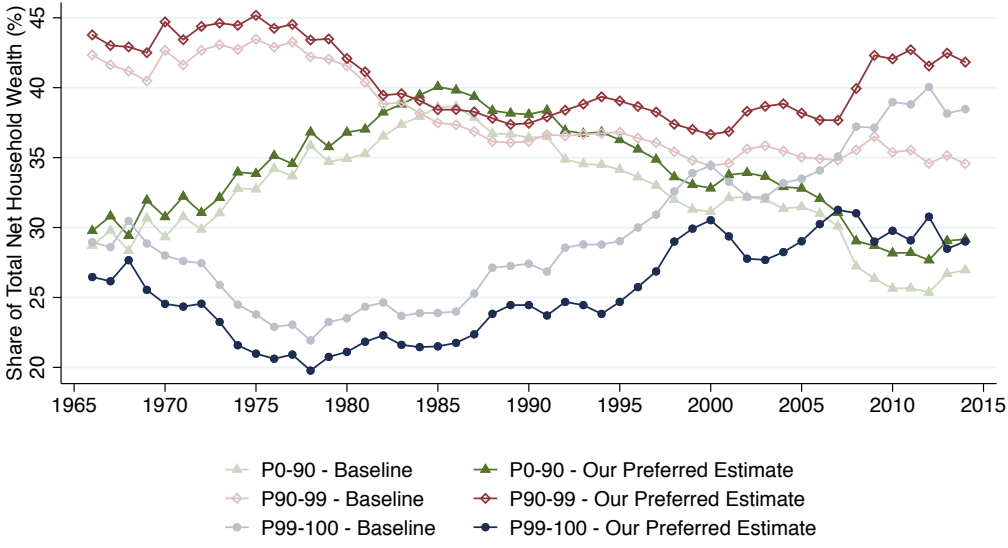
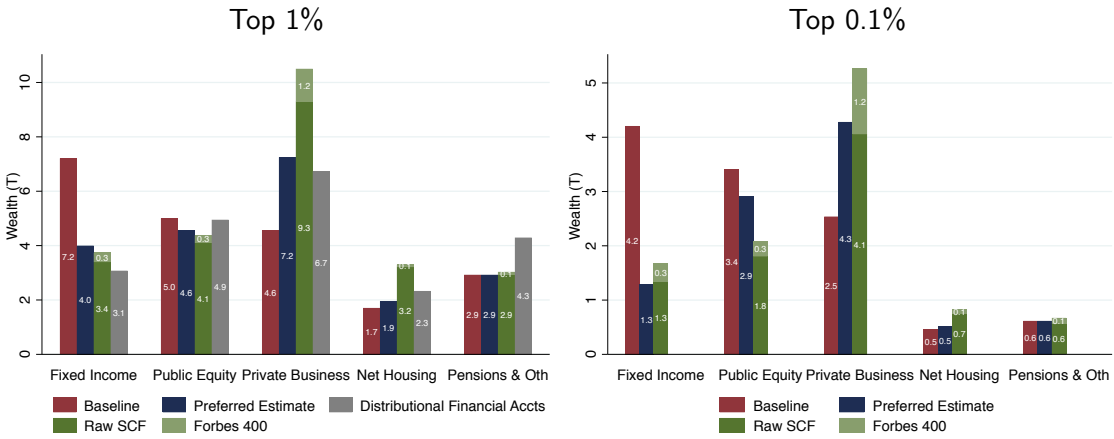
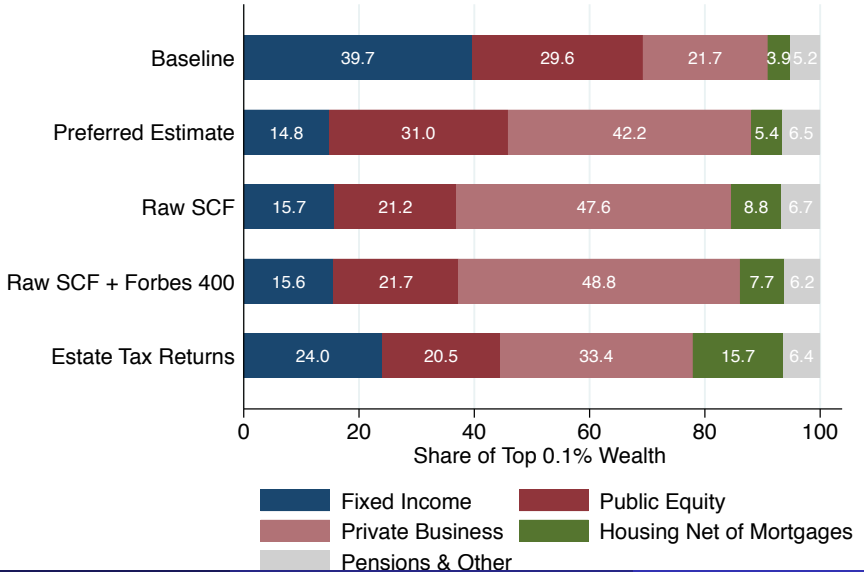


Top wealth composition in 2013 across estimation methods

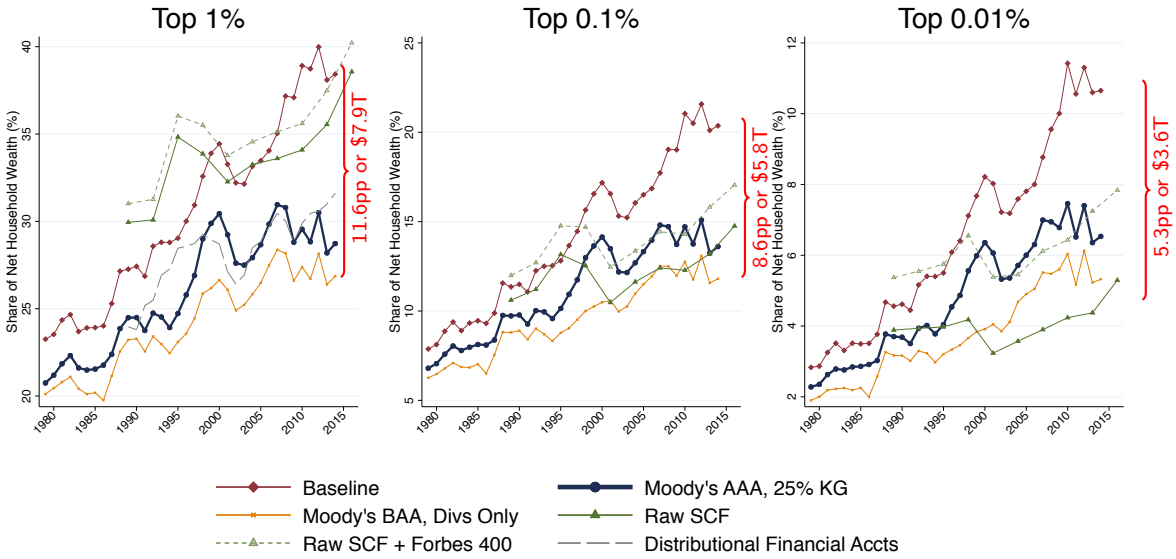


Note: Includes estimate that 20% of C-corporation wealth is private

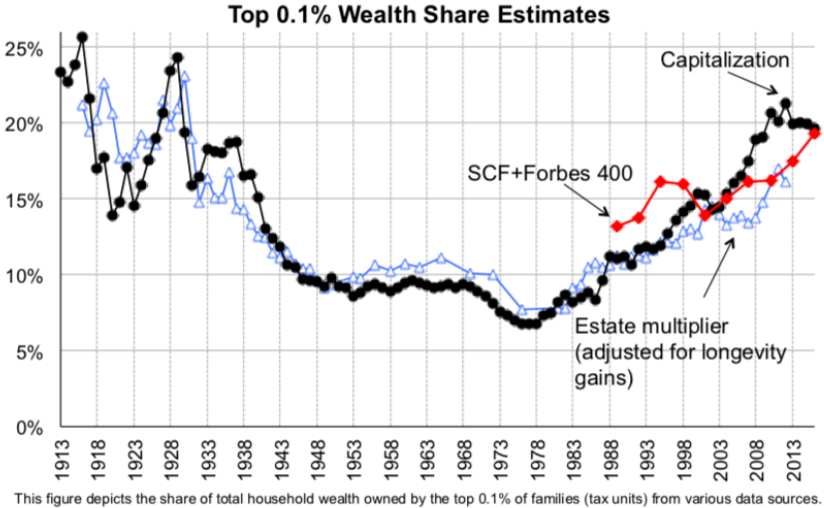
Top wealth composition in 2013 across estimation methods



Top shares grew by half as much



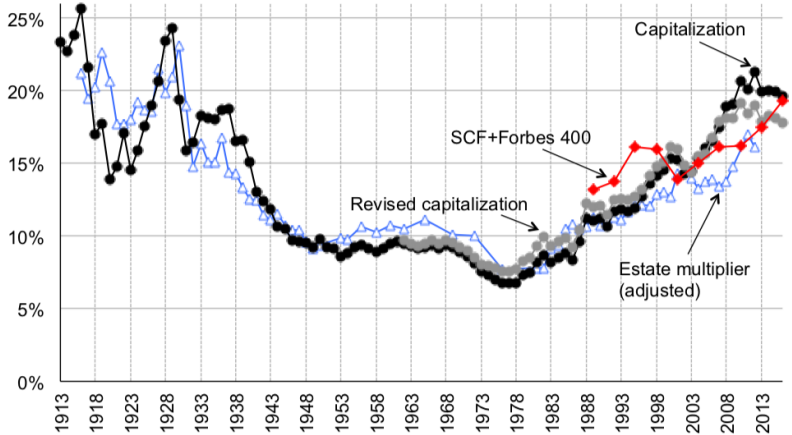
Saez Zucman (2019)'s updated series



Source: Saez Zucman (BPEA, 2019)

Saez Zucman (2019)'s series with partial adjustment

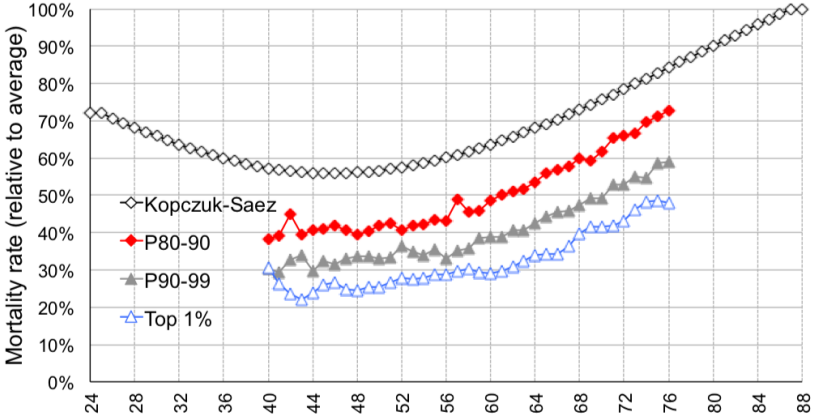
(a) Top 0.1% wealth share



Source: Saez Zucman (BPEA, 2019)

Saez Zucman (2019)'s estate tax update

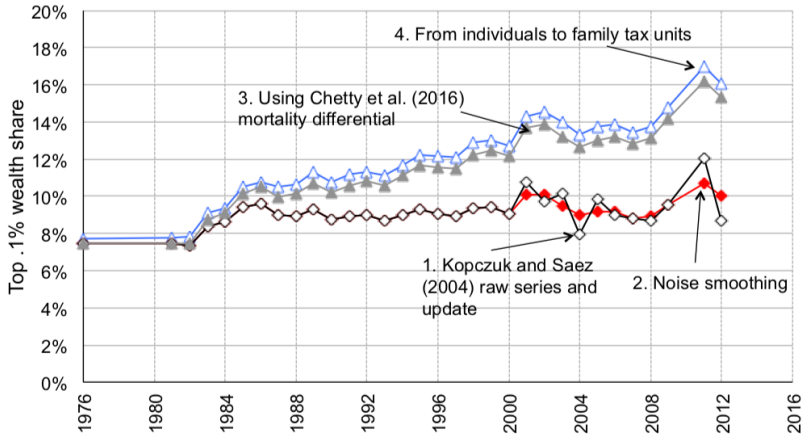
(a) Male mortality rate differentials by income percentiles in 2012-4



Source: Saez Zucman (BPEA, 2019)

Saez Zucman (2019)'s estate tax update

(b) Correcting estate multiplier estimates



Source: Saez Zucman (BPEA, 2019)

Sources of top wealth

Sources of wealth and capital income

Wealth $= W$, Return $= r$, Capital Income $= rW$

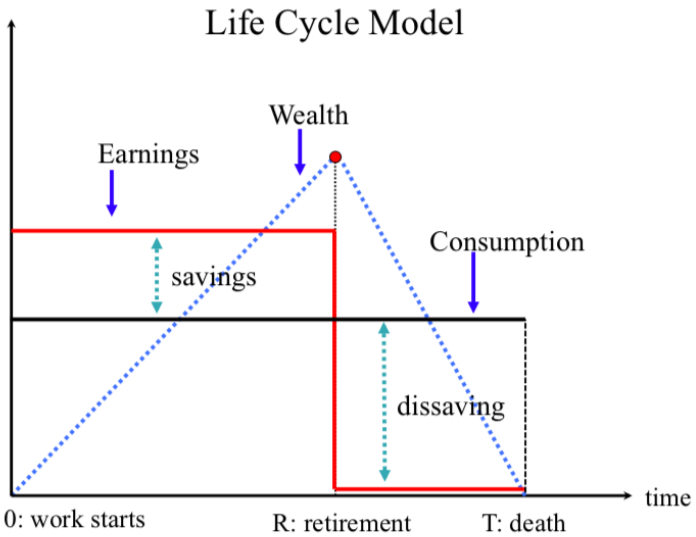
$$W_t = W_{t-1} + r_t W_{t-1} + E_t + I_t - C_t$$

where W_t is wealth at age t, C_t is consumption, E_t labor income earnings (net of taxes), r_t is the average (net) rate of return on investments and I_t net inheritances (gifts received and bequests - gifts given).

Differences in Wealth and Capital income due to:

1. Age
2. past earnings, and past saving behavior $E_t - C_t$ [life cycle wealth]
3. Net Inheritances received I_t [transfer wealth]
4. Rates of return r_t

Wealth over the lifecycle



Life cycle wealth versus Inherited wealth

1. **Life-cycle wealth** is wealth from savings earlier in your life
   - (e.g., pension contributions out of earnings, paying down a home mortgage, etc.)
2. **Inherited wealth** is wealth from inheritances received
   - (e.g., receiving a house or a trust fund from parents)

- Distinction matters for taxation because individuals are responsible for life-cycle wealth but not inherited wealth [meritocracy vs. aristocracy]
- Inherited wealth used to be very large in Europe (before World-War I), became small in post-World War II period, but is growing in recent decades (especially in Europe) Piketty (2014)

Piketty (2014) book: Capital in the 21st Century

Analyzes income, wealth, inheritance data over the long-run:

- Growth rate g = population growth + growth per capita. Population growth will converge to zero, growth per capita for frontier economies is modest (1-1.5%) $\Rightarrow$ long-run $g \simeq 1 - 1.5\%$
- Long-run aggregate wealth to income ratio (β) = savings rate (s) / annual growth (g):
  Proof: $W_{t+1} = (1+g) \cdot W_t = W_t + s \cdot Y_t \Rightarrow W_t / Y_t = s/g$
  With $s = 8\%$ and $g = 2\%$, $\beta = 400\%$ but with $s = 8\%$ and $g = 1\%$, $\beta = 800\%$ $\Rightarrow$ Wealth will become important

Piketty (2014) book: Capital in the 21st Century

- Rate of return on wealth $r \simeq 5\%$ significantly larger than g [except exceptional period of 1940s-1960s]
- With $r >> g$, role of inheritance in wealth grows and wealth inequality increases [past swallows the future]
  - Explanation: Rentier who saves all her return on wealth accumulates wealth at rate r bigger than g and hence her wealth grows relative to the size of the economy. The bigger $r - g$, the easier it is for wealth to "snowball": fortunes are created faster and last longer
- $\Rightarrow$ Capital income taxation reduces r to $r \cdot (1 - \tau_K) \Rightarrow$ reduces wealth concentration and relative weight of inherited wealth

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Overview of taxation of capital income

1. **Corporate Income Tax** (fed+state): 21% Federal tax rate on profits of corporations [complex rules with many industry specific provisions]: effective tax rate lower. Will discuss next week
2. **Individual Income Tax** (fed+state): taxes many forms of capital income
   - Realized capital gains and dividends receive preferential treatment (to lower double taxation of corporate profits)
   - Imputed rent of home owners and returns on pension funds are exempt
   - Will discuss more week after next
3. **Estate tax:** tax on very large estates (40% tax above $11m) bequeathed to heirs (now very small and poorly enforced)
4. **Property taxes** (local) on real estate (old tax):
   - Tax varies across jurisdictions. About 0.5% of market value on average
   - Won't be able to discuss land taxation or housing subsidies, but big deal/important area [see Henry George's Progress and Poverty, which sold millions of copies (second only to Bible in 1890s) and helped spark Progressive Era].

Quick aside on progress and poverty

Monopoly's Inventor: The Progressive Who Didn't Pass 'Go'

The Landlord's Game, which became Monopoly, was created by Elizabeth Magie Phillips. The Strong

By Mary Pilon

Source: https://www.nytimes.com/2015/02/15/business/behind-monopoly-an-inventor-who-didnt-pass-go.html

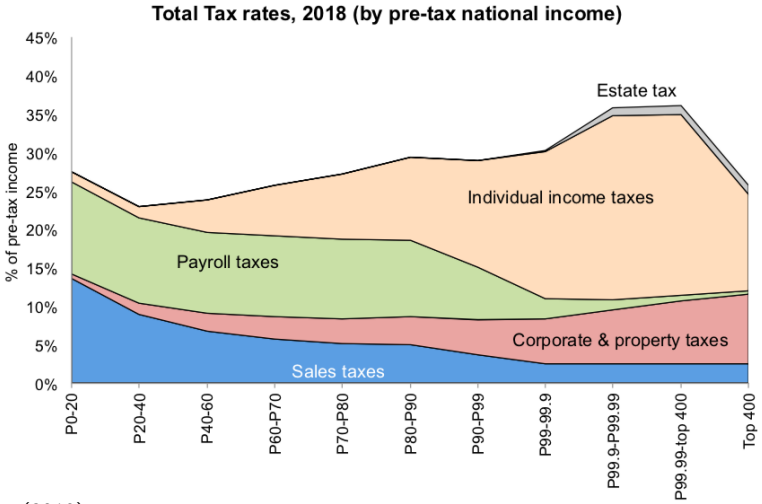
Current taxation of wealth and capital income

1. **Wealth**
   - Estate tax on inheritances
   - Local property tax
2. **Capital income**
   - Corporate tax
   - Individual income tax

But some cite concerns:

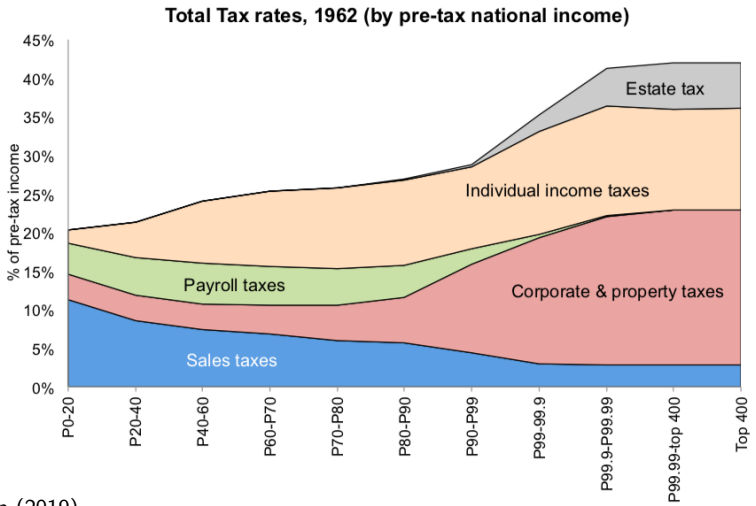
- Estate tax avoidance concerns, property tax not very progressive
- Low corporate tax rate (21%) and lack of integration $\Rightarrow$ Rich will incorporate and accumulate within corporations
- Realized capital gains tax partly retained earnings and pure K gains but with loopholes (deferral and step-up of basis after transfer/inheritance)

Recall estimated progressivity of US tax system in 2018



Source: Saez Zucman (2019)

Recall estimated progressivity of US tax system in 1962



Source: Saez Zucman (2019)

Source: https://www.wsj.com/articles/democrats-emerging-tax-idea-look-beyond-income-target-wealth-11566916571

A Progressive Wealth Tax

Ultra-millionaire wealth tax proposal and mechanical tax base in 2014

Warren Ultra-Millionaire Wealth Tax:

1. 2% tax on wealth above \$50M
2. Additional 1% tax on wealth above \$1B

Under equal returns (2014):

- 52,000 \$50+ millionaires, 930 billionaires
- Mechanical tax revenue:

$$.02 \times \underbrace{(\$9.1T}_{\$50+\text{M wealth}} - \underbrace{52000 \times \$50M)}_{\text{non-taxable } \$50+\text{M wealth}} +$$

$$.01 \times \underbrace{(\$2.4T}_{\$1\text{B wealth}} - \underbrace{930 \times \$1B)}_{\text{non-taxable } \$1\text{B wealth}} = \$146B$$

Ultra-millionaire wealth tax proposal and mechanical tax base in 2014

Warren Ultra-Millionaire Wealth Tax:

1. 2% tax on wealth above \$50M
2. Additional 1% tax on wealth above \$1B

Under equal returns (2014):

- 52,000 \$50+ millionaires, 930 billionaires
- Mechanical tax revenue: \$146B

Under Moody's Aaa, 25% KG (2014):

- 32,650 \$50+ millionaires, 436 billionaires
- Mechanical tax revenue: \$76B

$$.02 \times \underbrace{(\$5.1T}_{\text{\$50+M wealth}} - \underbrace{32650 \times \$50M)}_{\text{non-taxable \$50+M wealth}} +$$

$$.01 \times \underbrace{(\$1.1T}_{\text{\$1B wealth}} - \underbrace{436 \times \$1B)}_{\text{non-taxable \$1B wealth}} = \$76B$$

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Takeaway: ↓ ultra-millionaire threshold to $11M to raise revenue target of $146B

2019 tax base estimates

Tax base = total wealth × top wealth share × (1-evasion rate)

Table 2: Wealth Tax Base Estimates, 2019

	Top 1% cut-off	Top .1% cut-off	Top .01% cut-off	$50 million cut-off
Capitalized incomes				
Threshold ($m)	5.9	30.8	171.8	50.0
Base above threshold ($tr)	25.9	13.0	6.3	10.9
SCF+Forbes 400				
Threshold ($m)	9.0	40.6	172.3	50.0
Base above threshold ($tr)	27.5	11.5	5.5	9.7
Estates with multiplier				
Threshold ($m)		25.5	123.6	50.0
Base above threshold ($tr)		8.9	4.3	6.8
Estate tax implied evasion		31.6%	32.2%	37.8%

Tax base by source assuming no extra tax evasion (over and beyond what's already in the source). Tax assessed on family tax units.

Source: Saez Zucman (BPEA, 2019)

A related proposal of accrual taxation

- **Mark-to-market:** tax gains as they accrue. Assets valued every year, and taxpayers pay taxes on the gain or deduct the loss
- **Retroactive accrual:** tax gains upon sale. Minimize benefit of deferring sale by including deferral charge equivalent to back taxes due with interest
- **Combination approach:** mark-to-market for publicly traded assets and retroactive accrual for non-publicly traded assets (harder to price annually)

Proposed accrual tax plans

- **Sen. Ron Wyden**
  - Combination approach: mark-to-market and retroactive accrual
  - Applied only to top earners ($\geq$ \$1 million in annual income) and top wealth-holders ($\geq$ \$10 million in assets for three consecutive years, with some exemptions)
  - Use ordinary-income tax rates, no specified top rate
  - Use revenues to fund Social Security
- **Joe Biden**
  - Tax unrealized gains at death, abolishing stepped-up basis
  - Double income-tax rate on capital gains (currently 20%) for taxpayers with income $\geq$ \$1 million
  - Revenues delayed relative to other plans

A range of proposals

Note that these plans treat "buy, borrow, die" strategy differently

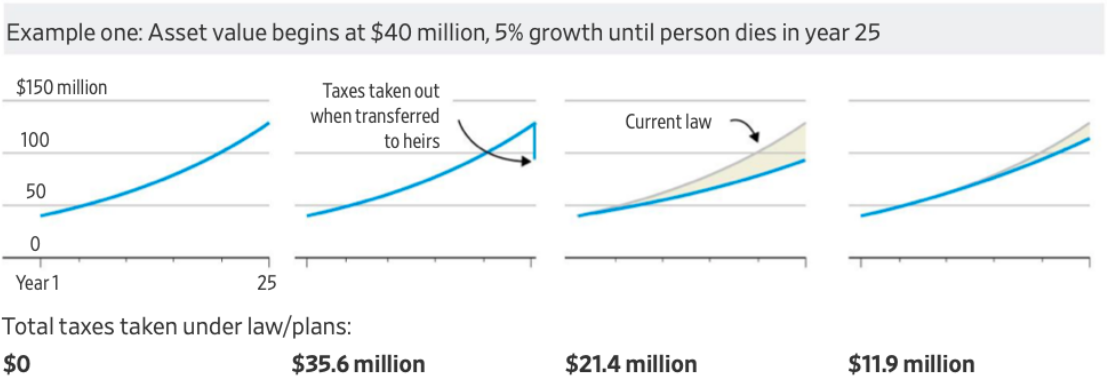
Rethinking Capital Gains Taxation

Democrats are looking at major changes to the way capital gains taxation works. The effects of their tax proposals would depend on each taxpayer's circumstances and on market performance.

CURRENT LAW	BIDEN PLAN	WYDEN PLAN	WARREN PLAN
Assets can appreciate without capital gains taxes and heirs pay taxes only on gains in value after the original owner's death.	Death would be considered a realization event, triggering capital gains taxes on appreciated assets, paid at ordinary income tax rates.	Each year, investors would pay income taxes on the gain in their assets. This is called a mark-to-market system.	Net worth above $50 million subject to a 2% annual tax, plus a 1% tax on net worth above $1 billion.

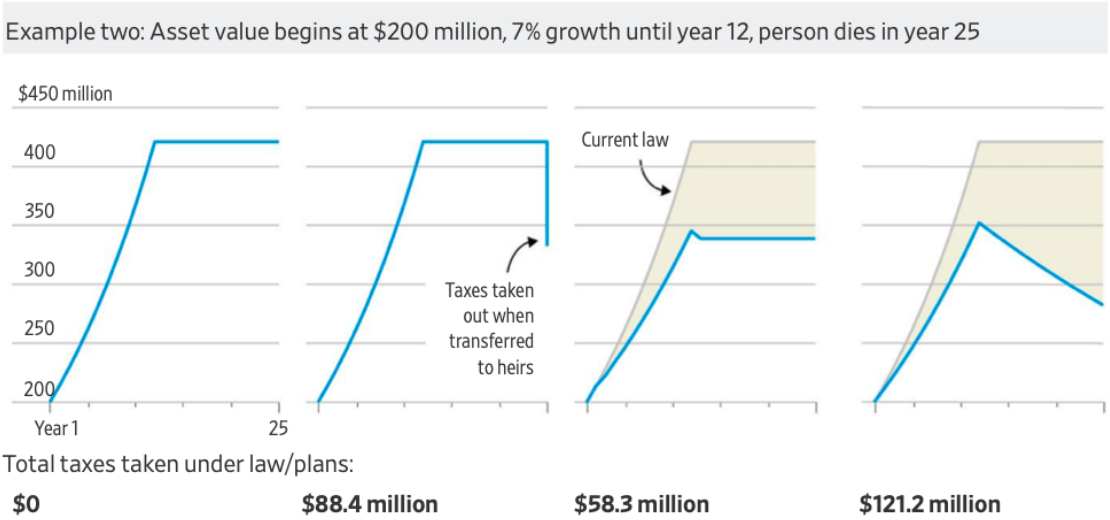
Source: https://www.wsj.com/articles/democrats-emerging-tax-idea-look-beyond-income-target-wealth-11566916571

Example



Source: https://www.wsj.com/articles/democrats-emerging-tax-idea-look-beyond-income-target-wealth-11566916571

Another Example



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Effects of Taxes on Wealth and Capital Income

Several considerations

- Mechanical effects (how big is the tax base)
- Behavioral responses, avoidance, effects on asset prices (and thus tax base)
- Taxing wealth versus capital income

Mechanical effects

As we saw, some uncertainty of how large the top wealth base is

- Smith Zidar Zwick (2019) considerations but 2014 data
- Large growth in aggregate wealth since 2014

Behavioral effects

- Changes in savings behavior (and labor supply)
- Changes in bequests
- Avoidance and evasion
- Also business creation, innovation, capital mobility across countries

Behavioral effects in life-cycle model

Individual lives for 2 periods, works l, earns wl, consumes c_1 in period 1, consumes c_2 in period 2:

$$U = u(c_1, l) + \delta v(c_2)$$

Start with case with no taxes
Savings $s = wl - c_1$, $c_2 = (1 + r)s$. Capital income rs

$$\text{Intertemporal budget:} \quad c_1 + \frac{c_2}{1+r} \leq wl$$

$$\max_{l, c_2} u\left(wl - \frac{c_2}{1+r}, l\right) + \delta v(c_2)$$

$$\text{First order condition labor Supply:} \quad w\frac{\partial u}{\partial c_1} + \frac{\partial u}{\partial l} = 0$$

$$\text{First order condition savings:} \quad \frac{\partial u}{\partial c_1} = \delta \cdot (1 + r)\frac{\partial v}{\partial c_2}$$

Taxes in the life-cycle model

- Budget with consumption tax at rate t_c:

$$(1 + t_c)[c_1 + c_2/(1 + r)] \leq wl$$

  Budget with labor income tax at rate τ_L:

$$c_1 + c_2/(1 + r) \leq (1 - \tau_L)wl$$

- Consumption and labor income tax are equivalent if

$$1 + t_c = 1/(1 - \tau_L)$$

  Both taxes distort only labor supply and not savings

Taxes in the life-cycle model

- Budget with capital income tax at rate τ_K: $c_2 = (1 + r(1 - \tau_K)) \cdot s \Rightarrow$

$$c_1 + c_2/(1 + r(1 - \tau_K)) \leq wl$$

  τ_K distorts only savings choice (and not labor supply)

- Budget with comprehensive income tax τ on both labor and capital income: $c_1 = w(1 - \tau)l - s, \quad c_2 = (1 + r(1 - \tau))s$

$$c_1 + c_2/(1 + r(1 - \tau)) \leq (1 - \tau)wl$$

  τ distorts both labor supply and savings

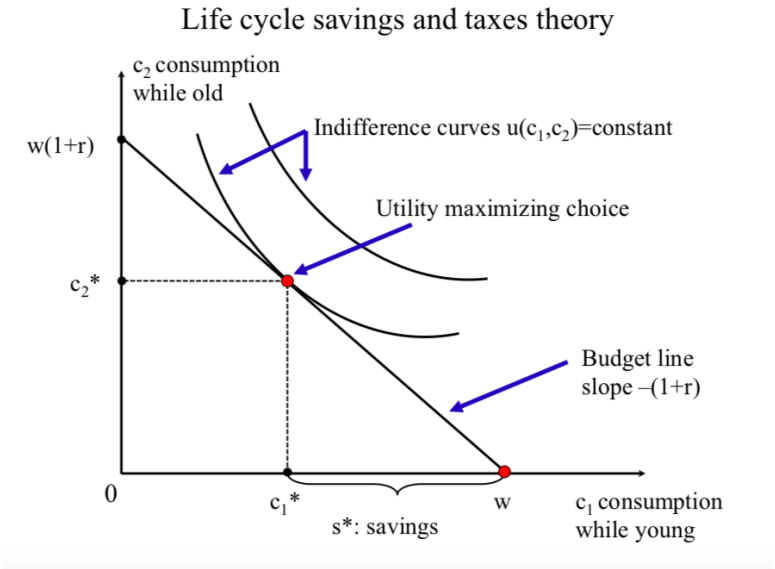
  τ imposes "double" tax: on (1) earnings AND on (2) savings

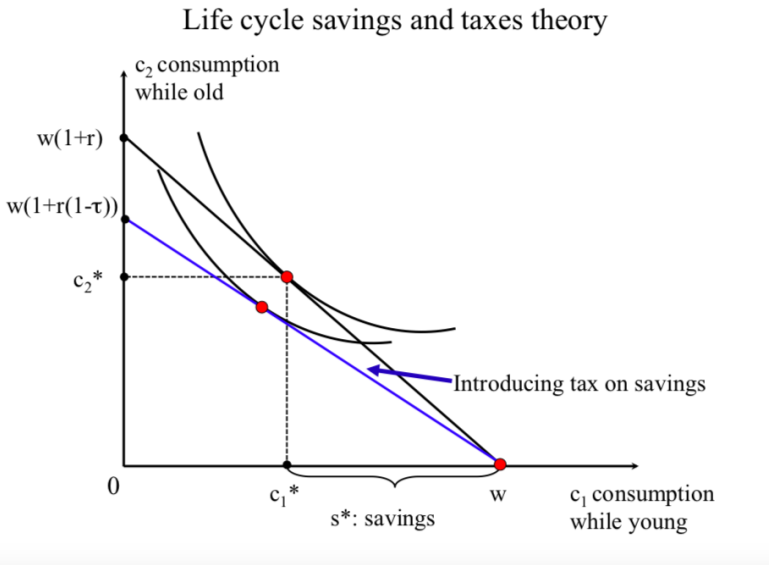
Effect of capital tax on savings

Consider simpler model (fixed earnings w in period 1)

$$\max_{c_1,c_2} u(c_1) + \delta u(c_2) \quad \text{subject to} \quad c_1 + \frac{c_2}{1 + r(1 - \tau_K)} \leq w$$

- Recall that $c_1 = w - s$ and $c_2 = [1 + r(1 - \tau_K)] \cdot s$
- Suppose τ_K increases and hence $1/[1 + r(1 - \tau_K)] \uparrow$
  - **Substitution effect:** price of $c_2 \uparrow \Rightarrow c_2 \downarrow$, $c_1 \uparrow \Rightarrow$ savings $s = w - c_1$ decrease
  - **Income effect:** consumer is poorer $\Rightarrow$ both c_1 and $c_2 \downarrow \Rightarrow$ savings s increase
- Total net effect is theoretically ambiguous $\Rightarrow \tau_K$ has ambiguous effects on s


Life cycle savings and taxes theory
c2 consumption while old
w(1+r)
Indifference curves u(c1,c2)=constant
Utility maximizing choice
c2*
Budget line slope –(1+r)
0
c1*
w
s*: savings
c1 consumption while young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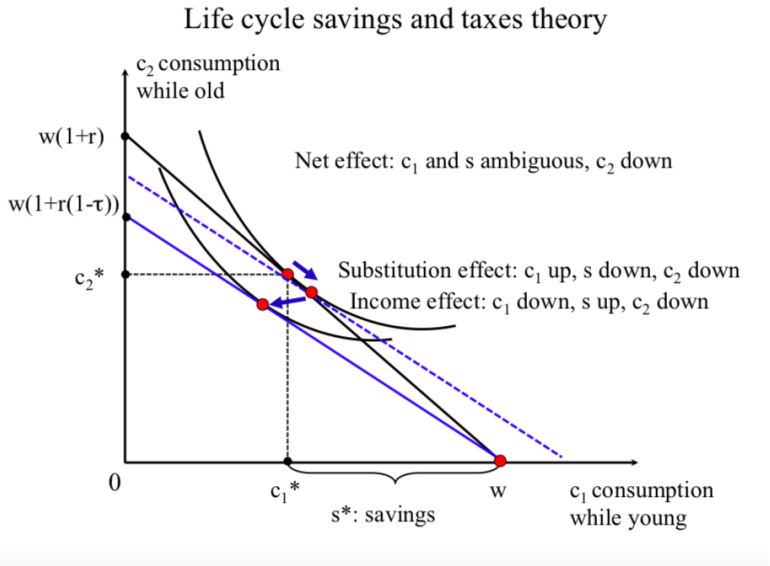
w(1+r(1-τ))
c2*
Introducing tax on savings
0
c1*
w
c1 consumption while young
s*: savings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c2*
Net effect: c1 and s ambiguous, c2 down
Substitution effect: c1 up, s down, c2 down
Income effect: c1 down, s up, c2 down
0
c1*
w
s*: savings
c1 consumption while young

Overview of optimal capital tax

The equity-efficiency trade-off is often obscured in complex models

- Broadly two main types of models:
  - Life-cycle models: wealth is due solely to life-cycle savings
  - Models with bequests: wealth is due solely to inheritances
- Classic Results
  - Chamley-Judd: zero capital taxes because capital supply is infinitely elastic
  - Atkinson-Stiglitz: zero capital taxes because, conditional on labor income, there is no heterogeneity in wealth
  - NDPF: small capital taxes due to uncertainty/insurance
- Recent work
  - Saez-Stantcheva: heterogeneous preferences for wealth $\rightarrow$ optimal tax depends on a finite capital supply elasticity
  - Jakobsen Jakobsen Kleven Zucman (2019) provide estimates that can help quantify this (long-run) elasticity

Optimal Tax in Life-Cycle model

- Government can use both a progressive labor income tax $T(wl)$ and a linear capital income tax τ_K
- Individuals live 2 periods, earn in period 1, retired in period 2

$$\max_{c_1,c_2,l} u(c_1) - h(l) + \delta u(c_2) \quad \text{s.t.} \quad c_1 + \frac{c_2}{1 + r(1 - \tau_K)} \leq wl - T(wl)$$

- Individuals differ only according to their earning ability w
- Government maximizes social welfare function based on individual utilities

- **Atkinson-Stiglitz JpubE'76 theorem:** The optimal tax τ_K on capital income should be zero. Using a labor tax on earnings $T(wl)$ is sufficient.

Optimal Tax in Life-Cycle model

- Atkinson-Stiglitz' theorem shows that life-time savings should not be taxed, tax only labor income
- Key intuition: in basic life-cycle model, inequality in life-time resources is due solely to differences in earnings ability. This inequality can be addressed with labor income taxation. Capital income taxation needlessly distorts saving behavior.
- From justice view: seems fair to not discriminate against savers if labor earnings is the only source of inequality.

Four Limits of the Life-Cycle model

In reality, capital income inequality also due

1. difference in rates of returns across individuals
2. shifting of labor income into capital income
3. inheritances
4. tax evasion through off-shore accounts

Difference in Rates of Returns Across Individuals

- Rate of return on wealth varies significantly over time and across individuals
- Example: stock market can gain 30% in some years or lose 20% in others
- Specific stocks can increase much faster for successful start-ups (Google) or collapse entirely for bankrupt firms (Enron)
- In general, richer individuals are able to invest in higher return assets due to ability to take risks and scale effects in financial advice [e.g., large University endowments get a larger return than smaller ones, Piketty 2014, Chapter 12]
- $\Rightarrow$ Taxing capital income is a way to mitigate such inequality

(Aside: note contrast to equal returns assumption fixed income capitalization factor)

Use it or Lose it: Taxing wealth versus capital income

TABLE I – Summary of the Illustrative Example

	Capital Income Tax		Wealth Tax	
	$r_F = 0\%$	$r_M = 20\%$	$r_F = 0\%$	$r_M = 20\%$
Wealth	\$1,000	\$1,000	\$1,000	\$1,000
Pre-tax income	\$0	\$200	\$0	\$200
Tax rate	$\tau_k = \frac{\$50}{\$200} = 0.25$		$\tau_a = \frac{\$50}{\$2{,}200} = 2.27\%$	
Tax liability	\$0	\$50	$\$1{,}000 \times \tau_a \approx \$23$	$\$1{,}200 \times \tau_a \approx \$27$
After-tax rate of return	0%	$\frac{\$200-\$50}{\$1{,}000} = 15\%$	$-\frac{\$23}{\$1{,}000} = -2.3\%$	$\frac{\$200-\$27}{\$1{,}000} = 17.3\%$
After-tax wealth ratio	$\frac{W_M}{W_F} = \frac{\$1{,}150}{\$1{,}000} = 1.15$		$\frac{W_M}{W_F} = \frac{\$1{,}173}{\$977} = 1.20$	

Notes: The subscripts F and M refer to Fredo and Michael's variables, respectively. See the text for further details.

Source: Guvenen Kambourov Kuruscu Ocampo Chen (2019)

Shifting of labor/capital income

- In practice, difficult to distinguish between capital and labor income [e.g., small business profits, professional traders].
- Differential tax treatment can induce shifting
  - Carried interest in the US: hedge fund and private equity fund managers receive fraction of profits of assets they manage for clients. Those profits are really labor income but are taxed as realized capital gains
  - Finnish Dual income tax system: taxes separately capital income at preferred rates since 1993: Pirttila and Selin SJE'11 show that it induced shifting from labor to capital income especially among self-employed
  - The Gingrich-Edwards Loophole: Smith Yagan Zidar Zwick (2019) estimate 75% of pass-through profits better reflects returns to human capital.
- With income shifting, taxing capital income becomes desirable to curb this tax avoidance opportunity

Inheritance: Estate Taxation in the United States

- Estate federal tax imposes a tax on estates above $11M exemption (less than .1% of deceased liable), tax rate is 40% above exemption (in 2018+)
- Charitable and spousal giving are fully exempt from the tax
- E.g.: if Bill Gates / Warren Buffet give all their wealth to charity, they won't pay estate tax
- Popular support for estate tax is pretty weak ("death tax") but public does not know that estate tax affects only richest
- Support for estate tax increase shots up from 17% to 53% when survey respondents are informed that only richest pay it (Kuziemko-Norton-Saez-Stantcheva AER'15 do an online Mturk survey experiment)

Taxation of Inheritances: Welfare Effects

- Inheritances (or gifts from living parents) raise difficult issues of social justice [see Kaplow 2001]:
  - Inequality in inheritances contributes to economic inequality and individuals not responsible for inheritances they receive:
  - $\Rightarrow$ seems fair to redistribute from those who received inheritances to those who did not
- However, it seems unfair to tax the parents who worked hard (and already paid tax on income) to pass on wealth to children

Taxation of Inheritances: Behavioral Responses

Potential behavioral response effects of inheritance tax:

1. reduces wealth accumulation of altruistic parents (and hence tax base) [no very good empirical evidence, Kopczuk-Slemrod 2001 suggest small effects]
2. reduces labor supply of altruistic parents (less motivated to work if cannot pass wealth to kids) [no good evidence]
3. induces inheritors to work more through income effects because they receive smaller inheritances (Carnegie effect, decent evidence from Holtz-Eakin,Joulfaian,Rosen QJE'93)

Critical to understand why there are inheritances for optimal inheritance tax policy. 3 models of bequests: (a) accidental, (b) altruistic bequests, (c) social/family pressure

(a) Accidental Bequests

- People die with a stock of wealth they intended to spend on themselves (or that they accumulated out of love for wealth, Carroll '98):
- Bequest taxation has no distortionary effect on behavior of parent and can only increase labor supply of inheritors (through income effects) $\Rightarrow$ strong case for taxing bequests heavily
- Surveys show that bequest motives are not the main driver of wealth accumulation (Kopczuk-Lupton '07):
- Only 1/3 of people surveyed say that the main reason they accumulate wealth is for bequests to their children

(b) Altruistic Bequests (Piketty and Saez 2013)

- Utility $u(c) - h(l) + \delta v(b^{\text{left}})$ where c is own consumption, l is labor supply, and b^{left} is net-of-tax bequests left to next generation and $v(b^{\text{left}})$ is utility of leaving bequests for donor
- Individual receives b^{received}, works and earns $wl - T(wl)$, consumes c, saves $s = wl - T(wl) + b^{\text{received}} - c$, which translates into $b^{\text{left}} = s(1+r)(1-\tau_B)$ for heir (τ_B is bequest tax rate)
- Bequests provide an additional source of life-income:

$$c + \frac{b^{\text{left}}}{(1-\tau_B)(1+r)} = wl - T(wl) + b^{\text{received}}$$

  In this model, Atkinson-Stiglitz breaks down and using bequest taxation is desirable to supplement labor income taxation
- $\Rightarrow$ Two-dimensional inequality (labor,bequests) requires two-dimensional tax policy tool (labor tax, bequest tax)

(c) Social-family pressure bequests

- Parents may not want to leave bequests but feel compelled to by pressure of heirs or society: bargaining between parents and children
- With estate tax, parents do not feel like they need to give as much $\Rightarrow$ parents are made better-off by the estate tax $\Rightarrow$ Case for estate taxation stronger
- Empirical evidence:
- Aura JpubE'05: reform of private pension annuities in the US in 1984 requiring both spouses signatures when worker decides to get a single annuity or couple annuity: reform increases sharply couple annuities choice
- Equal division of estates [Wilhelm AER'96, Light-McGarry '04]: estates are very often divided equally probably to avoid conflicts [gifts before death are not as equally split]

Coming back to the Wealth tax debate

The case:

- Efficiency: wealth concentration is bad per se (excessive economic and political power to the wealth). Evidence from Robber Barons US 19th century and devo countries that entrenched wealth stifles growth (Acemoglu-Robinson '10)
- Tax fairness: super-rich do not need to "realize" income and hence pay fairly small income tax relative to their true incomes (Warren Buffett example)

Concerns:

- can a wealth tax be properly enforced? [offshore evasion and valuation of businesses]
- will it induce rich people to leave the US?
- will it discourage entrepreneurs?
- hasn't it failed in other countries?

Saez Zucman (2019) Case for Progressive Wealth Tax

EVASION DEPENDS ON ENFORCEMENT

Clear evidence of behavioral responses to wealth taxes whenever avoidance opportunities exist:

1) Offshore tax evasion is large and concentrated (60% comes from top .1%, Zucman et al.) but can be curbed by leaks risk, cracking down on tax havens or their banks (FATCA)

2) Mobility is a serious threat if moving is easy and tax advantageous (Kleven-Kreiner-Saez '13 on EU football players, Moretti-Wilson '19 on Forbes 400 and state inheritance taxes)

3) Asset class exemptions can lead to massive shifting (Alvaredo-Saez '09 on Spain with stock exemption for owners managers)

4) Valuation discounts can reduce wealth by creating artificial illiquidity if such schemes allowed (US estate tax)

Source: Saez Zucman (2019)

Saez Zucman (2019) Case for Progressive Wealth Tax

WHY DID WEALTH TAXES FAIL IN EUROPE?

1) Tax competition concerns through offshore tax evasion and mobility of the rich

2) Exemption threshold too low (like $1m) creating hardship for illiquid millionaires (led to inefficient illiquid asset exemptions or tax limits based on reported income)

3) Reliance on self-assessment (making enforcement hard)

All 3 weaknesses could be remedied:

1) Fight offshore tax evasion (FATCA) and tax expatriates

2) Set high exemption threshold ($50m rather than $1m)

3) Develop systematic information reporting

Source: Saez Zucman (2019)

Saez Zucman (2019) Case for Progressive Wealth Tax

KEY ENFORCEMENT ASPECTS

1) Use a comprehensive tax base with no asset class exemption

2) Use information reporting (publicly traded stocks, fixed claim assets, mutual+pension funds, real estate, and debts)

3) Closely held stock ($\simeq$ 30% of top .1% wealth) toughest:

a) Large: pay tax in stock and create missing market

b) Small/medium: use valuation formula based on profits/capital stock/sales (as in Switzerland)

4) Always value underlying assets when assets held through intermediaries (pension and mutual funds, trusts, businesses)

5) Clear rules to assign shared assets (such as trusts)

$\Rightarrow$ with good enforcement, evasion rate of 15-20% possible

Source: Saez Zucman (2019)

Saez Zucman (2019) Case for Progressive Wealth Tax

ECONOMIC EFFECTS OF WEALTH TAXATION

Wealth concentration: well enforced wealth tax reduces wealth concentration (consensus)

Capital stock: Any reduction in saving from the wealthy could be compensated by higher public savings or higher middle class saving (pension, mortgage, debt regulations)

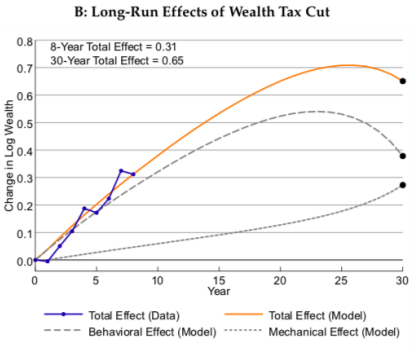
Entrepreneurship/innovation: No good empirical evidence. Wealth tax comes late. Early interventions (education / immigration / peers) might be more impactful. Founders may loose control sooner but could be hired as CEOs

Giving: Wealth tax could accelerate giving to charities and heirs. Socially desirable as long as they are not "straws"

Source: Saez Zucman (2019)

Some evidence from Denmark shows non-trivial long-run effects

Long-run elasticity of taxable wealth with respect to the net-of-tax return is sizable at top of distribution



Notes: The figure shows the long-run effects of wealth tax cuts when calibrating our model to the the ceiling DD. These are effects for the very wealthy (within the top 1%). The reform experiment cuts the wealth tax rate by 1.56 percentage points, corresponding to the tax cut for the average person in the treatment group. Panel A shows the observed lifecycle profile of wealth, the simulated lifecycle profile before the reform (calibrated to fit the empirical profile), and the simulated lifecycle profile after the reform. Panel B illustrates the total effects, the mechanical effects, and the behavioral effects on taxable wealth over 30 years, demonstrating that the model matches the quasi-experimental estimates over the initial 8 years.

Source: Jakobsen Jakobsen Kleven Zucman (2019)

GE effects are uncertain as are asset price (tax base) effects

To further focus the argument, consider a simple security – a riskless stock that pays \$4/year in dividends forever. Suppose the wealth tax is a surprise, and before the tax is announced, the stock sells for \$100, so the equilibrium (market clearing) rate of return is 4%. Suppose the wealth tax is 2% of the price of the bond at the beginning of each year, to be paid at the end of the year when the \$4 dividend is received.

What happens to the price of the stock when the wealth tax is announced? The dividend is \$4/year forever, so the new price that clears the market doesn't change thereafter. Thus, after the initial price change in response to the tax, there are no further capital gains or losses.

The new price has to keep the post-tax return at 4%. Since the post-tax price, P, is constant, the post-tax return, every year, is the end-of-year dividend (\$4) minus the tax (0.02P) all divided by the beginning-of-year price, P. The post-tax return, R, must be 0.04,

$$R = (4 - 0.02P)/P = 0.04,$$

so,

$$P = 4/0.06 = \$66.67.$$

The wealth tax, which is only 2%, causes the stock price to fall by 1/3rd. The reason? The tax is small as a fraction of wealth, but it is paid annually, and it is large relative to the annual dividend, which means it has a big effect on the stock price. The

Source: Fama "Wealth Taxes" (2019). N.b. not all stocks would face tax so smaller aggregate effects.