Use it Or Lose it: Efficiency Gains From Wealth Taxation

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The art of taxation consists in so plucking the goose…

…as to get the most feathers with the least hissing.

– Jean Baptiste Colbert, Minister of Finance to Louis XIV

Two Key Policy Questions

1. Is it "desirable" to tax wealth?
2. If yes, how should such a tax be structured?

This paper: Study (1) and (2) in a quantitative framework, which:

1. generates the concentration of wealth at the very (very!) top, by...
2. modeling persistent heterogeneity in investment returns
    1. building on the power law inequality models, and
    2. recent empirical evidence documenting such heterogeneity.

Key Idea: Persistent rate of return heterogeneity results in a **sharp contrast** between:

- Taxing income flow from capital (capital income tax)
- Taxing stock of capital (wealth) (wealth tax)

Simple Example

Return Heterogeneity: Simple Example

- One-period model. Tax collected end of period.
- Two brothers, Fredo and Mike, each with $1000 of wealth.
- Key heterogeneity: in investment/entrepreneurial ability
  - (Fredo) Low ability: earns $r_f = 0\%$ net return
  - (Mike) High ability: earns $r_m = 20\%$ net return.
- Government taxes to finance $G = \$50$

Capital Income vs. Wealth Tax

	Capital income tax		Wealth tax	
	Fredo ($r_f = 0\%$)	Mike ($r_m = 20\%$)	Fredo ($r_f = 0\%$)	Mike ($r_m = 20\%$)
Wealth	1000	1000	1000	1000
Before-tax Income	0	200	0	200
	$\tau_k = \frac{50}{200} = 25\%$		$\tau_a = \frac{50}{2200} \approx 2.27\%$	
Tax liability	0	50	$1000\tau_a = 22.7$	$1200\tau_a = 27.3$
After-tax return	0%	$\frac{200-50}{1000} = 15\%$	$-\frac{22.7}{1000} = -2.3\%$	$\frac{200-27}{1000} = 17.3\%$
After-tax $\frac{W_m}{W_f}$	$1150/1000 = 1.15$		$1173/977 \approx 1.20$	

Simple Example: Remarks

- Replacing capital income tax with wealth tax increases dispersion in after-tax returns.
- Potential effects:
  - Positive (+): Efficiency gain
    1. (Static): Capital is reallocated (mechanically) to more productive agents.
    2. (Dynamic): If savings rates respond to changes in returns, this could further increase reallocation of capital toward more productive agents.
  - Negative (-): Increased wealth inequality.
- Conjecture: positive effects will be first order and negative effects will be second order.

Why Misallocation in the Long Run?

- In this simple example, we assumed that Mike and Fredo had the same initial wealth.
- But if this static example is repeated over and over, Mike will eventually hold all the aggregate wealth.
- If so, maybe the misallocation of wealth to unproductive individuals will be a small problem?

Sources of Misallocation: Variation in Returns

- Across Generations
  - Children of very successful entrepreneurs often inherit large amounts of wealth but may not be able to work it efficiently.
- Over the Life Cycle
  - One-hit wonders versus serial entrepreneurs.
  - Sector-specific shocks.
- Wealth tax:
  - alleviates misallocation of capital across entrepreneurs with different productivities.
  - is like pruning: eliminates weak branches, strengthens stronger ones.

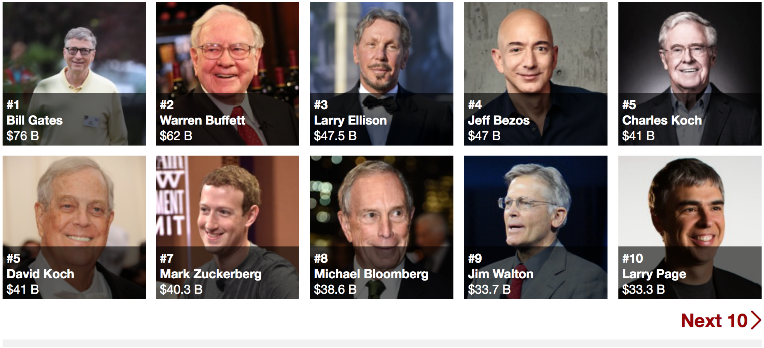
OUTLINE

1. Model
2. Parameterization
3. Tax reform experiment
4. Optimal taxation
5. Robustness
6. Conclusions and current work

MODEL

How Did Rich Become Rich?

FIGURE: Precautionary Saving or Higher Returns?



New Models of Inequality

- **First generation models:** rely on idiosyncratic income risk and precautionary savings to generate wealth inequality. BUT:
  - Empirically measured income risk cannot generate much wealth concentration at top end (Guvenen, Karahan, Ozkan, Song (2015)).
  - No Pareto tail.
- **New literature:** builds power law models of inequality (Benhabib, Bisin, et al (2011–2016), Gabaix, Lasry, Lions, and Moll (2016))
  - Persistent heterogeneity in returns is key for generating Pareto tail and concentration at top.
- Fagereng, Guiso, Malacrino, and Pistaferri (2015) document large heterogeneity and permanent differences in rate of returns (adjusted for risk).

Households

- OLG demographic structure.
- Individuals face mortality risk and can live up to H years.
- Let ϕ_h be the unconditional probability of survival up to age h, where $\phi_1 = 1$.
- Each household supplies labor in the market and produces a differentiated intermediate good using her capital (wealth) and borrowing from the credit market.
- Households maximize $\mathbb{E}_0 \left(\sum_{h=1}^{H} \beta^{h-1} \phi_h u(c_h, \ell_h) \right)$
- Accidental bequests are inherited by (newborn) offspring.

Household Labor Market Efficiency

- Labor market efficiency of household i at age h is

$$\log y_{ih} = \underbrace{\kappa_h}_{\text{life cycle}} + \underbrace{\theta_i}_{\text{permanent}} + \underbrace{\eta_{ih}}_{\text{AR(1)}}$$

- Individual-specific labor market efficiency θ_i is imperfectly inherited from parents:

$$\theta_i^{child} = \rho_\theta \theta_i^{parent} + \varepsilon_\theta$$

ENTREPRENEURIAL ABILITY

- **Key source of heterogeneity:** in entrepreneurial ability z_i.
- Household i produces x_{ih} units of intermediate good i according to

$$x_{ih} = z_{ih} k_{ih},$$

where z_{ih} is idiosyncratic entrepreneurial ability and k_{ih} is capital.

- z_{ih} has a permanent and a stochastic component:

$$z_{ih} = f\Big(\underbrace{z_i^p}_{\text{perm. comp.}} , \underbrace{z_{ih}^s}_{\text{stoch. comp.}} \Big)$$

- z_i^p is constant over the lifecycle and inherited imperfectly from parent:

$$\log(z^p_{child}) = \rho_z \log(z^p_{parent}) + \varepsilon_z.$$

- z_i^s is governed by transition matrix Π_z, specified in a moment.

Competitive Final Good Producer

- Final good output is $Y = Q^{\alpha} L^{1-\alpha}$, where

$$Q = \left(\int_i x_i^{\mu} di \right)^{1/\mu}, \quad \mu < 1.$$

- Price of intermediate good i is

$$p_i(x_i) = \alpha x_i^{\mu-1} \times Q^{\alpha-\mu} L^{1-\alpha}.$$

- Wage rate (per efficiency unit of labor) is

$$w = (1-\alpha) Q^{\alpha} L^{-\alpha}.$$

Household Budget

- Households can **borrow** up to a limit to finance their production: $k \leq \vartheta(z) \times a$
  - Setting $\vartheta(z) = 1 \Rightarrow$ HH's cannot borrow or lend.
  - Borrowing capacity is nondecreasing in ability: $d\vartheta(z)/dz \geq 0$
- Households can **lend** at interest rate r, determined in equilibrium (zero net supply).
- Letting $\overline{p} = \alpha Q^{\alpha-\mu} L^{1-\alpha}$, without taxes, wealth after-production:

$$\max_{k \leq \vartheta(z)a} \left[(1-\delta)k + \overline{p} \times (zk)^{\mu} - (1+r)(k-a)\right]$$
$$= (1+r)a + \pi^*(a,z)$$

- **After-tax wealth:**

$$\Pi(a,z;\tau_k) = a + [ra + \pi^*(a,z)](1-\tau_k) \qquad \text{under capital income tax}$$
$$\Pi(a,z;\tau_a) = [(1+r)a + \pi^*(a,z)](1-\tau_a) \qquad \text{under wealth tax}$$

Household Budget

- During retirement:

$$(1+\tau_c)c + a' = \Pi(a,z;\tau) + y_R(\theta,\eta)$$

- During working life:

$$(1+\tau_c)c + a' = \Pi(a,z;\tau) + (1-\tau_\ell)(wy_h n)^\psi$$

and $a' \geq 0$ at all ages.

- Benchmark: $\psi \equiv 1$ (flat labor income tax)
- Without heterogeneity in z and with $\mu = 1$, the two tax systems are equivalent.

Government

- The government budget balances. Two scenarios:

1. Taxing capital income and labor income:

$$G + SSC = \sum_{h,a,\mathbf{s}} \left[\tau_k \times (ra + \pi^*(z,a)) + \tau_\ell \times wy_h + \tau_c \times c_h(a,\mathbf{s})\right]\Gamma(a,\mathbf{s};h)$$

where

$$SSC = \sum_{a,\mathbf{s},h \geq R} y_R(\theta,\eta)\Gamma(h,a,\mathbf{s}).$$

2. Taxing wealth and labor income:

$$G + SSC = \sum_{h,a,\mathbf{s}} \left[\tau_a \times (((1+r)a + \pi^*(z,a))) + \tau_\ell wy_h + \tau_c c_h(a,\mathbf{s})\right]\Gamma(a,\mathbf{s};h)$$

- $\mathbf{s} \equiv (\theta,\eta,z)$ and $\Gamma(a,\mathbf{s};h)$ is the stationary distribution of agents over states.

Functional Forms and Parameters

- Preferences:

$$u(c,\ell) = \frac{\left(c^{\gamma}\ell^{1-\gamma}\right)^{1-\sigma}}{1-\sigma}$$

- Pension system:
  - $y_R(\theta,\eta) = \Phi(\theta,\eta) \times \overline{Y}$ where $\overline{Y}$ is the average labor income in economy, and
  - $\Phi(\theta,\eta)$ is a concave replacement rate function taken from Social Security's OASDI system.

Entrepreneurial Ability: Stochastic Component

- The **lifecycle pattern of wealth accumulation** for the very rich matters greatly for the effects of wealth taxation:

  1. **steady accumulation of wealth:** the rich today have high expected returns tomorrow.
     - Distortion is smaller. But wealthy are also more in favor of wealth taxation.

  2. **extremely fast growth followed by stagnation**: rich today have low expected returns tomorrow.
     - Distortion is big. Wealthy are not supportive of wealth taxes.

- With fixed productivity, z^p, returns fall as wealth increases (since $\mu < 1$), but not sufficiently.

- So, we consider a process that allows for both scenarios.

Life Cycle Evolution of Entrepreneurial Ability

- Over the life cycle, entrepreneurial ability evolves as follows:
  - $z^s_{ih} \in \{H, L, 0\}$

$$z_{ih} = f\left(z^p_i, z^s_{ih}\right) = \begin{cases} \left(z^p_i\right)^{\omega} & \text{if } z^s_{ih} = H \qquad \text{where } x > 1 \\ z^p_i & \text{if } z^s_{ih} = L \\ z_{min} & \text{if } z^s_{ih} = 0 \end{cases}$$

with transition matrix:

$$\Pi_{z^s} = \begin{bmatrix} 1 - p_1 - p_2 & p_1 & p_2 \\ 0 & 1 - p_2 & p_2 \\ 0 & 0 & 1 \end{bmatrix}.$$

- ω : degree of supernormal returns
- p_1: annual probability of losing supernormal returns
- p_2 :annual probability of losing investment ability completely $\rightarrow$ become a passive saver.

Two Calibration Targets

- Baseline:
  1. match the fraction of Forbes 400 rich that are self-made (54%, we get 50%)
  2. match the life cycle pattern of wealth accumulation for Forbes 400 (still in progress) Forbes 400 - (Civale and Díez-Catalán (2016))
- Permanent z alone does not create enough self-made Forbes 400 rich.
  - It takes too long (2-3 generations) to get into Forbes 400.
- We choose: $\omega = 5$, $p_1 = 0.05$, and $p_2 = 0.03$.
- We also have robustness analysis with constant productivity: $\omega = 1$, $p_1 = 0$, and $p_2 = 0$.

Parameters Set Outside the Model

Table: Benchmark Parameters

Parameter		Value
Curvature of utility	σ	4.0
Curvature of CES aggregator of varieties	μ	0.90
Capital share in production	α	0.40
Depreciation rate of capital	δ	0.05
Interg. persistence of invest. ability	ρ_{z^P}	0.10
Interg. persistence of labor efficiency	ρ_θ	0.50
Persistence of labor efficiency shock	ρ_η	0.90
Std. dev. of labor efficiency shock	$\sigma_{\varepsilon_\eta}$	0.20

$\tau_k = 25\%$, $\tau_\ell = 22.4\%$, and $\tau_c = 7.5\%$ (McDaniel, 2007)

Calibration Targets and Outcomes

- $\rho_{z^P} = 0.1$ is set based on Fagereng et al (2016) for Norway. (We have also experimented with values up to 0.5)
- We calibrate 4 remaining parameters $(\beta, \gamma, \sigma_{\varepsilon_{z^P}}, \sigma_{\varepsilon_\theta})$ to match 4 data moments:

Table: Benchmark Parameters Calibrated Jointly in Equilibrium

Parameter		Value	Moment	
Discount factor	β	0.948	Capital/Output	3.00*
Cons. share in U	γ	0.46	Avg. Hours	0.40*
σ of entrepr. ability	$\sigma_{\varepsilon_{z^P}}$	0.072	Top 1% share	0.36*
σ of labor fix. eff.	$\sigma_{\varepsilon_\theta}$	0.305	$\sigma(\log(\text{Earn}))$	0.80*

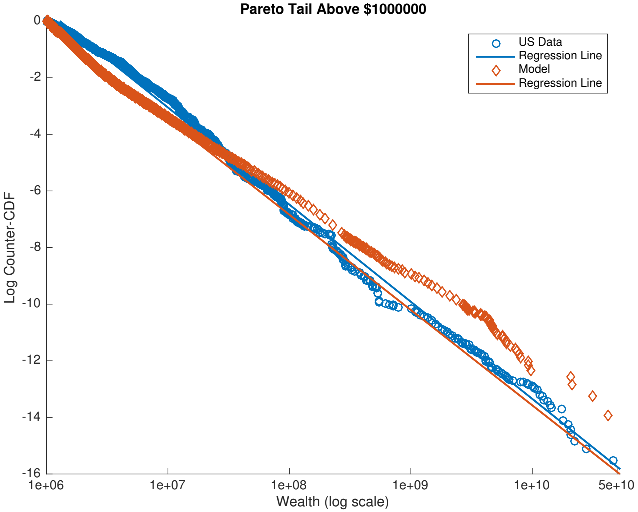
MOMENTS

TABLE: Benchmark vs. Wealth Tax Economy

	US Data	Benchmark	Wealth Tax
Top 1%	0.36*	0.36	
Capital/Output	3.00*	3.00	
Bequest/Wealth	1–2%	0.99%	
$\sigma(\log(\text{Earnings}))$	0.80*	0.80	
Avg. Hours	0.40*	0.40	

- Calibrated model generates:
  - total tax revenues: 25% of GDP (29.5% in the data)
  - ratio of capital tax revenue to total tax revenue: 25% (28% in the data)

$\mu = 0.9$ and Pareto Tail



Quantitative Results

Two Types of Experiments

1. **Tax reform:**
   - Calibrate to current US economy **with** capital income taxes.
   - Replace capital income taxes with wealth taxes so as to keep government revenue constant.

2. **Optimal taxation:** Government maximizes utilitarian social welfare choosing:
   1. linear labor income and capital income taxes, or
   2. linear labor income and wealth taxes,

Note:

- In all experiments 2.a to 3.b, we keep the **pension benefits fixed** at the baseline values.

Preview of Extensions We Have Studied

1. Progressive labor income taxes (Reform & Optimal)
2. Progressive wealth taxes–flat tax, single threshold (Optimal)
3. No financial constraints (Reform & Optimal)
4. Unlimited borrowing, with $R^{\text{borrow}} \gg R^{\text{save}}$ (Optimal)
5. Log utility (Reform and Optimal)
6. $z_{ih} = z_i^p$ at all ages (Reform and Optimal)
7. $\mu = 0.8$ (Reform, Optimal—in progress)
8. Estate taxes, calibrated (Reform and Optimal, both in progress)
9. Consumption taxes (Optimal—in progress).
10. Some more extensions...

Summary: The substantive conclusions presented next are robust to ALL these extensions.

1. Tax Reform

Rate of Return Heterogeneity

Table: Benchmark vs. Wealth Tax Economy

	Percentiles of Return Distribution (%)				
	P10	P50	P90	P95	P99
			Before-tax		
Benchmark	2.00	2.00	17.28	22.35	42.36
Wealth tax	1.74	1.74	14.62	19.04	36.91
			After-tax		
Benchmark	1.50	1.50	12.96	16.76	31.77
Wealth tax	0.59	0.59	13.32	17.69	35.35

Tax Reform: Wealth Distribution

Table: Benchmark vs. Wealth Tax Economy

	US Data	Benchmark	Wealth Tax
Top 1%	0.36*	0.36	**0.46**
Capital/Output	3.00*	3.00	**3.25**
Bequest/Wealth	1–2%	0.99%	1.07%
$\sigma(\log(\text{Earnings}))$	0.80*	0.80	0.80
Avg. Hours	0.40*	0.40	0.41

Tax Reform: Aggregate Variables

Table: Benchmark vs. Wealth Tax Economy

	Benchmark	Wealth Tax	% Change
τ_k	25.0%	0.00	
τ_a	0.00	1.13%	
$\overline{k}$			19.4
Q			24.8
w			8.7
Y			10.1
L			1.3
C			10.0

Reallocation of Wealth Across Agents

Table: Tax Reform from τ_k to τ_a: Change in Wealth Composition

	% Change in number of z_i's in Top x% Wealth Group								
Top x%	z_1	z_2	z_3	$\mathbf{z_4}$	z_5	z_6	z_7	z_8	z_9
1	–14.8	–11.7	–10.0	–15.0	–10.8	12.6	10.9	6.5	17.4
5	–5.1	–4.8	–9.9	–6.9	1.6	9.9	8.6	6.4	3.2
10	–4.3	–4.5	–8.4	–3.9	2.9	7.5	6.6	5.1	0.0
50	–3.3	–3.7	–3.8	0.6	1.8	1.5	1.1	1.2	0.0

Welfare Analysis: Two Measures

Let $s_0 \equiv (\theta, z, a_0)$, and V_0 and $\mathbb{V}_0$ be lifetime value function in benchmark (US) and counterfactual economies, respectively.

- Measure 1: Compute individual specific consumption equivalent welfare and integrate:

$$V_0((1+CE_1(s_0))c^*_{\mathrm{US}}(s_0), \ell^*_{\mathrm{US}}(s_0)) = \mathbb{V}_0(c(s_0), \ell(s_0))$$

$$\overline{CE}_1 \equiv \sum_{s_0} \Gamma_{\mathrm{US}}(s_0) \times CE(s_0)$$

- Measure 2: Fixed proportional consumption transfer to all individuals in the benchmark economy:

$$\sum_{s_0} \Gamma_{\mathrm{US}}(s_0) \times V_0((1+\overline{CE}_2)c^*_{\mathrm{US}}(s_0), \ell^*_{\mathrm{US}}(s_0)) = \sum_{s_0} \Gamma(s_0) \times \mathbb{V}_0(c(s_0), \ell(s_0)).$$

Tax Reform: Who Gains, Who Loses?

Age	*Productivity group*								
	z_1	z_2	z_3	z_4	z_5	z_6	z_7	z_8	z_9
20–25	**7.3**	**7.2**	**6.8**	**6.8**	**7.4**	**8.8**	**10.5**	**11.1**	**10.7**
25–34	7.0	6.9	6.4	6.0	5.9	6.0	5.9	3.7	1.2
35–44	6.1	6.0	5.4	4.9	4.3	3.3	1.4	-1.7	-4.3
45–54	4.6	4.5	4.1	3.5	2.8	1.7	-0.5	-3.1	-5.2
55–64	1.9	1.9	1.6	1.3	0.9	0.0	-1.6	-3.5	-5.3
65–74	-0.3	-0.3	-0.4	-0.5	-0.6	-1.0	-2.1	-3.4	-4.7
75+	-0.1	-0.1	-0.1	-0.1	-0.1	-0.4	-1.0	-1.9	-2.7

Note: Each cell reports the average of $CE_1(\theta, z, a, h) \times 100$ *within each age and productivity group*

Sharing the Gains with Retirees

Age	*Productivity group*								
	z_1	z_2	z_3	z_4	z_5	z_6	z_7	z_8	z_9
20–25	**5.3**	**5.2**	**4.8**	**4.9**	**5.7**	**7.4**	**9.6**	**10.6**	**10.4**
25–34	5.3	5.1	4.6	4.4	4.5	5.0	5.2	3.2	0.6
35–44	4.9	4.8	4.3	3.8	3.4	2.8	0.9	-2.4	-5.3
45–54	4.8	4.7	4.3	3.8	3.3	2.1	-0.2	-3.1	-5.6
55–64	5.6	5.6	5.3	4.8	4.3	3.1	0.8	-1.9	-4.3
65–74	**7.0**	**7.0**	**6.8**	**6.3**	**5.8**	**4.7**	**2.6**	**0.1**	**–2.2**
75+	**7.7**	**7.7**	**7.6**	**7.4**	**7.0**	**6.2**	**4.5**	**2.5**	**0.6**

Note: Each cell reports the average of $CE_1(\theta, z, a, h) \times 100$ *within each age and productivity group*

Political Support for Wealth Taxes

	Productivity group								
Age	z_1	z_2	z_3	z_4	z_5	z_6	z_7	z_8	z_9
20–25	0.98	0.98	0.96	0.96	0.97	0.97	0.97	0.97	0.94
25–34	0.99	0.99	0.98	0.97	0.95	0.94	0.89	0.78	0.59
35–44	0.98	0.98	0.97	0.95	0.91	0.84	0.67	0.45	0.34
45–54	0.96	0.96	0.93	0.90	0.84	0.71	0.54	0.41	0.31
55–64	0.77	0.77	0.73	0.70	0.64	0.53	0.42	0.32	0.24
65–74	0.00	0.06	0.06	0.08	0.09	0.08	0.06	0.04	0.03
75+	0.00	0.12	0.09	0.11	0.10	0.09	0.07	0.05	0.04

Political Support with Retirees on Board

	Productivity group								
Age	z_1	z_2	z_3	z_4	z_5	z_6	z_7	z_8	z_9
20–25	0.97	0.97	0.95	0.94	0.96	0.97	0.97	0.96	0.94
25–34	0.98	0.98	0.96	0.95	0.94	0.93	0.88	0.77	0.59
35–44	0.98	0.98	0.96	0.93	0.90	0.83	0.67	0.45	0.34
45–54	0.98	0.98	0.96	0.93	0.89	0.78	0.60	0.46	0.35
55–64	0.99	0.98	0.97	0.95	0.92	0.81	0.65	0.50	0.38
65–74	**1.00**	**1.00**	**0.99**	**0.98**	**0.96**	**0.87**	**0.71**	**0.56**	**0.43**
75+	**1.00**	**1.00**	**1.00**	**1.00**	**0.99**	**0.94**	**0.81**	**0.66**	**0.52**

Tax Reforms: Summary

	Baseline		Baseline &pens.	
	$\overline{CE}_1$	$\overline{CE}_2$	$\overline{CE}_1$	$\overline{CE}_2$
Average CE for newborns	7.40%	7.86%	5.58%	4.71
Average CE	3.14%	5.14%	4.95	4.10
% in favor of reform	67.8%		94.8%	

Optimal Taxation

Two Optimal Tax Problems

Compare:

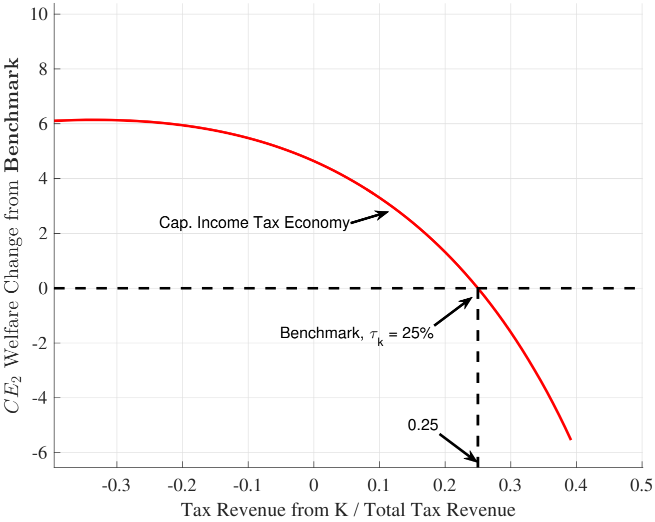
1. (linear) labor taxes and capital income taxes
2. (linear) labor taxes and wealth taxes.

The government maximizes average utility of the newborn.

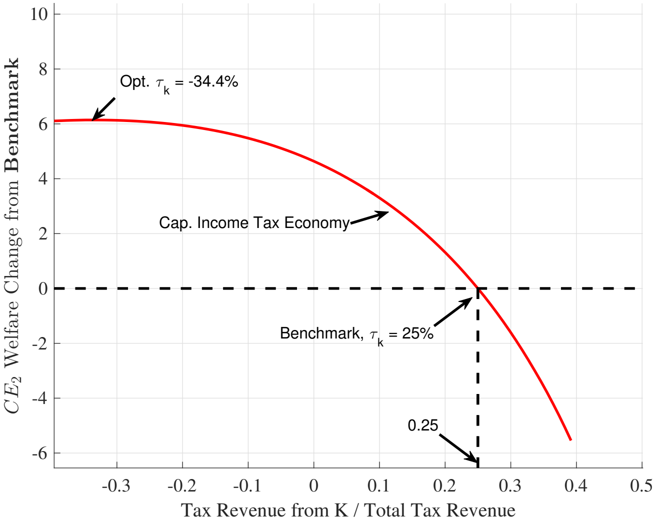
Then analyze:

- Benchmark vs. Optimal tax (either capital income or wealth)

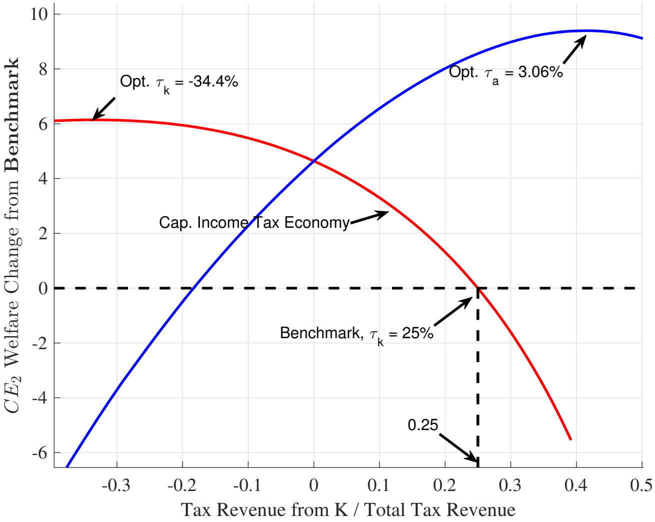
Welfare Change: Optimal Taxes



WELFARE CHANGE: OPTIMAL TAXES



Welfare Change: Optimal Taxes

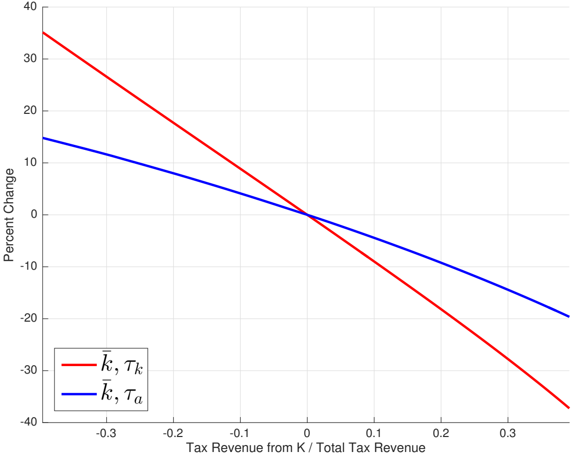


Optimal Taxes: Wealth Distribution

Baseline

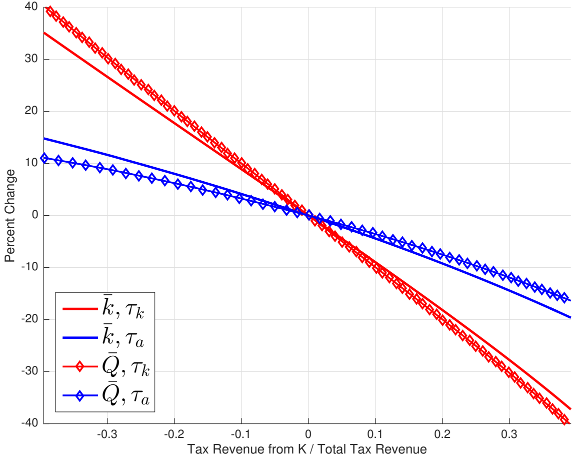
	τ_k	τ_ℓ	τ_a	$\bar{k}/Y$	Top 1%
Benchmark	25%	22.4%	–	3.0	0.36
Tax reform	–	22.4%	1.13%	3.25	0.46
Opt. τ_k	–34.4%	36.0%	–	4.04	0.56
Opt. τ_a	–	14.1%	3.06%	2.90	0.47
Opt. τ_a	–	14.2%	3.30%	2.86	0.47
Threshold	$\frac{Threshold}{\overline{E}} = 25\%$			percent taxed = 63%	

WEALTH TAXES – DISTORTIONS AND MISALLOCATION



- Raising revenue through wealth taxes reduces capital stock $\overline{k}$ **less** than raising through capital income taxes.

Wealth Taxes – Distortions and Misallocation



- Quality-adjusted capital, $\overline{Q}$, declines **less** than $\overline{k}$ under wealth taxes. Opposite is true under capital income taxes.

Optimal Taxes: Aggregate Variables

% change	ΔK	ΔQ	ΔL	ΔY	Δw	Δw (net)	Δr	Δr (net)
Tax reform	19.37	24.79	1.28	10.10	8.70	8.70	–0.25	-0.90
Opt. τ_k	68.97	79.57	–1.16	25.51	26.97	4.72	–1.51	–0.87
Opt. τ_a	2.76	10.26	3.90	6.40	2.41	13.42	0.68	–1.92
Opt. τ_a Threshold	0.41	8.12	3.67	5.42	1.70	12.48	0.78	–2.07

Optimal Taxes: Welfare

Baseline

	τ_k	τ_ℓ	τ_a	$\overline{CE}_2$ (%)	Vote (%)
Benchmark	25%	22.4%	–	–	–
Tax reform	–	22.4%	1.13%	7.86	
Opt. τ_k	–34.4%	36.0%	–	6.28	
Opt. τ_a	–	14.1%	3.06%	9.61	
Opt. τ_a	–	14.2%	3.30%	9.83	
Threshold	$\frac{Threshold}{\overline{E}} = 25\%$				

Welfare: Levels vs. Redistribution

Formula

	Tax Reform	Opt. τ_k	Opt. τ_a
CE_2 (NB)	7.86	6.28	9.61
	Consumption		
Total	8.27	5.90	11.02
Level	10.01	21.04	8.28
Dist.	-1.58	-12.51	2.53
	Leisure		
Total	-0.38	0.36	-1.27
Level	-0.66	0.73	-2.21
Dist.	0.27	-0.38	0.76

Optimal Capital Income Tax: Welfare

Optimal Capital Income Taxes

	Productivity group								
Age	z_1	z_2	z_3	z_4	z_5	z_6	z_7	z_8	z_9
20–25	**3.7**	**3.6**	**3.7**	**4.9**	**7.1**	**10.7**	**14.8**	**16.7**	**17.1**
25–34	3.5	3.4	3.4	4.4	5.9	8.2	10.1	8.9	7.3
35–44	2.9	2.8	2.7	3.4	4.1	4.7	3.8	1.5	-0.6
45–54	2.1	2.0	1.9	2.4	2.7	2.6	1.0	-1.1	-3.2
55–64	0.7	0.7	0.6	1.0	1.2	1.0	-0.2	-2.0	-3.9
65–74	-0.3	-0.3	-0.3	0.0	0.2	0.1	-0.7	-2.0	-3.5
75+	-0.1	-0.1	-0.1	0.1	0.2	0.2	-0.3	-1.0	-1.9

Optimal Wealth Tax: Welfare

Optimal Wealth Taxes

	Productivity group								
Age	z_1	z_2	z_3	z_4	z_5	z_6	z_7	z_8	z_9
20–25	**11.0**	**10.7**	**9.9**	**9.1**	**9.2**	**10.3**	**12.1**	**12.4**	**11.3**
25–34	10.5	10.2	9.1	7.7	6.6	5.7	4.3	-0.1	-5.5
35–44	8.9	8.6	7.5	5.8	4.1	1.7	-2.4	-8.2	-13.1
45–54	6.5	6.3	5.4	3.9	2.3	-0.3	-4.6	-9.3	-13.2
55–64	2.5	2.4	1.8	0.9	-0.1	-2.1	-5.4	-9.1	-12.3
65–74	-0.7	-0.7	-0.9	-1.3	-1.8	-3.0	-5.3	-7.9	-10.4
75+	-0.1	-0.1	-0.2	-0.3	-0.6	-1.3	-2.7	-4.5	-6.2

Optimal Wealth Tax with Threshold: Welfare

Optimal Wealth Taxes with Threshold

	Productivity group								
Age	z_1	z_2	z_3	z_4	z_5	z_6	z_7	z_8	z_9
20–25	**10.5**	**10.3**	**9.8**	**9.3**	**9.5**	**10.6**	**12.4**	**12.6**	**11.4**
25–34	10.1	9.9	9.0	7.8	6.7	5.7	4.2	-0.5	-6.3
35–44	8.6	8.4	7.4	5.8	4.1	1.5	-2.8	-9.0	-14.2
45–54	6.3	6.2	5.3	3.9	2.2	-0.5	-5.1	-10.0	-14.2
55–64	2.5	2.4	1.9	1.0	0.0	-2.1	-5.7	-9.6	-13.0
65–74	-0.5	-0.5	-0.6	-1.0	-1.5	-2.8	-5.3	-8.2	-10.9
75+	-0.1	-0.1	-0.1	-0.2	-0.4	-1.1	-2.7	-4.7	-6.5

OPTIMAL TAXES: WELFARE

Baseline

	τ_k	τ_ℓ	τ_a	$\overline{CE}_2$ (%)	Vote (%)
Benchmark	25%	22.4%	–	–	–
Tax reform	–	22.4%	1.13%	7.86	67.8
Opt. τ_k	–34.4%	36.0%	–	6.28	69.7
Opt. τ_a	–	14.1%	3.06%	9.61	60.7
Opt. τ_a Threshold	–	14.2%	3.30%	9.83	78.9

Robustness

Tax Reform: Aggregates

% Change	Baseline	No Shock	No Const.	Prog. Labour Tax
$\overline{k}$	19.37	9.56	6.28	21.27
Q	24.79	22.37	6.28	25.61
w	8.70	7.66	2.10	9.25
Y	10.10	9.54	3.02	10.01
L	1.28	1.75	0.91	0.69
C	10.01	11.25	2.93	10.01

Tax Reform: Welfare

	Baseline	No Shock	No Const.	Prog. Labour Tax
Wealth Tax Rate	1.13%	1.23%	1.65%	0.90%
CE_1 (All)	3.14	2.29	0.44	2.79
CE_1 (NB)	7.40	5.46	1.86	6.48
CE_2 (All)	5.14	2.92	0.36	4.68
CE_2 (NB)	7.86	5.36	1.43	7.06

OPTIMAL TAXES

	τ_k	τ_ℓ	τ_a	Top 1%	$\overline{CE}_2$ (%)
Baseline	25%	22.4%	–	0.36	
Opt. τ_k	–34.4%	36.0%	–	0.56	6.28
Opt. τ_a	–	14.1%	3.06%	0.47	9.61
No Shock					
Opt. τ_k	-2.33%	29.0%	–	0.47	3.27
Opt. τ_a	–	18.5%	2.21%	0.46	5.80
No Constraint					
Opt. τ_k	13.6%	26.0%	–	0.39	0.41
Opt. τ_a	–	22.7%	1.57%	0.42	1.43

Optimal Taxes

	τ_k	τ_a	τ_ℓ	ψ	Top 1%	$\overline{CE}_2$ (%)
Baseline						
Opt. τ_k	–34.4%	–			0.56	6.28
Opt. τ_a	–	3.06%			0.47	9.61
Prog. Lab. Tax						
Benchmark	25%	–	15.0%	0.185	0.36	–
Tax reform	–	0.90%	15.0%	0.185	0.67	7.06
Opt. τ_k	-38.8%	–	29.3%	0.280	0.61	9.31
Opt. τ_a	–	2.40%	12.7%	0.280	0.53	10.71

Comparison To Earlier Work

- Conesa et al (AER, 2009) study optimal capital income taxes in incomplete markets OLG model
    - with idiosyncratic labor risk
    - without return heterogeneity
    - and find optimal $\tau_k = 36\%$
    - increase in welfare of CE = 1.33%.
- Why do we find optimal smaller τ_k or negative (but a large τ_w)?
    - In both Conesa et al and in our model, higher τ_k reduces capital accumulation and leads to lower output.
    - However, in our model, higher τ_k hurts productive agents disproportionately, leading to more misallocation, and further reductions in output.
    - With wealth tax, the tax burden is shared between productive and unproductive agents, leading to smaller misallocation and lower declines in output with τ_a.

Conclusions and Current work

- Many countries currently have or have had wealth taxes:
  - France, Spain, Norway, Switzerland, Italy, Denmark, Germany, Finland, Sweden, among others.
- However, the rationale for such taxes are often vague:
  - fairness, reducing inequality, etc...
  - and not studied formally
- Here, we are proposing a case for wealth taxes entirely based on efficiency benefits and quantitatively evaluating its impact.

Conclusions and Current work

- Wealth tax has opposite implications of capital income tax.
- Revenue neutral tax reform from τ_k to τ_a:
  - reallocates capital from less productive wealthy to the more productive wealthy.
  - gives the right incentives to the right people to save.
  - increases output, consumption, wages, and welfare.
  - Welfare gains are substantial.
- Optimal wealth taxes are positive and large. Optimal capital taxes are negative or small.
  - Welfare gain is substantially larger under wealth taxes.

Conclusions and Current work

- Current work and extensions:
  - Complete the calibration of the stochastic component of entrepreneurial productivity.
  - Optimize over consumption taxes.
  - Introduce estate taxes and study optimality vs. wealth taxes.
  - Are global wealth taxes necessary?

Thanks!

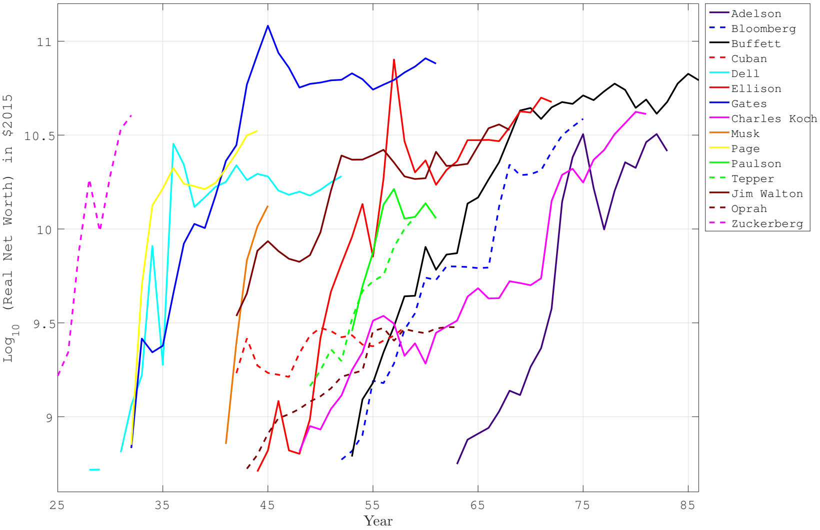
TABLE: Wealth Concentration by Asset Type

	Stocks w/o pensions	*All stocks*	*Non-equity financial*	*Housing equity*	*Net Worth*
Top 0.5%	41.4	37.0	24.2	10.2	25.6
Top 1%	53.2	47.7	32.0	14.8	34.0
Top 10%	91.1	86.1	72.1	51.7	68.7
Bottom 90%	8.9	13.9	27.9	49.3	31.3

Gini Coefficients	
Financial Wealth	*Net Worth*
0.91	0.82

Source: Poterba (2000) and Wolff (2000)

BACK


Adelson
Bloomberg
Buffett
Cuban
Dell
Ellison
Gates
Charles Koch
Musk
Page
Paulson
Tepper
Jim Walton
Oprah
Zuckerberg
11
10.5
10
9.5
9
Log10 (Real Net Worth) in $2015
25
35
45
55
65
75
85
Year

	Calendar Year			
Name	80s	90s	00s	10s
Warren Buffett	44.37	18.57	0.02	5.81
Michael Dell		87.94	-5.58	2.97
Larry Ellison	54.09	31.31	4.90	8.06
Bill Gates	51.94	48.06	-7.54	5.46
Elon Musk				107.57
Larry Page			69.67	11.96
Mark Zuckerberg			33.81	62.24

Back

- $1 + CE = (1 + CE_C)(1 + CE_L)$
- CE_C is given by

$$V_0((1 + CE_C(\mathbf{s}))c^*_{\mathrm{US}}(\mathbf{s}), \ell^*_{\mathrm{US}}(\mathbf{s})) = \widetilde{\mathbb{V}}_0(c(\mathbf{s}), \ell^*_{\mathrm{US}}(\mathbf{s}))$$

  - CE_C can be decomposed into level $CE_{\overline{C}}$ and distrubution component CE_{σ_C} as

$$V_0((1 + CE_{\overline{C}}(\mathbf{s}))c^*_{\mathrm{US}}(\mathbf{s}), \ell^*_{\mathrm{US}}(\mathbf{s})) = \widehat{\mathbb{V}}_0(\widehat{c}(\mathbf{s}), \ell^*_{\mathrm{US}}(\mathbf{s}))$$

where $\widehat{c}(\mathbf{s}) = c(\mathbf{s})\frac{\overline{C}}{C^*_{US}}$ and

$$\widehat{\mathbb{V}}_0((1 + CE_{\sigma_C})\widehat{c}(\mathbf{s}), \ell^*_{\mathrm{US}}(\mathbf{s})) = \widetilde{\mathbb{V}}_0(c(\mathbf{s}), \ell^*_{\mathrm{US}}(\mathbf{s}))$$

- CE_L is given by

$$V_0((1 + CE_L(\mathbf{s}))c^*_{\mathrm{US}}(\mathbf{s}), \ell^*_{\mathrm{US}}(\mathbf{s})) = \widetilde{\mathbb{V}}_0(c^*_{\mathrm{US}}(\mathbf{s}), \ell(\mathbf{s}))$$

- Similar decomposition applies to leisure.

Back

Political Support for Wealth Taxes

Fraction with Positive Welfare Gain-**Optimal Capital Inc. Tax**

	Productivity group								
Age	z_1	z_2	z_3	z_4	z_5	z_6	z_7	z_8	z_9
20–25	0.96	0.95	0.95	0.98	0.99	0.99	0.99	0.99	0.99
25–34	0.97	0.97	0.96	0.98	0.97	0.96	0.94	0.90	0.85
35–44	0.95	0.94	0.92	0.95	0.93	0.88	0.80	0.68	0.58
45–54	0.88	0.88	0.86	0.89	0.85	0.78	0.66	0.53	0.43
55–64	0.68	0.67	0.68	0.72	0.69	0.62	0.52	0.41	0.31
65–74	0.09	0.05	0.14	0.22	0.22	0.21	0.18	0.15	0.11
75+	0.12	0.12	0.13	0.15	0.15	0.15	0.13	0.11	0.09

Political Support for Wealth Taxes

Fraction with Positive Welfare Gain-**Optimal Wealth Tax**

	Productivity group								
Age	z_1	z_2	z_3	z_4	z_5	z_6	z_7	z_8	z_9
20–25	0.97	0.97	0.95	0.93	0.93	0.94	0.93	0.90	0.87
25–34	0.98	0.98	0.96	0.93	0.90	0.86	0.77	0.59	0.43
35–44	0.97	0.97	0.94	0.87	0.80	0.66	0.48	0.35	0.27
45–54	0.93	0.93	0.88	0.79	0.68	0.55	0.42	0.32	0.25
55–64	0.73	0.72	0.67	0.59	0.51	0.41	0.33	0.25	0.19
65–74	0.00	0.02	0.01	0.02	0.01	0.01	0.01	0.00	0.00
75+	0.00	0.00	0.04	0.03	0.02	0.02	0.01	0.01	0.00

Political Support for Wealth Taxes

Frac. with Pos. Welfare Gain-**Optimal Wealth Tax with Threshold**

	Productivity group								
Age	z_1	z_2	z_3	z_4	z_5	z_6	z_7	z_8	z_9
20–25	0.97	0.97	0.95	0.93	0.93	0.94	0.93	0.90	0.86
25–34	0.98	0.98	0.96	0.93	0.90	0.85	0.77	0.57	0.42
35–44	0.97	0.97	0.94	0.87	0.79	0.66	0.48	0.35	0.27
45–54	0.93	0.92	0.87	0.79	0.68	0.55	0.42	0.32	0.25
55–64	0.79	0.78	0.74	0.65	0.56	0.46	0.36	0.28	0.21
65–74	0.70	0.63	0.65	0.57	0.49	0.42	0.34	0.26	0.20
75+	0.93	0.92	0.90	0.84	0.78	0.68	0.55	0.43	0.34