

The macroeconomic and distributional effects of progressive wealth taxes

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Capital is back!

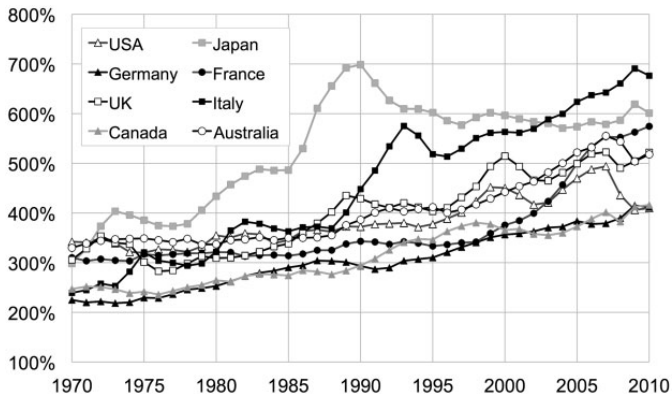
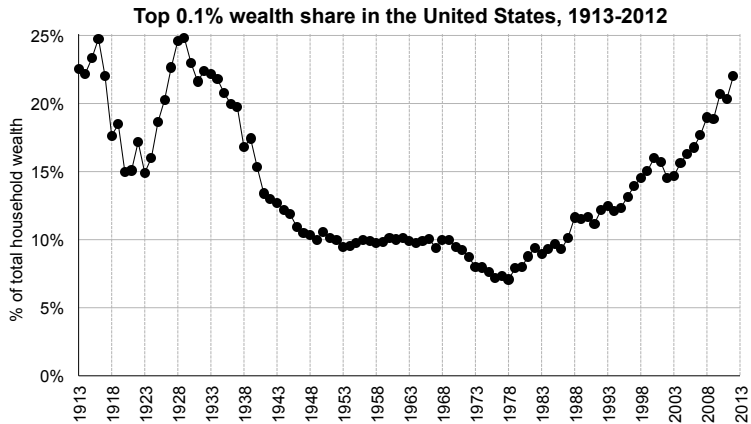


FIGURE I

Private Wealth-National Income Ratios, 1970–2010

Source : Piketty and Zucman, 2014 (QJE)

Distribution of Wealth in US



This figure depicts the share of total household wealth held by the 0.1% richest families, as estimated by capitalizing income tax returns. In 2012, the top 0.1% includes about 160,000 families with net wealth above \$20.6 million. Source: Appendix Table B1.

Source : Saez and Zucman, 2015 (QJE)

Piketty's Hypothesis

- Capitalist system is doomed !
 - K/Y ratio will rise indefinitely.
 - Wealth will become increasingly concentrated.
- Solution : A global wealth tax on the super wealthy.

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Piketty's Wealth Tax Proposal

Basic Proposal

Net Worth (euros)

From	To	Tax Rate	Percentile*
0	1,000,000	0	%
1,000,000	5,000,000	1%	4.0 - 0.4
5,000,000	and over	2%	<0.4

Broad Proposal

Net Worth (euros)

From	To	Tax Rate	Percentile
0	200,000	0	
200,000	1,000,000	0.5%	46.0 - 4.0%
1,000,000	5,000,000	1%	4.0 - 0.4%
5,000,000	and over	2%	<0.4

* assuming a pareto distribution with a tail index of 1.4.

Pros and Cons of Wealth Taxation

Proponents

- Social equity and peace
- Efficient allocation of capital (Güvener 2015)

Opponents

- Lower output and growth
- Tax avoidance and capital flight
- Administrative burden
- Liquidity issues

This paper

What are the macroeconomic and distributional implications of
Piketty's wealth tax proposal?

Preliminary Finding :

*Even in the absence of practical challenges, a progressive wealth tax may fail
to achieve its equity objectives.*

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Piketty's wealth tax proposal?

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*Even in the absence of practical challenges, a progressive wealth tax may fail
to achieve its equity objectives.*

Methodological Approach

- Build a quantitative model of an economy with realistic earnings and wealth inequality
- Calibrate the model economy to the U.S. economy in 2010
- Simulate the effects of Piketty's wealth tax proposal
- Form predictions of short-run and long-run distributions of welfare

Model

Aiyagari-Bewley-Huggett *à la* Castañeda et al., *JPE* 2003

- Life-Cycle and Intergenerational Income Risk
- Retirement
- Superstars
- ⇒ Matches income and wealth inequality well

Institutions :

- Social security
- Corporate, Estate, Income and Sales Taxation
- Exogenous government expenditures

Household's Problem

$$V(k, z, \mathcal{R}) = \max_{c, x \geq 0, h \in [0, 1]} \left\{ \frac{c^{1-\sigma}}{1-\sigma} - \theta \frac{h^{1+\epsilon}}{1+\epsilon} + \beta \mathbb{E}[V(k', z', \mathcal{R}') | z] \right\}$$

subject to

$$\begin{aligned} c(1 + \tau_s) + x &= y^d(wzh, rk, \omega(z, \mathcal{R})) + k - \tau_p(k), \\ k' &= x - E(x, \mathcal{R}, \mathcal{R}') \\ x &\geq 0 \end{aligned}$$

Income Tax System and Disposable Income

- Taxation of Corporate Income :

$$\tau_c \max(rk - d_c, 0)$$

- Adjusted Gross Income :

$$y_{agi} = wzh + \min(rk, d_c) + \omega(z, \mathcal{R})$$

- Taxation of Personal Income :

$$y_{agi} - \lambda [\min(y_{agi}, y_b)]^{1-\tau_l} - (1 - \tau_{\max}) \max(y_{agi} - y_b, 0)$$

- $0 \leq \tau_l \leq 1$ measures the degree of progressivity.
 - Permits net transfers (e.g. EITC).
 - τ_{\max} is the top MTR, applicable for $y > y_b$.
- Taxation of Estates : $E(x)$ piecewise linear as in the law. ▶ $E(\cdot)$

Demographics and Labor Productivity

$$\Pi = \left[\begin{array}{c|cc} & z_W & z_R \\ \hline z_W & \Pi_{WW} & \Pi_{WR} \\ z_R & \Pi_{RW} & \Pi_{RR} \end{array} \right]$$

Demographics and Labor Productivity

$$\Pi = \left[\begin{array}{c|cc} & z_W & z_R \\ \hline z_W & \Pi_{WW} & \Pi_{WR} \\ z_R & \Pi_{RW} & \Pi_{RR} \end{array} \right]$$

$$\Pi_{WW} = \left(\begin{array}{c|cccccc} & f_L + a_L & f_L + a_H & f_H + a_L & f_H + a_H & z_{awel} & z_{aweh} \\ \hline f_L + a_L & A_{11} & A_{12} & 0 & 0 & \lambda_{in} & 0 \\ f_L + a_H & A_{21} & A_{22} & 0 & 0 & \lambda_{in} & 0 \\ f_H + a_L & 0 & 0 & A_{11} & A_{12} & \lambda_{in} & 0 \\ f_H + a_H & 0 & 0 & A_{21} & A_{22} & \lambda_{in} & 0 \\ z_{awe_l} & \lambda_{out} & \lambda_{out} & \lambda_{out} & \lambda_{out} & \lambda_{ll} & \lambda_{lh} \\ z_{awe_h} & 0 & 0 & 0 & 0 & \lambda_{hl} & \lambda_{hh} \end{array} \right)$$

▶ other Π 's

Income Process : Intergenerational

$$\Pi = \left[\begin{array}{c|cc} & z_W & z_R \\ \hline z_W & \Pi_{WW} & \Pi_{WR} \\ z_R & \Pi_{RW} & \Pi_{RR} \end{array} \right]$$

$$\Pi_{RW} = \left(\begin{array}{c|cccccc} & f_L + a_L & f_L + a_H & f_H + a_L & f_H + a_H & z_{awe_1} & z_{awe_h} \\ \hline f_L + a_L & F_{11} & 0 & F_{12} & 0 & \phi_{in} & 0 \\ f_L + a_H & F_{11} & 0 & F_{12} & 0 & \phi_{in} & 0 \\ f_H + a_L & F_{21} & 0 & F_{22} & 0 & \phi_{in} & 0 \\ f_H + a_H & F_{21} & 0 & F_{22} & 0 & \phi_{in} & 0 \\ z_{awe_1} & \phi_{out_1} & 0 & \phi_{out_2} & 0 & \phi_{ff} & 0 \\ z_{awe_h} & \phi_{out_1} & 0 & \phi_{out_2} & 0 & \phi_{ff} & 0 \end{array} \right)$$

Later : $\phi_{in} = \phi_{ff} = 0$, $\phi_{out_1} = F_{21}$, $\phi_{out_2} = F_{22}$

Closing the Model

- Firms

$$r = F_K(K, N) - \delta$$

$$w = F_N(K, N)$$

- Markets Clear
- Government

$$\text{Corporate Tax} + \text{Income Tax} + \text{Estate Tax} + \text{Sales Tax} + \text{Wealth Tax} \\ = \text{Transfers} + G$$

Quantitative Exercise

- Calibrate the model to match the 2010 economy (?).
- Introduce Piketty's progressive wealth tax.
- Analyze welfare implications at the steady-state and along the transitional phase.

Model Calibration

Parameter	Value	Data Target and Value
<i>Preset Parameters</i>		
σ	1.1	Risk Aversion
α	0.36	Capital Income Share
δ	0.079	$K/Y = 3.0$
μ_r	0.022	Average Career Length of 45 yrs.
μ_d	0.067	Average Retirement Length of 15 yrs.
<i>Taxes</i>		
τ_l	0.08	Average income tax burden on top 1%
τ_c	0.236	Marginal Corporate Tax Rate, Gravelle (2010)
τ_e		Actual Estate Tax Schedule
τ_s	0.05	Sales tax revenue/GDP
γ	0.108	$G/Y = 0.17$

Model Calibration

Parameter Value		Data Target and Value	
<i>Productivity Process</i>			
ρ_{lc}	0.985	Kindermann and Krueger (2014)	
ρ_{ig}	0.30	Solon (1992)	
σ_a	0.5×0.38	household earnings variance	0.71
σ_f	0.5×0.62	share of fixed effects	0.62
<i>Jointly Calibrated Parameters</i>			
β	0.958	Interest Rate	0.028
θ	12	mean hours	0.35
ϵ	1.67	Frisch elasticity	0.6
ψ^*	0.215	(Pension+Medicare)/GDP	8%
d_c/r	$0.47 \times K$	Corporate tax revenue/GDP	1.9%

Results : Income Process

$z_W \backslash z_W$	6.7	19.2	20.5	58.4	61.4	1222
6.7	0.967	0.009	0	0	0.002	0
19.2	0.006	0.970	0	0	0.002	0
20.5	0	0	0.967	0.009	0.002	0
58.4	0	0	0.006	0.970	0.002	0
61.4	0.034	0.034	0.034	0.034	0.826	0.014
1222	0	0	0	0	0.205	0.773

 $\Pi_{WW} :$

Top 1% earnings dynamics :

	model	data
persistence	0.74	ca. 0.75
std. dev. of log earnings growth	0.76	1.1
skewness of log earnings growth	-1.72	-1.26
kurtosis of log earnings growth	14	18

▸ Π_{RW}

Income and Wealth Inequality in 2010

	Top Percentile							Gini
	0.5%	1%	5%	10%	20%	40%	60%	
Wealth Share (Data)	0.31	0.40	n/a	0.74	0.83	0.95	0.99	0.82
Wealth Share (Model)*	0.43	0.52	0.74	0.86	0.98	1.0	1.0	0.92
Income Share (Data)	0.16	0.20	0.35	0.46	0.62	0.82	0.94	0.43
Income Share (Model)	0.16	0.20	0.34	0.45	0.53	0.75	0.88	0.43
Earnings Share (Data)	0.12	0.16	0.33	0.47				0.42
Earnings Share (Model)	0.17	0.21	0.34	0.47	0.57	0.72	0.90	0.42

Caveat : * Long-run wealth distribution associated with 2010 institutions and income structure.

Benchmark Average Tax Rates by Income Group

	Corporate Tax			Estate Tax			Income Tax		
	1%	99%	R/Y	1%	99%	R/Y	1%	99%	R/Y
Data	5.1	1.9	1.9	2.2	0	0.3	25.8	19.4	23
Model	4.6	1.7	1.9	2.5	0.3	0.7	27.6	22.7	24

Note.— *R/Y* stands for revenue as a fraction of GDP. The data values come from NIPA and from Joulfaian (2013). The data values for the top 1% and 99% are taken from Piketty and Saez (2007).

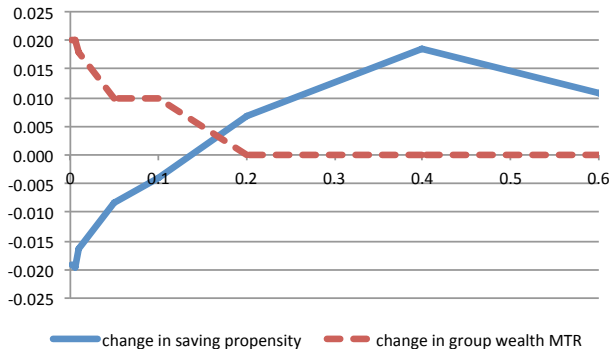
Aggregate implications of progressive wealth taxes

Scenario	K	N	Y	C	w	r (%)	ATY (%)
benchmark	100	100	100	100	100	2.8	24.2
wealth taxes :							
basic progressive	86.8	98.9	94.4	97.1	95.4	3.7	20.7
broad progressive	85.2	99.2	94.0	97.1	94.7	3.9	19.7
flat	89.9	100.0	96.2	98.6	96.2	3.5	20.3

Composition of tax revenue (% of GDP) : steady-state

Scenario	Tax on					Total tax revenue
	wealth	income	corporate	estates	sales	
benchmark	0	20.0	1.9	0.7	1.3	23.8
wealth taxes :						
basic progressive	2.4	17.7	2.3	0.4	1.3	24.1
broad progressive	3.0	17.0	2.4	0.4	1.3	24.1
flat	2.3	17.3	2.3	0.6	1.3	23.9

Savings response to progressive wealth taxes



Note : The saving propensity is defined as $k' / (k + y^d)$.

Distribution of key variables : steady-state comparison

Scenario	Wealth group				Gini coefficient
	Top 1%	Top 5%	Top 10%	Top 20%	
<i>Wealth :</i>					
benchmark	52.0	73.2	85.5	98.1	0.922
basic wealth tax	40.7	62.7	75.4	93.2	0.875
broad wealth tax	42.9	64.7	78.2	94.1	0.885
flat wealth tax	52.9	74.1	86.2	98.4	0.925
<i>Income :</i>					
benchmark	14.0	28.3	39.7	54.9	0.534
basic wealth tax	14.3	29.9	39.5	54.5	0.531
broad wealth tax	14.6	29.4	40.1	55.1	0.534
flat wealth tax	15.1	29.7	41.1	55.8	0.539

Distribution of key variables : steady-state comparison

Scenario	Wealth group				Gini coefficient
	Top 1%	Top 5%	Top 10%	Top 20%	
<i>Disposable income :</i>					
benchmark	12.9	26.2	36.8	51.4	0.485
basic wealth tax	12.7	27.2	36.3	50.7	0.479
broad wealth tax	12.9	26.6	36.8	51.2	0.481
flat wealth tax	13.5	27.0	37.7	51.9	0.487
<i>Earnings :</i>					
benchmark	10.7	26.2	38.9	55.1	0.566
basic wealth tax	11.9	28.8	39.0	53.9	0.566
broad wealth tax	11.8	28.0	39.1	54.5	0.565
flat wealth tax	11.0	26.7	39.4	55.1	0.563
<i>Consumption :</i>					
benchmark	13.8	26.2	36.6	51.5	0.452
basic wealth tax	11.1	24.8	34.5	49.1	0.430
broad wealth tax	11.2	24.2	34.6	49.2	0.431
flat wealth tax	13.1	25.4	35.9	50.5	0.444

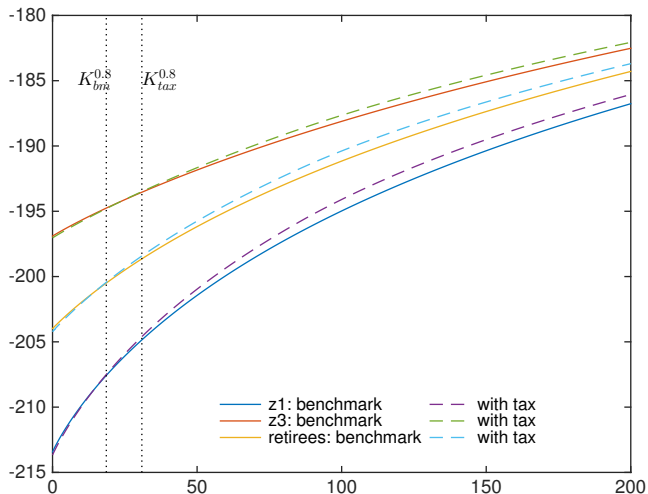
Income tax burden for different income groups : steady-state comparison

Scenario	Income group				
	Top 1%	1-5%	5-10%	10-20%	Bottom 80%
benchmark	27.6	26.5	27.5	21.2	19.3
basic wealth tax	27.0	23.6	23.4	16.5	15.6
broad wealth tax	26.3	22.5	22.6	15.6	14.6
flat wealth tax	25.5	22.6	23.9	17.2	15.1

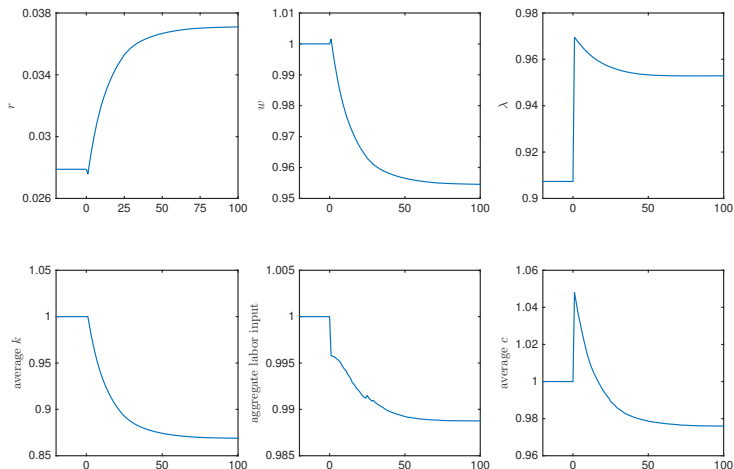
Welfare of different wealth groups : steady-state comparison

Scenario	Wealth group				
	Top 1%	1-5%	5-10%	10-20%	Bottom 80%
<i>Workers and retirees :</i>					
basic wealth tax	-6.80	-0.19	0.35	0.62	0.22
broad wealth tax	-6.38	-0.36	0.12	0.02	0.25
flat wealth tax	-1.82	-0.73	-0.35	-0.76	0.16
<i>Workers :</i>					
basic wealth tax	-7.24	-0.21	0.39	0.22	0.22
broad wealth tax	-6.76	-0.34	0.16	-0.17	0.21
flat wealth tax	-2.02	-0.70	-0.30	-0.72	0.12
<i>Retirees :</i>					
basic wealth tax	-6.50	-0.97	0.64	1.63	0.25
broad wealth tax	-6.13	-1.04	0.20	0.72	0.33
flat wealth tax	-1.92	-1.21	-0.81	-0.70	0.17

Value functions for selected productivity levels, benchmark and basic progressive wealth tax economies

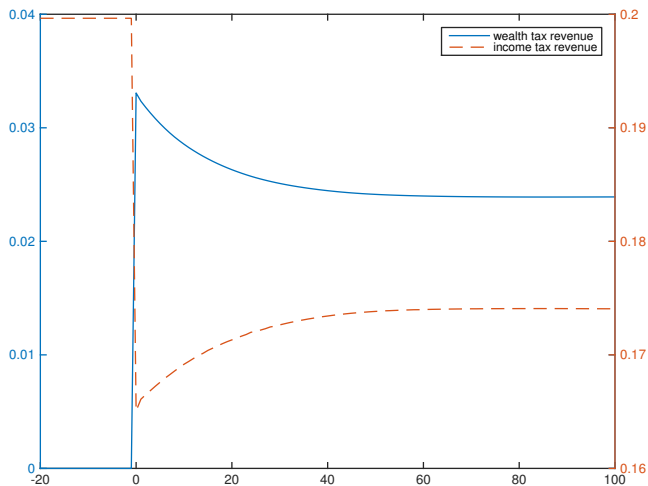


Transitional dynamics



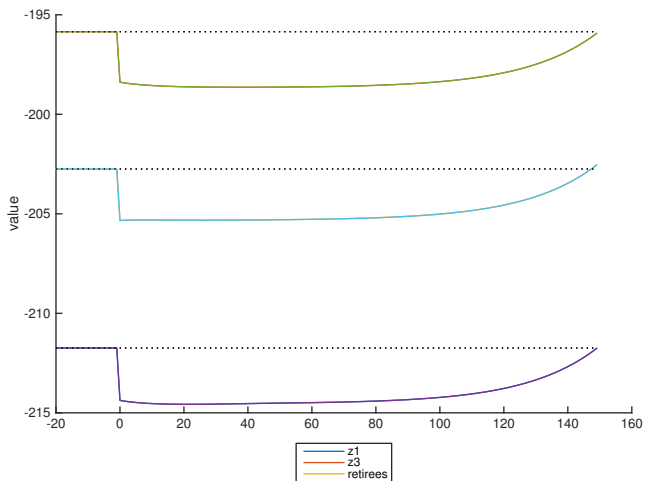
Values relative to the benchmark economy (= 1), except for r and λ . The new tax system with the basic progressive wealth tax scenario goes into effect at $t = 0$.

Revenue from wealth and income taxes (% of GDP)



Note : Income tax revenue on the right axis.

Average welfare for selected productivity levels (...in progress)



Summary of mechanisms at work

- 1 Price Externalities ($w \searrow$ $r \nearrow$)
 - asset poor salaried are hurt.
 - benefits upper middle class who have some assets, but are not touched by the wealth tax.
- 2 Fiscal Externalities
 - drop in income taxes : benefits all, especially the income-poor workers offsetting the decline in pre-tax earnings.
 - less output and earnings : crowds-out existing transfer schemes, e.g. pensions.
- 3 Transitional Dynamics
 - pleasant ride for top groups eating their wealth away.
 - tough ride for the non-wealthy giving up consumption to accumulate wealth.

Conclusion/Discussion

Progressive wealth tax results in ...

- ... substantial tax revenue : 2.4-3.0% of GDP.
- ... large output losses in the long-run : 5-6%.
- ... results in a substantial reduction in wealth concentration : 9.1-11.3 drop in top 1% share.
 - due to a decline in the savings rate of top groups.
 - and to accumulation of new wealth by the rest.
- ... marginal gains in social welfare in the long-run.
- ... dominated by losses in social welfare in the short-run.
 - due to reduced consumption among the non-wealthy in accumulation of new wealth.
 - and to reduction in social transfers, e.g. pension pay.