Taxing the Rich

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Revisit Current Debate on Inequality

- Centered on the high degree of concentration of income and wealth in U.S.
  - for pre-tax distribution of household income: top 1% of richest households held $\approx$ 27% of it in 2016 (SCF)
  - for distribution of household wealth: top 1% of richest households held $\approx$ 39% of it in 2016 (SCF) details
    - much more unequal than all other OECD countries in which wealth share held by top 1% btw 10% and 25%
    - our estimates from SCF (others based on individuals or from different data sources roughly comparable)

- Such degree of inequality has spurred intense debate in U.S. on its causes and the remedies for it

- Specifically, many have recently argued a progressive wealth tax
  - may have a large beneficial impact on distribution of welfare in society
  - with effectively minimal or no adverse effects on real economic activity (Saez and Zucman 2019)
  - is this conjecture correct?

Purpose of Paper

- Propose novel framework for study of income and wealth inequality in which
  - accumulation of wealth plays key role as it helps *align incentives* of managers/executives/entrepreneurs
  - with those of firm owners thereby supporting output and productivity growth in the aggregate
  - this is critical dimension optimal taxation literature has largely ignored

- Show model successfully reproduces distributions of income and wealth in U.S. ("fat" right tails)
  - use framework to quantitatively evaluate merits of alternative income and wealth taxes

- In particular: find wealth taxes distort incentives of managers
  - to select profitable projects and build up managerial expertise (i.e. exert effort and improve productivity)
  - so have large distortionary impact on an economy in contrast to presumption of their advocates

Next: how does our approach differ from those in existing literature?

Two Large Strands of Literature on Wealth Inequality

- On models of entrepreneurs: this literature has focused on role played by entrepreneurs in
  - accounting for top percentiles of wealth distribution (Quadrini 2000, Cagetti and DeNardi 2006)
  - but sizable fraction of income earned by those at top of wealth distribution is *labor income*
  - attributable to executives/managers of publicly-owned firms financed by equity and debt
  - rather than *capital income* from assets of sole owners (i.e. many rich individuals manage publicly-held firms)

- On Aiyagari-Bewley models of incomplete markets: workhorse framework features
  - consumers supplying labor whose productivity stochastically varies over time
  - facing exogenously incomplete financial markets (can only invest in a safe bond) so insure by saving
  - but since incentives for precautionary savings taper off at high levels of wealth
  - hard time at reproducing observed fatter tail of the distribution of wealth than that of income

Outstanding Puzzle

- These models of incomplete financial markets *can* generate a heavy-tailed wealth distribution
  - once augmented with idiosyncratic returns on investments (consumers can invest in risky assets)
  - but this class of models (e.g. Angeletos 2007, Benhabib, Bisin and Zhu 2011, Benhabib and Bisin 2018)
  - has run into a well-known puzzle: why don't agents diversify their portfolios?

- This is the challenge to current economic thinking on wealth inequality
  - how to account for the *dispersion of returns* in economies in which agents would like to hedge risk?

Next: our approach to this puzzle

Our Approach: Focus on Incentives

- Idea: to provide incentives for managers
  - to act in their firms' best interest, capital markets must expose managers to their firms' idiosyncratic risk
  - so managers in our model act like investors facing idiosyncratic investment opportunities

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- This is how we resolve outstanding (Angeletos-Benhabib-Bisin) puzzle: managers do not diversify
  - because their compensation contracts are optimally structured to prevent them from doing so
  - i.e. returns on managers' savings closely tied to the idiosyncratic returns of their firms for incentive reasons
  - this is key mechanism that makes their wealth and the wealth in the economy spread out

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- So key takeaway: we provide a micro-foundation of market incompleteness
  - that is capable of explaining both income and wealth inequality: crucial because to assess impact of taxes
  - need to understand mechanisms giving rise to the observed income and wealth distributions

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- How does our model manage to account for them? Because
  - it gives rise to stochastic returns on assets that do not taper off as wealth ↑
  - since agency problem at core of model if anything more severe at high levels of wealth (income effects)

What Accounts for Our Results on Wealth Taxation?

- Proponents of wealth taxes reach their conclusions by abstracting from critical margin

- Namely, by controlling managers' remuneration and so wealth accumulation
  - managerial compensation contracts help *solve the conflict of interests* between managers and firms
  - do so by rewarding successful managers with wealth increments that move closely with firm fortunes
  - but these compensation schemes expose managers to risk that they dislike
  - so their compensation, unlike what is often contended, is naturally *high* and *variable* for incentive reasons

- Wealth taxes then have detrimental effect on an economy
  - because they distort the contractual alignment of firm and manager incentives
  - hence by discouraging managers from pursuing high-risk/high-return ventures (that require "effort")
  - they exacerbate agency frictions and depress output and productivity as a result

Evidence on U.S. Income and Wealth Inequality

Characteristics of Top Incomes and Wealth

- If consider income sources of those in top 1% of HH income (resp. wealth) distribution 1989-2016
  - wages and salaries: 50% (resp. 38%)
  - business income (farms and sole proprietorship): 14% (resp. 10%)
  - capital income (mutual funds, interests and accrued dividends): 32% (resp. 49%)
  - other (inheritance, scholarships, settlements from lawsuits): 4% (resp. 2%)
  - note: top 1% income cutoff is $620,000 and 1% wealth cutoff is $7.40 million over sample period

    $\rightarrow$ so very large fraction of income for those in top 1% of each distribution is from *labor*

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- As for their occupations: % of those in top 1% of HH income (resp. wealth) distribution who are
  - managers (managerial and professional-specialty occupations): 75% (resp. 65%)
  - entrepreneurs (self-employed active business owners): 47% (resp. 51%)
  - but entrepreneurs who are not managers: 8% (resp. 11%)

    → so many of those in top 1% of each distribution are *managers*

    e.g. even Bill Gates and Paul Allen (Microsoft) or Michael Eisner (Disney) became famously rich by holding their wealth in stock of *one* company that they helped *manage* after it went public

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So understanding determinants of managerial pay seems important to understand those of inequality

Model

Overview: How We Address Income and Wealth Inequality

- Our model revolves around a fundamental incentive problem stemming from
  - notion is relatively easy to monitor workers but difficult to monitor managers: who monitors the monitor?
  - however, managers' actions are critical to firms' productivity and returns
  - for this reason, managers are provided with incentives for performance
  - by linking their compensation to firm value through bonuses, shares, stock options and similar asset grants

- That is, managers' compensation is structured so as to provide incentives
  - that work by *concentrating* rather than *diversifying* their portfolios
  - this incentive mechanism will prove to be the crucial driver of wealth inequality

Economy

- We consider economy composed of workers, managers and financial intermediaries
  - workers supply observable labor services (efficient units of labor)
  - managers provide unobservable labor services ("effort")
  - intermediaries ("firm owners") contract managerial services, hire workers and purchase k to produce

- Output is produced using managerial, capital and labor services according to
  - nested CES production function with k-manager complementarity: $y_t = F(z_{mt}h_{mt}, k_t, \int z_{\ell t}h_{\ell t}d\mu_{\ell t})$
  - h_{mt} and $h_{\ell t}$: manager and worker human capital (HK) at beginning of t
  - k_t: physical capital assigned to manager in t
  - $z_{mt}h_{mt}$ and $\int z_{\ell t}h_{\ell t}d\mu_{\ell t}$: effective managerial labor supply and labor services a manager supervises in t

- Today: focus on simple model in which agents born as workers or managers
  - transit probabilistically across occupational states only at death that occurs at rate ϕ
  - full model: agents can choose to be either managers or workers at any time (in progress)

Manager

- Enters period t with wealth A_{mt} and HK h_{mt} so beginning-of-t state is $s_{mt} = (A_{mt}, h_{mt})$
  - *privately* chooses effort e_{mt} that shifts density of productivity $f_m(z_{mt}|e_{mt})$ in FOSD ($\uparrow e_{mt} \uparrow z_{mt}$)
  - accumulates HK according to standard law of motion $h_{mt+1} = (1 - \delta_m)h_{mt} + B_m z_{mt}^{\gamma_{mz}} h_{mt}^{\gamma_{mh}}$
  - a manager's productivity z_{mt} and wealth A_{mt} are publicly observed

- Managers and financial intermediaries agree to compensation contracts

- Contract for a manager is pair $x_{mt}(s_{mt}) = (w_{mt}(s_{mt}, z_{mt}), A_{mt+1}(s_{mt}, z_{mt}))$ consisting
  - a "wage" (total salary) $w_{mt}(s_{mt}, z_{mt})$ and end-of-period wealth level $A_{mt+1}(s_{mt}, z_{mt})$ for each z_{mt}
  - note: focusing on one-period contracts is without loss if both sides can walk away
  - i.e. show that if intermediaries and managers can freely terminate an existing contract in each t as we allow
  - then an optimal long-term contract can be implemented through a sequence of one-period contracts details

Understanding Managerial Compensation Contracts

- Intermediaries compensate managers with wages and wealth dependent on their productivity
  - so as to balance incentivizing managers to work against insuring them against production risk
  - according to the standard risk-incentive trade-off of moral hazard models

- Not standard: since optimal to tie a manager's compensation to the manager's productivity z_{mt}
  - we endogenize the feature that the *effective return on manager wealth* $A_{mt+1}(s_{mt}, z_{mt})/A_{mt}$
  - has an *idiosyncratic component* based on a manager's realized productivity
  - this feature will prove key to reproducing an empirically plausible wealth distribution

Worker

- Effort is observed and primitives have similar form to manager's but parameterized differently
  - enters period t with wealth A_{wt} and HK h_{wt} so beginning-of-t state is $s_{wt} = (A_{wt}, h_{wt})$
  - chooses effort e_{wt} that shifts density of productivity $f_w(z_{wt}|e_{wt})$ in FOSD ($\uparrow e_{wt} \uparrow z_{wt}$)
  - accumulates HK according to law of motion $h_{wt+1} = (1 - \delta_w)h_{wt} + B_w z_{wt}^{\gamma_{wz}} h_{wt}^{\gamma_{wh}}$
  - a worker's productivity z_{wt} and wealth A_{wt} are publicly observed

- Crucially, managers and workers differ in their contribution to output
  - managers' services are *complementary* to capital whereas workers' services are *substitutes* for it
  - as in setup of Krusell, Ohanian, Rios-Rull and Violante (2001)

- Contract for worker $x_{wt}(s_{wt}) = w_{wt}(s_{wt}, z_{wt})$ simply consists of
  - a wage w_{wt} for each realized level of productivity (efficiency units $z_{wt}h_{wt}$)
  - so worker problem is similar to that in standard Aiyagari-Bewley model
  - note: because of this feature it is irrelevant if their effort is observable or not

Financial Intermediary

- Given rental rates R and w_w for capital k and worker ℓ services, intermediaries
  - choose k and ℓ for each manager in order to maximize profits *per unit* of managerial input
  - by solving the corresponding problem with value $\Pi(w_w, R) = \max_{k,\ell}\{F(1, k, \ell) - Rk - w_w\ell\}$

- We assume market for intermediaries is perfectly competitive timing
  - so expected profits from manager with HK h_m under a contract paying $w_m(z_m)$ to induce e_m will be zero

$$\int_{z_m} [\Pi(w_\ell, R) z_m h_m - w_m(z_m)] \, f(z_m|e_m) dz_m = 0$$

Next: manager and worker problems and equilibrium are defined in the natural way

Managerial Contracting Problem in Recursive Form

- Consists of choosing contingent one-period contracts $(w(s,z), A'(s,z))$ to induce effort e

$$V(A,h) = \max_{e,c(z),w(z),A'(z)} \int_z \left[u(c(z),e) + \beta V(A'(z),h'(z))\right] f(z|e)dz$$

- Subject to a manager's budget constraint: $c(z) + A'(z)/R = w(z) + A$ (m is suppressed)

- To law of motion of a manager's human capital: $h' = (1-\delta)h + Bz^{\gamma_z}h^{\gamma_h}$

- To the incentive-compatibility constraint for a manager's effort:

$$e = \arg\max_{\tilde{e}} \int_z \left[u(c(z),\tilde{e}) + \beta V(A'(z),h'(z))\right] f(z|\tilde{e})dz$$

- To the non-negative expected profit constraint for intermediaries:

$$\int_z \left[\Pi(w_w,R)zh - w(z)\right] f(z|e)dz \geq 0$$

Worker Problem and Equilibrium

- Workers solve standard consumption-savings problem

$$V_w(A,h) = \max_{e,c(z),A'(z)} \int [u(c(z),e) + \beta V_w(A'(z),h'(z))] f_w(z|e) dz$$

$$\text{subject to} \quad c(z) + \frac{A'(z)}{R} \leq w_w z h + A$$

- In this economy a stationary equilibrium consists of
  - rental prices R and w_w for capital and labor
  - measures $\mu_m(s)$ and $\mu_w(s)$ of managers and workers
  - an aggregate capital stock k
  - value functions and optimal decision rules for managers, workers and intermediaries
  - such that all agents optimize and markets clear

To Illustrate How Our Model Works

- Consider a simple instance of our model under the assumptions that
  - the rental rates R and w_w for capital and labor are given
  - the law of motion of HK simplifies to a linear form: $h'_m(z_m) = B_m z_m^{\gamma_{mz}} h_m$
  - but utility as in the general model: CRRA in a consumption-leisure index $c^\gamma g(1-e)^{1-\gamma}$ ($g(\cdot)$ decreasing)

$$u(c, 1-e) = \frac{(c^\gamma g(1-e)^{1-\gamma})^{1-\sigma}}{1-\sigma}$$

  - note these preferences are consistent with balanced growth

- We show this simple partial-equilibrium version of model with only managers
  - generates a thick right tail for distribution of wealth
  - as a manager's compensation contract implies an increasingly large spread in wealth
  - similar intuition applies to full general-equilibrium model

How Does Our Model Generate Wealth Inequality?

- For this version of model: it is easy to show that the manager value function has a certain form

$$V(A,h) = \frac{A^{1-\sigma}}{1-\sigma}\phi\left(\frac{h}{A}\right)$$

  - it is homogeneous of degree $1-\sigma$ in state $s=(A,h)$

- Given this form, can show that equilibrium contract implies that e, w and A' policies are such that

$$e(s) = \alpha_e\left(\frac{h}{A}\right), \quad w(s,z) = \alpha_w\left(\frac{h}{A},z\right)A \quad \text{and} \quad A'(s,z) = \alpha_A\left(\frac{h}{A},z\right)A$$

  - effort is homogeneous of degree 0 in state $s=(A,h)$
  - wages/assets homogeneous of degree 1 (linear) in state s: depend on z and linear in current assets given h/A

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  - wages/assets homogeneous of degree 1 (linear) in state s: depend on z and linear in current assets given h/A

- Note that here w, A' and c vary with z so model gives rise to *endogenously* incomplete markets
  - in that comovement of consumption and wealth with z is merely due to incentive reasons: w/o moral hazard
  - c would be constant across productivity states (so full risk-sharing) and A accumulation would be undistorted
  - in particular: managers are optimally made *not to diversify* for incentive reasons

Details of Result: Intuition

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- Since the optimal asset policy implies that future assets grow linearly in current A

$$A'(s,z) = \alpha_A\left(\frac{h}{A}, z\right) A$$

  - in equilibrium wealth undergoes compound growth with per-period growth rate of $\alpha_A\ (h/A,\ z)$
  - that depends on manager's stochastic z
  - thus if A and $h \approx$ grow at same rate, randomness in z implies wealth follows *geometric* random walk process

- This process is known to generate an arbitrarily large degree of inequality in distribution of wealth
  - we derive a bounded stationary distribution by introducing "death" for managers

- This is how our model gives rise to a wealth distribution that matches the observed one

Details of Result: Logic of Portfolio Choice Problem

- Observe this result extends logic of Merton and Samuelson' (1969) portfolio-choice model
  - for consumer w/ CRRA preferences: show invests a fixed proportion of wealth in a risky and in a safe asset
  - with factor of proportionality that depends on stochastic return on it
  - so resulting wealth distribution exhibits arbitrarily large degree of dispersion

- Our result is similar in form but intuition is different: due to moral hazard
  - an optimal managerial compensation contract links a manager's *future* asset holdings
  - to the manager's *current productivity* z
  - hence *endogenously* gives rise to stochastic returns on wealth (instead *given* in Merton and Samuelson' model)

Details of Result: Income and Wealth Distributions

- Now same argument applies to the distribution of income but in data income has *thinner* right tail
- How does model generate a thicker tail for wealth distribution than for income distribution?
  - answer is simple: whenever *future assets* grow with current A faster than *wages* increase with current A
  - equivalently, by a manager's budget constraint, whenever slope of consumption schedule in z is not too high

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- This occurs when difficult to infer e from manager productivity z thus moral hazard hard to solve
  - i.e. when likelihood ratio $\partial \log f(z|e)/\partial e = f_e(z|e)/f(z|e)$ does not increase fast with z
  - so high z's do not convey much "good news" about effort: in this case inducing a steep wealth accumulation path
  - helps support effort incentives (wages are insufficient as an incentive instrument)

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- Idea: controlling manager A in addition to w allows inter'y to fine-tune pay variability within/across t
  - since inter'y can now reward manager's productivity through increases in *either* current *or* future consumption
  - then, by reducing the variability of current consumption, inter'y can provide *same* incentives at lower cost

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- These intuitions extend to general model so explain how model works in theory. How well in practice?

Model vs. Data

To Quantify Model

- Consider nonseparable preferences of the form $u(c, 1-e) = (c^{\gamma}(1-e)^{1-\gamma})^{1-\sigma}/(1-\sigma)$
  - parameterized ($\gamma = 0.9$ and $\sigma = 2$) so that RRA coefficient is 1.7 (calculated as $\gamma[1-\gamma(1-\sigma)]$)
  - consistent with estimates in literature
  - e.g. Herranz, Krasa and Villamil (2015) estimate 1.6 for entrepreneurs (Survey of Small Business Finances)

- Human capital function for $i = m, w$ given by $h_{it+1} = (1-\delta_i)h_{it} + A_i z_{it}^{\gamma_{iz}} h_{it}^{\gamma_{ih}}$
  - estimated to match income profiles of managers and workers in PSID

- Select parameters of production function to reproduce income shares of managers and workers in SCF

- We choose probability of transition from manager to worker and worker to manager
  - to match fraction of managers and workers in SCF

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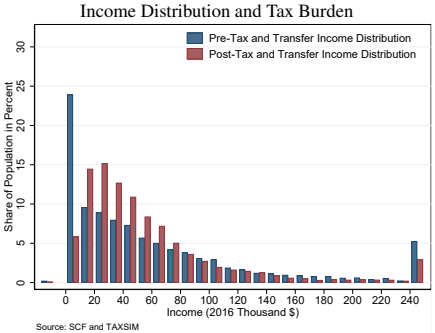
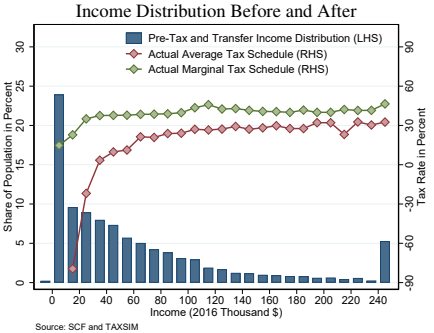
- Thought experiment of interest: evaluate wealth taxes in the context of current U.S. tax-transfer system

Next: how do we account for its progressivity in our baseline exercise?

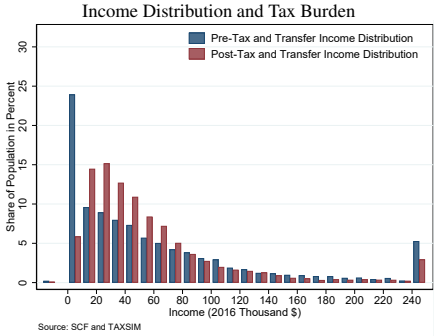
Income Distribution Before and After Taxes and Transfers

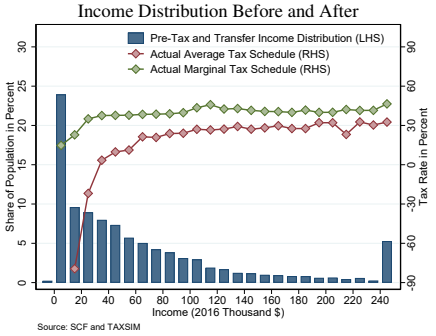




Important since system is redistributive especially at low income levels (implies negative average tax rates)

Income Distribution Before and After Taxes and Transfers





Left panel shows achieved redistribution (sizable) and right the average-marginal tax schedules at each pctile

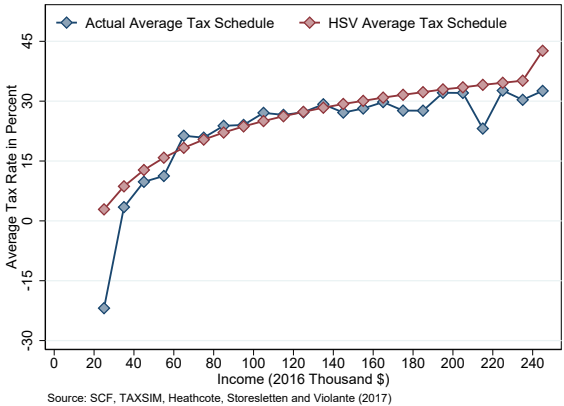
How We Capture Level and Progressivity of U.S. Tax System

- We follow approach of Heathcote, Storesletten and Violante (2017) (HSV)
  - who flexibly describe the U.S. income tax and transfer system through the function $T(y) = y - \lambda y^{1-\tau}$

- To understand it, consider the parameter τ that measures the degree of progressivity of the system
  - $\tau = 1$: the system achieves full redistribution with $T(y) = y - \lambda$ and $y = \lambda$
  - $0 < \tau < 1$: is progressive with marginal tax rates above average ones ($T'(y) > T(y)/y$)
  - $\tau = 0$: is proportional with linear taxes of rate $T'(y) = T(y)/y = 1 - \lambda$

- Using data from the PSID, TAXSIM and SSA on income pre and post taxes and transfers
  - these authors estimate τ to be equal to 0.181 and set λ to 0.894 so that tax revenues amount to 19.2% of GDP
  - i.e. the average observed government expenditure (on goods and services) over the period 2000-2006
  - we obtain very similar estimates from IRS and TAXSIM tax and transfer data
  - in line with those in Auten and Splinter (2019) and Splinter (2020) (JCCT)

Actual and Approximate U.S. Tax Burden



This tax-transfer schedule well approximates actual one (federal and state income taxes and payroll taxes)

Comparing Model to Data: Income and Wealth Distributions

- Find our model fits the U.S. data very well
  - in particular large concentration at top of both income and wealth distributions
  - thicker right tail of wealth distribution than that of income distribution

- In the data between 1989 and 2016: the top
  - 1% of the *income* distribution holds 18% of it
  - 0.1% of the *income* distribution holds 7% of it
  - 1% of the *wealth* distribution holds 36% of it
  - 0.1% of the *wealth* distribution holds 13% of it

- In the model: the top
  - 1% of the *income* distribution holds 16% of it
  - 0.1% of the *income* distribution holds 6% of it
  - 1% of the *wealth* distribution holds 36% of it
  - 0.1% of the *wealth* distribution holds 15% of it (if anything model produces more inequality)

Wealth Taxes

How About Wealth Taxes?

- Since the U.S. tax system does not tax wealth
  - start by reviewing the experience of OECD countries that have been levying wealth taxes

- Will then evaluate in the context of the U.S.
  - the effect of wealth taxes similar to those adopted by these countries
  - as well as impact of wealth tax proposal advanced by Senator Warren (Sen. Sanders's one: in progress)
  - by analyzing what would happen if U.S. implemented them

Next: begin with overview of international experience with wealth taxes

Wealth Taxes: OECD Experience

- Only three OECD countries currently levy a wealth tax
  - namely, Norway, Spain and Switzerland
  - in each of these countries the tax provides a relatively trivial percentage of the country's tax revenues
  - other countries like Belgium, France, Italy and the Netherlands *only* impose a wealth tax on selected assets
  - e.g. in Italy tax applies to real estate properties and financial investments outside of Italy

- However many other countries (13) had a wealth tax up to 1990s
  - when a repealing wave took momentum

Next: table providing brief history of implementations and repeals among OECD countries

Implementations and Repeals of Wealth Taxes in OECD

Wealth Taxes in OECD Countries in Percentage of Tax Revenues

	1995	2005	2010	2018
Switzerland	2.86	3.36	3.40	3.88
Norway	1.31	1.02	1.12	1.15
Iceland	1.16	–	–	–
Netherlands	0.55	0.03	0.01	–
Spain	0.53	0.52	0.21	0.53
Sweden	0.41	0.36	–	–
Germany	0.26	0.01	–	–
France	0.25	0.40	0.53	–
Italy	0.21	–	–	–
Denmark	0.19	–	–	–
Finland	0.08	0.18	–	–
Austria	0.06	–	–	–
Greece	0.05	–	–	–
Countries with Wealth Tax	13	8	5	3

- Thirteen OECD countries had a wealth tax in 1995 (OECD Global Revenue Statistics)
- Switzerland was the country that raised the largest tax receipts, Greece the one that raised the smallest
- Five countries already opted out 10 years later: some of those who kept them raised much ↓ revenues
- Overall generated a very small amount of revenues: all but three countries gave up on them by 2019

Reasons for Repeal of Wealth Taxes

- Why have they not been successful? For reasons related to their design and enforcement, primarily
  1. the small revenues they tend to raise
  2. their high administrative costs (e.g. to valuing assets not largely traded and private businesses)
  3. erosion of tax base they trigger (rich individuals, responsible for the greatest overall tax burden, migrate out)

- According to survey of 400 wealthiest Norwegians by consulting firm NHHS (Bloomberg June 3, 2021)
  - the tax seems to have had major impact on decision to move among those who have moved abroad
  - but finance minister Mr. Sanner has also voiced concerns about capital flight/job creation should a new gov't ↑ tax

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- Since these taxes entail a double taxation of the income that has generated the taxed wealth
  - tend to be unpopular among those much below the top 1%: this is because in order to generate revenues
  - the tax usually cuts deeper into the wealth distribution than 1st percentile (e.g. Switzerland and Norway)

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Next: U.S. wealth-tax experiments

Wealth Tax Experiments in the United States

- Will proceed by evaluating the impact of introducing in the U.S. the wealth tax
  - currently implemented in Switzerland and Norway
  - as well as that proposed by Senator Warren
  - overall: tension emerges btw degree of inequality reduction achieved or revenues raised and distortions introduced

- A common theme to these experiments
  - if goal is to achieve a certain decrease in inequality
  - a wealth tax would cause great output and consumption losses *across* the income distribution not just for rich

First Wealth Tax Experiment: Introducing Swiss Tax

- Wealth tax schedule in Canton of Geneva, the most progressive one, can be well approximated by

$$T(A) = \begin{cases} 0 & \text{if } A \leq A_0 = 50\% \\ A - \lambda_A A^{1-\tau_A} & \text{if } A > A_0 \end{cases}$$

- Applies to A above A_0 or 50th percentile of U.S. pre-tax wealth distribution (GDP p.c. $80,450)
  - λ_A and τ_A estimated to match the observed marginal tax rate that ranges from 0.06% to 0.92%

- Once we simulate introduction of this tax in U.S. economy, we find
  - share of wealth at top 1% of wealth distribution declines from 36% to 35%
  - share of wealth at top 0.1% of wealth distribution barely changes
  - output falls by 3%, consumption by 4% and employment slightly declines ($\downarrow e, \downarrow k, \downarrow$ productivity, $\downarrow$ output)
  - tax revenues are 2.8% of output so contribute little to total revenues

- So the tax reduces inequality but at great cost to the economy and for the benefit of little revenues

Second Wealth Tax Experiment: Introducing Norwegian Tax

- The Norwegian wealth tax schedule has this form

$$T(A) = \begin{cases} 0 & \text{if } A \leq A_0 = 60\% \\ \tau_A(A - A_0) & \text{if } A > A_0 \end{cases}$$

- The tax applies to net wealth above NOK 1.5M ($180,000) with rate 0.85% (GDP p.c. $75,500)
  - A_0 corresponds to the 60th percentile of U.S. pre-tax wealth distribution

- Once we simulate introduction of this tax in U.S. economy, we find
  - share of wealth at top 1% of wealth distribution barely declines
  - share of wealth at top 0.1% of wealth distribution declines from 15% to 11%
  - output falls by 4%, consumption by 3% and employment by 4% ($\downarrow e, \downarrow k,$ $\downarrow$ productivity, $\downarrow$ output)
  - tax revenues are 1.34% of output so again contribute little to total revenues

- So the tax reduces inequality but at great cost to the economy and for the benefit of little revenues

Third Wealth Tax Experiment: Introducing Warren Proposal

- Senator Warren's proposal consists of a tax on wealth
  - with a rate of 2% on wealth over $50 million that increases to 4% for wealth over $1 billion

- Such a tax would raise very little revenues: less than 0.1% of output (GDP p.c. $60,000)

- Specifically, once we simulate introduction of this tax in U.S. economy, we find
  - share of wealth at top 1% of wealth distribution declines from 36% to 35.8%
  - share of wealth at top 0.1% of wealth distribution declines from 15% to 14.9%
  - output, consumption and employment fall by 0.001%
  - tax revenues are 0.08% of output so contribute very little to total (abstracting from impl'n cost and tax avoidance)

- The tax is not that distortionary but achieves a very minor reduction in inequality

What Is the Logic of the Distortions?

- When wealth taxes raise any revenues they are highly distortionary. Why?
- Recall that in order to align the incentives of managers with those of intermediaries
  - managers' compensation is tied to firm performance
- But this exposes managers to risk: since managers are risk averse
  - connecting their remuneration to firm performance
  - raises managers' expected compensation to offset the greater uncertainty they face
  - so incentive considerations lead managers' compensation to be *high* and *variable*
- As a result: taxing managers' wealth worsens agency frictions by weakening managers' incentives
  - correspondingly reduces not only their income and wealth but also aggregate productivity and output
- In fact there would be *fewer* millionaires to start with in an economy without agency costs

Impact of Wealth Taxes: Intuition

- To elaborate, key to the distortions are agency frictions
  - if we were to consider an economy *without* them
  - wealth taxes of the size of those in Switzerland or Norway would reduce output, consumption and employment
  - *only* by 0.1 to 0.5 pctg. points

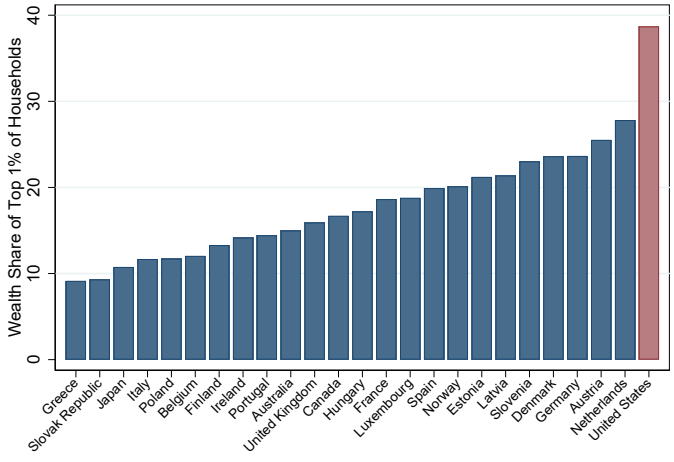
- In our economy *with* agency frictions instead
  - wealth taxes cause output, consumption and employment to decline by much greater percentages
  - because they make it too expensive to induce high levels of effort and support managerial productivity

- So overall wealth taxes are just a very inefficient way to redistribute resources: same revenues
  - could be raised with a small increase in VAT taxes at much smaller cost for the economy
  - in that output, consumption and employment would fall only by a negligible amount (preliminary estimates)

Conclusion

- We have proposed novel framework for study of income and wealth inequality
  - to account for distributions of income and wealth in the U.S.
- We have shown this framework is promising at accounting for observed inequality: we plan to use it
  - as laboratory to investigate impact of alternative taxation regimes
  - to account for the increase in measured income and wealth inequality in U.S. over recent decades
- Preliminary findings: wealth taxes can be highly distortionary
  - as they discourage productive risk-taking behavior

World Wealth Inequality



Source: OECD and SCF

U.S. country displaying largest concentration: share of top 1% DE, AT, NL around $\approx 25\%$ back

Managerial Contracting Problem: Long-Term vs. Short-Term

- We allow for long-term contracts between intermediaries and managers subject to
  - period-by-period participation constraints for both intermediaries and managers
  - expected zero-profit constraint for intermediaries

- Important result: we prove an optimal such long-term contract
  - can be implemented through a sequence of one-period contracts
  - that consist of a manager's compensation for the period and assets next period
  - both functions of the state s_t and realized productivity z_t

Managerial Contracting Problem: Equivalence Argument

Long-term contract $x = \{e_t(z^{t-1}), c_t(z^t), w_t(z^t), A_{t+1}(z^t) \text{ all } t, z^t\}$ is budget feasible if

$$\sum_{t=0}^{\infty} \sum_{z^t} Q_t \pi(z^t) w_t(z^t) \leq \sum_{t=0}^{\infty} \sum_{z^t} Q_t \pi(z^t) \Pi(w_t, r_t) h_t(z^t)$$

$$c_t(z^t) + Q_{t,t+1} A_{t+1}(z^t) = w_t(z^t) + A_t(z^{t-1})$$

and incentive compatible if recommended effort $e = \{e_t(z^{t-1}) \text{ all } t, z^t\}$ solves

$$e \in \arg\max \sum_{t=0}^{\infty} \sum_{z^t} \beta^t \pi(z^t) u(c_t(z^t), \hat{e}_t(z^{t-1}))$$

A contract is an equilibrium long-term contract with two-sided commitment if it solves

$$\max \sum_{t=0}^{\infty} \sum_{z^t} \beta^t \pi(z^t) u(c_t(z^t), e_t(z^{t-1})$$

subject to budget feasibility and incentive compatibility

Equivalence Argument: Introducing Walk-Away Constraints

- We augment this problem with "walk-away" constraints
  - both manager and intermediary at beginning of any period
  - can opt out of existing contract before current period e chosen
- If intermediary unilaterally opts out
  - relation with that manager terminates for good
  - but intermediary can hire new manager under new long-term contract
- If manager unilaterally opts out
  - relation with that intermediary terminates for good
  - but manager can offer new long-term contract to new intermediary
- This competitive aspect of contracting problem key to equivalence
  - under this setup we can prove highest manager utility under such a long-term contract
  - can be achieved through a sequence of one-period contracts (described next)

Equivalence Argument: Walk-Away Constraints

- Intermediary walk-away constraint and manager optimality imply back
  - at each date PV of intermediary profits from that date on is zero

- Manager walk-away constraint implies
  - continuation utility is at least as high as market utility

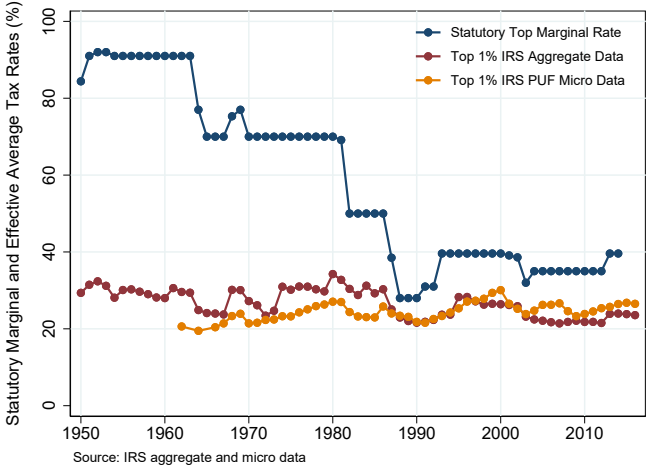
- Market utility is maximal PV of utility manager can receive under any contract satisfying
  - current and future budget constraints
  - incentive compatibility
  - intermediary walk-away constraint for all future (s, z^{s-1}) with $s \geq t$ s.t.
    - at beginning of every future period PV of intermediary profits is non-negative
  - manager walk-away constraint for all future (s, z^{t-1}) with $s \geq t$ s.t.
    - at beginning of every future period PV of manager utility is as high as market utility

Rise in Firm Size and Agency Costs

- Rise in income/wealth inequality has been paralleled by significant ↑ in firm size back
  - share of firms w/ 500 to 1,000 employees ↑ from ≈ 15% to ≈ 25% between '93 and '20
  - share of firms w/ more than 1,000 employees ↑ from ≈ 15% to ≈ 25% between '93 and '20

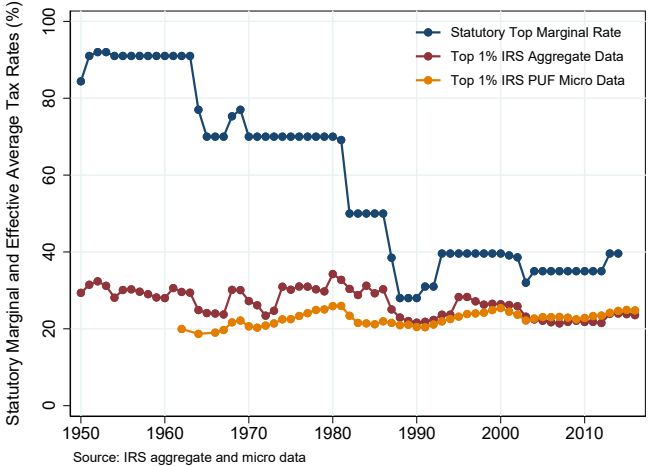
- It has been estimated this growth in size has been reflected into a rise of agency costs
  - Gayle-Miller (2009) estimate this ↑ largely explains secular ↑ value/variability man'l compens'n
  - interpretation: as conflicts of interest btw shareholders/managers are magnified in large firms
    - optimal compensation plans have become more closely linked to insider wealth as firm size ↑
    - indeed much of ↑ taken form of ↑ asset grants whose value explicitly tied to firm performance

Taxes and Average Burden: Total Income



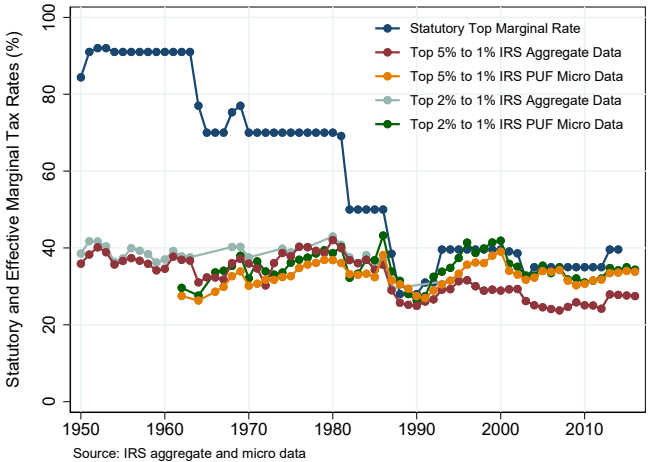
Effective average burden on top 1% (liabilities/income) much lower than statutory rates and stable

Taxes and Average Burden: Total Income with Capital Gains



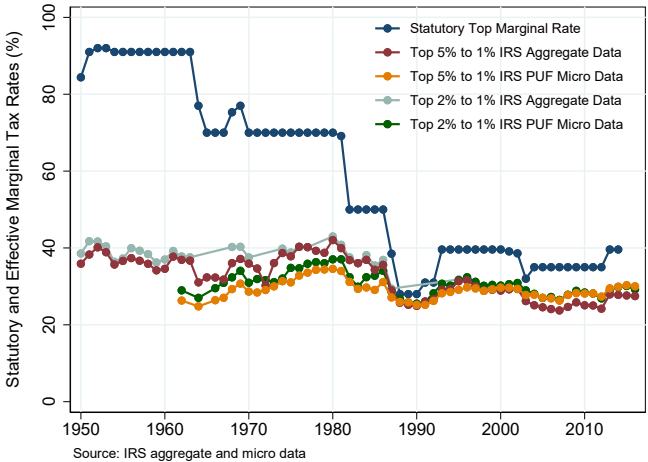
Effective average burden on top 1% (liabilities/income+gains) much lower than statutory rates and stable

Statutory and Effective Rates: Total Income



Effective marginal rates on top 1% (from 2% or 5%) much lower than statutory and fairly constant

Statutory and Effective Rates: Total Income with Capital Gains



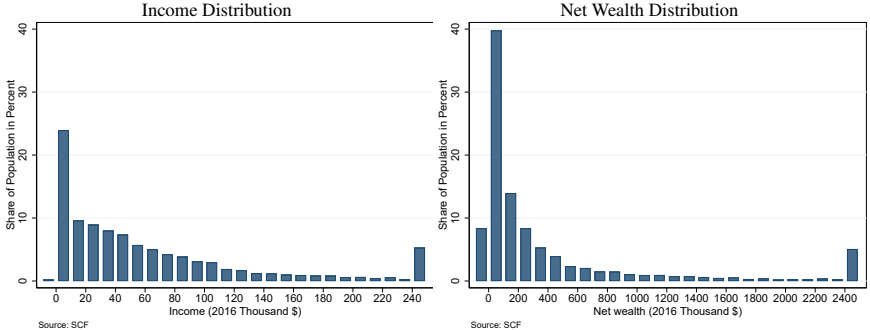
Effective marginal rates on top 1% (from 2% or 5%) much lower than statutory and fairly constant

back

Timing

- At beginning of any period t, managers and intermediaries agree to contracts
- Firms (intermediaries and managers) hire workers and purchase capital services
- Managers and workers exert effort and their productivity is realized
- Production takes place and payments are made
- Human capital of managers and workers is updated back

U.S. Income and Wealth Distributions



Wealth distribution is much more concentrated than income distribution