How to Tax Capitalists in the Twenty-First Century?

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Capitalists in the Twenty-First Century

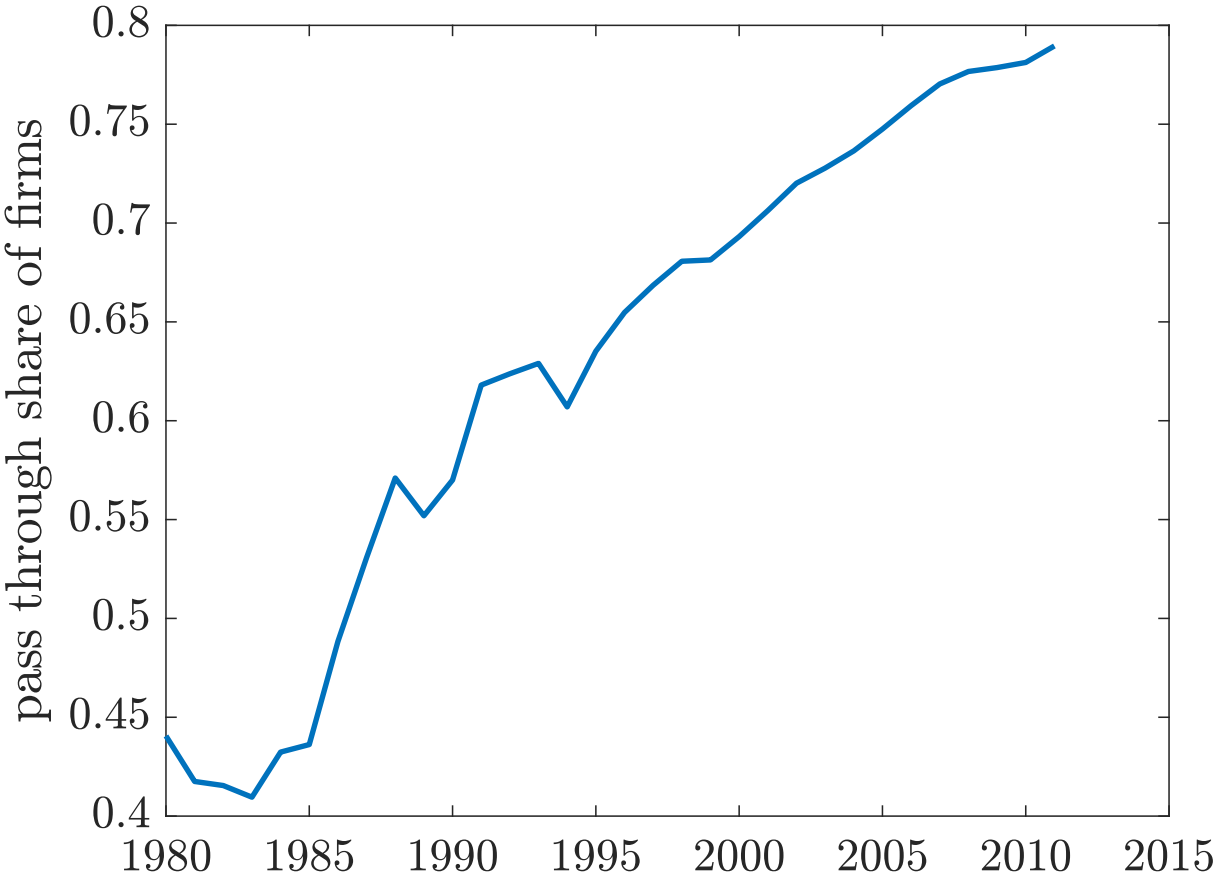
- Secular shift in the distribution of the legal forms of organization (LFO) of the U.S. businesses over the last 40 years.
- Profitable and closely held businesses have become dominant in the firms' population and their owners shape the right tail of income and wealth distribution.
- Predominantly organized as pass-through businesses - Dyrda, Pugsley (2019), Smith, Yagan, Zidar, Zwick (2019).
- Smith et. al. (2019) label them: Capitalists in the Twenty-First Century

Legal Forms of Organization (LFO) in the US

	Liability Protection	Ownership	Taxation of Profits
Sole Properietorship	No	individual or family	Pass-through
General Partnership	No	general partners	Pass-through
Limited Partnership	No for partners Yes for limited part.	general and limited partners	Pass-through
Limited liability company	Yes	single or multiple members	Pass-through
S Corporation	Yes	one class of 1-100 domestic shareholders	Pass-through
C Corporation	Yes	no limit on number and type	Entity level

Key trade-off: tax and organizational simplicity versus flexibility to raise outside equity

Rise of the pass-throughs since 1980



Source: Authors calculations from Census LBD and Business Register

- Employment share of pass-throughs increased from **17.5** percent in 1980 to **65.4** percent in 2012. LBD Summary Statistics

The current U.S. Tax Code: key challenges

1. The code distorts and insures both labor and capital margins.
   - Personal income tax code applies to both labor income (wages and salaries) and capital income (interest income, dividends and some business profits).
   - Different elasticities and different risks associated with the two.

2. Business owners choose their LFO in response to the tax code modifications.
   - Dyrda, Pugsley (2019): this margin is quantitatively relevant, flows were large following past reforms. Flows in the Past

3. Multidimensional heterogeneity which interacts with the tax code.
   - Workers and business owners are different "species" in the data. Differ among many dimensions.

This paper: How to Improve the Existing Code?

Design of the optimal tax system under two revenue-neutral scenarios:

1. Current legal framework

2. Uniform business profits taxation

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Design of the optimal tax system under two revenue-neutral scenarios:

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In a model featuring:

- Endogenous choice of legal form of business organization and selection across forms consistent with the data.
- Separation between labor income risk (productivity) and capital income risk (investment).
- Realistic representation of the current US tax code.
- Heterogeneity among workers and entrepreneurs.

Takeaway: unified, separate business profits tax

1. Optimal policy under **current legal restrictions**:
    - The system is too restrictive to resolve conflicting interests of workers and entrepreneurs.
    - Optimality calls for elimination of the corporate income taxes and increase of progressivity of the personal income tax code. Benefits workers via GE effects.

2. **Uniform Business Profits Tax:**
    - Welfare-dominant over the current legal restrictions reform.
    - Separates intertemporal distortion on capital accumulation from intratemporal distortions on labor supply.

Contribution to literature

1. Optimal taxation with workers: Domeij and Heathcote (2004), Conesa, Kitao, and Krueger (2009), Poschke et al. (2012), Krueger and Ludwig (2016), Heathcote et al. (2017a)

   Contribution: Study the optimal policy problem in a model with workers and entrepreneurs.

2. Optimal taxation with entrepreneurs/firms: Panousi (2008), Meh and Terajima (2009), Panousi and Reis (2012), Evans (2014), Scheuer (2014)

   Contribution: Endogenize the choice of the LFO in the optimal taxation problem.

3. LFOs in quantitative macro: Short and Glover (2019), Chen, Qi and Schlagenhauf (2018), Bhandari, McGratten (2021).

   Contribution: Discipline the selection into the LFOs and study the optimal policy problem.

THE MODEL ECONOMY

Environment

- Unit measure of infinitely-lived households:
  - Fraction μ are workers.
  - Fraction $1 - \mu$ are entrepreneurs (Active Business Owners).
- Workers are subject to idiosyncratic labor productivity risk. Entrepreneurs are subject to idiosyncratic productivity risk. No aggregate risk.
- Incomplete markets with respect to idiosyncratic shocks.
- Entrepreneurs make endogenous choice of the legal form of organization.

Workers

Standard income fluctuation problem:

$$
\begin{aligned}
V^W(a,\varepsilon) \quad = \quad & \max_{c,h,a'} u(c,1-h) + \beta \mathbb{E}\left[V^W(a',\varepsilon') \,|\varepsilon \right] \\
& \text{subject to} \\
& c + a' = a + y - T_y(whs) - \tau_d r a \\
& y = ra + whs \\
& a' \geq \underline{a}
\end{aligned}
$$

a : savings

ε : stochastic labor productivity

$T_y(\cdot)$: income tax schedule

τ_d : dividend income tax

Stylized tradeoff between legal forms

C corporation:

Pro	Con
• Access to the supply of external equity • Completely diversified investment risk	• Profits subject to both corporate income and distribution taxes • Overhead costs

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Pass through:

Pro	Con
• Profits taxed once at personal income tax • Simple organization with no overhead costs	• Capital financed only through own equity • Undiversified investment risk

Entrepreneurs: technology and diversification

- DRS technology $f(k, n; z)$ homogeneous in k, n and z
- Gross profits:

$$\pi(z, k) = \max_{n} \{f(k, n; z) - wn\} = f_k k + f_z z$$

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C-corporation entrepreneur is fully diversified:

- Mutual fund chooses capital k^* at the end of the previous period before z was realized to equate

$$\mathbb{E}[(1 - \tau_c)(f_k(k^*; n^*; z) - \delta)] = r$$

- Entrepreneur receives preferred dividend

$$D(z, k^*) = (1 - \tau_c)(f_z(k^*; n^*; z)z - c_f)$$

where τ_c is the corporate income tax.

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Pass-through entrepreneur makes an investment decision and bears the idiosyncratic risk.

Entrepreneurs: C corporation (C)

Dynamic problem with pass through conversion option in continuation W^C:

$$
\begin{aligned}
V^C(a, k^*, z) \quad = \quad & \max_{s,c} u\left(c, 1-\overline{h}\right) + \beta W^C(s, z) \\
& \text{subject to} \\
& c + s = a + y - \tau_d(ra + D(z, k^*)) \\
& y = ra + D(z, k^*) \\
& s \geq \underline{a}
\end{aligned}
$$

Dividend and risk free investment return taxed at τ_d

Income fluctuations from stochastic preferred dividend $D(z, k^*)$

Entrepreneurs: pass-through (P)

Dynamic problem with conversion option in continuation W^P

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V^P(a, e, z) \quad = \quad & \max_{s,\, c} u\left(c, 1-\bar{h}\right) + \beta\, W^P(s, z) \\
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Homogeneity of technology in z, k and n implies:

$$\pi(e, z) = f_k e + f_z z$$

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IFP from rents $f_z z$ and undiversified return on business equity $f_k e$

Continuation values: conversion and portfolio choice

Continuation value of the pass-through entrepreneur:

$$W^P(s,z) = \max\left\{\mathbb{E}_C\left[V^C(s,k^*(z),z')\middle|z\right] - f_s,\ \max_{e'\leq s-\bar{a}}\left\{\mathbb{E}_P\left[V^P(s-e',e',z')\middle|z\right]\right\}\right\}$$

Continuation value of the C-corp entrepreneur:

$$W^C(s,z) = \max\left\{\mathbb{E}_C\left[V^C(s,k^*(z),z')\middle|z\right],\ \max_{e'\leq s-\bar{a}}\left\{\mathbb{E}_P\left[V^P(s-e',e',z')\middle|z\right] - f_s\right\}\right\}$$

where is f_s is a switching cost.

Aggregation and market clearings

- The number of pass-through owners **p** is determined by

$$\mathbf{p} = \mu \left(\int_{A \times E \times Z} d\lambda_P \left(a, e, z \right) \right)$$

and then the fraction of the C corporation owners is $(1 - \mu)(1 - p)$

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- Market clearing for labor requires

$$\begin{aligned}\int_A\int_\epsilon h\left(a,\varepsilon\right)\varepsilon d\lambda_w\left(a,\varepsilon\right) &= \int_{A\times Z} n^*\left(z\right) d\lambda_C\left(a,z\right)\\ &+ \int_{A\times E\times Z} n\left(a,e,z\right) d\lambda_P\left(a,e,z\right)\end{aligned}$$

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- Market clearing for the capital stock requires (?) Foreign Holdings of Equity

$$\begin{aligned}\int_{A\times Z} k^*\left(z\right) d\lambda_C\left(a,z\right) + B &= \int_{A\times\epsilon} a'\left(a,\varepsilon\right)\ d\lambda_w\left(a,\varepsilon\right) + \int_{A\times Z} a'\left(a,z\right)\ d\lambda_C\left(a,z\right)\\ &+ \int_{A\times E\times Z} a'\left(a,e,z\right)\ d\lambda_P\left(a,e,z\right)\end{aligned}$$

TAKING THE MODEL TO THE DATA

Preferences and Technology

- Preferences:

$$u^i(c, h) = \frac{c^{1-\gamma}}{1-\gamma} - \mathbf{1}_{i=w}\psi\frac{h^{1+\frac{1}{\theta}}}{1+\frac{1}{\theta}} \qquad i \in \{w, e\}$$

  where $i = e$ is entrepreneur, $i = w$ is worker.

- Entrepreneurs, regardless of their legal form of business organization, have access to the DRS, production technology:

$$f(z, k, n) = z^{1-\nu}\left(k^{\alpha} n^{1-\alpha}\right)^{\nu}$$

- Workers' productivity follows standard AR(1) process:

$$\log \varepsilon' = \mu_w + \rho_w \log \varepsilon + \eta_w$$

  where $\eta_w \sim N(0, \sigma_w)$.

LFO-dependent productivity processes

The productivity Markov processes are:

$$\Gamma^P = \begin{bmatrix} p_{11} & \cdots & p_{1n} & 0 \\ \vdots & \ddots & \vdots & 0 \\ p_{n1} & \cdots & p_{nn} & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}, \qquad \Gamma^C = \begin{bmatrix} p_{11}(1-f_1) & \cdots & p_{1n}(1-f_1) & f_1 \\ \vdots & \ddots & \vdots & \vdots \\ p_{n1}(1-f_n) & \cdots & p_{nn}(1-f_n) & f_n \\ 0 & 0 & 1-q & q \end{bmatrix}$$

where

- $p_{i,j}$ for $i, j = 1, ..., n$ are elements of the matrix obtained through the discretization procedure.

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where

- $p_{i,j}$ for $i, j = 1, \ldots, n$ are elements of the matrix obtained through the discretization procedure.
- $q \in [0, 1]$ is the probability of staying in the top state for the C corporation
- probability of switching to the top state for the C corporation are given by

$$f_i = \theta_{f1} \left(\frac{z_i}{z_n} \right)^{\theta_{f2}} \qquad i \in \{1, \ldots, n\}$$

- we allow for $q = 0$ and $\theta_{f1} = 0$ in calibration which makes $\Gamma^P = \Gamma^C$.

Switching costs: extreme value shocks

- Switching costs: i.i.d. with a logistic distribution with mean f_s and dispersion parameter σ_f.
- Continuation value of the pass-through entrepreneur is then:

$$W^P(s,z) = \sigma_f \ln\left\{\exp\left\{\frac{\mathbb{E}_C\left[V^C(s,k^*(z),z')\middle|z\right]-f_s}{\sigma_f}\right\} + \exp\left\{\frac{\max_{e'\leq s-\bar{a}}\mathbb{E}_P\left[V^P(s-e',e',z')\middle|z\right]}{\sigma_f}\right\}\right\}.$$

- Decision rule becomes conditional choice probability:

$$\Pr(C|s,P) = \frac{\exp\left\{\frac{\mathbb{E}_C\left[V^C\left(s,k^*(z),z'\right)\middle|z\right]-f_s-\max_{e'\leq s-\bar{a}}\mathbb{E}_P\left[V^P\left(s-e',e',z'\right)\middle|z\right]}{\sigma_f}\right\}}{1+\exp\left\{\frac{\mathbb{E}_C\left[V^C(s,k^*(z),z')\middle|z\right]-f_s-\max_{e'\leq s-\bar{a}}\mathbb{E}_P\left[V^P(s-e',e',z')\middle|z\right]}{\sigma_f}\right\}}$$

and $W^C(s,z)$, $\Pr(C|s,P)$ are determined symetrically.

Tax system in the initial equilibrium

- Income tax schedule from Heathcote-Storesletten-Violante:

$$T(y) = y - \lambda_y y^{1-\tau_y}$$

  where:
  - τ_y controls progressivity of the code. We estimate $\tau_y = 0.097$.
  - λ_y is set to balances the budget so that Gov. Revenues/GDP is 21%.

- Dividend income tax: $\tau_d = 26.3\%$ to match average marginal tax rate on dividends in TAXIM.

- Corporate income tax: $\tau_d = 19.7\%$ to match average effective tax rate estimated from NIPA.

- Debt to GDP: 102% to match the 2013-2017 average

Model Fit

Statistic	Source	Model	Target
Capital/Output*	NIPA	1.25	1.25
Avg Labor Supply	CPS	0.34	0.33
Gini Income	SCF	0.62	0.65
Gini Ent Income	SCF	0.64	0.67
Gini Wor Income	SCF	0.59	0.62
Top 1 Ent Inc Share	SCF	0.20	0.27
Top 10 Ent Inc Share	SCF	0.49	0.53
Fraction of P ent	LBD	0.80	0.81
Emp Share of P ent	LBD	0.64	0.57
Flow CP	LBD	0.02	0.01
Flow PC	LBD	0.004	0.002
Logit CH	SCF	-0.94	-1.08
Logit Prof.	SCF	-0.82	-0.93
Logit CH&Prof.	SCF	0.17	0.06

* We define the capital stock in the data as the sum of private fixed assets and durable consumption.

Model Parameters

Selection: who is who via indirect inference

- Split the SCF population into workers and Active Business Owners (ABO) and attach the legal form of organization to each ABO.
- Run for the ABOs the logistic regression:

$$\Pr\left(D_{it}=1\right)=F(\mu_t+\gamma_1 \log \Pi_{it}+\gamma_2 \log X_{it}+\gamma_3 \log \Pi_{it} \times \log X_{it}) \quad (1)$$

where

D_{it}: pass-through dummy

μ_t: year fixed effect

Π_{it}: profits

X_{it}: net worth

$F(x)=\frac{e^x}{1+e^x}$

$t \in \{2004, 2007, 2010, 2013, 2016\}$: SCF waves

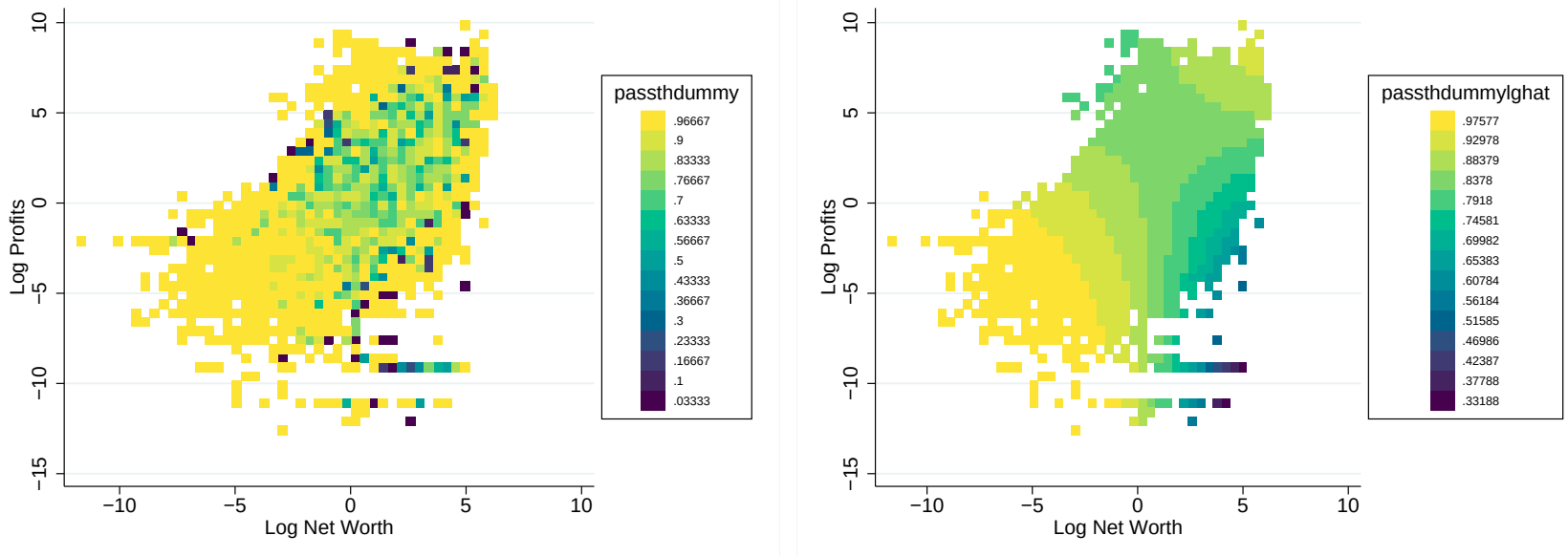
Selection: model vis a vis the data.

	Data		**Model**
	(1) $passth_{it}$	(2) $passth_{it}$	
$\log networth_{it}$	-0.955	-0.927	-0.823
	(0.183)	(0.184)	
$\log prof_{it}$	-1.095	-1.081	-0.944
	(0.132)	(0.133)	
$\log networth_{it} \times \log prof_{it}$	0.064	0.062	0.170
	(0.012)	(0.012)	
N	27,507	27,507	
R^2	0.062	0.065	
Time FE	No	Yes	

Note: Pooled SCF waves 2004-2016; estimated parameters of logistic regression; robust standard errors in parentheses; R^2 measure is pseudo-R^2.

Selection: who is who in the SCF?

Figure: Conditional Probability of observing the pass-through - empirical distribution (left panel), logit regression (right panel)



Notes: SCF waves 2004-2019, the variables are deviations from annual average

Selection: who is who in the model?

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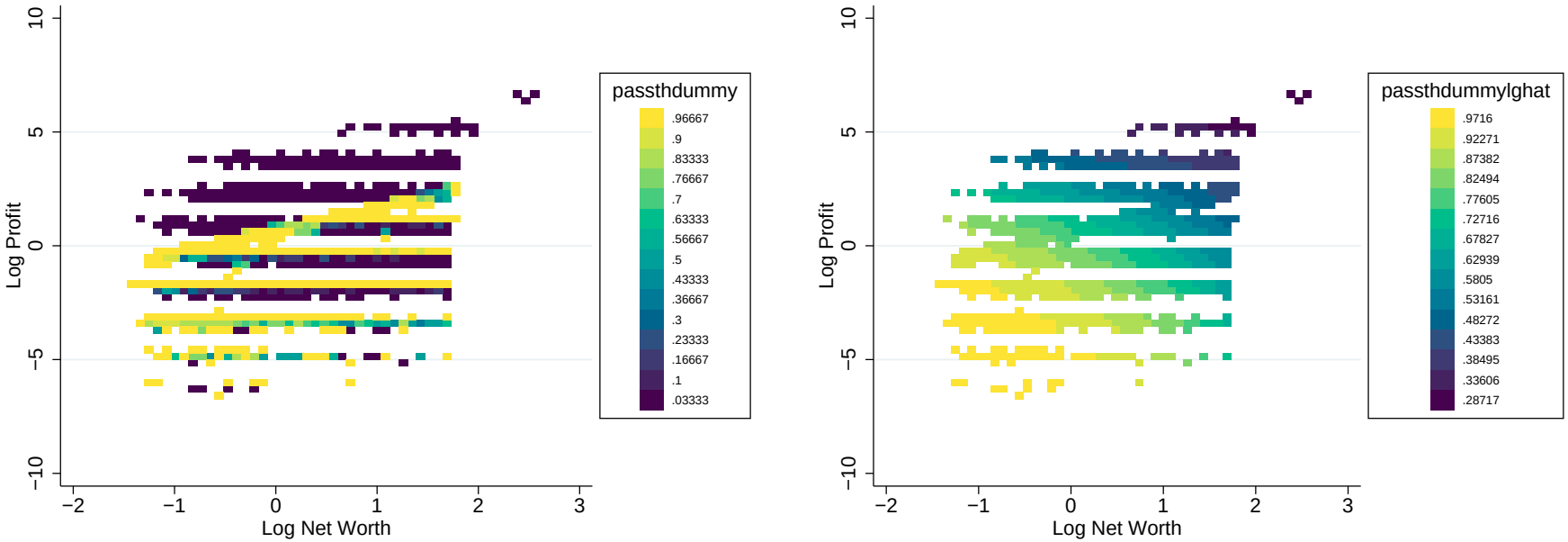


Notes: The variables are deviations from average

THE OPTIMAL POLICY

Social Welfare Function

- Workers

$$SWF_w(\mathcal{T}) = \int_{A\times E} V_1^W(a, \varepsilon; \mathcal{T})\, d\lambda_0(a, \varepsilon)$$

where $V_1^W(a, \varepsilon; \mathcal{T})$ is the value function in the first period of the transition induced by new tax system $\mathcal{T}$ and $\lambda_0(a, \varepsilon)$

- Entrepreneurs

$$SWF_e(\mathcal{T}) = \int_{X\times Z} p\, V_1^P(x, z; \mathcal{T})\, d\lambda_{0P}(x, z) + (1-p)\, V_1^C(x, z; \mathcal{T})\, d\lambda_{0C}(x, z)$$

- Population welfare

$$SWF(\mathcal{T}) = \mu\, SWF_w(\mathcal{T}) + (1-\mu)\, SWF_e(\mathcal{T})$$

where μ=0.88 is the fraction of workers in the population.

Optimal Tax System

- The optimal tax reform is the sequence $\mathcal{T}^* = \left\{\tau_{c,t}, \tau_{d,t}, \tau_{y,t}, \lambda_{y,t}\right\}_{t=0}^{\infty}$ that solves:

$$\mathcal{T}^* \in \arg\max_{\mathcal{T}\in\Gamma} \; SWF(\mathcal{T}) \tag{2}$$

- Solving (2) is a bit challenging (Dyrda, Pedroni (2022) for SIM model). More pragmatic approach: one-time policy change, i.e.:

$$\tau_{c,t} = \tau_{c,1}\,, \tau_{y,t} = \tau_{y,1}$$

- Adjust $\lambda_{y,t}$ so that the reform scenarios are revenue neutral. Keep dividend income tax $\tau_{d,t}$ and interest rate fixed.

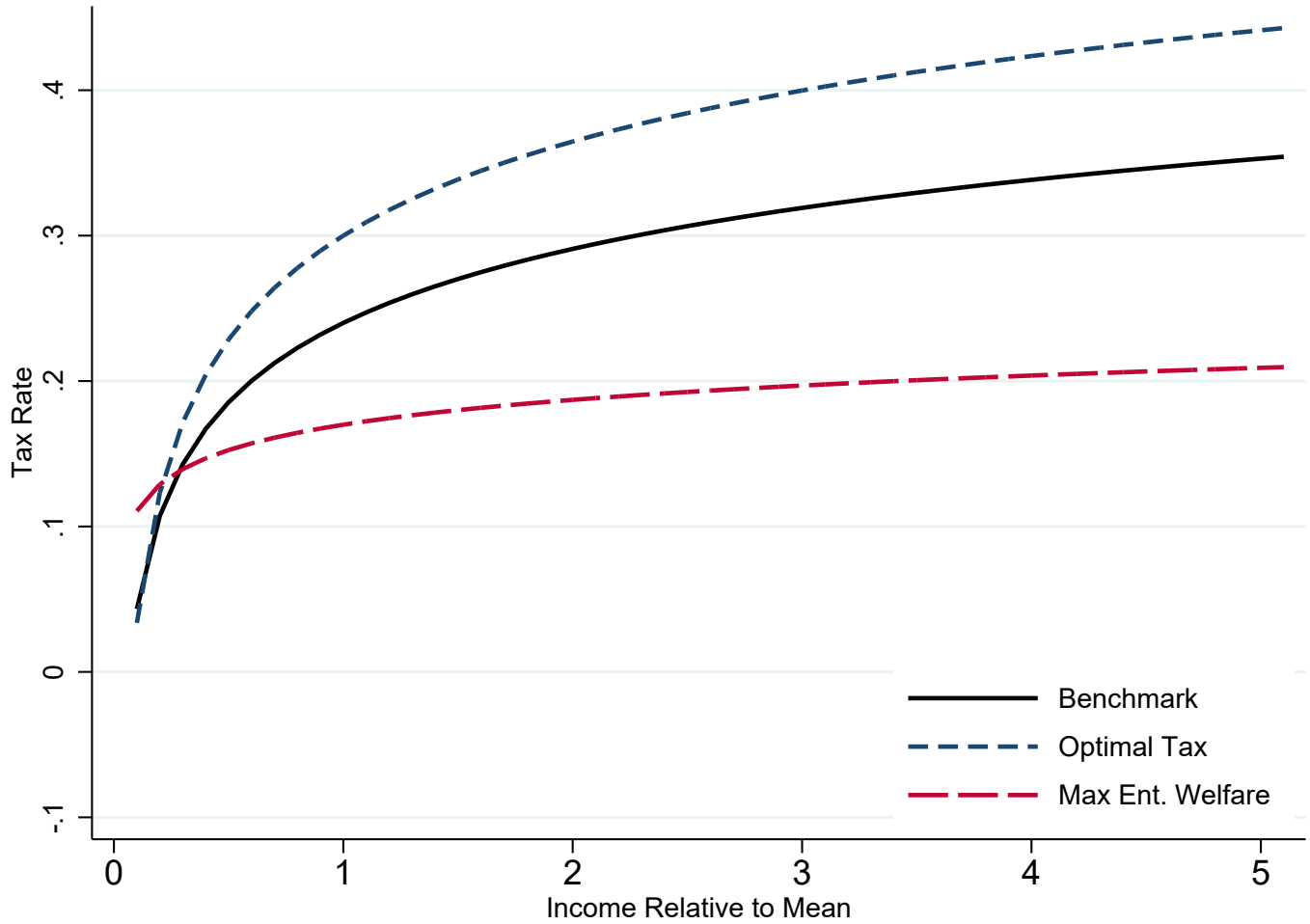
- Today a limited version: max welfare in stationary equilibrium, but less relevant in SOE.

Current Framework: the optimal tax schedules

	Baseline Economy	**Optimal Tax System**	**Max. Entr. Welfare**
Progressivity, τ_y	0.10	0.14	0.03
Corporate Income Tax, τ_c	0.20	0.00	0.00
Fiscal closure, $1-\lambda_y$	0.24	0.30	0.17
Debt to GDP	1.02	1.02	1.02
Revenues to GDP	0.21	0.21	0.21
$\Delta SWF_w(\%)$	-	1.37	-1.09
$\Delta SWF_e(\%)$	-	7.01	8.84
$\Delta SWF(\%)$	-	2.05	0.12
% of Pass-Throughs	80.4	14.0	28.1

- Trade-off: distortions on capital accumulation vs. distortions of labor and redistribution/insurance provision for workers
- Increase of progressivity + elimination of τ_c benefits both workers and entrepreneurs

Current Framework: the optimal tax schedules



Current Framework: macro aggregates (% changes)

	Baseline Economy	**Optimal Tax System**	**Max. Entr. Welfare**
Employment	0.0	-0.7	1.7
Output	0.0	3.3	4.9
Capital	0.0	17.7	17.9
Wage	0.0	4.0	3.1
Employment C	0.0	271.0	223.2
Employment P	0.0	-88.6	-70.0
Output C	0.0	285.8	233.3
Output P	0.0	-88.2	-69.0
% of Pass-Throughs	80.4	14.0	28.1

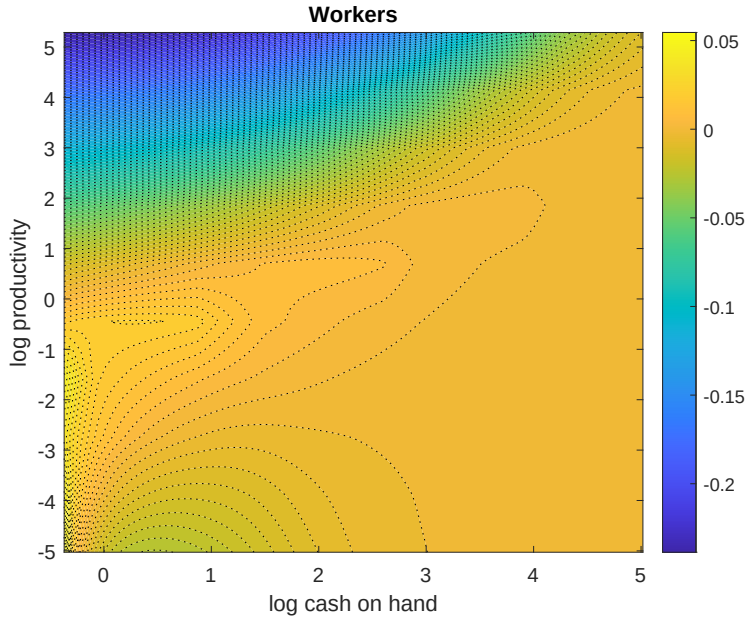
- Optimal Tax System: workers benefit higher wages, allocation of capital improved.
- Value added and employment reallocated towards C corporations.

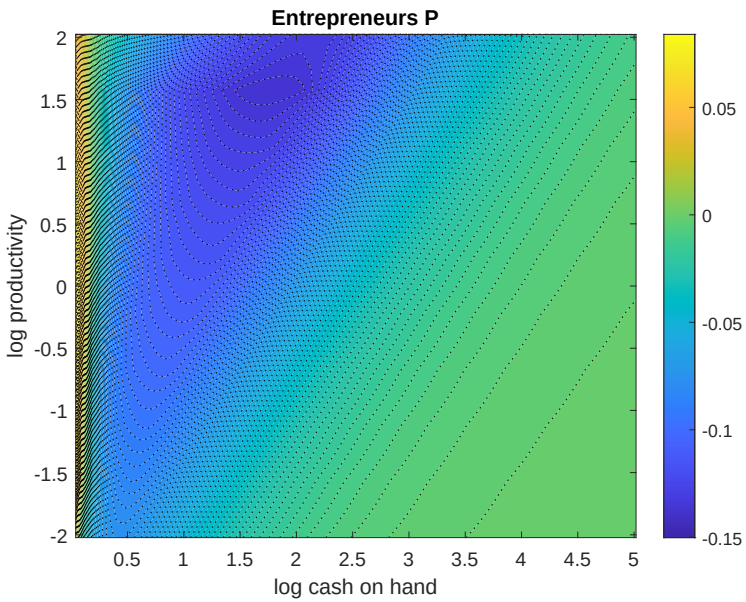
Inequality Implications

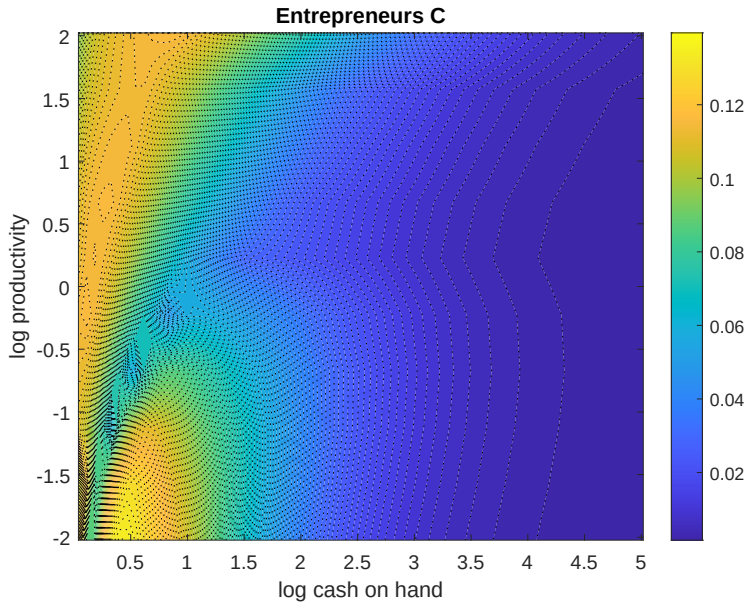
	Baseline Economy	**Optimal Tax System**	**Max. Entr. Welfare**
Gini Population	0.62	0.58	0.60
Top 1% Share (%)	15.2	16.3	16.2
Top 10% Share (%)	45.1	43.5	44.0
Gini Workers	0.59	0.60	0.61
Gini Entrepreneurs	0.64	0.71	0.78
% of ABOs in Top 10%	40.0	25.6	33.1
% of Pass-Throughs	80.4	14.0	28.1

- Income dispersion within entrepreneurs increases.
- Wage boost makes workers and entrepreneurs more similar in terms of income.

Conditional welfare: who gains, who looses?







Uniform Business Profit Tax in the Model

- Abandon double-taxation of profits.
- Introduce the same-flat tax rate τ_b on business profits.
- What changes in the model?

$$\begin{aligned} \text{C ent:} \quad c+s = \quad & (1+r)a - \tau_d(ra + (1-\tau_c)(f_z(k^*;n^*;z')z' - c_f)) \\ \text{P ent:} \quad c+s = \quad & \pi + (1-\delta)e + (1+r)a - \tau_d ra - T_y(\pi - \delta e) \end{aligned}$$

- The number of instruments remains unchanged (2 instruments set optimally). Just redefining the tax base.
- Again budget-neutral reform.

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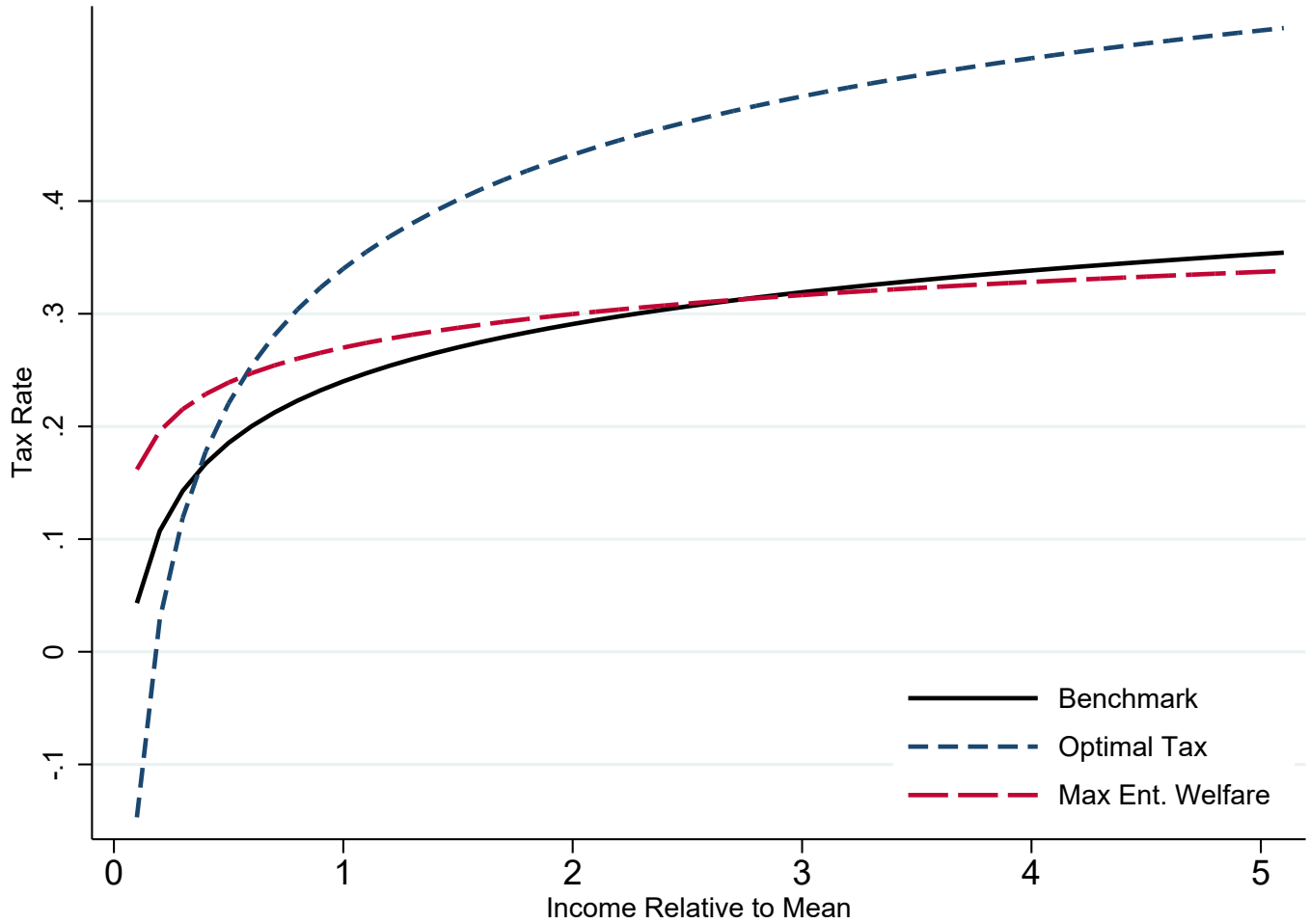
Uniform Business Tax: the optimal tax schedules

	Baseline Economy	**Optimal Tax System**	**Max. Entr. Welfare**
Progressivity, τ_y	0.10	0.24	0.06
Uniform Business Tax, τ_b	–	0.26*	0.09
Fiscal closure, $1-\lambda_y$	0.24	0.34	0.27
Debt to GDP	1.02	1.02	1.02
Revenues to GDP	0.21	0.21	0.21
$\Delta SWF_w(\%)$	-	2.63	-4.38
$\Delta SWF_e(\%)$	-	12.72	29.11
$\Delta SWF(\%)$	-	3.85	-0.32

* Should be compared with 0.20 is a corporate income tax + 0.26 of dividend tax.

- Separation of the codes welfare-dominates the existing code. Both workers and entrepreneurs gain.
- More insurance and redistribution among workers via sharp increase in progressivity. Overall tax burden lower for large entrepreneurs.

Uniform Business Tax: the optimal tax schedules



Uniform Business Tax: macro aggregates (% changes)

	Baseline Economy	**Optimal Tax System**	**Max. Entr. Welfare**
Employment	0.0	-3.9	2.2
Output	0.0	-1.2	4.6
Capital	0.0	5.2	14.5
Wage	0.0	2.8	2.3
Employment C	0.0	-80.0	134.0
Employment P	0.0	20.7	-40.4
Output C	0.0	-79.5	139.4
Output P	0.0	24.1	-39.0
% of Pass-Throughs	80.4	91.0	48.7

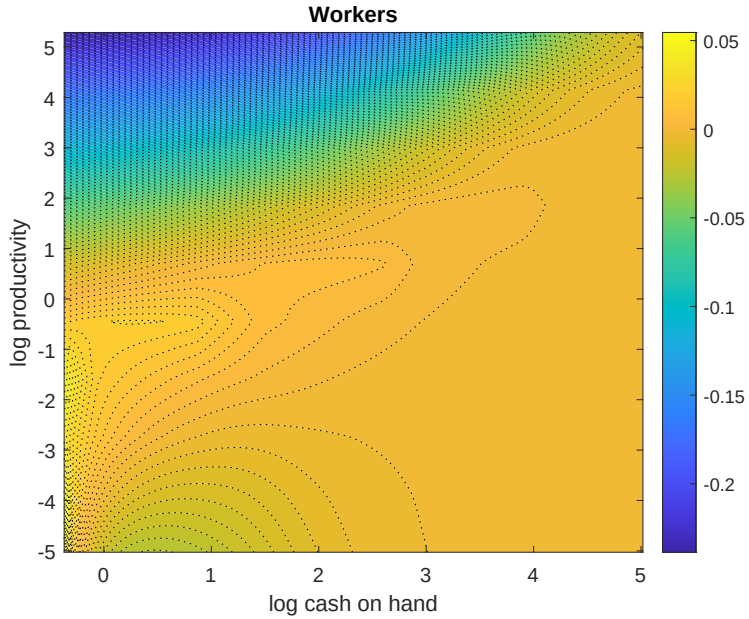
- Output and employment fall following the reform (high distortions on lab supply), reversed for Max. Ent. welfare.
- Reallocation of value added towards pass-through businesses, reversed for Max. Ent. welfare.

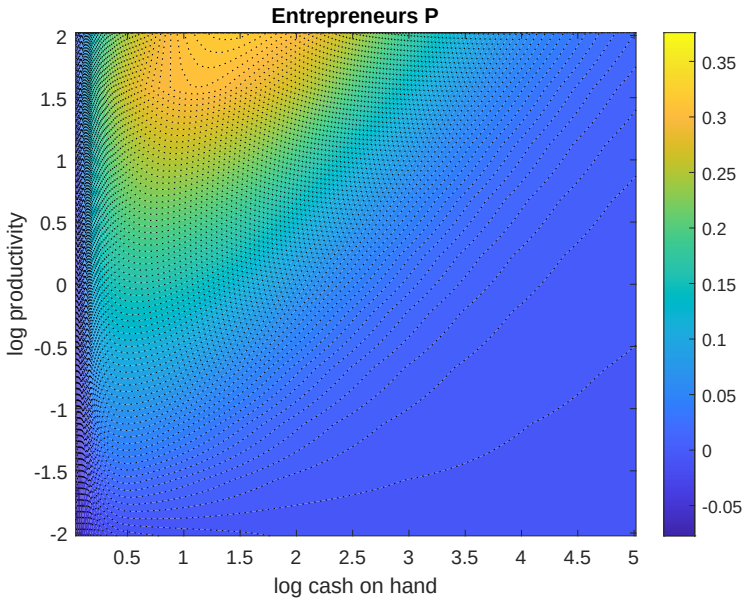
Inequality Implications

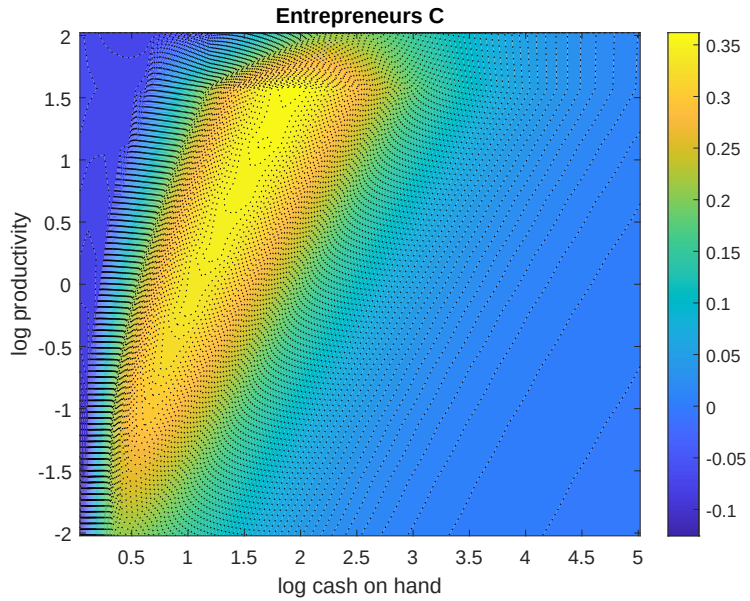
	Baseline Economy	**Optimal Tax System**	**Max. Entr. Welfare**
Gini Population	0.62	0.63	0.60
Top 1% Share (%)	15.2	16.3	16.9
Top 10% Share (%)	45.1	47.3	44.8
Gini Workers	0.59	0.57	0.61
Gini Entrepreneurs	0.64	0.62	0.73
% of ABOs in Top 10%	40.0	42.5	38.2
% of Pass-Throughs	80.4	95.0	48.7

- Reform increases inequality by moving more entrepreneurs towards the top of the income distribution.

Conditional welfare: who gains, who looses?







Conclusions

- Study the design of the optimal tax system taking seriously the nature of business and labor income and the **endogenous choice of legal form of business organization**.

- We find existing tax code can not resolve the tensions between workers and entrepreneurs.

- **Key policy prescription:** abandon double taxation of profits and separate taxation of labor income and business profits (labor distortion and labor risk vs. capital distortions + investment risk).

ADDITIONAL SLIDES

LBD Summary Statistics

	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004	2005-2009
Average size (employees)						
C corporations	23.12	18.25	19.62	19.68	19.83	19.06
S corporations	10.67	13.94	13.91	13.17	12.63	11.99
Partnerships	8.44	9.33	11.34	12.53	17.14	18.35
Sole proprietors	3.94	4.07	4.14	4.37	4.89	5.46
Exit rate (percent)						
C corporations	11.11	9.97	8.68	8.56	9.03	9.27
S corporations	14.51	10.83	8.71	8.67	8.57	9.42
Partnerships	22.20	19.67	16.18	15.99	14.35	14.23
Sole proprietors	20.22	17.26	15.55	16.35	16.10	17.44
Share of employers (percent)						
C corporations	55.59	50.05	39.52	34.83	29.27	24.15
S corporations	9.27	15.77	26.35	33.35	39.80	45.44
Partnerships	7.78	7.90	6.70	6.91	9.61	12.64
Sole proprietors	27.36	26.27	27.42	24.91	21.32	17.78

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Model Parametrization

Parameter	Symbol	Discipline	Value
Externally calibrated			
Fraction of workers	μ	SCF data	0.88
Risk aversion	γ	-	1.50
Frisch elasticity	θ	-	0.85
Depraciation rate	δ	NIPA	0.08
Interest rate	r	Jorda et. al (2019)	0.02
Internally calibrated			
Discount factor	β	Targets in Table	0.98
Returns to scale	ν	Targets in Table	0.82
Persistance ent.	ρ_z	Targets in Table	0.96
Std ent. product.	σ_z	Targets in Table	0.44
Mean prod. wor.	μ_w	Targets in Table	2.59
Persistance wor.	ρ_w	Targets in Table	0.95
Std wor. product.	σ_w	Targets in Table	0.29
Fixed cost C corp.	c_f	Targets in Table	0.15
Mean switching cost	f_s	Targets in Table	27.14
Extreme value shock std	σ_s	Targets in Table	5.18
Scaling C corp. productivity	θ_z	Targets in Table	1.09
Probability shifter for C corp.	θ_{f1}	Targets in Table	0.29
Probability power for C corp.	θ_{f2}	Targets in Table	18.61
Probability of staying in the top state	q	Targets in Table	0.35

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LBD - estimating firm level transitions

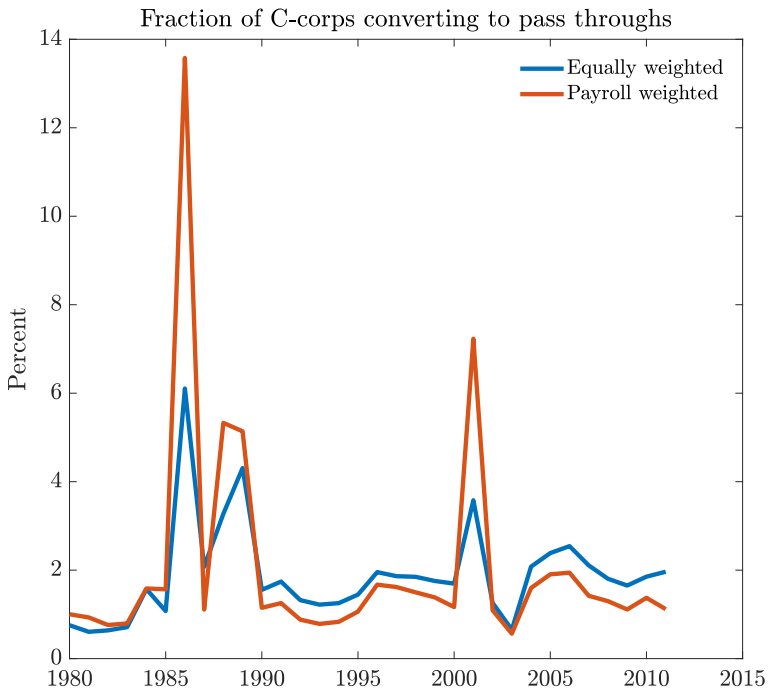
1. US Census Bureau Longitudinal Business Database (LBD) and linked Business Register (BR)
   - Near universal coverage of the nonfarm private sector
   - Longitudinally linked at the establishment level and aggregated to firms
   - Linkages robust to changes in ownership and LFO

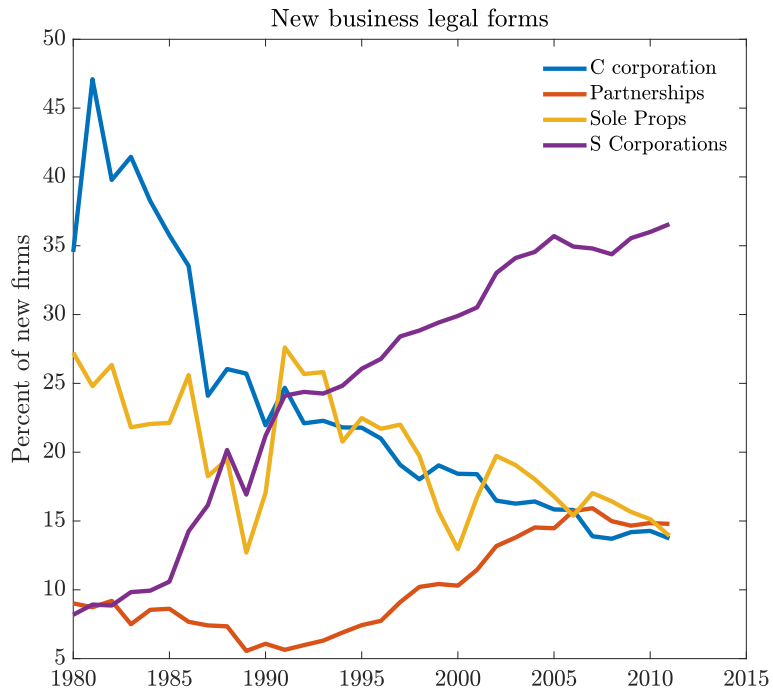
2. Using LBD and linked BR record 4 possible legal forms: **C corporation**, **Partnerships** (General/LLC/LLP), **Sole Proprietors**, and **S corporation**.

3. Estimate transition matrix across these states plus an entry/exit state for the years 1980 to 2012 using empirical distribution.

LBD Summary Statistics

Increases in pass throughs around major tax reforms





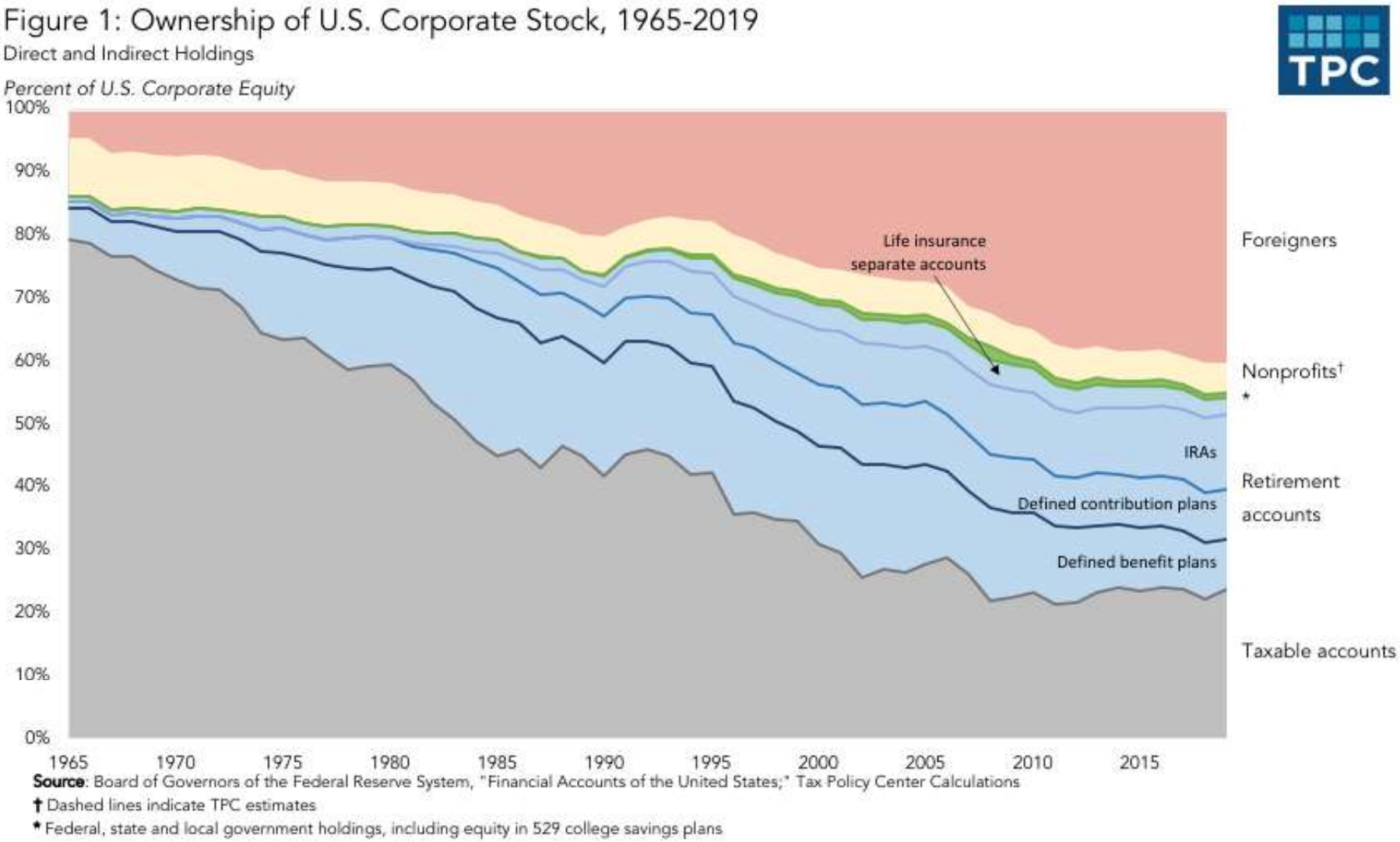
Source: Census LBD and Business Register

- Conversions surge around major tax reforms: Tax Reform Act of 1986, Economic Growth and Tax Relief Reconciliation 2001.
- Both reduced personal income tax rates, relative to the dividend and corporate income tax.

Back

Who is left to tax?

Back



Government

- Tax Revenues:

$$
\begin{aligned}
R_i &= \int_{A\times\epsilon} T_i\left(wh\varepsilon\right)\ d\lambda_w\left(a,\varepsilon\right) + \int_{A\times E\times Z} T_i\left(\pi\left(e,z\right)-\delta e\right)\ d\lambda_P\left(a,e,z\right) \\
R_d &= \int_{A\times Z} T_i\left(D(z)+ra\right)\ d\lambda_C\left(a,z\right) + \int_{A\times E\times Z} T_i\left(ra\right)\ d\lambda_P\left(a,e,z\right) \\
&+ \int_{A\times\epsilon} T_i\left(ra\right)\ d\lambda_w\left(a,\varepsilon\right) \\
R_c &= \int_{A\times Z} \tau^c\left(\pi(k^*(z);z)-c_f\right)\ d\lambda_C\left(a,z\right)
\end{aligned}
$$

- Government budget constraint:

$$G+\left(1+r\right)B = B' + R_i + R_c \tag{1}$$

Portfolio choice: private equity expected return

Pass-through allocates savings s to solve

$$\max_{e' \leq s - \bar{a}} \left\{ \mathbb{E} \left[V^P \left(s - e', e', z' \right) \middle| \right] \right\}$$

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Choose e' so after-tax net expected return on private equity

$$\mathbb{E} \left[\left(1 - T'_y \right) \left(f_k - \delta \right) \middle| z \right] = \left(1 - \tau_d \right) r - \frac{\text{Cov} \left[u_c, \left(1 - T'_y \right) f_k | z \right]}{\mathbb{E} \left[u_c | z \right]} + \frac{\xi}{\beta \mathbb{E} \left[u_c | z \right]}$$

Multiplier ξ on capital constraint $\xi(s - \bar{a} - e') = 0$

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Decompose private equity return:

- Return on savings (mutual fund) $(1 - \tau_d) r$
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