Tax Evasion and Capital Taxation

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* Shahar Rotberg co-authored this paper in his own personal capacity and time. The opinions expressed herein do not reflect the views of the CMHC.

Introduction

Motivation

Wealth inequality has evoked calls to tax capital more heavily, but echoed by concerns that the rich would respond by concealing wealth offshore

- 4% of aggregate U.S. wealth held offshore under current tax code, reduces capital income tax revenues by $35 billion per year (Zucman, 2015)

This paper:

- Would raising capital income taxes or taxing wealth significantly increase tax evasion?
- Implications for public finances and inequality? For investment and wages in equilibrium?
- Implications of evasion for design of optimal tax systems?

Introduction

What we do

Develop dynamic theory of wealth concealment and tax evasion

- Concealing assets in tax shelter reduces reported capital income and wealth
- Costly and risks fine if detected by gov't; only ultra-wealthy choose to conceal

Integrate into OLG model calibrated to represent US economy under current tax code

- Rate-of-return heterogeneity generates wealth concentration, distinction between capital income vs. wealth taxes (Cagetti and De Nardi, 2009; Guvenen et al., 2023)
- Concealment costs, detection rate, fine calibrated to match facts about offshore tax evasion

Simulate consequences of capital income tax reform and wealth taxation

- Measure effects of evasion by comparing model to no-evasion counterfactual

Introduction

What we find

Capital income tax reform

- No evasion: revenue maximized by increasing tax rate by 30pp
- With evasion: flat Laffer curve
- Reported wealth inequality falls, but actual inequality rises

Wealth taxes

- No evasion: revenue-maximizing tax = 6.3%, progressive taxes increase welfare
- With evasion: revenue-maximizing tax = 2.7%, progressive taxes reduce welfare
- Actual inequality falls, but less than reported inequality

Model

Model

Overview

OLG households heterogeneous in labor productivity, entrepreneurial opportunity, entrepreneurial skill

Representative firm produces output using labor, homogeneous “corporate” capital, differentiated capital varieties purchased from entrepreneurs’ businesses

Government pays SS benefits, lump-sum transfers financed by distortionary taxes

Households can evade taxes by concealing wealth in tax shelters

- Flow of wealth into shelter reduces reported capital income taxes
- Stock of wealth concealed in past protected from wealth taxation
- Fixed admin cost, proportional transfer cost, prob. of detection by gov’t

Model

Tax evasion

Households have access to two forms of wealth: reported (a_r) and hidden (a_h)

Stock of hidden wealth protected from wealth taxation

- Reported wealth tax liability = $\tau_a a_r$ regardless of a_h

Flow of hidden wealth reduces capital income taxes

- Reported capital income tax liability = $\tau_k \max[\pi - \max(a_h' - a_h, 0), 0]$

Hiding wealth is costly

- Fixed cost θ + proportional cost $\eta \Rightarrow$ total cost = $\mathbb{1}_{\{a_h' > 0\}}\theta + \eta|a_h' - a_h|$

Hiding wealth is risky

- Detected w/ prob. $d(a_h, a_h')$
- Lose fraction χ_a of concealed wealth, pay multiple χ_τ of unreported tax liability

Model

Demographics + preferences

Overlapping generations of finitely-lived households

- Maximum lifespan of J years, survival probability ϕ_j decreasing with age
- Decedents replaced by newborns who inherit parents' wealth and (partially) abilities
- Mandatory retirement from labor market at age R

Preferences over consumption + leisure

$$U = \mathbb{E}\left\{\sum_{j=0}^{J} \beta^j \phi_j \frac{\left[c_j^{\mu}(1-\ell_j)^{1-\mu}\right]^{1-\sigma}}{1-\sigma}\right\}$$

- Do not care about descendents' utility $\Rightarrow$ bequests are accidental
- Tax evasion + estate taxation in model with intentional bequests next on agenda!

Model

Labor market

Labor productivity: $\zeta_j \times e$

- ζ_j: deterministic life-cycle component
- e: persistent over life cycle + across generations

Workers ($j < R$):

- Choose labor supply $\ell \in [0, 1]$
- Earn labor income $W\zeta_j e\ell$

Retirees ($j \geq R$):

- Supply $\ell = 0$ units of labor
- Receive social security benefits $B(e)$ that depend on labor productivity at retirement

Model

Entrepreneurship

Entrepreneurial productivity: $\iota \times z$

- $\iota \in \{0, 1\}$: opportunity shock, Markov over life cycle
- z: skill, fixed over life cycle + persistent across generations

Produce $q = \iota z k$ units of differentiated good using k units of capital, sell at price $p(q)$

Reportable capital income:

$$\pi = \max_k \{p(\iota z k) \times \iota z k - (r + \delta)k + r a_r\} \quad \text{s.t.} \quad k - a_r \leq \lambda(z)(a_r + a_h)$$

- Hidden + reported wealth both serve as collateral
- $\lambda'(z) > 0$: higher-ability entrepreneurs can borrow more (Lian and Ma, 2020; Li, 2022)
- Concealed wealth also earns interest; total capital income = $\pi + r a_h$

Model

Household's problem

$$V_j(e,z,\iota,a_r,a_h) = \max_{c,\ell,a_r',a_h'} \Big\{ u(c,1-\ell) + \beta \frac{\phi_{j+1}}{\phi_j} \left(1 - d(\iota,a_h,a_h')\right) \mathbb{E}_{e',\iota'} \left[V_{j+1}(e',z,\iota',a_r',a_h') \right] + \beta \frac{\phi_{j+1}}{\phi_j} d(\iota,a_h,a_h') \mathbb{E}_{e',\iota'} \left[V_{j+1}(e',z,\iota',a_r' - \text{fine},0) \right] \Big\}$$

subject to

- $c, a_r', a_h' \geq 0, \ell \in [0, \mathbb{1}_{\{j<R\}}]$
- $c + a_r' + a_h' + \text{taxes} + \text{evasion cost} = \text{income} + a_h + a_r$
- $\text{taxes} = \tau_c c + \tau_k \max\left[\pi - \max(a_h' - a_h, 0), 0\right] + \tau_a a_r + \tau_\ell W \zeta_j e \ell$
- $\text{evasion cost} = \mathbb{1}_{\{a_h'>0\}} \theta + \eta |a_h' - a_h|$
- $\text{income} = \mathbb{1}_{\{j<R\}} W \zeta_j e \ell + \mathbb{1}_{\{j \geq R\}} B(e) + \pi + r a_h + T$
- $\text{fine} = \chi_a a_h + \chi_\tau \left\{ \tau_a a_h + \tau_k \min[\pi, \max(a_h' - a_h, 0)] \right\}$

Model

Government

Tax instruments

- τ_ℓ: labor income
- τ_k: capital income
- τ_c: consumption
- τ_a: wealth

Expenditures

- G: public consumption, "thrown in the ocean"
- $\sum_{j=R}^{J} \int B(e)$: social security benefits
- T: lump-sum transfers to all households

Budget constraint

$$G + \sum_{j=0}^{J} \int \left(T + \mathbb{1}_{\{j \geq R\}} B(e)\right) d\Psi_j =$$

$$\sum_{j=0}^{J} \int \left\{\tau_c c + \tau_k \max\left[\pi - \max(a_h' - a_h, 0), 0\right] + \tau_a a_r + \tau_\ell W \zeta_j e \ell + d(\iota, a, a_h')\text{fine}\right\} d\Psi_j$$

Model

Aggregation

Production technology:

$$Y = K^{\gamma} Q^{\alpha} L^{1-\alpha-\gamma}, \quad L = \sum_{j=0}^{R} \int \zeta_j e \ell \, d\Psi_j, \quad Q = \left(\sum_{j=0}^{J} \int q^{\nu} \, d\Psi_j \right)^{1/\nu}$$

- Q: bundle of entrepreneurial goods w/ standard CES demand curve $q(p)$
- K: homogeneous "corporate" capital rented directly from households
  - Corporations less financially constrained than private businesses (Boar and Midrigan, 2022)

Aggregate capital demand = aggregate supply of reported + hidden wealth

$$K + \sum_{j=0}^{J} \int k \, d\Psi_j = \sum_{j=0}^{J} \int (a_r + a_h) \, d\Psi_j$$

- Offshore wealth often reinvested back in US (Zucman, 2015; Coppola et al., 2021; Beck et al., 2023)
- Similar results in small open economy model

Calibration

Calibration

Overview

Approach

- Set parameters so that stationary equilibrium represents US economy under current tax code

External calibration

- Assign standard parameter values and estimates from literature

Internal calibration

- Set remaining parameters to match wealth distribution, micro + macro facts about tax evasion

Validation

- Compare non-targeted moments with data counterparts (“in-sample”)
- Compare micro-level responses to tax reforms with empirical estimates (“out-of-sample”)

Calibration

Key moments

Statistic	Model	Data	Source
(a) Assigned/targeted			
Top 0.1% share of reported wealth	20%	20%	Saez and Zucman (2019)
Pct. of HH w/ offshore wealth	0.1%	0.1%	Guyton et al. (2020)
Pct. of agg. wealth concealed	4%	4%	Zucman (2015)
Pct. taxes evaded by top 0.01%	6%	6%	Guyton et al. (2020)
Avg. detection prob.	0.6%	0.6%	Guyton et al. (2020)
Penalty on hidden wealth	50%	50%	IRS
Penalty on unpaid taxes	175%	175%	IRS
(b) Non-targeted			
Reported wealth dist.			
Top 1% share	36	39	SCF (2016)
Top 10% share	66	77	
Top 20% share	79	88	
Bottom 50% share	4	1	
Aggregate tax evasion (% GDP)	0.5	0.2	Zucman (2015)
Avg. % wealth concealed by evaders	29.0	31.0–42.3	Alstadsæter et al. (2018)

Quantitative analysis

Quantitative analysis

Overview

Analyze implications of tax evasion for

- Capital income tax reform
- Flat taxes on all households' wealth (Guvenen et al., 2023; Boar and Midrigan, 2022)
- Progressive wealth taxes that apply only to ultra-wealthy (e.g. Sanders, Warren)

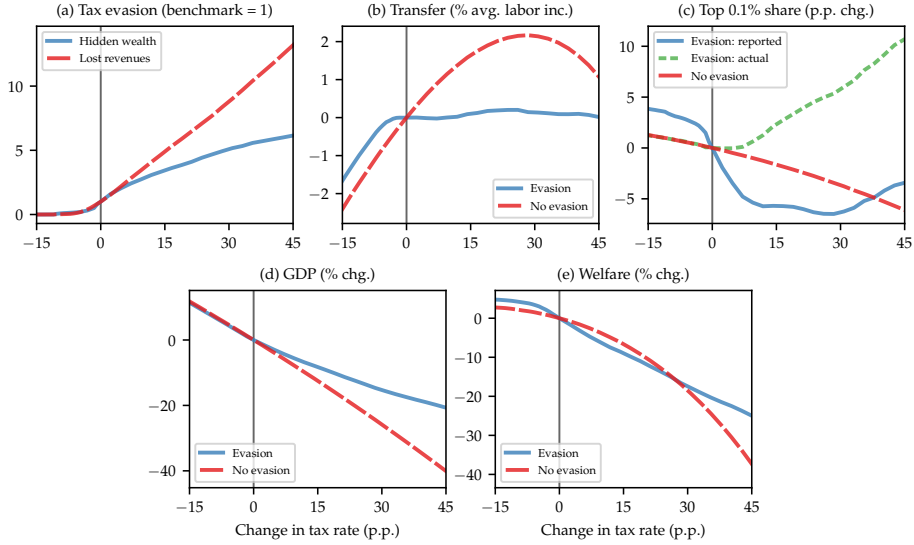
Approach: compare baseline model to no-evasion counterfactual

- Calibrated to match same targets (aside from those related to evasion)

Comprehensive LR steady-state analysis + example transitions

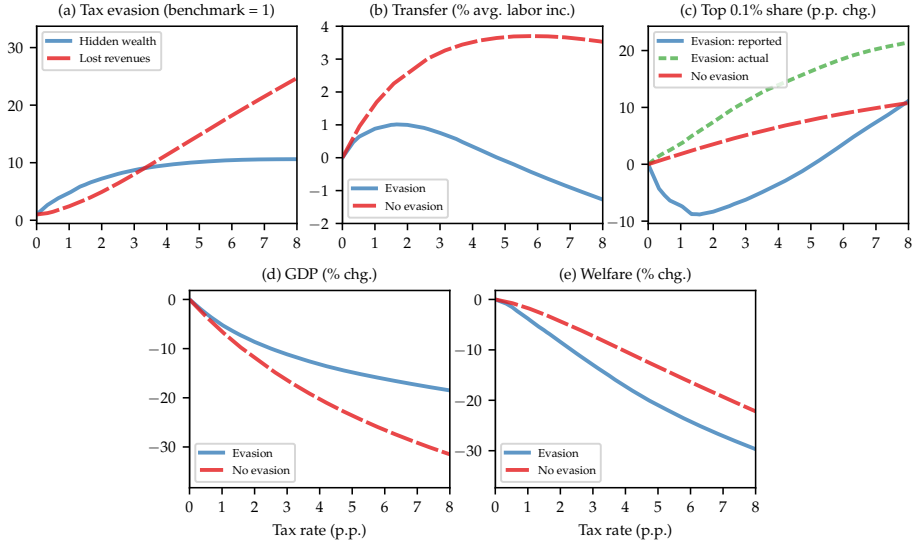
Quantitative analysis

Capital income tax reform in the long run



Quantitative analysis

Flat wealth taxes in the long run



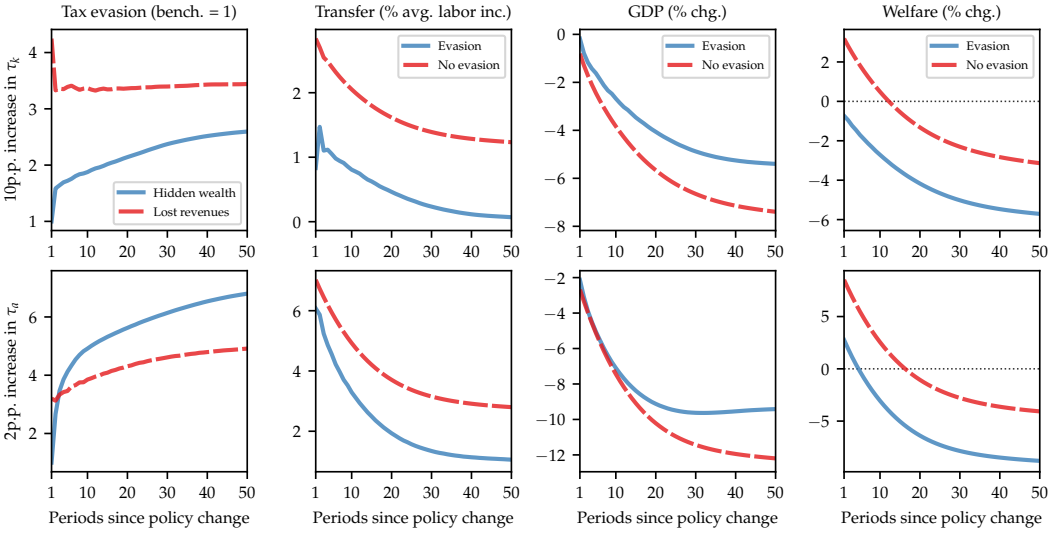
Quantitative analysis

Progressive wealth taxes in the long run

	With evasion		No evasion		
Outcome	Warren	Sanders	Warren	Sanders	Optimal
Tax rate (%)	2–3	1–8	2–3	1–8	3.25
Tax threshold ($M)	50	32	50	32	4.81
Transfer (% avg. wage)	0.06	0.07	0.30	0.36	1.00
Concealed wealth (benchmark = 1)	2.43	2.64	–	–	–
Lost revenues (benchmark = 1)	1.91	2.13	–	–	–
GDP (% chg.)	-0.69	-0.89	-1.32	-1.60	-4.55
Top 0.1% share, reported (p.p. chg.)	-6.48	-7.59	–	–	–
Top 0.1% share, actual (p.p. chg.)	-1.45	-1.74	-2.80	-3.34	-4.67
Welfare (% chg.)	-0.34	-0.43	0.39	0.44	1.08
Approval rate (%)	1.73	1.58	82.36	82.17	51.00

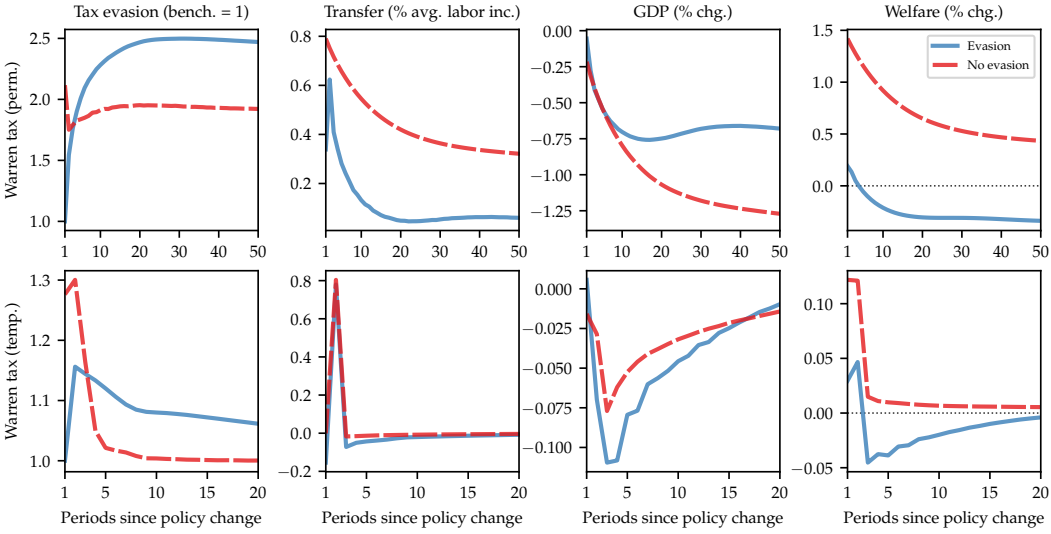
Quantitative analysis

Transition dynamics, part 1



Quantitative analysis

Transition dynamics, part 2



Quantitative analysis

Elasticities of reported income & wealth: model vs. data

	Model		Data	
Horizon	Evasion	No evasion	Estimates	Sources
(a) Capital income tax reform				
Short-run	0.45–2.2	0.0	0.90–3.6	Dowd et al. (2012); Heim (2010); Choi (2014); Agersnap and Zidar (2020)
Long-run	0.65–1.7	0.15–0.2	0.8–2.6	
(b) Flat wealth taxes				
Short run	2.4–4.5	0.0	0.3–15.6	Seim (2017); Jakobsen et al. (2018); Londoño-Vélez and Ávila-Mehcha (2020); Zoutman (2018); Durán-Cabré et al. (2019)
Long run	18.6–37.2	10.5–17.2	35.0	Brulhart et al. (2016)
(c) Progressive wealth taxes				
Short run	9.9	0.0	–	–
Long run	40.8	15.4	–	–

Conclusion

Conclusion

Developed quantitative theory of offshore tax evasion, demonstrated significant implications for capital income tax reform + wealth taxes

- No evasion: both taxes could generate lots of revenue, and progressive wealth taxes could generate widespread welfare gains
- With evasion: neither tax would generate much revenue, and progressive wealth taxes would hurt virtually all households
- Reported wealth inequality would fall dramatically, but actual inequality would fall only slightly or even rise

Results align with empirical estimates of behavioral responses to tax reforms

- Evasion is key driver of these responses, especially for capital income taxes
- GE framework accounts for interactions with broader economy

Advice for policymakers: reforms must come with increased enforcement!

- IRS using new IRA funding to increase scrutiny of rich households—will it be enough?

Calibration details

Calibration

External assignments

Demographics from US Census, $j = 0$ corresponds to age 25

Depreciation, labor + capital shares standard

- Corporate capital share = 7.1% (corporate income/GDP in NIPA tables)

Labor productivity distribution, taxes from Guvenen et al. (2023)

Intergenerational persistence of entrepreneurial skill = 0.1 (Fagereng et al., 2018)

Entrepreneurial opportunity process chosen to match hump shape in share of households with business income over life cycle

- Pr(opportunity at birth) = 8.7% (SCF 2016)
- Pr(lose opportunity) = 8.1% (Clementi and Palazzo, 2016)
- Pr(regain opportunity) = 2.3% (SCF 2016)

Calibration

Internal moment-matching

Parameter	Description	Value	Target	Source
σ_z	Entr. ability std. dev.	0.42	Reported top 0.1% share = 20%	Saez and Zucman (2019)
β	Discount factor	0.98	Reported wealth/GDP = 3	Guvenen et al. (2023)
μ	Consumption share	0.43	Avg. labor supply = 40%	Guvenen et al. (2023)
λ	Collateral constraint	2.0	Debt/GDP = 1.3	Guvenen et al. (2023)
θ	Fixed evasion cost	1.1	HH with offshore wealth = 0.05%	Guyton et al. (2020)
η	Proportional evasion cost	0.11	Hidden/total wealth = 4%	Zucman (2015)
ω_1	Detection prob. (entr.)	2e-4	Tax evasion by top 0.01% = 6%	Guyton et al. (2020)
ω_0	Detection prob. (others)	8e-6	Avg. detection prob. = 0.6%	Guyton et al. (2020)

- Target top 0.1% share of reported wealth; actual wealth more unequally distributed since only ultra-rich conceal
- Fixed evasion cost $>$ average households' labor income
- $d(\iota, a_h, a_h') = \tanh\left(\omega_\iota \max(a_h' - a_h, 0)\right)$. $\omega_1 > \omega_0 \Rightarrow$ entrepreneurs more likely to get caught

Sensitivity analysis

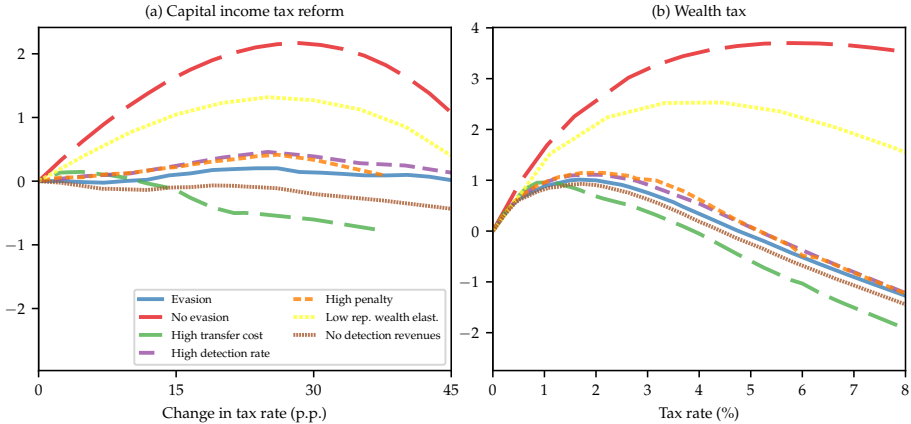
Sensitivity analysis

Evasion parameters

Outcome	Baseline	No evasion	High transfer cost	High detection rate	High penalty	Lower rep. wealth elast.
(a) Benchmark equilibrium						
Concealed wealth (% total)	3.79	–	0.60	2.05	2.33	1.38
Lost revenues (% GDP)	0.50	–	0.04	0.41	0.43	0.19
(b) Revenue-maximizing capital income tax						
Change in tax rate (p.p.)	26.05	28.42	4.74	25.00	26.05	25.00
Transfer (% avg. wage)	0.20	2.17	0.15	0.46	0.42	1.32
Concealed wealth (bench. = 1)	4.68	–	5.65	7.32	6.73	4.66
Lost revenues (bench. = 1)	7.69	–	9.24	7.91	8.19	8.37
(c) Revenue-maximizing wealth tax						
Tax rate (%)	1.67	5.79	1.07	1.93	1.93	4.44
Transfer (% avg. wage)	1.01	3.70	0.96	1.11	1.15	2.53
Concealed wealth (bench. = 1)	6.60	–	25.94	11.99	10.46	8.02
Lost revenues (bench. = 1)	4.00	–	19.40	4.98	4.82	11.72
(d) Warren wealth tax						
Transfer (% avg. wage)	0.06	0.30	0.01	0.12	0.10	0.28
Concealed wealth (bench. = 1)	2.43	–	11.94	3.75	3.26	2.34
Lost revenues (bench. = 1)	1.91	–	13.17	1.83	1.87	1.87
Welfare (% chg.)	-0.34	0.40	-0.53	-0.10	-0.19	0.24
Approval (%)	1.73	82.36	1.33	19.87	8.31	48.43
(e) Reported wealth elasticity to 1.5% tax						
Short run	3.88	–	4.30	3.77	3.71	1.36
Long run	32.42	16.10	32.19	31.82	31.39	18.37

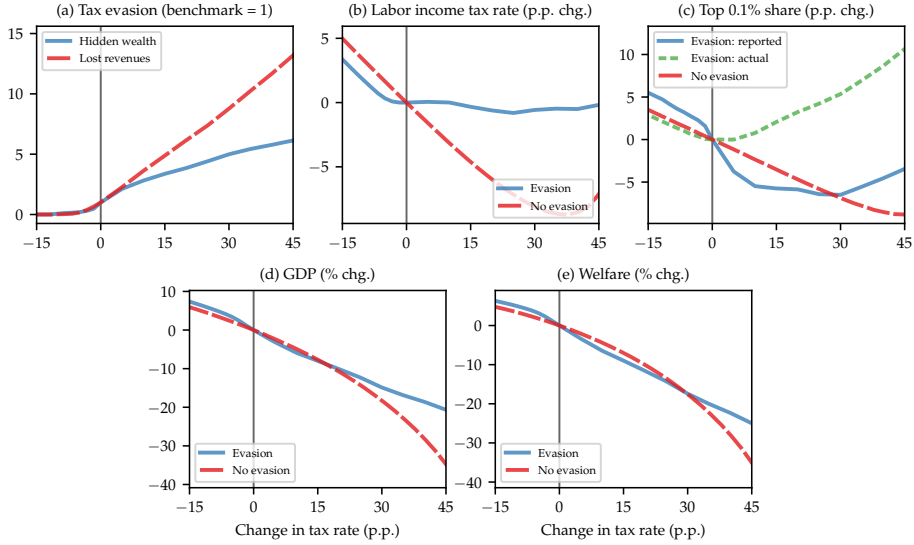
Sensitivity analysis

Evasion parameters



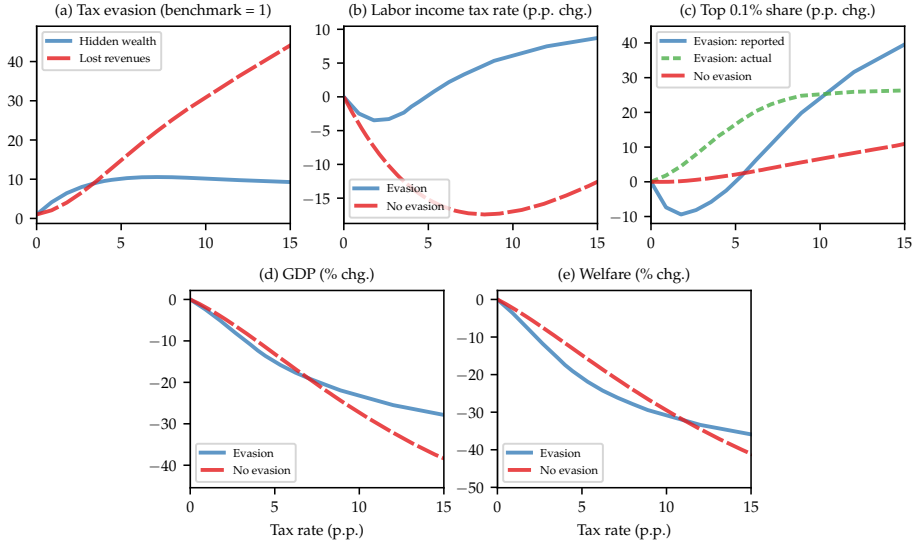
Sensitivity analysis

Labor income tax reform instead of lump sum taxes (capital income tax reform)



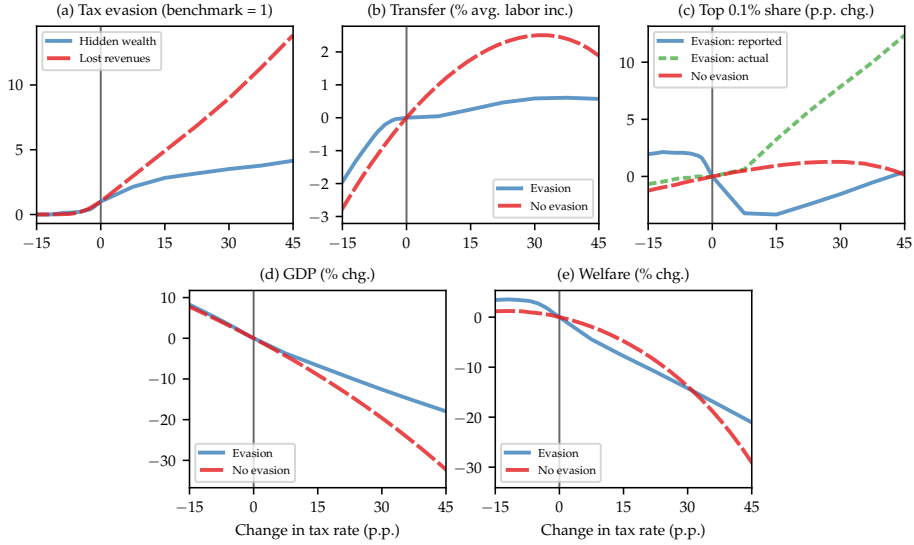
Sensitivity analysis

Labor income tax reform instead of lump sum taxes (wealth taxes)



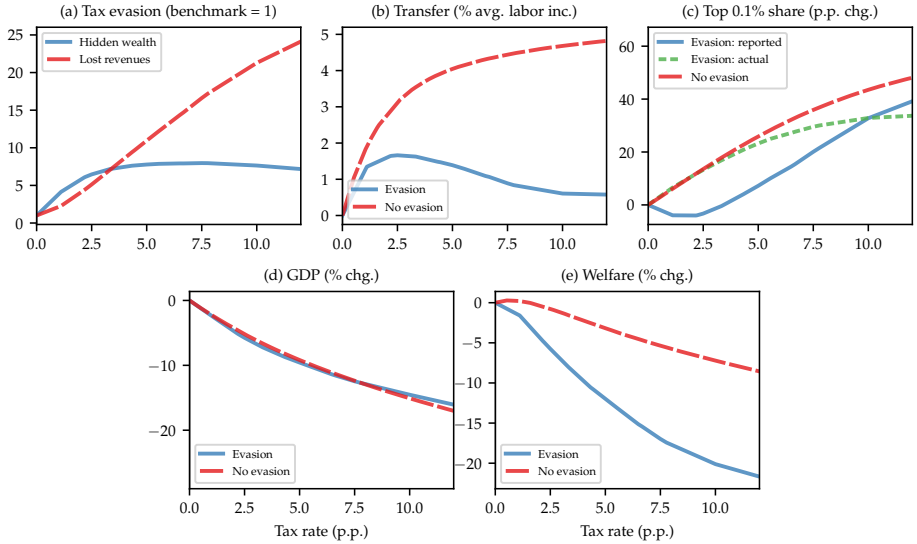
Sensitivity analysis

Small open economy (capital income tax reform)



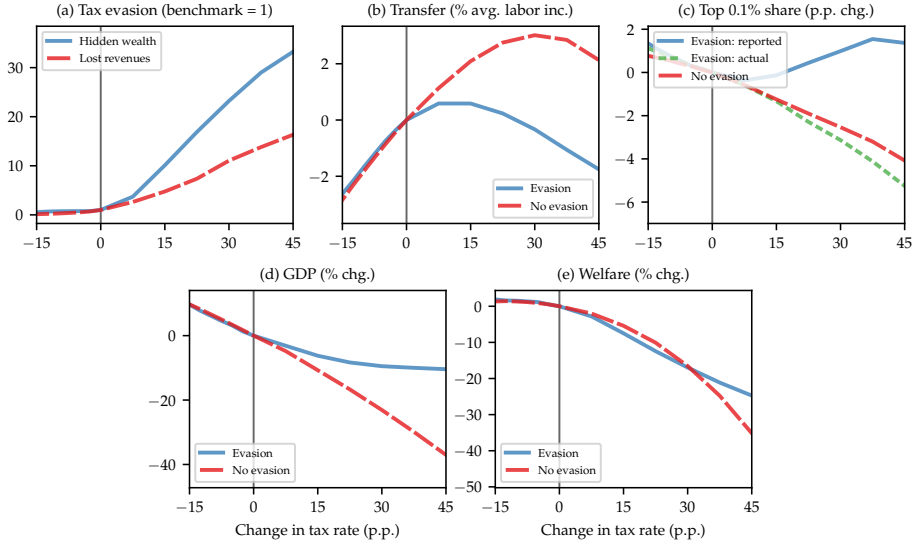
Sensitivity analysis

Small open economy (wealth taxes)



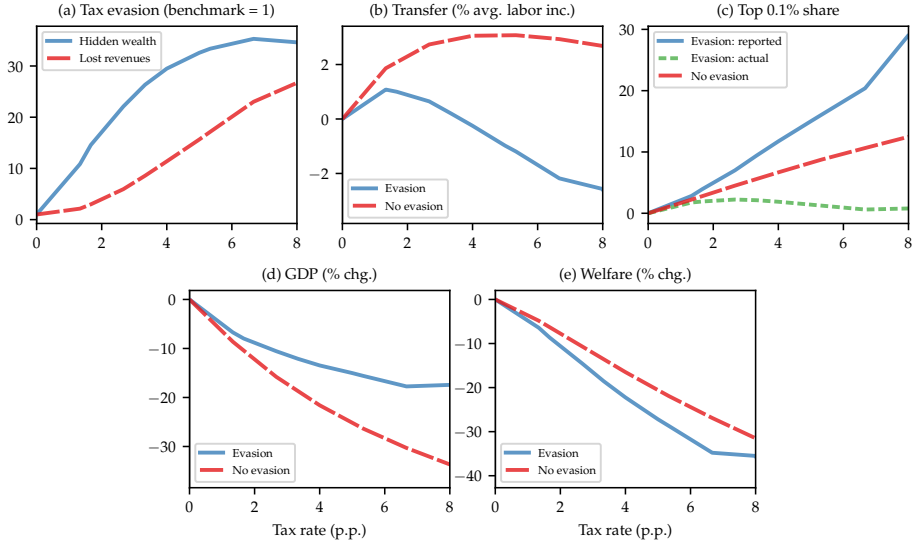
Sensitivity analysis

No collateral constraint (capital income tax reform)



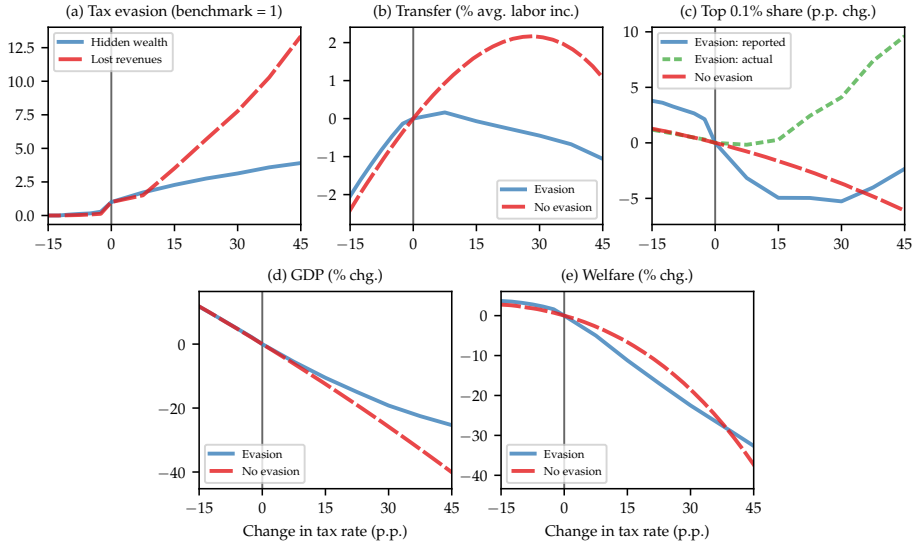
Sensitivity analysis

No collateral constraint (wealth taxes)



Sensitivity analysis

Hidden wealth cannot be collateralized (capital income tax reform)



Sensitivity analysis

Hidden wealth cannot be collateralized (wealth taxes)