Income Tax Fluctuations and Uncertainty

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Motivation

Income tax and income-tested benefit policies fluctuate considerably over time, mainly driven by changes in governmental leadership. These regular fluctuations in income tax policy induce general uncertainty among households. What are the consequences of this fiscal uncertainty?

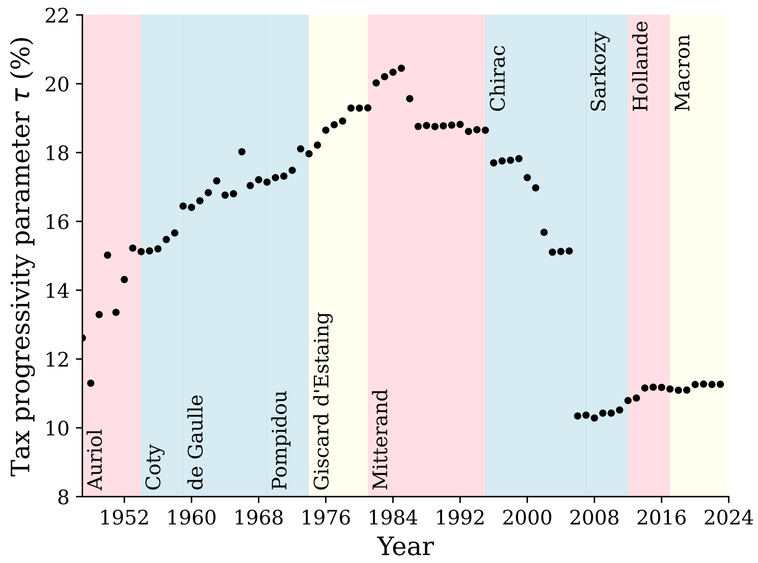

Figure 1. Evolution of the tax progressivity parameter over time. Estimation using IPP income tax data.

Contribution: Study the consequences of income tax uncertainty, which requires

- Heterogeneous agents
- Progressive taxation (Heathcote et al., 2017)
- Aggregate uncertainty (regarding the tax progressivity)

Model

Households.

$$v_t(e, a_-) = \max_{a,c,n} \frac{c^{1-\sigma}}{1-\sigma} - \theta \frac{n^{1+\nu}}{1+\nu} + \beta \mathbb{E}_t v_{t+1}(e', a)$$
$$\text{s.t. } c + a = (1+r)a_- + (1-\lambda)(wen)^{1-\tau}$$
$$a \geq 0$$

with e the idiosyncratic productivities, τ the tax progressivity and λ the tax level parameter.

Firms. Linear production function $Y_t = Z_t L_t$. As a result, $w_t = Z_t$.

Government. The government raises tax revenues $\mathcal{T}_t(\tau_t, \lambda_t) \equiv \int_{e,a_-} (w_t e_t n_t - (1-\lambda_t)(w_t e_t n_t)^{1-\tau_t}) \, \mathrm{d}\Gamma_t(e, a_-)$, spends G_t and issues debt B. Besides, it runs a balanced budget at every period

$$\mathcal{T}_t(\tau_t, \lambda_t) = r_t B + G_t$$

The government can choose the level of progressivity τ_t but this has to be neutral in terms of revenue ($\mathcal{T}_t(\tau_t, \lambda_t) = \mathcal{T}, \ \forall t$), which will pin down a value for λ_t.

Intuition

Simplified model:

- Hand-to-mouth households face a static consumption-labor decision problem *à la* Ferriere et al., 2023.
- Government can change the progressivity $\tau \in \{\tau^-, \tau^+\}$ (probability p to be in τ^- state).

The uncertainty cost for variable $X \in \{n, Y, W\}$ is

$$u^X \equiv \underbrace{\mathbb{E}[X]}_{pX(\tau^-)+(1-p)X(\tau^+)} - X[\mathbb{E}(\tau)]$$

Labor supply, output, and welfare are concave functions of tax progressivity. Fiscal uncertainty is thus always detrimental.

Extension: If some households receive an exogenous income besides labor income (proxy of financial income), output is further depressed due to the wealth effect.

Quantitative model

Consider the model with aggregate tax progressivity risk: τ follows a three-state $\{\tau^- = 11.1\%, \bar{\tau} = 13.6\%, \tau^+ = 17.6\%\}$ (corresponding to the historical low, average and high values over the 2001-2024 period) Markov chain with transition matrix $\begin{pmatrix} 0.835 & 0.165 & 0 \\ 0.109 & 0.821 & 0.070 \\ 0 & 0.310 & 0.690 \end{pmatrix}$.

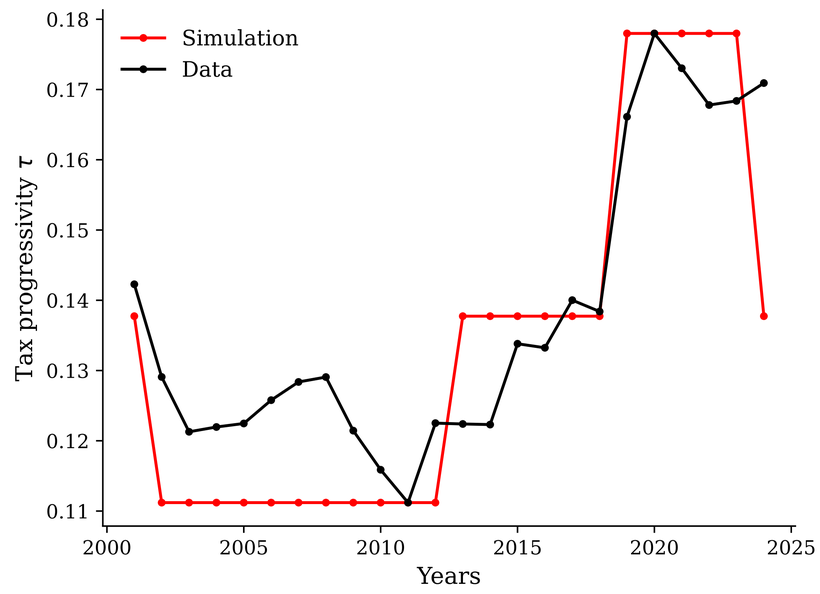

Figure 2. Approximation of tax progressivity changes by a Markov process. Estimation using OECD TaxBEN income tax and benefit data.

I solved the model using a Krusell and Smith, 1998 algorithm variant.

	Stochastic SS	Deterministic SS	Deviation
Tax progressivity τ	19.4%	19.4%	0.00%
Tax level λ	20.3%	20.1%	0.88%
Real rate r	2.897%	2.902%	-0.15%
Consumption $\mathcal{C}$	0.8014	0.8011	0.03%
Output Y	1.0024	1.0021	0.03%
Labor $\mathcal{N}^e$	1.0024	1.0021	0.03%
Hours $\mathcal{N}$	0.8310	0.8305	0.05%
Government spending G	0.20102	0.20098	0.02%
Government spending ratio $\frac{G}{Y}$	20.04%	20.05%	-0.06%

Table 1. Steady-state impact of fiscal uncertainty.

As risk increases, households are more willing to save, pushing the real rate down. As the asset supply is fixed, financial incomes are depressed, incentivizing wealthy households to supply more labor.

Meanwhile, low-productivity households work less as they receive more transfers. The middle of the distribution is less affected by tax changes, leaving its labor supply unaffected.

Since aggregate consumption increases less than hours worked, tax uncertainty diminishes welfare.

References

Ferriere, A., Grübener, P., Navarro, G., & Vardishvili, O. (2023).“On the optimal design of transfers and income-tax progressivity”. *Journal of Political Economy Macroeconomics*, *1*, 276–333.

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