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Abstract

We study the optimal one-shot tax reform in the standard incomplete markets model where households differ in their wealth, earnings, permanent labor skill, and age. The government can provide transfers by raising tax revenue and has several tax instruments at its disposal: a flat capital income tax, a flat consumption tax, and a non-linear labor income tax. The optimal fiscal policy funds a transfer that is nearly 50 percent of GDP through a combination of very high taxes on consumption and capital income. The labor tax schedule has a high average rate but is also moderately progressive. We find an identical outcome when policy is instead determined by majority voting. Finally, we offer suggestive empirical evidence that households' preferences for tax and redistribution are more strongly associated with political identity than economic status.
KEYWORDS: Optimal Taxation; Inequality; Heterogeneous Agents; Incomplete Markets; Voting;
JEL CLASSIFICATION CODES: E62, E21, D72, H21

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1 Introduction

The past half-century has been marked by an increase in earnings and wealth inequality. This trend has raised questions about whether the government should redistribute income to reduce economic disparities and, if so, how it should achieve this aim. Which revenue sources should be taxed and in what proportions? These questions are especially challenging because the revenue for financing redistribution comes primarily from distortionary taxation, and this leads to the classic "equity/efficiency" trade-off wherein more equitable divisions of the economic pie come at the cost of reducing the pie.

To understand how the set of taxes and their implied degree of redistribution affect optimal fiscal policy, we build a dynamic general equilibrium incomplete markets model in which households differ by income, wealth, labor market skill, and age. We calibrate the model to match the US data with a particular attention to inequality in labor earnings and wealth, including the top tails of both distributions, and then use the model as a quantitative laboratory to study how permanent reforms to the current tax/transfer system affect both aggregate activity and household welfare. The model allows us to evaluate the effects of a wide range of fiscal policy regimes. Consumption taxes, capital income taxes, and labor income taxes may all be adjusted. In addition to the average level of taxation on labor income, the progressivity of the schedule can also be modified. In equilibrium, each fiscal policy gives rise to a sequence of lump-sum transfers.

Starting from the calibrated steady state, we solve for the fiscal policy reform that maximizes utilitarian social welfare, taking into account the transitional dynamics to the new steady. The optimal policy features a very high level of taxation. Starting from a finite but wide and numerous set of combinations, the choice of tax rates for consumption and capital income is 51.2 and 60 percent, respectively. The average labor tax rate is also chosen to be 60 percent, but the schedule maintains the progressivity in the current US system so that the brunt of the high rates is still borne by high earners.

These confiscatory levels of taxation support large lump-sum transfers that are in the order on 50 percent of GDP. The large and comprehensive tax bill, coupled with a massive windfall redistribution, not surprisingly greatly distorts economic activity. In the final steady state of the chosen menu of tax policies, the aggregate capital of the economy and average hours worked plummet to levels that are more than 40 percent lower than those in the initial benchmark economy. Aggregate output falls by almost one-third in the long run, while transfers rise to a level roughly six times higher than its benchmark level.

Despite having severe consequences for the aggregate economy, the optimal fiscal policy leads to much higher welfare, particularly for lower-income households. The high degree of inequality present in the initial steady state and the very limited means available to households for insuring against persistent fluctuations in their income streams drive this result. Support in the model for a massive redistribution is so widespread that the classic equity/efficiency trade-off has almost no bearing on the policy outcome. Introducing features that increase the tax elasticity of revenue and push the peak of the Laffer curve to the left would most probably do little to erode support.

The primary reason for high redistribution in the model is the relative importance of low-income households. They are numerous and have high marginal utilities of consumption, which means that their welfare has an outsized weight in the objective function of a utilitarian social planner. Moreover, most of these households' income derives from their labor, and the equilibrium policy makes use of progressivity to collect revenue and deliver high transfers to them while also minimizing their tax burden.

The optimal tax structure pushes all tax parameters to their maximal feasible values with the exception of labor tax progressivity.[2] The equilibrium policy essentially strikes a balance between two effects from greater progressivity: increasing overall welfare by shifting the tax burden away from low- and middle-income earners and reducing output (and as a consequence transfers) by discouraging the most productive households. Progressivity is also the dimension along which wealth-poor households disagree. The lowest earners favor a flat high-rate labor tax to maximize the transfer. Median earners also want a high labor tax rate but wish to pair it with just enough progressivity to prevent them from paying a substantial share of the tax bill. Households with low wealth but high earnings push the balance in the other direction: very high progressivity, a lower average rate, and less transfer.

The high-tax equilibrium policy is not a simple by-product of the initial distribution of capital. Repeating the optimal policy exercise starting from a much starker low-wealth distribution –specifically, the one that arises in the long run under the high-tax optimal policy in the baseline– returns nearly the same result. The only difference between the baseline and

[2]We consider a tax menu set with a total of 2160 combinations stemming from different grids on each tax instrument. The details are explained in Section 4.

the low-wealth solution is that progressivity is slightly lower in the second case, a consequence of a greater tax elasticity of revenue. A potential reason for the robustness of the high-tax policy is that the costs of transitioning to a low-tax economy with greater aggregate activity are so high that it is welfare maximizing to keep the status quo. Households, in a sense, would be held hostage to the policies of the past. We test this by solving for the policy that maximizes average steady-state utility, meaning that transitional dynamics are ignored, and we find that the solution still features high taxation and very high transfers. One important difference in this case, however, is that when transitions are not internalized, it is optimal to eliminate capital income taxation and maximize progressivity.

Overall the model predicts that in highly unequal societies one should observe very strong support for large welfare states. However, among the OECD countries, no economy imposes distortionary taxes at the levels suggested by the model. Two potential explanations for this spring to mind. First, the model may still understate the efficiency loss from distortionary taxes, causing it to overstate the feasible level of transfers. For instance, productive economic activities like entrepreneurship and human capital accumulation may be especially sensitive to high taxation. However, introducing these additional factors seems unlikely to materially alter our findings given low-income households' general preference for redistribution in lieu of economic activity in the model. Furthermore, we also observe that large reductions in the equilibrium wage, present in the model's outcome of the equilibrium policy, do little to reduce low-income workers' desire for large transfers.

Second, the model may not accurately reflect the process by which equilibrium policy is determined in the data. Utilitarian social planners, while a useful thought experiment, do not exist in the real world. Instead, in most advanced economies, a democratic political process ultimately decides the level of taxation and redistribution. When we instead search for all fiscal policies that could arise under a majority vote as in Carroll et al. (2021), we find that households choose the same policy as the social planner. Again, the high population share of the poor and their unanimity of preference for redistribution decide elections in favor of high taxes. Although the policy under majority voting and the optimal policy are the same, this is true when each household votes only in accordance with its fiscal interest as captured by its individual state space in the model. If, however, low-income households have less political power or if they place less importance on tax policy than on other non-tax issues, the equilibrium under voting could feature more moderate taxes and transfers.

We find suggestive evidence for this hypothesis from the 2021 sample of the Generalized Social Survey (GSS) in the US, which surveys respondents' preferences toward different tax and redistribution-related questions as well as political views, including their vote in the 2016 presidential election. We are able to document that political views, as captured by ideological and party identity in the data, are strongly correlated with respondents' views regarding the federal level of taxes, taxation of high-income Americans, and government-driven redistribution, even after controlling for income and demographic characteristics. We also observe that there is a clear distinction and disagreement in regard to respondents' views on taxes and redistribution depending on their political and ideological views. Furthermore, our analysis suggests that the effect of income on respondents' attitudes toward taxation and redistribution may be offset or even reversed by their preferences over the political spectrum.

Related Literature. Our paper contributes to the quantitative macroeconomics literature that focuses on the positive, normative, and political effects of public finance reforms through the lens of heterogeneous agents models. We are closely related to the now established literature that analyzes the effects of optimal income and labor tax progressivity in quantitative heterogeneous agents models, such as in Bakış et al. (2015), Guner et al. (2016), Heathcote et al. (2017), Imrohoroğlu et al. (2018), Holter et al. (2019), and Kindermann and Krueger (2022). We contribute to this branch by expanding the usual focus on optimal progressivity to an environment where all tax rates available in the government's menu are also being chosen simultaneously with the curvature of the Benabou tax function.

Given that our results support the welfare optimality and political preference for large lump-sum transfers, our paper relates to a recent strand of the literature that studies the effects of such transfers in similar model environments, often in the shape of NIT and UBI reforms such as in Lopez-Daneri (2016), Conesa et al. (2021), Daruich and Fernández (2020), Guner et al. (2021), and Luduvice (2021). In more recent analyses, Dyrda and Pedroni (2022), Acikgoz et al. (2018), Boar and Midrigan (2022), Ferriere et al. (2022), and Guner et al. (2023) comprise a set of papers that study tax reforms focusing on the flexibility of the schedule menu available to the government and the planner. The first two of the latter group allow labor and capital taxes to be time-varying along the transition, approximating the solution to an unrestricted Ramsey problem. The last two have flexible schedules in which the welfare optimization is conducted over the parameters that govern the different functions that approximate the tax schedules. For Ferriere et al. (2022) those are on progressivity and transfers and for Boar and Midrigan (2022), a wealth tax is substituted for the latter. Our approach allows for flexibility in the full menu of taxes, including the degree of progressivity and the consumption tax, in a model with workers and retirees and heterogeneous skill levels while adding the political equilibrium methodology alongside the usual social planner aggregation for optimality. Guner et al. (2023) find that, with a given an increasing revenue objective, high consumption taxes coupled with large transfers and a lower level of progressivity could generate less welfare costs. This result is consistent with our welfare-maximizing tax menu, despite having a different policy objective.

We also engage with a branch of the literature in the same methodological tradition that departs from exploring the political voting schedule but focuses on the weights that a social planner would choose to implement tax schedules and changes observed in the data. Some of the papers that discuss these Pareto weights, also in the context of progressivity choice, are Chang et al. (2018), Heathcote and Tsujiyama (2021), and Wu (2021). Here the Downsian voting schedule we analyze can be rationalized to capture the embedded political mechanism that is behind the weights that implement a given policy. Our paper is also connected with the branch that focuses on political equilibria in such economies as in Aiyagari and Peled (1995), Krusell et al. (1997) Corbae et al. (2009), Bachmann and Bai (2013), de Souza (2022), and others. In our discussion of alternative aggregation methods beyond the Social Planner, we employ the novel methodology of Downsian voting used in Carroll et al. (2021) in an environment with several layers of heterogeneity, adding a demographic structure with retirement, dual skill levels, labor income tax progressivity, and a starting level of earnings and wealth heterogeneity that closely mimics the US data.

Road Map. The paper is organized as follows. Section 2 constructs the quantitative model and defines the recursive competitive equilibrium. Section 3 describes the calibration used to map the model to the data. Section 4 presents the results of our numerical experiment. Section 5 reports the optimal reform and explores the factors underpinning it. Section 6 extends our findings to a multidimensional voting equilibrium concept and describes empirical evidence on political preferences and ideology. Finally, Section 7 concludes the paper.

2 Model

We build a heterogeneous agents model with incomplete markets as in Aiyagari (1994), Bewley (1986), Huggett (1993), and Imrohoroğlu (1989), augmented by overlapping generations, exogenous retirement, heterogeneous permanent skill levels, endogenous labor supply, and a menu of distortionary taxes, including consumption and progressive labor income taxation. Time is discrete. In any period, t, there is a unit continuum of households that are, with a certain probability, either young or old. Each is endowed with one unit of discretionary time. The fundamental difference between the two household age types is that only the former may supply labor with their discretionary time, while old households may only use it to consume leisure. For this reason, we may use the descriptors "young" and "worker" interchangeably, and the same is true for "old" and "retiree." Denote the age of a household by $a \in \mathcal{A} \equiv \{W, R\}$. There is a measure μ_s of skilled households and μ_u of unskilled households with $\mu_u = 1 - \mu_s$. A household's permanent skill type is denoted by $j \in \mathcal{J} \equiv \{u, s\}$. Agents are also heterogeneous with respect to their idiosyncratic productivity shock, $\varepsilon \in \mathcal{E}$, with $\mathcal{E}$ finite, and asset holdings $k \in \mathcal{K}$. The state space of the economy is then the set $X \equiv \{\mathcal{K} \times \mathcal{E} \times \mathcal{J} \times \mathcal{A}\}$.

Demographics. Households age stochastically in a perpetual youth life-cycle as in Yaari (1965) and Blanchard (1985). At the end of each period, a fraction ψ_a of young households age and enter the next period as an old household. Likewise, a fraction ψ_d of old households die. When a household dies, its assets are transferred to a newborn household of the same skill type. The initial idiosyncratic productivity of this newborn is drawn from the skill-specific invariant distribution of productivity.

Preferences. Households have a time-separable period utility function, u, consume non-durable goods, c, choose how much labor to supply, h, and save using a risk-free, non-state-contingent asset, k, which they may borrow up to an exogenous limit, k_b. Positive savings earn interest at a rate r. They maximize their discounted expected lifetime utility defined as follows

$$\mathbb{E}\left[\sum_{t=1}^{\infty} \beta^t \psi_a \, u(c, h)\right], \tag{1}$$

where β is the discount factor and $\mathbb{E}$ is the expectation operator.

Technology. There is a Cobb-Douglas production technology over aggregate capital and effective labor, $F(K,N) = AK^{\alpha}N^{1-\alpha}$ for $\alpha \in (0,1)$. A stand-in firm operates this technology and behaves competitively. The zero-profit conditions are

$$r_t = \alpha A \left(\frac{K_t}{N_t}\right)^{\alpha-1} \tag{2}$$

$$w_t = (1-\alpha) A \left(\frac{K_t}{N_t}\right)^{-\alpha} \tag{3}$$

Workers and the Labor Market. At the beginning of a period, every worker household draws labor productivity, $\varepsilon \in \mathcal{E}$. Productivity draws are assumed to follow a Markov chain with skill-dependent transition probabilities $\pi_u(\varepsilon, \varepsilon')$ and $\pi_s(\varepsilon, \varepsilon')$ with corresponding invariant distributions, $\overline{\pi}_u(\varepsilon)$ and $\overline{\pi}_s(\varepsilon)$. The worker's effective labor is $exp(\varepsilon) \cdot h$. For each unit of effective labor supplied, a worker receives a wage $\zeta(j) \cdot w$, where $\zeta(s) > \zeta(u) = 1$ represents the skill premium. Letting y denote a worker's total labor earnings, $y_{j,t}(h, \varepsilon) = \zeta(j) \cdot w_t \cdot \exp \cdot (\varepsilon) \cdot h$.

Government and Taxes. A government collects tax revenues and spends it on two types of expenditures: wasteful government spending G_t and non-retirement transfers, Υ_t. To fund these expenditures, it administers a flat tax on consumption, $\tau_{c,t}$, a flat tax on capital income $\tau_{k,t}$, and a progressive tax on labor earnings $T_h(y_t)$. Following what is now standard in the literature (Benabou, 2002; Heathcote et al., 2017), we employ a non-linear tax schedule given by

$$T_h(y_t) = y_t - \frac{(1-\tau_{y,t})\, y_t^{(1-\nu_{y,t})}}{1-\nu_{y,t}} \tag{4}$$

where $\tau_{y,t}$ controls the average labor taxes of the economy and $\nu_{y,t}$ controls the curvature of the function and hence its degree of progressivity. In any period t, the government budget constraint is

$$G_t + \Upsilon_t = \tau_{c,t} C_t + TN_t + \tau_{k,t} r_t K_t \tag{5}$$

where TN_t is the aggregate level of labor income tax revenue.

Retirement and Social Security. The government also manages the Social Security system that has its budget balanced separately. It disburses aggregate benefits B and funds them with an additional flat tax on earnings, τ_{SS}. Total Social Security contributions are capped at $\bar{t}_{SS}$, which is used to close the system's budget.

When a household ages into retirement, it begins receiving a Social Security benefit $b_j(\varepsilon)$, which is indexed to the household's last labor productivity draw from its working life. We follow the US Social Security schedule to calculate the payments:

$$b_j(\varepsilon) = \begin{cases} r_1\bar{y}_j(\varepsilon), & \text{if } \bar{y}_j(\varepsilon) \leq b_1\bar{y} \\ r_1 b_1\bar{y}_j(\varepsilon) + r_2(\bar{y}_j(\varepsilon) - b_1\bar{y}_j(\varepsilon)), & \text{if } b_1\bar{y} < \bar{y}_j(\varepsilon) \leq b_2\bar{y} \\ r_1 b_1\bar{y}_j(\varepsilon) + r_2 b_2\bar{y}_j(\varepsilon) + r_3(\bar{y}_j(\varepsilon) - b_2\bar{y}_j(\varepsilon)), & \text{o.w.} \end{cases} \tag{6}$$

where $\bar{y}_j(\varepsilon)$ is the average labor earnings of a household with skill j and labor productivity ε; $\bar{y}$ is average earnings in the economy; r_1, r_2, r_3 are the replacement rates at the different levels of income; and b_1, b_2 are the function bend points.

2.1 Recursive Household Problem

The individual state space of the households is $x \equiv [k, \varepsilon, j, a] \in X$. For convenience, we henceforth omit the time subscript in the definition of the recursive household problem. In some instances, it will also be useful to distinguish between households of different ages and skills. In those cases, let f_j^a indicate that f, which may be a value function, decision rule, or subset of X, is associated with a household of age a and skill j. For example, the policy function for consumption of a skilled worker is

$$g_c(k, \varepsilon, s, W) \equiv g_{s,c}^W(k, \varepsilon).$$

Taking a tax policy $\boldsymbol{\tau} \equiv \{\tau_c, \tau_k, \tau_y, \nu_y\}$ as given, a household chooses its consumption c, asset holdings k', and, if young, its labor supply h so as to maximize expected lifetime utility according to the discount factor, $\beta \in (0, 1)$. The problem of a retired household with assets,

k, productivity type, ε, and skill, j, is

$$
\begin{aligned}
&V_j^R(k,\varepsilon) = \max_{c,k'} u(c,0) + (1-\psi_d)\beta V_j^R(k',\varepsilon) \\
&\text{s.t.} \\
&(1+\tau_c)c + k' = (1+(1-\tau_k)r)k + (1-\tau_{SS})b_j(\varepsilon) + \Upsilon \\
&\qquad c > 0, \qquad k' \geq k_b
\end{aligned}
\tag{7}
$$

The problem for a working household is

$$
\begin{aligned}
&V_j^W(k,\varepsilon) = \max_{c,h,k'} u(c,h) + \beta\left[(1-\psi_a)\sum_{\varepsilon'\in\mathcal{E}} \pi_j(\varepsilon,\varepsilon') V_j^W(k',\varepsilon') + \psi_a V_j^R(k',\varepsilon)\right] \\
&\text{s.t.} \\
&(1+\tau_c)c + k' = (1+(1-\tau_k)r)k + y_j(h,\varepsilon) - T_h[y_j(h,\varepsilon)] - \min[\tau_{SS}\cdot y_j(h,\varepsilon), \bar{t}_{SS}] + \Upsilon \\
&\qquad c > 0, \qquad k' \geq k_b, \qquad h \in [0,1)
\end{aligned}
\tag{8}
$$

The solution of the dynamic programs (7) and (8) yields the decision rules for household choices on consumption, savings, and labor supply, $\left\{g^a_{j,c}(k,\varepsilon), g^a_{j,k}(k,\varepsilon), g^a_{j,h}(k,\varepsilon)\right\}_{\substack{a\in\{W,R\}\\ j\in\{u,s\}}}$.

2.2 Definition of Equilibrium

Agents are heterogeneous at each point in time in the state $x \in X$. The agents' distribution among the states x is described by a measure of probability Γ_t defined on subsets of the state space X. Let $(X, \mathcal{B}(X), \Gamma_t)$ be a space of probability, where $\mathcal{B}(X)$ is the Borel σ-algebra on X. For each $\omega \subset \mathcal{B}(X)$, $\Gamma_t(\omega)$ denotes the fraction of agents who are in probability state ω. There is a transition function $M_t(x,\omega)$ that governs the movement over the state space from time t to time $t+1$ and that depends on the invariant probability distribution of the idiosyncratic shock $\bar{\pi}_j(\varepsilon)$ and on the decision rules obtained from the household problem.

Definition 1 (Competitive economic equilibrium)**.** *Given initial conditions K_1 and Γ_1, a competitive economic equilibrium is a sequence of social security tax rates and benefit schedules $\{\tau_{SS}, b_j(\varepsilon_t)_{j\in J}\}_{t=1}^{\infty}$, government expenditures $\{G_t\}_{t=1}^{\infty}$, lump-sum transfers $\{\Upsilon_t\}_{t=1}^{\infty}$, tax* *policies* $\{\boldsymbol{\tau}_t\}_{t=1}^{\infty}$, *value functions* $\{V_t(x), g_{c,t}(x), g_{k,t}(x), g_{h,t}(x)\}_{t=1}^{\infty}$, *factor prices* $\{r_t, w_t\}_{t=1}^{\infty}$, *firm plans* $\{K_t, N_t\}$, *and measures* $\{\Gamma(x)\}_{t=1}^{\infty}$ *such that,* $\forall t$

1. *Given factor prices, taxes, and transfers,* $\{V_t(x), g_{c,t}(x), g_{k,t}(x), g_{h,t}(x)\}$ *solve the household problems in* (7) *and* (8).

2. *Given factor prices,* $\{K_t, N_t\}$ *satisfy equations (2) and (3).*

3. *Markets clear:*

   (a)
$$K_t = \int k_t d\Gamma_t(x)$$

   (b)
$$Y_t = \int g_{c,t}(x) \, d\Gamma_t(x) + \int g_{k,t}(x) \, d\Gamma_t(x) - (1-\delta) K_t + G_t$$

   (c)
$$N_t = \sum_{j \in \mathcal{J}} \int exp(\varepsilon_t) \, g_{j,h,t}(k,\varepsilon) \, d\Gamma_{j,t}^{W}(k,\varepsilon)$$

4. *The government budget constraint clears*

$$G_t + \Upsilon_t = \sum_{j \in \mathcal{J}} \int T_t\left(y_{j,t}^{W}(k,\varepsilon)\right) d\Gamma_{j,t}^{W}(k,\varepsilon) + \tau_{k,t} r_t \int_X k d\Gamma_t(x) + \tau_{c,t} \int_X g_{c,t}(x) \, d\Gamma_t(x)$$

5. *The Social Security budget balances*

$$\sum_{j \in \mathcal{J}} \int b_j(\varepsilon) \, d\Gamma_{j,t}^{R}(k,\varepsilon) = \int \min\left[\tau_{SS} y_{j,t}^{W}(k,\varepsilon), \bar{t}_{SS}\right] d\Gamma_{j,t}^{W}(k,\varepsilon).$$

6. *We can split* Γ_t *into the invariant distributions,* $\Gamma_j^W(k,\varepsilon)$ *and* $\Gamma_j^R(k,\varepsilon)$. *For any* $\omega \in \mathcal{B}(\mathcal{K} \times \mathcal{E})$, *distributions* $\Gamma_j^W(k,\varepsilon)$ *and* $\Gamma_j^R(k,\varepsilon)$ *are consistent with household decisions. Meaning that for all* $j \in J$,

$$\Gamma^W_{j,t}(\mathcal{K},\mathcal{E}) = (1-\psi_a)\int \sum_{\varepsilon'\in\mathcal{E}} 1_{\left\{g^W_{j,k}(k,\varepsilon)\in\mathcal{K}\right\}} \pi_j(\varepsilon,\varepsilon')\, d\Gamma^W_j(k,\varepsilon)$$
$$+\psi_d \int \sum_{\varepsilon\in\mathcal{E}} \overline{\pi}_j(\varepsilon) 1_{\left\{g^R_{j,k}(k,\varepsilon)\in\mathcal{K}\right\}} d\Gamma^R_{j,t}(k,\varepsilon)$$
$$\Gamma^R_{j,t}(\mathcal{K},\mathcal{E}) = (1-\psi_d)\int 1_{\{\varepsilon\in\mathcal{E}\}} 1_{\left\{g^R_{j,k}(k,\varepsilon)\in\mathcal{K}\right\}} d\Gamma^R_{j,t}(k,\varepsilon)$$
$$+\psi_a \int 1_{\{\varepsilon\in\mathcal{E}\}} 1_{\left\{g^W_{j,k}(k,\varepsilon)\in\mathcal{K}\right\}} d\Gamma^W_{j,t}(k,\varepsilon)$$

where the conditional transitions $M^a_{j,t} : (\mathcal{K}\times\mathcal{E}, \mathcal{B}(\mathcal{K}\times\mathcal{E})) \to (\mathcal{K}\times\mathcal{E}, \mathcal{B}(\mathcal{K}\times\mathcal{E}))$ *are explicitly written inside the sums.*

3 Calibration

Demographics. In the model, households expect to work for $J_W = 40$ years and to stay retired for $J_R = 15$ years. The aging and death probabilities are hence the inverse of those years, $\{1/J_W, 1/J_R\}$, respectively. The fraction of the population with high skill, μ_s, is set to 41 percent, to match the share of the population with a college degree in the US as in Kindermann and Krueger (2022).

Preferences. The period utility is

$$u(c,h) = \frac{c^{1-\gamma}}{1-\gamma} - \theta\frac{h^{1+\frac{1}{\varphi}}}{1+\frac{1}{\varphi}} \tag{9}$$

where γ is relative risk aversion, θ controls the intensity of labor vs. consumption, and φ is the inverse of the Frisch elasticity. We follow the standard in the literature and set $\gamma = 2.0$ and $\varphi = 2.0$. The value of θ is obtained by calibrating it to target average working hours in the model of 30 percent of disposable time. The discount factor β is calibrated to match a capital-output ratio of 3.0.

Technology. We set the capital share of the economy to be $\alpha = 36$ percent, which is standard in the literature. We calibrate the depreciation rate of capital δ to be 5 percent so that investment is 15 percent of GDP.

Labor Income. We set the college skill premium, ζ_s/ζ_u, to 175 percent to match the data for the US. For each skill, we divide the productivity levels into seven increasing elements. In each group, the first five productivity levels are drawn from distinct skill-dependent Markov processes, while the highest two are independent of education. For the first "regular" worker states, we discretize the Markov chain into a standard AR(1) process as follows:

$$\log \varepsilon' = \rho_j \log \varepsilon + \iota,\ \iota \sim N\left(0, \sigma^2_{\varepsilon,j}\right). \tag{10}$$

We follow Carroll and Hur (2022) and use their estimated values for the persistence ρ_j and standard deviation $\sigma_{\varepsilon,j}$ obtained from the PSID. The values are $\rho_h = 0.941$ and $\sigma_{\varepsilon,u} = 0.197$ and $\rho_s = 0.914$ and $\sigma_{\varepsilon,s} = 0.229$.

We name the sixth and seventh productivity elements the "stepping-star" and "super-star" states, respectively. At those states workers have a substantially higher productivity than the average worker, with the "super-star" state being an extreme outlier. We follow Kindermann and Krueger (2022) and calibrate the associated parameters of the discretized Markov transition matrix to match moments at the top of the earnings and wealth distributions. In particular, we calibrate the set of transition probabilities, $\{\pi_{x,6}, \pi_{6,6}, \pi_{6,7}, \pi_{7,7}\}$, and the associated productivity shock levels, $\{\varepsilon_6, \varepsilon_7\}$, to match the top 5 percent and top 1 percent shares and Gini coefficients of the earnings and wealth distributions. For those moments, we target the values computed in the 2019 SCF update of Kuhn and Ríos-Rull (2015).

Government. We calibrate the benchmark consumption tax, τ_c, to 6.4 percent and the capital income tax τ_k is set to 27.3 percent, both being the average in the US between 1990-2000 as calculated by Carey and Rabesona (2003) using OECD data. For the labor earnings tax, the parameter τ_y is calibrated to target an average labor tax rate of 21 percent as in McDaniel (2007) and the curvature parameter is initially set to 0.180 as in Heathcote et al. (2017).

Social Security. The average labor income $\bar{y}$ used in the benefits payment schedule is obtained endogenously in the solution of the model. The contribution cap $\bar{t}_{SS}$ that closes the budget of the Social Security system is equal to 45.4 percent. The replacement rates r_1, r_2, r_3 and bend points b_1, b_2 are calibrated from the Social Security data as in Huggett and Parra (2010) and Kindermann and Krueger (2022). The aggregate level of government spending, G, is calibrated to be 16 percent of GDP.

3.1 Summary of Calibration

We summarize the information associated with the calibrated parameters in the sequence of tables below. In Table 1, one can find the exogenously calibrated parameters and their sources. Table 2 shows the endogenously calibrated parameters, the targeted moments associated with each of them, the source of such moments for their data counterparts, and the value of such statistics computed for the model economy.

Table 1: Exogenously calibrated parameters

	Parameter	**Value**	**Target / Source**
Demographics			
Working and retirement years	J_W, J_R	$\{40, 15\}$	Standard
Aging and death probabilities	ψ_a, ψ_d	$\{1/J_W, 1/J_R\}$	Standard
Fraction of pop. with college	μ_s	41%	Kindermann and Krueger (2022)
Preferences			
Relative risk aversion	γ	2.00	Standard
Inverse Frisch elasticity	φ	2.00	Standard
Technology			
Capital share	α	0.36	Standard
K depreciation rate	δ	0.05	Standard
Labor Income			
AR(1) non-college	$\{\rho_u, \sigma_{\varepsilon,u}\}$	0.941, 0.197	PSID (Carroll and Hur, 2022)
AR(1) college	$\{\rho_s, \sigma_{\varepsilon,s}\}$	0.914, 0.229	PSID (Carroll and Hur, 2022)
College skill premium	$\{\zeta_u, \zeta_s\}$	1.00, 1.75	Carroll and Hur (2022)
Government			
Consumption tax	τ_c	6.4%	Carey and Rabesona (2003)
Capital income tax	τ_k	27.3%	Carey and Rabesona (2003)
Payroll tax	τ_{SS}	12.4%	IRS
Curvature of income taxes	ν_y	0.18	Heathcote et al. (2017)
Government spending	G	16%	
Social Security			
Replacement rates	$\{r_1, r_2, r_3\}$	$\{0.90, 0.32, 0.15\}$	Soc. Sec. data (Huggett and Parra, 2010)
Bend points	$\{b_1, b_2, b_3\}$	$\{0.21, 1.29, 2.42\}$	Soc. Sec. data (Huggett and Parra, 2010)

Notes: The table shows model parameters, their numerical values, targeted moments in the model economy, and their data sources.

Table 2: Endogenously calibrated parameters

	Parameter	Value	Target	Data	Model
Preferences					
Discount factor	β	0.924	K/Y	3.0	3.0
Labor disutility	θ	41.520	Average hours	0.3	0.3
Technology					
Aggregate productivity	Z	0.734	Normalize GDP	1.0	1.0
Government					
Scale parameter of labor tax	τ_y	0.264	Avg labor tax rate	21%	21%
Lump-sum transfer	T	0.075	Balance govt budget	0.0	0.0
Social Security					
Contribution cap	$\bar{t}_{SS}$	0.454	Balance Soc. Sec. budget	0.0	0.0
Avg earn. parameter	$\bar{Y}$	0.880	Avg labor earnings.	-	0.880
Inequality Statistics					
Prob. of staying stepping-star	$\pi_{6,6}$	0.9678	Earnings 95% - 99%	18.2	19.8
Prob. to superstar	$\pi_{6,7}$	0.0009	Earnings 99% - 100%	16.9	17.8
Prob. to star region	$\pi_{x,6}$	0.0090	Earnings Gini	0.65	0.65
Stepping-star shock	ε_6	16.3212	Wealth 95% - 99%	26.5	23.8
Superstar shock	ε_7	729.7702	Wealth 99% - 100%	38.5	27.0
Prob of staying superstar	$\pi_{7,7}$	0.929	Wealth Gini	0.85	0.84

Notes: The table shows model parameters, their numerical values, and targeted moments in the model economy. The details for the data counterparts of the targets are outlined in the text. For the inequality statistics, the data moments are taken from the 2019 update of the SCF calculations by Kuhn and Ríos-Rull (2015).

4 Numerical Experiment

We now turn to the primary numerical experiment of the paper. Our purpose is to uncover the indirect preferences for tax and transfers over a wide menu of fiscal policies. Specifically, we compare policies with different consumption and capital income tax rates combined with different labor income tax schedules, the latter in terms of both average levels and degrees of progressivity. Finally, we identify the policy that maximizes average welfare.

We start the economy in the calibrated steady state and evaluate permanent fiscal policy reforms.[3] As part of this process, for each policy we solve for the transition to the associated final steady state. Attention to the transition is necessary because some policies may lead to a higher level of the long-run capital stock relative to the initial steady state. Reaching these

[3] This experiment assumes the government is able to perpetually and fully commit to the enacted policies.

high capital levels requires some periods of increased aggregate investment at the expense of forgone consumption. For this reason, restricting the analysis to comparing steady states could be misleading since the transitional costs of building up a large capital stock may outweigh the long-run benefits of being in a steady state with high capital. Of course, the opposite is also true: the welfare gains of eating into an initially high capital stock come early, and the costs of low capital come later. The life-cycle properties of our model make confronting this issue even more critical.

Let $\mathcal{P}$ denote the menu of fiscal policies, p. p has five elements: four permanent tax parameters and one time-varying transfer, that is,

$$p \equiv \{(\tau_y, \nu_y, \tau_k, \tau_c), \Upsilon_t\}_{t=1}^{\infty}. \tag{11}$$

The time-varying path of transfers results from the government balancing its budget in each period of the transition.

Let $V_x(\overline{p})$ be the indirect utility from tax reform $\overline{p}$ for a household with initial state vector $x \equiv \{k, \varepsilon, j, a\}$. Define $p_x^\star$ as the household's *most-preferred policy*, given by

$$p_x^\star = \arg\max_{p \in \mathcal{P}} V_x(p) \tag{12}$$

Define p_{SP} as the policy that maximizes social welfare measured by the population-weighted sum of the indirect utilities of all households that are alive in the initial steady state. Formally,

$$p_{SP} = \arg\max_{p \in \mathcal{P}} \int V_x(p) d\Gamma_0(x), \tag{13}$$

where Γ_0 is the initial wealth distribution.

In our computational experiment, we solve for a large set of potential tax menus so that households can choose over a wide range of rates for each of the tax instruments. Specifically, we construct the menu of fiscal policies, $\mathcal{P}$, from the combinations of four defined grids over the different tax rates. We assign six potential values for the rates $\{\tau_y, \tau_k, \tau_c\}$ and ten for the curvature parameter that governs the progressivity level, ν_y. The grids are as follows:

$$\tau_y \in \{5.0\%, 15.0\%, 26.4\%, 35.0\%, 45.0\%, 60.0\%\},$$
$$\nu_y \in \{0.0\%, 7.5\%, 15.0\%, 16.5\%, 18.0\%, 19.5\%, 21.0\%, 25.0\%, 29.0\%, 35.0\%\},$$
$$\tau_k \in \{0.0\%, 10.0\%, 18.7\%, 27.3\%, 40.0\%, 60.0\%\},$$

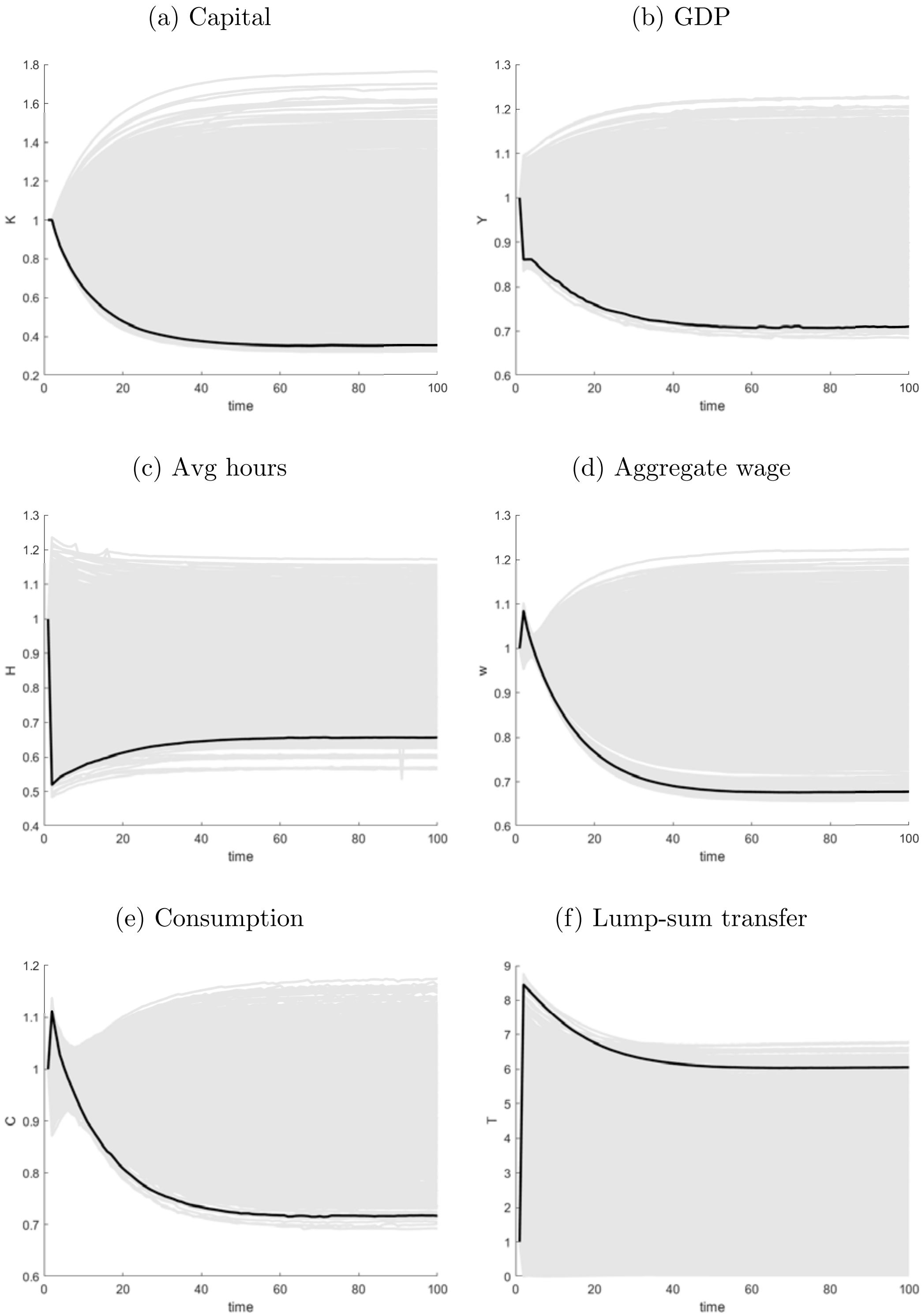
$$\tau_c \in \{0.0\%, 3.2\%, 6.4\%, 12.8\%, 25.6\%, 51.2\%\}.$$

The cardinality of the set $\mathcal{P}$ is then 2160, reflecting the number of total combinations defined by the grids. Each tax grid is centered around the corresponding calibrated value for the benchmark economy shown in Table 1, and, together, the grids span a wide range of tax policies in terms of both tax levels and composition. Notice that we allow for a zero tax rate for τ_k and τ_c as well as a flat tax on labor ($\nu_y = 0$),with an associated rate of τ_y. We cap the top end of all four grids at high levels so it is also feasible to achieve stringent taxation scenarios. We exclude negative transfers from consideration, both in the terminal steady state and along the transition, because negative transfers may require allowing some households to default on their tax obligations in order to maintain positive consumption.

4.1 Aggregate Effects of Tax Changes

The policies in $\mathcal{P}$ can span a wide variety of transitional dynamics. Figure 1 plots the transition paths for the capital stock, GDP, hours, the aggregate wage, aggregate consumption, and transfers relative to their pre-reform levels that result from each element of $\mathcal{P}$. The darkened line in each figure highlights the path induced by p_{SP}. Notice that p_{SP} tanks the economy. GDP drops by nearly 30 percent over the transition, with about half of that decline occurring in the first period (panel b). The steep initial plummet is caused by a drastic decline in hours (panel c), pushed by the combination of higher distortionary taxation with large lump-sum transfers, which recover only partially as high-income households gradually respond to a greater and greater negative wealth effect. Very high capital income taxation produces severe capital shallowing (panel a). In the long run, the capital stock is only one-third of its original level. Viewed against the collection of alternatives, p_{SP} is among a handful of high taxation policies that produce the lowest aggregate activity.

Figure 1: Transition paths of aggregates



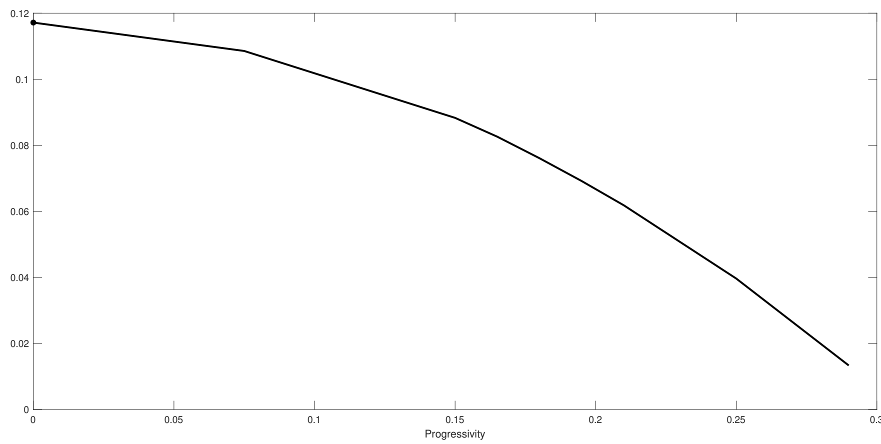
Notes: The figure shows the transitional dynamics for aggregate capital, output, average hours, aggregate wage, aggregate consumption, and aggregate transfers for all the feasible tax menus. In all panels, the solid black line shows the path induced by p_{SP}. The initial period represents the original steady-state quantities, which are normalized to 1.0. The duration of the transition is truncated at 100 years for the sake of exposition.

Despite the extreme negative effect that p_{SP} has on aggregate activity, a majority of households support the reform. This support is the result of the high degree of inequality in the initial steady state. Most households have income below the average, and there is an even more pronounced skewness in the wealth distribution. As a consequence, although the reform greatly reduces the size of the economic pie, most households still have a larger slice relative to their initial consumption, as shown by the large increase in panel (e). Adding to this the large increase of the lump-sum transfer at the beginning of the transition and the sharp decrease in hours worked, it is not surprising that such a combination will generate large positive welfare effects in the economy.

The desire for transfers is a common theme in incomplete-markets models calibrated to the US wealth distribution. In recent papers that allow for more flexibility in the menu of taxes chosen by the planner such as in Dyrda and Pedroni (2022), the optimal time-dependent transfer is 40 percent of output in the initial period of the transition. A similar pattern is present in Ferriere et al. (2022), where the optimal level of transfers achieves a value of 45 percent of median income and the desirability for its size is mostly driven by the left tail of the wealth distribution. In both cases, such large transfers are also coupled with large levels of tax rates, in ranges similar to ours. In another variation of the same finding, Boar and Midrigan (2022) show that with an optimal high and flat labor income tax, lump-sum transfers play a significant role in achieving utilitarian welfare gains and have a better redistribution effect than increasing marginal income taxes.

Progressivity and Revenues. It is not immediately obvious how revenues respond to an increase in the progressivity of the labor income tax function. On the one hand, revenue could rise, since increasing progressivity trades away tax receipts from low earners to gain receipts from high earners. On the other hand, there is a negative effect from shifting the incentive to work additional hours from the most productive toward the least. In our model we find that the second effect dominates so that more progressive tax schedules are associated with lower revenues and therefore also lower transfers. Figure 2 illustrates that behavior, showing the decrease in the present discounted value of lump-sum transfers, all else fixed, as the degree of progressivity ν_y increases.

Figure 2: Transfer as a function of tax progressivity



Notes: The figure shows the present discounted value of equilibrium transfers as a function of the progressivity parameter, ν_y. All other tax parameters are fixed at their initial steady-state values. Without loss of generality, the PDV shown is calculated using the formula for the initial young as described in Appendix A.

4.2 Household Tax Preference by Type

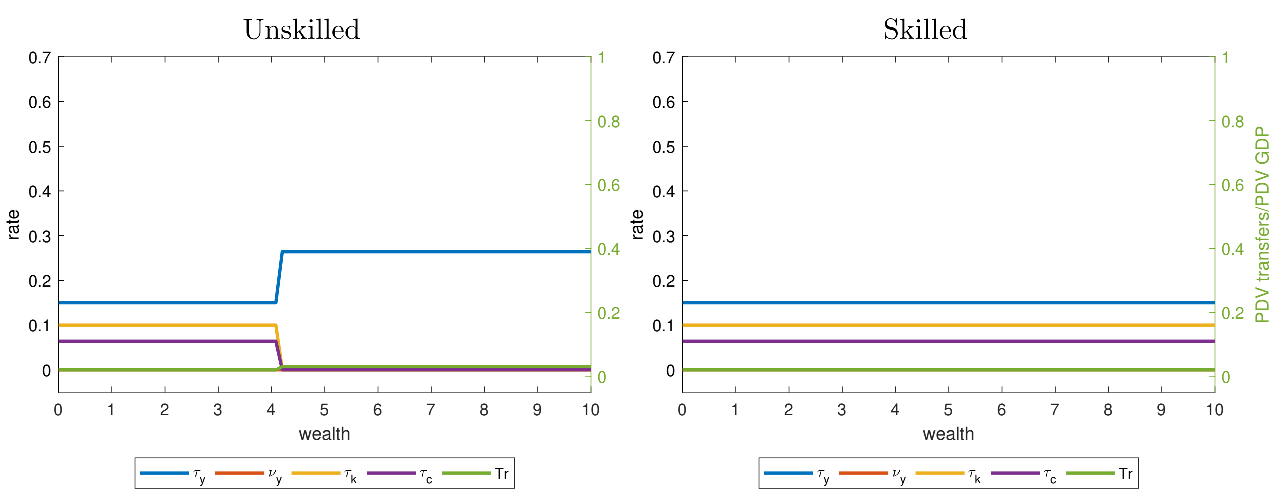
In this section, we inspect the different preferences for the available tax menus by putting a magnifying lens over the state space and analyzing the choice of distinct groups of households. The model features a significant amount of household heterogeneity. Not only are households very unequal in their levels of income and wealth, but they also differ in the composition of their income between labor and capital. In addition, because retirement benefits are fixed, old households face no risk around their future income stream. All of these factors lead to a wide range of most preferred policies, $p^\star$, across household types. Although the variation in policy preferences can appear complicated at first glance, each household's $p^\star$ comes down to balancing the trade-off between maximizing the transfer and minimizing its own tax burden.

Effect of Wealth. Wealth heterogeneity is the principal ingredient in the model and also the dimension along which the widest disagreement occurs. As a rule of thumb, low-wealth households want a high transfer. To achieve this, they prefer to place high tax rates on consumption and capital income. The motivation for high capital income taxes is simple: these households own a small share of the capital stock and most have a low probability of being wealthy in the near future due to the persistence of their idiosyncratic shocks. Additionally, consumption taxes act as a tax on initial wealth, which is highly unequally distributed.

The trade-off is, however, somewhat more nuanced. First, flat consumption taxation is more onerous for poor households, especially those near the borrowing limit, since they have higher marginal propensities to consume. Second, high capital income taxation discourages the accumulation of capital in the future, and in general equilibrium, this has the effect of reducing wages. Nonetheless, for all but a few near-average-wealth households, these considerations are of second-order importance compared to the additional transfer.

Many low-wealth households also support policies with a high average labor tax rate; however, the strength of support depends on other factors like productivity (or, equivalently, initial and expected wages), skill, and the progressivity of the tax schedule. We discuss the role of these later. For now, holding fixed other factors, as the initial wealth level of a household increases, the desire for a high transfer wanes, and support increases for reductions in consumption and in capital income tax rates.

Figure 3: Most preferred policy of young superstars



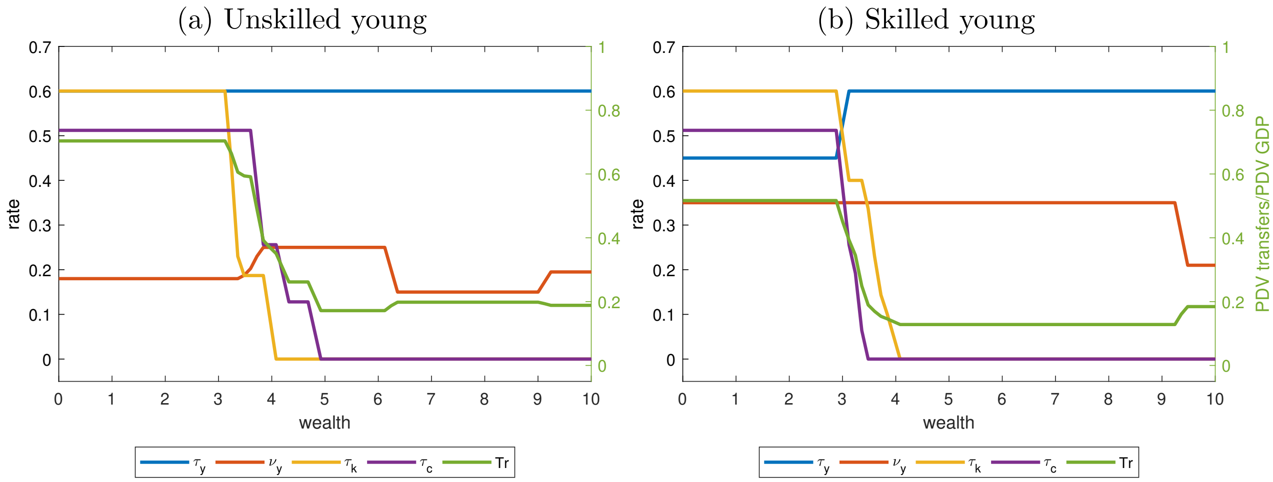
Notes: The figures shows the most preferred level of each of the tax instruments along the wealth dimension for young superstar workers. The left panel highlights unskilled workers and the right panel skilled workers. For both panels, the y-axis on the left-hand side marks the different tax rates, while the y-axis on the right-hand side shows the present discounted value of the lump-sum transfers as a fraction of the present discounted value of output. For more details on how to compute the discounting of aggregate measures, see Appendix A. All lines are smoothed for exposition purposes using a moving median adjustment.

At high wealth levels, households prefer low transfers that are financed entirely through labor income taxes. This again comes down to avoiding taxes. Due to the wealth effect on leisure, capital income becomes a more substantial fraction of wealthy households' total income. This is most apparent in the preferences of young superstar households, which are shown in Figure 3. All superstars, regardless of their wealth, dislike transfers and choose a value of zero for them. Unskilled superstars with low wealth expect to be wealthy very soon; hence, they want capital income and consumption taxes to be at their lowest possible values. They also want to keep labor income taxes down, since the very high wage strongly incentivizes work. These households essentially balance the three tax rates in order to cover government expenditures and, whenever the wealth effect dominates, choose to make the switch to a labor-tax-only system. Skilled superstars have similar preferences. The only difference between them and their unskilled counterparts is that the switching point happens at a much higher level of wealth.

Effect of Skill Type. We start with the most straightforward dimension in terms of its effect on policy preferences. Skilled households behave for all intents and purposes like a higher-wage unskilled household.[4] Comparing panels (a) and (b) in Figure 4, we see that, across the wealth distribution, $p^\star$ is broadly similar for the unskilled and the skilled. At low wealth levels, both types support a mixture of taxes and high transfers (though this is somewhat lower for the skilled). The switch to labor-tax-only government financing occurs at a slightly lower level of wealth for the skilled, but the pattern is very similar. The main area of disagreement between the two groups is over progressivity. The unskilled generally favor moderate progressivity as it boosts the transfer level. Skilled households, which all else equal have higher earnings, prefer to keep progressivity high.

[4]Naturally, beyond productivity levels there are some small differences coming from the slightly higher variance in the stochastic process for skilled labor productivity.

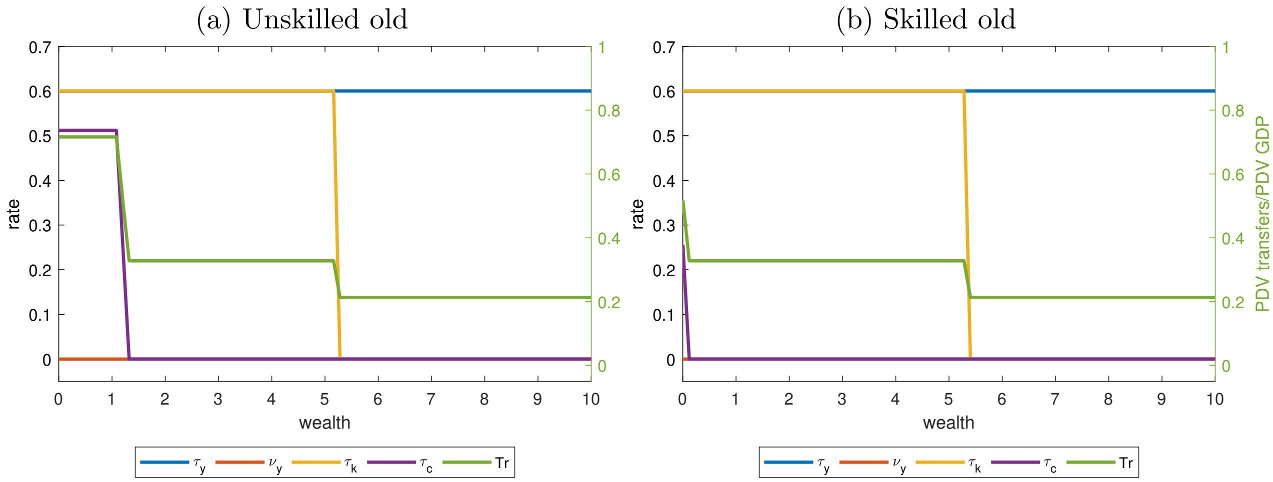
Figure 4: Most preferred policy by skill



Notes: The figure shows the most preferred level of each of the tax instruments along the wealth dimension for workers with regular productivity levels. The left panel highlights unskilled workers and the right panel skilled workers. For both panels, the y-axis on the left-hand side marks the different tax rates, while the y-axis on the right-hand side shows the present discounted value of the lump-sum transfers as a fraction of the present discounted value of output. For more details on how to compute the discounting of aggregate measures, see Appendix A. All lines are smoothed for exposition purposes using a moving median adjustment.

Effect of Age. Like young wealthy households, retirees also support high labor tax rates; however, retirees differ in that most want a sizeable transfer. As can be seen in Figure 5, all but the richest retirees favor using high capital income taxes and, in some cases, high consumption taxes in order to raise revenue for redistribution.

Figure 5: Most preferred policy of old



Notes: The figure shows the most preferred level of each of the tax instruments along the wealth dimension for retired workers who had regular productivity levels during their working years. The left panel highlights unskilled retirees and the right panel skilled retirees. For both panels, the y-axis on the left-hand side marks the different tax rates, while the y-axis on the right-hand side shows the present discounted value of the lump-sum transfers as a fraction of the present discounted value of output. For more details on how to compute the discounting of aggregate measures, see Appendix A. All lines are smoothed for exposition purposes using a moving median adjustment.

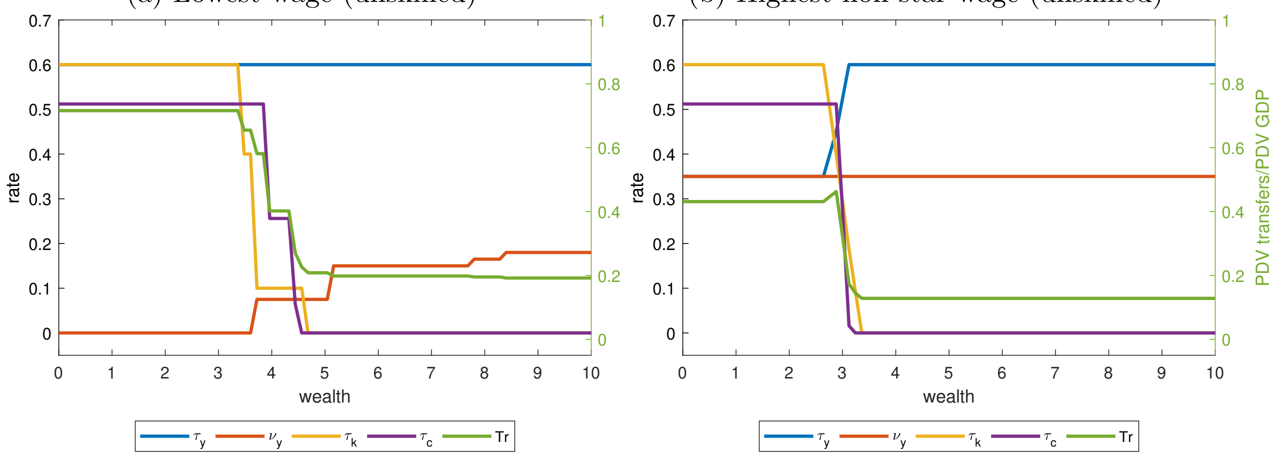
Effect of Initial Wage/Productivity. A large portion of the disagreement over policy comes from differences in the initial distribution of wages (i.e., labor productivity) over young households. Excluding stepping-stars and superstars, young worker households comprise about two-thirds of the model economy. Figure 6 plots the most preferred policy of two types of these households: one with the lowest wage and one with the highest wage (again, excluding star households). Both types display the familiar "switching" pattern for consumption and capital income taxes as initial wealth increases. The strongest disagreement along this dimension is over how labor income is taxed, and consequently, the level of transfers.

Starting with the low-wage earner (panel 6a), at low levels of initial wealth, the transfer is the most important factor. These households want the transfer to be as large as possible and are willing to face a linear labor tax to achieve it. At sufficiently high initial wealth levels, these households give back some transfer to "purchase" progressivity in the labor tax. Notice that even at very high levels of wealth, the low-wage households still favor just moderate progressivity. To understand this, recall that the wage process has substantial persistence, meaning that even initially rich households expect to run down their savings well into the future. Anticipating that they may be poor, they wish to maintain a moderate social safety net.

High initial wage earners, on the other hand, have a weaker indirect preference for transfers. Those with low initial wealth want lower average labor taxes and high progressivity, since they plan to exploit their good fortune by working a lot and accumulating wealth. Like their low-wage counterparts, wealthy high-wage households want to maintain some positive level of transfers, but not at the expense of reducing progressivity.

Figure 6: Most preferred policy by initial wage

(a) Lowest wage (unskilled) (b) Highest non-star wage (unskilled)



Notes: The figure shows the most preferred level of each of the tax instruments along the wealth dimension for unskilled workers. The left panel highlights workers with the lowest regular wage and the right panel the ones with the highest regular wage. For both panels, the y-axis on the left-hand side marks the different tax rates, while the y-axis on the right-hand side shows the present discounted value of the lump-sum transfers as a fraction of the present discounted value of output. For more details on how to compute the discounting of aggregate measures, see Appendix A. All lines are smoothed for exposition purposes using a moving median adjustment.

Distribution of Preferences. While the figures above relate the wide range of households' indirect preferences over fiscal policy by initial state, they convey nothing about the initial distribution of households over those states. For instance, from Figure 6 panel (a), we know that a sufficiently wealthy, unskilled young household with low labor productivity does not want to tax consumption or capital income, but this preference has no bearing on equilibrium policy because there is zero mass in that region of the state space. To get a sense of how any particular type of household affects policy outcomes, it is helpful to know the policy this group favors along with the population share of the group. This information is displayed along with that from other groups in Table 3.

After accounting for the distribution of these subgroups, the strong preference for redistribution becomes even more apparent. The tax instruments that generate the most disagreement are the average tax rate τ_y and the progressivity value ν_y. In that case, it is clear that: for retired households, the outcome is a high flat labor income tax; for "star" households, the outcome is a moderate flat high labor income tax; and for young non-star households, there is a cross-effect between progressivity and average labor tax, along the lines of the aforementioned mechanism of using progressivity as a means of generating more revenue and hence larger lump-sum transfers. The taxes on consumption and capital are all at their highest levels.

Table 3: Social welfare maximizing policy by subgroup

HH Type	τ_y	ν_y	τ_k	τ_c	$\frac{T}{Y}$	Population Share
Young, non-star						
unskilled	60.0	18.0	60.0	51.2	46.0	37.0
skilled	45.0	35.0	60.0	51.2	33.3	25.7
All stars	35.0	0.0	0.0	0.0	9.3	13.8
Retired						
unskilled	60.0	0.0	60.0	51.2	50.3	13.9
skilled	60.0	0.0	60.0	51.2	50.3	9.6
Bottom 50%	60.0	15.0	60.0	51.2	46.8	50.0
Mid 50% − 80%	60.0	21.0	60.0	51.2	45.2	30.0
Top 20%	60.0	18.0	0.0	0.0	18.2	20.0

Notes: The table shows the tax rate that maximizes utilitarian social welfare for each of the taxes in the available menu by the different household types. The last column shows the population share that the group of household type represents. All units are in percents. $\frac{T}{Y}$ is the ratio of the present discounted value of the lump-sum transfers to GDP.

5 Optimality

Under the utilitarian specification, the social planner effectively places more weight on households with high marginal utility; so it is not surprising that p_{SP} aligns with the preferences of unskilled workers. The optimal policy calls for a massive redistribution of income. The present discounted value of transfers-to-GDP over the transition is 46 percent, up from just over 7 percent in the initial steady state. To finance these large outlays, p_{SP} places high tax rates on consumption and capital income, 51.2 and 60.0 percent, respectively. At 60.0

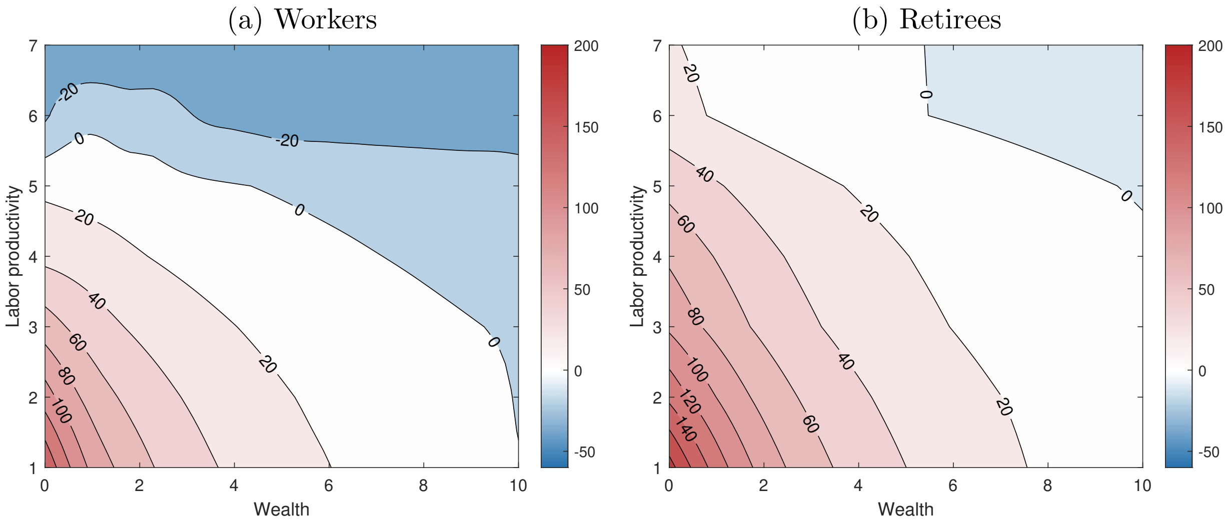
percent, τ_y is also very high, but progressivity, ν_y, remains at 0.18 so low-income workers still pay little in labor taxes.

Enacting the optimal policy produces enormous average welfare gains (measured in consumption equivalent). When averaged over the initial living households, the welfare gain is 51.6 percent, and it is 50.5 percent when calculated "under the veil of ignorance."[5] Figure 7 plots the welfare gains induced by p_{SP} for workers and retirees along the productivity and wealth dimensions, aggregated at the skill level. The range of wealth depicted covers more than 90 percent of the mass of households.

One can observe that for both demographic categories, households with low wealth and low productivity achieve substantial welfare gains, with the vast majority in both graphs having positive and large gains from the reform. Most of the retirees are better off at the optimal policy, showing only moderate losses whenever they are in the top tail of the wealth distribution. Working-age "stepping stars" and "super stars" lose from the reform, since there is no way for them to avoid the new high tax rates. Retired stars, however, typically enjoy a moderate welfare gain because their income is much lower than their younger counterparts. Only the most wealth-rich among them lose from the optimal policy. Finally, workers with productivity above the median show some heterogeneity in their welfare depending on their wealth, a disagreement that was highlighted in Figure 6. Overall, 83.1 percent of households support the reform.

[5]The "behind the veil of ignorance" measure excludes certain household types from the calculation because a person cannot be born into those states. These excluded states are stepping-stars, superstars, and retirees.

Figure 7: Welfare gains (in percent)



Notes: The figure shows the welfare gains of the optimal policy p_{SP} in terms of consumption equivalent variation for workers and retirees along the wealth and productivity grids. The x-axis shows the numerical wealth levels, which are capped at the value of 10 to highlight the part of the distribution in which there is the most mass of households. More than 90 percent of households are located at the range depicted. The y-axis scales productivity levels from the lowest to the highest, number 7, being a "super-star" household. Panel (a) on the left-hand side shows the heat map for workers and panel (b) on the right-hand side for retirees. Both panels are aggregated at the skill level, showing the results for both skilled and unskilled households weighted by their relative masses.

5.1 Progressivity

It is important to keep in mind that each element of the policy is related to the others. If we had optimized over only one tax instrument while holding the others fixed, we could have come to very different conclusions about optimal tax policy. We demonstrate this for progressivity. Figure 8 plots social welfare as a function of progressivity in different feasible tax environments.[6] In each panel, two of the other three tax parameters are held fixed at their initial steady-state values, while the final one is varied (shown by different curves).

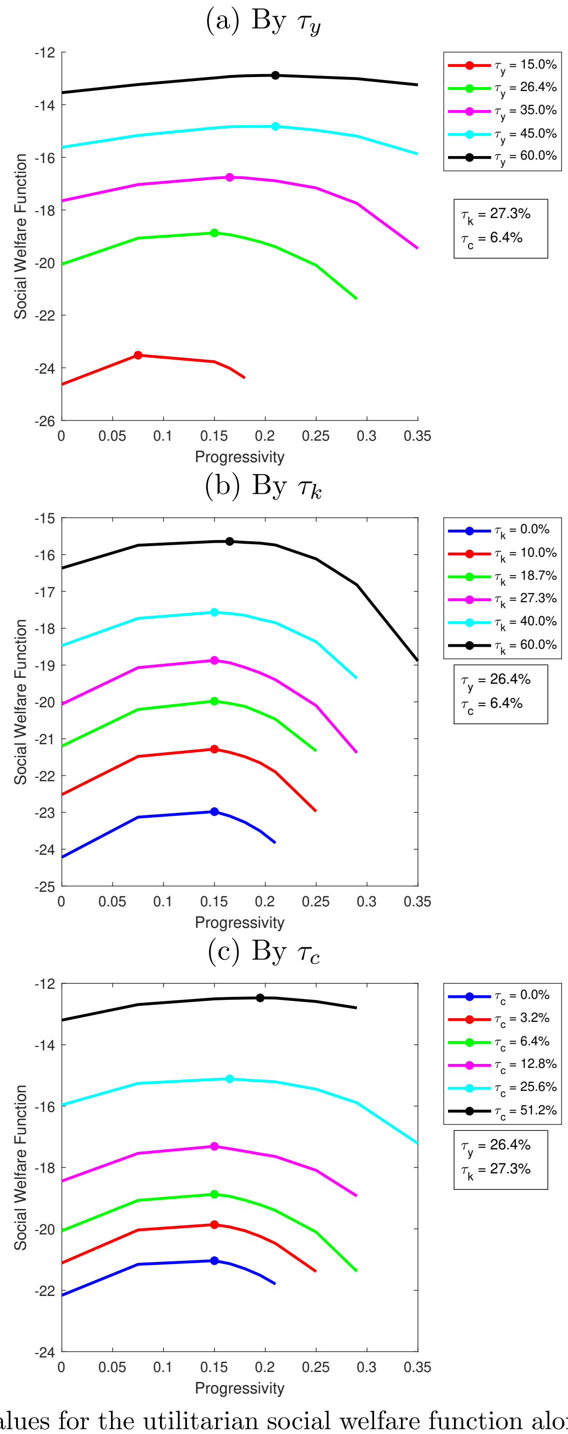
Panel (a) shows how optimal progressivity changes as the average level τ_y changes. The capital income tax rate and the consumption tax rate remain at their initial values of 27.3 percent and 6.4 percent, respectively. The "buying progressivity" concept is apparent: when labor taxes are low on average, the optimal schedule must be flattened in order to boost revenue and fund the transfer. As the overall tax level increases and the level of revenues

[6]Infeasible policies violate the non-negativity constraint on revenues. Their locations are suggested by curves that either terminate "early" or are not shown at all (for example, there is no line for $\tau_y = 5.0$ percent in panel (a)).

rises, a greater degree of tax progressivity can be offered. Recall that lowest-income, lowest-wealth agents have the highest weight in the social welfare function. Increasing the size of transfers by increasing τ_y unambiguously makes these agents better off and has the biggest impact on the social welfare function. However, unless progressivity is also adjusted, these gains in revenue come at the cost of adding to the tax burden of poor agents. With sufficiently high revenue, the social welfare function can be further optimized by shifting the tax burden even more from poor to rich households.

Optimal progressivity depends far less on the level of capital income taxation (panel b). With τ_c and τ_y fixed at their initial values, the optimal ν_y shows almost no response to changes in τ_k. Meanwhile, consumption taxation sits between capital income taxes and average labor taxes. The trade-off between revenue and progressivity is visible in panel (c) but it is much more muted than in panel (a). The effect of consumption taxation on households' decisions shares aspects of both the labor and the capital income taxes. Like capital income taxation, consumption taxes distort intertemporal consumption/savings decisions though only in the first period. Like labor taxes, consumption taxes make leisure more attractive relative to consumption reducing hours; however, this applies only to young households and the strength of this distortion wanes as household wealth rises.

Figure 8: Optimal progressivity



Notes: The figure shows the values for the utilitarian social welfare function along the progressivity grid for each of the other three tax instruments. Each panel shows the function for different levels for a given tax rate with the other two fixed at their calibrated benchmark values. The top panel depicts it for the labor tax, the center panel for capital income tax, and the bottom panel for the consumption tax. Each line has a highlighted dot that indicates the welfare-maximizing level of progressivity at the given tax rate.

Optimal progressivity then greatly depends on the surrounding tax environment, especially on the level of labor income taxation. This should be kept in mind when analyzing optimal tax progressivity in isolation from the overall level of taxation and redistribution: local optima are likely to be far from the global optimum.

Similar analysis of the non-progressivity tax parameters offers only one additional insight: fixing a progressivity level and conditioning on any two of the other three tax parameters, welfare is maximized by the highest value of the remaining tax. Figures plotting these results can be viewed in Appendix C. This follows from the strong motivation for transfers discussed above.[7]

5.2 The Role of the Initial Wealth Distribution and Transitional Dynamics

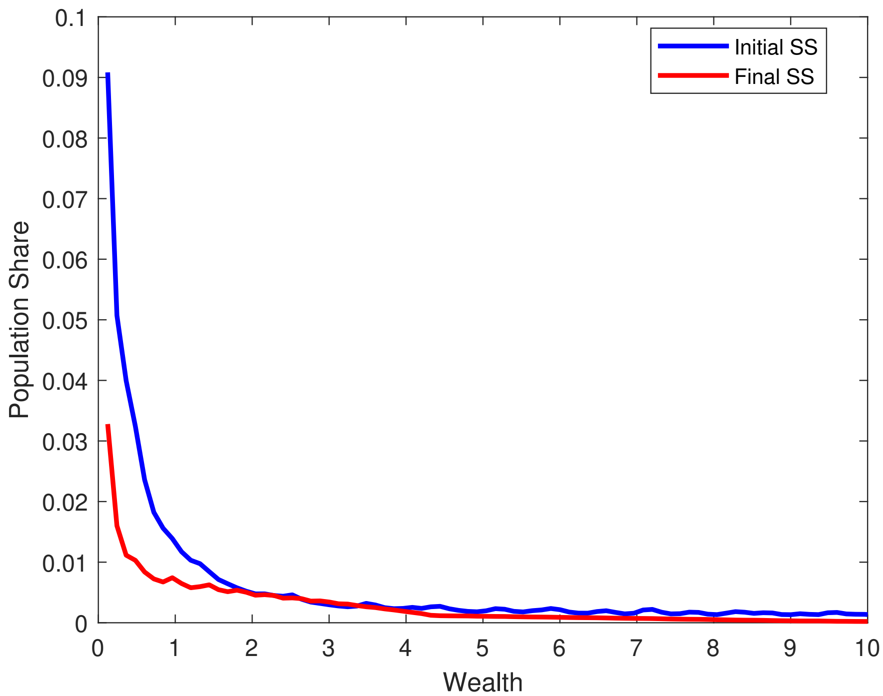
The optimal policy features strikingly high tax rates on all sources, and consequently it leads to drastic reductions in economic activity over time. The central motivation behind the policy is that the revenues fund a large transfer that mitigates the stringent effects of market incompleteness on the poor. This can lead to confiscatory behavior for three reasons. First, the policy change is evaluated according to the preferences of households living in the initial steady state, an environment calibrated to match the high degree of income and wealth inequality in the US. The long right tail of accumulated past savings presents a tempting target for redistribution. Second, households face mortality risk, meaning that these decisive households likely live through only a small portion of the transition and so do not fully internalize the consequences of the reform on the capital stock. Third, policy is chosen "once-and-for-all." This disallows time-varying paths that may provide for redistribution of initial wealth inequality while also encouraging future capital accumulation as in Dyrda and Pedroni (2022). The benefit from initial redistribution then is entangled with that from providing a permanent higher level of social insurance against labor income risk.

We now conduct two numerical experiments to better separate the effect of initial inequality and transitional costs on the optimal policy. First, we repeat our exercise but from

[7] We have conducted an exercise similar to the one presented here but where the transfer level is fixed and the consumption tax clears the government budget constraint. We consider two exogenous transfer levels. One at the benchmark value used here and a much higher level similar to that in some of the European countries in the OECD. In either case, the optimal policy finances the transfer with the largest possible capital income and labor taxation and with benchmark progressivity, essentially the same result as for our main analysis. When lump-sum transfers cannot be increased, optimal policy compensates by reducing consumption taxes. At the benchmark transfer level, this generates a consumption subsidy.

the *final* steady state arising under the baseline optimal policy. As a consequence of past high tax policy, the wealth distribution inherited by these households is quite different. Relative to the initial distribution from the baseline, this "tax-and-transfer" wealth distribution has a 64.1 percent lower mean level of wealth and a far greater percentage of households that are borrowing constrained (74.7 vs 41.0). It is also severely compressed (Figure 9) so there is far less wealth to redistribute from the tail.

Figure 9: Initial and final densities of wealth



Notes: The figure shows the initial and final steady-state densities along the wealth grid. The density was derived from the distribution by aggregating across all dimensions for all households. The density is truncated at the zero wealth level for visualization purposes and only shows households that are above the borrowing constraint. The x-axis shows the numerical wealth levels, which are capped at the value of 10 to highlight the part of the distribution in which there is the most mass of households.

One can think of this exercise as either solving the social planner's problem with fewer initial resources or, from the political economy perspective, as a surprise "re-vote" where households living through the consequences of their ancestors' redistribution are offered the chance to remake policy according to their wishes. As before, we find that the social planner's policy is also the voting equilibrium policy, and, perhaps surprisingly, it is nearly identical to the baseline.

That high taxes are still chosen in this low-wealth environment undermines the argument

Table 4: Summary of optimal policies

	τ_y	ν_y	τ_k	τ_c	T/Y
Baseline	60.0%	18.0%	60.0%	51.2%	46.0%
Tax-transfer	60.0%	15.0%	60.0%	51.2%	46.8%
Steady-state only	60.0%	35.0%	0.0%	51.2%	47.7%

Notes: The table shows the optimal tax policy along with the present discounted value of transfers to GDP associated with each. "Baseline" evaluates policies from the calibrated initial steady state. "Tax-transfer" evaluates from the final steady state arising under the optimal policy in the baseline. "Steady-state only" ignores transitional dynamics and maximizes average steady-state welfare.

that our baseline result was purely a consequence of initial wealth conditions combined with the assumption that the government can commit to a tax policy. Instead it reinforces the intense preference for greater insurance. The new policy's lower degree of progressivity does not conflict with this conclusion, but rather is simply a reflection of the higher tax elasticity of transfers. In the tax-transfer steady state, the disincentives to supplying labor are already quite strong; so buying progressivity is more expensive.

While strongly suggestive, this experiment on its own is nevertheless not fully convincing. This is because policies with lower taxes that lead to steady states with higher capital also necessitate that households forgo consumption in the transition to build up that capital. It is possible then that households in the tax-and-transfer steady state would like to exit it for more prosperous outcomes but the transition costs imposed by the low-wealth initial condition dissuade them.

To investigate this further, we solve for the optimal policy that maximizes average steady-state welfare.[8] With transition costs removed from consideration, the optimal policy is $\{60.0\%, 35.0\%, 0.0\%, 51.2\%\}$ with a transfer-to-GDP ratio of 41.3 percent.

The interpretation of this result is straightforward. Households still want a lot of insurance. Consumption taxation is still at its highest allowable value. Labor income tax rates are at a corner, but the progressivity of the schedule is at its upper limit. High progressivity can exist with very large transfers because capital income taxation has been eliminated. The

[8] One could think of this as a "behind-the-veil-of-ignorance" exercise where a household chooses which steady state to live in, but does not know the household state it will start with. Optimal policy then maximizes expected utility in the steady state.

economy has a very high level of capital, which boosts wages and labor income, particularly among high earners.[9] The greater level of aggregate economic activity fostered by eliminating taxes on capital also expands the consumption tax base. Again, this highlights the importance of making a consumption tax available in the tax menu.

6 Discussion

6.1 Voting

The socially optimal levels of taxation and redistribution in the model economy are far greater than anything observed in the data. One candidate explanation for this discrepancy is that social planners do not exist. In practice, government policy is chosen through some political process. We now examine the second method for aggregating preferences: majority voting.

We search for all tax policies that could arise from a sequence of head-to-head elections among all p in the tax space, $\mathcal{P}$. It is well-known that when the policy space is multidimensional (as it is here), the final outcome of these elections can depend on how elections are ordered in the sequence.[10] We follow the method described in Carroll et al. (2021) to identify political equilibria. This method uses the initial distribution of households over X and the indirect utilities, $\{V(\boldsymbol{p}; x)\} \forall p \in \mathcal{P}$, and conducts several successive refinements of $\mathcal{P}$. At the end of this process, the remaining set contains all the policies that could be an equilibrium even under strategic voting and agenda setting. The benefit of this method is that it does not require any onerous additional structure to be imposed on either household preferences or the voting process. Should multiple political equilibria exist, this method will find them.[11]

Although we adopt this robust method for identifying political equilibria, we never find a set that is other than a singleton. That is, there is a unique policy, p_{Cond}, in $\mathcal{P}$ that defeats all other policies in any arrangement of head-to-head elections.[12] Carroll et al. (2021)

[9]The result of this dynamic shift of τ_k is also seen in Dyrda and Pedroni (2022), where the tax starts at confiscatory levels and then declines as labor income taxes are substituted for it. This a classic result of Ramsey taxation as discussed in Conesa et al. (2009) and others.

[10]See Persson and Tabellini (2002) for a deeper discussion of multidimensional voting.

[11]As discussed in Carroll et al. (2021), the method relies on $\mathcal{P}$ being finite, which is satisfied by construction in our experiment.

[12]Such a policy is known as a "Condorcet" winner.

provide some reasoning for why a unique equilibrium is not surprising in our environment. Essentially, it comes down to two features of the model. First, as shown in Section 4.2, there is a lot of disagreement among households over fiscal policy, and second, no single household type has a large weight. Taken together, these factors ensure that the model will not have just a few voting blocs that can be combined in multiple ways to reach a majority.

The political equilibrium under majority voting is identical to the one that maximizes social welfare in (13). In this sense, our analysis revisits a classical argument highlighted by Aiyagari and Peled (1995) in which majority voting and utilitarian planner outcomes do not yield substantively different results. In that paper the similarity of the two equilibrium concepts hinges critically on agents' need for insurance. When the need for insurance is very low, the utilitarian planner will tax less than the majority voting outcome. As the desire for insurance increases, the utilitarian planner is *more responsive* than majority voting to this need. When households' risk aversion and idiosyncratic shock volatility fail in ranges consistent with the data, the policies from both concepts are roughly equivalent.

The same principle applies here. Under "one man, one vote," the political weight of any household type is just equal to its population share. Relative to this benchmark, a utilitarian social planner takes into account not only the population share but also the household type's marginal utility. The initially wealth poor, particularly those with low productivity draws, have very high present and expected future marginal consumption. The boost to social welfare from shifting resources toward them far outweighs the loss suffered by the initially rich. Thus, the social planner further shifts policy toward the poor by giving an even larger weight to the poor.

6.2 Suggestive Empirical Evidence

In our numerical experiment, the two methods for aggregating preferences yielded the same choice of policy $p_{SP} = p_{Cond}$. Here, the underlying economic characteristics of households dominate the mechanism behind the selection of their most preferred tax menu. For the social planner, the same logic is applied when the SWF is weighted by household marginal utility of consumption. This result is not surprising given the amount of heterogeneity in the calibrated economy that maps into very high wealth inequality and substantial low accrual at the bottom. Nonetheless, the observed tax menu in the US, the one to which the benchmark economy is calibrated, is starkly different than the one implied by the model.

This suggests that there is more to the voting process and households' decisions than what is purely captured by our model, a discussion that spans a wide literature in both political science and economics.[13]

In order to better discipline the idea of "non-economic" factors being part of the ultimate driving forces behind households' decisions over the tax menus, we provide some suggestive empirical evidence that political preferences play a significant role in people's preferences on tax menus often diverging and potentially neutralizing or offsetting what would be implied by their economic markers. To do this, we use data from the 2021 sample of the General Social Survey (GSS) to study the effects of party affiliation, voting behavior, and political views on attitudes toward progressive taxation and redistribution.

The GSS is amply used in sociological and political science research and aims to capture the views of American society over a wide range of topics. It provides standard demographic characteristics and detailed variables on political behavior and preferences over taxes and redistribution. There has been a growing interest in the political science literature on citizens' preferences toward redistributive tax policies. For instance, also using the GSS, Barnes (2015), in a cross-country analysis, distinguishes preferences over taxation levels and structure and finds that the modal respondent prefers lower tax levels but favors redistribution. Ballard-Rosa et al. (2017) show that economic and fairness concerns have an effect on individual tax preferences and that there is conflict primarily in their attitudes toward the taxation of higher incomes. We tie our analysis back to the economic literature by following the approach in Stantcheva (2021), who finds that policy views are defined more by concerns about the fairness of inequality and by broader views of government than they are by efficiency. This results is also consistent with de Souza (2022), who finds that ideological motives are more important than income for voting and shows in a quantitative model that agents would choose a larger size of government if their ideological views on redistribution were disregarded.

Using the 2021 sample of the GSS, we conduct our empirical analysis by running regressions on income and political preferences. The regressions include controls for respondents' gender, age, race, parental status, education, employment status, and self perception of class.[14] We include four regressions for each tax preference variable in which the political

[13]In economics, see, for example, Chang et al. (2018) and Wu (2021) that make use of Pareto weights to recover specific policies or Bachmann and Bai (2013), who use wealth-weighted voting.

[14]See Appendix D for a detailed description of the data, summary statistics, comparison with Stantcheva

view is represented by party affiliation, political views captured by the distinction between "liberal" and "conservative," their vote in the 2016 presidential election, and the joint relation between their vote and their political view in a spirit similar to that of the variable used in Stantcheva (2021).

The most important takeaway message from the analysis is that respondents' perception of tax levels, taxes on high incomes, and redistribution is remarkably different depending on how they identify themselves along the political spectrum. There is clear disagreement between groups on each of our political view variables. Our preferred specification is the one that uses the joint effect of vote in the 2016 presidential election and ideological identification. Nonetheless, the regression coefficients show significant magnitudes of opposite signs for all our different variables of political identity in each of our regressions of perceptions regarding tax instruments.[15]

(2021)'s sample, and expanded regressions.

[15] Our results are consistent with recent evidence using different data regarding the growth of the partisan divide over views regarding the fairness of the US tax system (Pew Research Center, 2019).

Table 5: Regressions on the determinants of tax levels

	Level of Federal Income Tax			
	(1)	(2)	(3)	(4)
Middle Income (40,000 to 74,999 USD)	−0.109**	−0.113***	−0.147***	−0.143***
	(0.043)	(0.044)	(0.052)	(0.051)
High Income (>74,999 USD)	−0.114***	−0.136***	−0.178***	−0.172***
	(0.042)	(0.042)	(0.051)	(0.050)
Republican	−0.157***			
	(0.037)			
Democrat	0.092**			
	(0.038)			
Conservative		−0.029		
		(0.042)		
Liberal		0.233***		
		(0.043)		
Trump			−0.261***	
			(0.067)	
Clinton			0.056	
			(0.067)	
Didn't Vote			−0.129	
			(0.124)	
Trump x Conservative				−0.231***
				(0.045)
Trump x Moderate				−0.269***
				(0.045)
Clinton x Liberal				0.189***
				(0.051)
N	1,779	1,760	1,210	1,180
Adj. R^2	0.09	0.09	0.25	0.26

Notes: The table shows regressions of political choices on taxation preferences. The dependent variable for columns (1)-(4) is the categorical variable "TAX" of the GSS 2021, which asks respondents whether they consider the amount of federal income tax they have to pay as "too high," "about right," or "too low." Regressions (1)-(4) all include controls for sex, age, race, self-perceived income class, being a parent, education, and employment status. The omitted category for income is "Low Income" for columns (1)-(4). For column (1), we omit "Independent"; for column (2), we omit "Moderate"; for column (3), we omit "Other"; and for column (4), we omit "Clinton x Moderate." The regressions are obtained via a survey-weighted generalized linear model using the GSS sampling structure. We report only the coefficients more related to the discussion in the text for exposition purposes; the full table can be found in Appendix D.2. *p<0.1; **p<0.05; ***p<0.01

Table 5 shows the relation of income and political views to respondents' perceptions of the overall level of federal income taxes. Apart from the clear opposite relations depending on to which category of the political spectrum a respondent belongs, the effect across income levels is of the same sign, showing that, on average, the level of taxes is perceived to be too high. There is a decrease in the absolute magnitude for the income variable in which a differential effect is apparent, showing that respondents with higher incomes are more inclined to perceive the level of taxes as high. Furthermore, the coefficients on political views are of sufficient magnitude to sometimes more than offset the effect of income on a respondent's perception when their signs differ. We understand this as suggestive evidence that there is much more "noise" in the decision process of a household when voting for a tax policy than the analysis of pure economic factors would imply. This is in line with the aforementioned discussion in which one either needs to add such noise via probabilistic voting or to tilt the balance of weights each vote contributes in order to sustain the tax regime observed in reality.

Table 6 shows the relationship of income and political views to respondents' perceptions of taxes for those with high incomes. For the case of our dependent variable, a lower value indicates that the respondent thinks that taxes on high income are too high.[16] Once again, we find that political views are significantly correlated with respondents' attitudes toward taxation of high incomes, with substantial disagreement between groups in each of the regressions, and magnitudes that offset the effect of income whenever it is significant.

[16]Since we control for whether respondents perceive themselves as "upper class" in a manner similar to that in Stantcheva (2021), we understand that the effect of the income variable is potentially less confounded with the usual misperception of lower-income individuals regarding their own position in the distribution, as documented by Hvidberg et al. (2020).

Table 6: Regressions on the determinants of taxes on high incomes

	Taxes on High Incomes			
	(1)	(2)	(3)	(4)
Middle Income (40,000 to 74,999 USD)	0.177	0.185*	0.270**	0.333***
	(0.113)	(0.110)	(0.129)	(0.129)
High Income (> 74,999 USD)	−0.037	−0.097	−0.182	−0.119
	(0.121)	(0.112)	(0.130)	(0.132)
Republican	−0.544***			
	(0.114)			
Democrat	0.424***			
	(0.092)			
Conservative		−0.521***		
		(0.115)		
Liberal		0.898***		
		(0.093)		
Trump			−0.492**	
			(0.199)	
Clinton			0.499**	
			(0.193)	
Didn't Vote			−0.942***	
			(0.325)	
Trump x Conservative				−0.809***
				(0.134)
Trump x Moderate				−0.564***
				(0.136)
Clinton x Liberal				0.674***
				(0.108)
N	1,198	1,190	822	802
Adj. R^2	0.11	0.15	0.29	0.30

Notes: The table shows regressions of political choices on taxation preferences. The dependent variable for columns (1)-(4) is the categorical variable "TAXRICH" of the GSS 2021, which asks respondents how they would describe taxes in America today for those with high incomes, on a scale from 1 to 5, achieving the lowest value if the answer is "much too high" and the highest value if the answer is "much too low." Regressions (1)-(4) all include controls for sex, age, race, self-perceived income class, being a parent, education, and employment status. The omitted category for income is "Low Income" for columns (1)-(4). For column (1), we omit "Independent"; for column (2), we omit "Moderate"; for column (3), we omit "Other"; and for column (4), we omit "Clinton x Moderate." The regressions are obtained via a survey-weighted generalized linear model using the GSS sampling structure. We report only the coefficients more related to the discussion in the text for exposition purposes; the full table can be found in Appendix D.2. *p<0.1; **p<0.05; ***p<0.01

Table 7 repeats the same analysis with a variable that captures respondents' opinions on whether the government should reduce income differences between the rich and the poor. The variable increases as respondents think the government should not reduce such differences and decreases otherwise. We can observe that the results are consistent with the ones shown in Tables 5 and 6. This highlights the importance of the political, i.e., "non-economic," factor when considering how respondents' preferences would be mapped into voting outcomes.[17]

Table 7: Regressions on the determinants of redistribution preferences

	Government Redistribution			
	(1)	(2)	(3)	(4)
Middle Income (40,000 to 74,999 USD)	0.211	0.202	0.043	0.010
	(0.143)	(0.144)	(0.175)	(0.172)
High Income (> 74,999 USD)	0.420***	0.578***	0.519***	0.479***
	(0.145)	(0.133)	(0.164)	(0.155)
Republican	1.420***			
	(0.151)			
Democrat	−1.053***			
	(0.117)			
Conservative		1.733***		
		(0.151)		
Liberal		−1.573***		
		(0.107)		
Trump			0.879***	
			(0.293)	
Clinton			−1.717***	
			(0.279)	
Didn't Vote			0.051	
			(0.597)	
Trump x Conservative				2.477***
				(0.179)
Trump x Moderate				1.413***
				(0.188)
Clinton x Liberal				−1.464***
				(0.124)
N	1,774	1,762	1,202	1,172
Adj. R^2	0.22	0.27	0.42	0.46

Notes: The table shows regressions of political choices on taxation preferences. The dependent variable for columns (1)-(4) is the categorical variable "EQLWTH" of the GSS 2021, which asks respondents whether the government ought to reduce the differences between the rich and the poor, on a scale from 1 to 7, achieving the lowest value if the answer is "the government should reduce income differences," and the highest value if the answer is "the government should not concern itself with reducing income differences." Regressions (1)-(4) all include controls for sex, age, race, self-perceived income class, being a parent, education, and employment status. The omitted category for income is "Low Income" for columns (1)-(4). For column (1), we omit "Independent"; for column (2), we omit "Moderate"; for column (3), we omit "Other"; and for column (4), we omit "Clinton x Moderate." The regressions are obtained via a survey-weighted generalized linear model using the GSS sampling structure. We report only the coefficients more related to the discussion in the text for exposition purposes; the full table can be found in Appendix D.2. *p<0.1; **p<0.05; ***p<0.01

[17] In Appendix D.2, we also include a fourth regression on respondents' perception of whether people with high income should pay a larger share of their income in taxes relative to those with low incomes. Results remain similar to the ones reported in the three regressions discussed.

7 Conclusion

We have explored the optimal tax-and-transfer policy in an environment with rich household heterogeneity and where the government has many tools for raising tax revenue. The optimal policy places very high tax rates on capital income and on consumption. Labor income taxes feature high top tax rates but also a progressive schedule similar to that currently in the US code. Greater degrees of tax progressivity are welfare reducing because they come at the cost of a lower feasible transfer while providing tax reductions to households that are not among the very poor. When a policy is instead decided by majority voting, the outcome is identical to the social planner's choice.

The fiscal policy predicted by the model is quite different than any seen in the data. Making the two more consistent would require shifting policy more in the direction of that preferred by more educated and wealthier households. We provide evidence that political identity and ideology are strong predictors of people's opinions about tax and transfers. Voters may choose candidates with tax platforms that do not maximize their best economic interests but better satisfy them along other dimensions unrelated to fiscal policy.

We have assumed that production is Cobb-Douglas so that the elasticity of substitution between factors is always equal to one. Although this is a common specification in literature and perhaps a sufficient approximation to the aggregate production we see in developed countries, it is doubtful whether this is a reasonable assumption in an economy as starved of capital as the one resulting from the equilibrium policy. Rather the production structure of the economy would likely be weakened in a such a way as to make it less robust to imbalances in factors. We plan to explore line of inquiry in the future.

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Appendix

A Discounting with Stochastic Aging

Since our economy has stochastic aging, in order to properly measure the value of aggregates and welfare along the transition, we have to adjust their value and discount it to the required periods. We start by defining the sequential value of a given flow value, f_t, for a given worker at time t. In order to spare notation and allow the algebra to be representative for models with similar structure, we will omit, without loss of generality, the elements of the state space x and will only use time arguments. Hence, the value function for a retired worker at time t can be represented as:

$$V^R(t) = f_t + \beta(1-\psi_d)f_{t+1} + \cdots = \sum_{i=t}^{\infty} \left[\beta(1-\psi_d)\right]^{i-t} f_i \tag{14}$$

For a young worker, we can use the value in equation (14) to define her value function at time t:

$$V^W(t) = f_t + \beta\left[(1-\psi_a)V^W(t+1) + \psi_a V^R(t+1)\right] \tag{15}$$

Evaluating the value in (15) at $t+1$ and substituting it into time t, we have that:

$$V^W = f_t + \beta\left\{(1-\psi_a)\left[f_{t+1} + \beta\left[(1-\psi_a)V^W(t+2) + \psi_a V^r(t+2)\right]\right] + \psi_a V^R(t+1)\right\} \tag{16}$$

Rearranging the equation above yields:

$$V^W(t) = f_t + \beta(1-\psi_a)f_{t+1} + \beta^2(1-\psi_a)^2 V^W(t+2) + \beta(1-\psi_a)^2\psi_a V^R(t+2) + \beta\psi_a V^R(t+1) \tag{17}$$

Hence, iterating the previous step until a certain finite period of time T, we can compute the present discounted value for the worker at time t:

$$V^W(t) = f_t + \sum_{j=1}^{T} [\beta(1-\psi_a)]^j f_{t+j} + \sum_{j=1}^{T} \beta^j (1-\psi_a)^{j-1} \psi_a V^R(t+j) + [\beta(1-\psi_a)]^T V^W(t+T) \tag{18}$$

We can then also compute the steady-state values of the flows for both household types. From the retired household value in (14), if we start at $t = 0$, we have that:

$$V^{R,SS} = \frac{f^{SS}}{1 - \beta(1-\psi_d)} \tag{19}$$

For the worker, we can take the limit and evaluate (18) at $T \to \infty$, starting at $j = 0$ to obtain:

$$V^W(t) = \sum_{j=0}^{\infty} [\beta(1-\psi_a)]^j f_{t+j} + \beta\psi_a \sum_{j=0}^{\infty} [\beta(1-\psi_a)]^j V^R(t+j+1) \tag{20}$$

where we used the fact that $\lim_{T\to\infty} \beta^T (1-\psi_a)^T V^W(t+T) = 0$, since V^W is bounded above.

Hence, in the steady state, we have that:

$$V^W = \frac{f^{SS} + \beta\psi_a V^{R,SS}}{1 - \beta(1-\psi_a)} \tag{21}$$

We can then construct a simple algorithm to compute the presented discounted value of a given flow f_t at the transition:

1. Start at T, with T large representing the machine equivalent of infinity, and approximate the time limit for the transition. From the steady-state value, $V^{R,SS}$, we know that $\frac{f^{SS}}{1-\beta(1-\psi_d)}$, where f^{SS} is already computed for the steady-state economy.

2. Define two auxiliary functions $A_1(t)$ and $A_2(t)$, which can be defined at time T as

$$A_1(T) \equiv f_T + \beta\left[(1-\psi_a)V^{W,SS} + \psi_a V^{R,SS}\right] \tag{22}$$

$$A_2(T) \equiv f_T + \beta(1-\psi_d)V^{R,SS} \tag{23}$$

3. Hence, in $T-1$, we can compute:

$$A_1(T-1) = f_{T-1} + \beta\left[(1-\psi_a)A_1(T) + \psi_a A_2(T)\right] \tag{24}$$

$$A_2(T-1) = f_{T-1} + \beta(1-\psi_d)A_2(T) \tag{25}$$

4. Iterate backward to $t = 1$ to find the values at the enacted period of the transition:

$$A_1(1) = f_1 + \beta\left[(1-\psi_a)A_1(2) + \psi_a A_2(2)\right] \tag{26}$$

$$A_2(1) = f_1 + \beta(1-\psi_d)A_2(2) \tag{27}$$

B Computation of the Model

We solve the model in several steps. First, for each $p = [\tau_y, \nu_y, \tau_k, \tau_c]$ from the grids in Section 4, we solve for the recursive competitive equilibrium (RCE) detailed in Section 2.2. This involves first solving for the steady state under p and then for the transition path back to the initial steady state. This also returns households' indirect utility, $V_x(p)$, from implementing reform p. Using these indirect utilities and the initial wealth distribution, Γ_1, we compute social welfare according to equation (13).

Solving for an RCE is done in the usual way. To find a steady state use the following steps:

1. Guess a rental rate r and lump-sum transfer Υ. Since the wage w can be expressed as a function of r from the firms's first-order conditions, households have all the information they need to solve their problem.

2. Solve the household problem given the guess at r and Υ.

3. Beginning with some initial wealth distribution, iterate on the distribution using the household decision rules. Repeat until the sup norm over the difference between any two consecutive distributions is less than a very small tolerance.

4. Use the converged wealth distribution and decision rules to check that, at r, aggregate capital supplied by the households equals the firm's demand and that Υ clears the government budget constraint. If not, then update the guesses at r and Tr and repeat the steps above.

A transition path is solved in a similar way.

1. Assume that the transition is completed in T periods, guess *a sequence* of rental rates r_t and lump-sum transfers Tr_t.

2. Use $V_T(x)$ to solve the household problem in $T-1$. Along with $V_{T-1}(x)$, this also yields household decision rules in $T-1$, $g_{T-1}(x)$. Iterate backward to $t=1$, collecting the household decisions for all periods.

3. Starting at the initial steady-state distribution, Γ_1, use $g_1(x)$ to find Γ_2 and compute all time 1 aggregate variables. Repeat until the entire sequence of distributions from $1, ..., T$ has been found along with the associated sequences of capital supplies and government surpluses.

4. Check that the capital market and government budget constraint clear in every period. If not, update the guessed sequences using the values implied by the firm's first-order condition for capital demand and the government budget constraint in each period. As is customary, to better ensure convergence we use a dampening factor to update the guess slowly.

Once an RCE has been found for each p in $\mathcal{P}$, we compute the outcome under majority voting at the enacted period of the transition. We do this using the method detailed in Carroll et al. (2021). We use the following steps:

1. First, discard any policy that would be unanimously defeated by another policy in $\mathcal{P}$. The remaining policies form the Pareto set.

2. Next, reduce the Pareto set to the uncovered set by constructing the **adjacency matrix** M.

    - M is a square matrix of 0's and 1's with a dimension N, where N is the cardinality of $\mathcal{P}$.

    - Ordering the policies in $\mathcal{P}$ by $1, 2, ..., N$, $M(i, j)$ equals 1 if policy i defeats policy j in a head-to-head competition and 0 if not.

3. From M, the uncovered set can be found by computing the matrix

$$M^* = M^2 + M + I.$$

- Any policy i for which there exists a policy j with $m^*_{i,j} = 0$ is said to be covered by j.
- The uncovered set then consists of all the policies for which the corresponding rows of M^* contain only 1's.

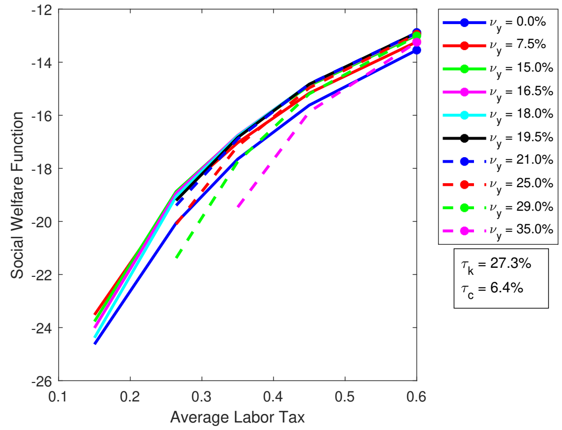
4. If only a single policy satisfies this criterion, then it is the Condorcet winner policy. As stated in Section 6.1, we always find a Condorcet winner.

C Additional Optimal Tax Rates

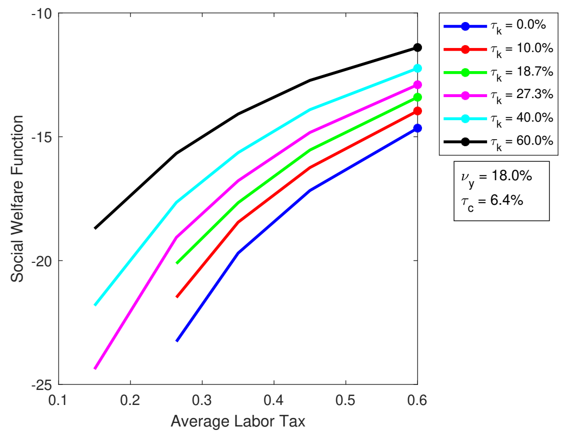
Figures 10-12 plot the relationships between the non-progressivity tax parameters in the model. In every case, social welfare is maximized when these parameters are at their highest feasible values.

Figure 10: Optimal τ_y

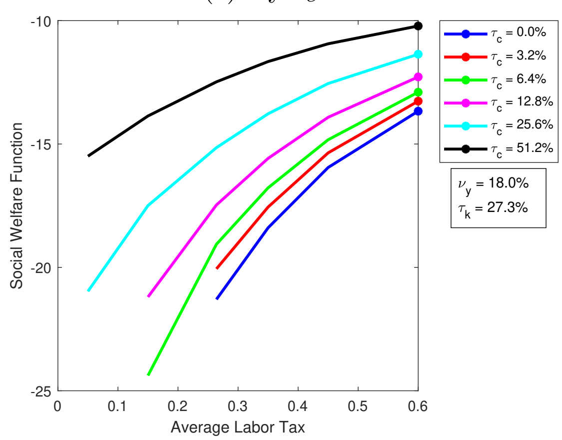
(a) By ν_y



(b) By τ_k



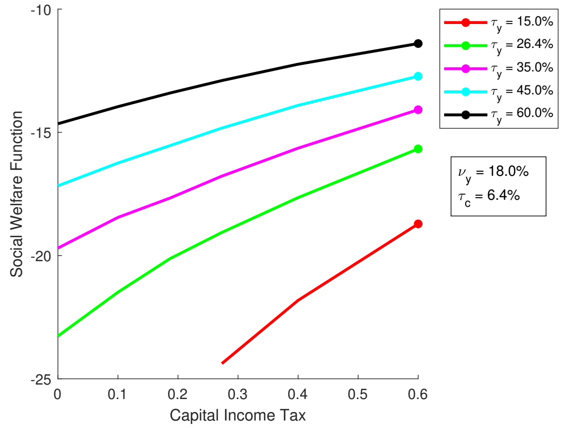
(c) By τ_c



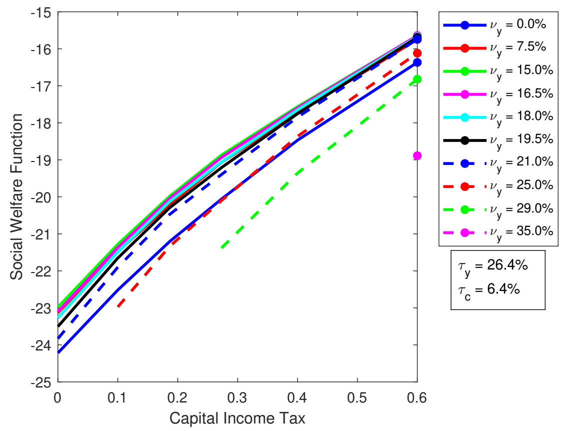
Notes: The figure shows the values for the utilitarian social welfare function along the average labor tax grid for each of the other three tax instruments. Each panel shows the function for different levels for a given tax rate with the other two fixed at their calibrated benchmark values. The top panel depicts it for the progressivity parameter, the center panel for capital income tax, and the bottom panel for the consumption tax. Each line has a highlighted dot that indicates the welfare-maximizing level of average labor tax at the given tax rate.

Figure 11: Optimal τ_k

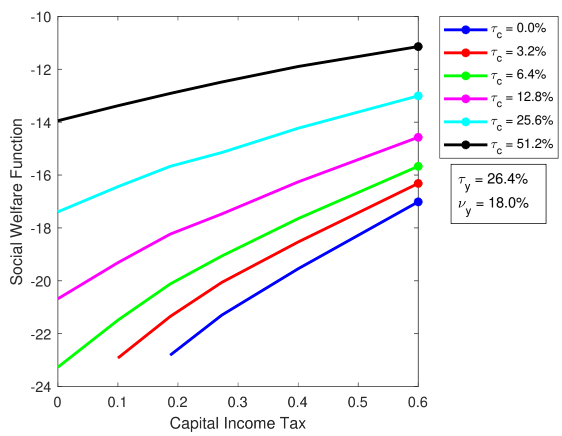
(a) By τ_y



(b) By ν_y



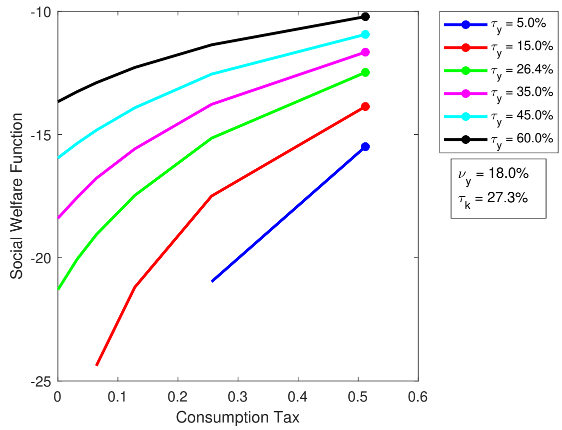
(c) By τ_c



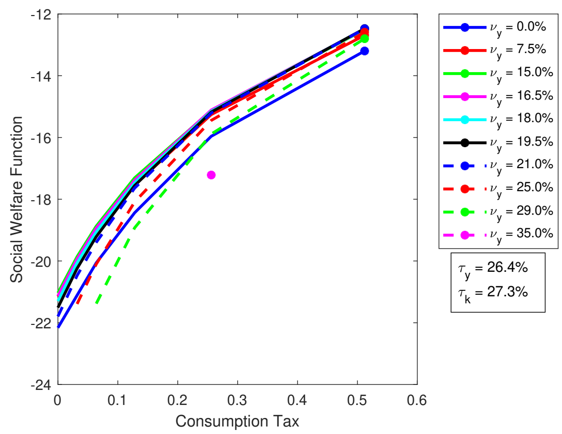
Notes: The figure shows the values for the utilitarian social welfare function along the capital income tax grid for each of the other three tax instruments. Each panel shows the function for different levels for a given tax rate with the other two fixed at their calibrated benchmark values. The top panel depicts it for the labor tax, the center panel for the progressivity parameter, and the bottom panel for the consumption tax. Each line has a highlighted dot that indicates the welfare-maximizing level of capital income at the given tax rate.

Figure 12: Optimal τ_c

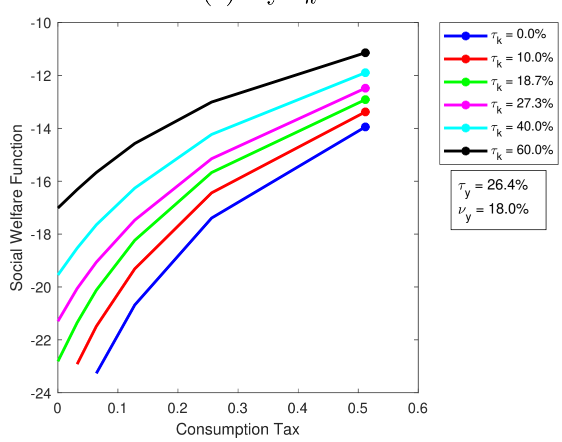
(a) By τ_y



(b) By ν_y



(c) By τ_k



Notes: The figure shows the values for the utilitarian social welfare function along the consumption tax grid for each of the other three tax instruments. Each panel shows the function for different levels for a given tax rate with the other two fixed at their calibrated benchmark values. The top panel depicts it for the labor tax, the center panel for the progressivity parameter, and the bottom panel for the capital income tax. Each line has a highlighted dot that indicates the welfare-maximizing level of consumption tax at the given tax rate.

D Details of the Empirical Analysis

D.1 Data - General Social Survey (GSS) 2021

We use the 2021 sample of the General Social Survey (GSS). The GSS is a series of nationally representative cross-sectional interviews in the US that date back to 1972. It collects data on contemporary issues in American society with a wide range of topics. The sample is composed of adults 18 or older in the US who live in non-institutional housing at the time of the interview. For the 2021 sample, interviews were web-based and supplemented by phone. The final sample size of the survey is of 4,032 respondents.

For our sample selection and overall analysis, we follow Stantcheva (2021) and restrict respondents' age to a maximum of 69 years. In the interest of precision in our income variable, we also exclude respondents who refused to answer questions about their income. Table 8 summarizes the main characteristics of our sample and compares them to those of the representative US population and to the Income Tax Survey data as shown in Table I of Stantcheva (2021).

In order to make a direct comparison, we have approximated our variable definitions to be consistent with our comparison base. The main difference is in the income variable, for which the pre-defined brackets of the GSS differ moderately from the brackets of the Income Tax Survey and the addition of "Indigenous American" as a separate group in the race variable. We keep all possible income brackets from the two surveys in the table for ease of comparison. With respect to the US population in 2019, our GSS 2021 sample is substantially different only when it comes to the percentage of high school graduates, which naturally reduces the sample percentage of respondents with a college degree or more. This fact naturally entails a relative weakness of our sample in that dimension. We understand, however, that for the purposes of suggestive evidence and given the proximity of the numbers to the income variables, apart from the top bracket, the overall effect of the variables related to political views may be preserved.

Table 8: Sample characteristics and comparison to Stantcheva (2021)

	GSS 2021	US Population	Income Tax Survey
Male	0.53	0.49	0.48
18-29 years old	0.36	0.24	0.23
30-39 years old	0.19	0.2	0.2
40-49 years old	0.17	0.18	0.19
50-59 years old	0.15	0.19	0.21
60-69 years old	0.14	0.19	0.18
$0-$19,999	0.18	0.13	0.15
$20,000-$39,999	0.16	0.21	0.23
$40,000-$74,999	0.28	-	-
$75,000-$109,999	0.17	-	-
$70,000 - $109,999	-	0.2	0.19
$110,000+	0.21	0.31	0.24
Four-year college degree or more	0.19	0.34	0.48
High-school graduate or less	0.68	0.38	0.19
Employed	0.62	0.7	0.63
Unemployed	0.12	0.03	0.07
Self-employed	0.10	0.07	0.07
Married	0.44	0.53	0.55
White	0.70	0.61	0.76
Black/African-American	0.13	0.12	0.06
Hispanic/Latino	0.07	0.18	0.06
Asian/Asian American/Other	0.13	0.06	0.07
Indigenous American	0.03	-	-
Democrat	0.30	0.3	0.34
Republican	0.21	0.26	0.31
Independent	0.49	0.42	0.33
Voted for Clinton in the 2016 presidential election	0.27	0.48	0.44
Voted for Trump in the 2016 presidential election	0.17	0.46	0.44
Sample size	2731	-	2784

Notes: The table displays in the first column the characteristics of our sample from the GSS 2021 and compares them to the statistics for the overall US population and for the Income Tax Survey, in the second and third column, respectively, both taken directly from the numbers shown in Table I in Stantcheva (2021). We restrict our sample to respondents who are less than 69 years old and exclude any respondent who refused to answer questions about their income. All of the statistics are adjusted using the survey design and sample weights.

D.2 Expanded Regressions

We show in Tables 9 to 12 the expanded regressions in Tables 5 to 7 and an extra regression on the "TAXSHARE" variable of the GSS in Table 12. The tables show the coefficients for all the control variables. We have also conducted the same analysis and regressions using a simple OLS estimator instead of the survey-weighted generalized linear model method used in the regressions shown in all tables in the main text and appendix. The results are similar both in sign and order of magnitude of the coefficients.

Table 9: Regressions on the determinants of tax levels

	Level of Federal Income Tax			
	(1)	(2)	(3)	(4)
Female	−0.063*	−0.053*	−0.061*	−0.061*
	(0.032)	(0.032)	(0.034)	(0.034)
Age: 30 to 49	−0.016	−0.009	0.021	0.018
	(0.052)	(0.051)	(0.065)	(0.066)
Age: 50 to 69	−0.069	−0.058	−0.024	−0.010
	(0.053)	(0.053)	(0.066)	(0.068)
Black/African-American	−0.079	−0.011	−0.257***	−0.207***
	(0.051)	(0.049)	(0.052)	(0.053)
Hispanic/Latino	0.097	0.117	−0.102	−0.070
	(0.100)	(0.107)	(0.120)	(0.123)
Asian, Pacific Islander, or Other	0.070	0.109*	0.072	0.066
	(0.068)	(0.066)	(0.082)	(0.081)
Indigenous American	−0.129	−0.104	−0.224***	−0.179**
	(0.082)	(0.086)	(0.085)	(0.086)
Parent	−0.023	−0.011	0.020	0.036
	(0.037)	(0.037)	(0.041)	(0.042)
College Degree	0.146***	0.146***	0.135***	0.123***
	(0.033)	(0.034)	(0.037)	(0.038)
Employed	−0.111***	−0.095**	−0.096**	−0.080*
	(0.039)	(0.040)	(0.044)	(0.043)
Unemployed	−0.128*	−0.109	−0.172**	−0.156*
	(0.072)	(0.073)	(0.080)	(0.083)
Middle Income (40,000 to 74,999 USD)	−0.109**	−0.113***	−0.147***	−0.143***
	(0.043)	(0.044)	(0.052)	(0.051)
High Income (> 74,999 USD)	−0.114***	−0.136***	−0.178***	−0.172***
	(0.042)	(0.042)	(0.051)	(0.050)
Upper Class	0.263**	0.229**	0.266***	0.264***
	(0.112)	(0.108)	(0.100)	(0.096)
Republican	−0.157***			
	(0.037)			
Democrat	0.092**			
	(0.038)			
Liberal		0.233***		
		(0.043)		
Conservative		−0.029		
		(0.042)		
Clinton			0.056	
			(0.067)	
Trump			−0.261***	
			(0.067)	
Didn't Vote			−0.129	
			(0.124)	
Trump x Conservative				−0.231***
				(0.045)
Trump x Moderate				−0.269***
				(0.045)
Clinton x Liberal				0.189***
				(0.051)
N	1,779	1,760	1,210	1,180
Adj. R^2	0.09	0.09	0.25	0.26

Notes: The table shows regressions of political choices on taxation preferences. The dependent variable for columns (1)-(4) is the categorical variable "TAX" of the GSS 2021, which asks respondents whether they consider the amount of federal income tax they have to pay as "too high," "about right," or "too low." Regressions (1)-(4) all include controls for sex, age, race, self-perceived income class, being a parent, education, and employment status. The omitted category for income is "Low Income" for columns (1)-(4). For column (1), we omit "Independent"; for column (2), we omit "Moderate"; for column (3), we omit "Other"; and for column (4), we omit "Clinton x Moderate." The regressions are obtained via a survey-weighted generalized linear model using the GSS sampling structure. *p<0.1; **p<0.05; ***p<0.01

Table 10: Regressions on the determinants of taxes on high incomes

	Taxes on High Incomes			
	(1)	(2)	(3)	(4)
Female	−0.006	0.026	−0.039	0.002
	(0.082)	(0.080)	(0.088)	(0.088)
Age: 30 to 49	0.008	0.024	0.311**	0.331**
	(0.140)	(0.131)	(0.157)	(0.156)
Age: 50 to 69	0.036	0.122	0.212	0.329**
	(0.145)	(0.140)	(0.153)	(0.158)
Black/African-American	−0.520***	−0.302**	−0.658***	−0.432***
	(0.156)	(0.142)	(0.162)	(0.154)
Hispanic/Latino	0.042	0.034	−0.015	−0.030
	(0.242)	(0.234)	(0.223)	(0.263)
Asian, Pacific Islander, or Other	−0.223	−0.115	0.222	0.201
	(0.182)	(0.166)	(0.245)	(0.233)
Indigenous American	0.141	0.236	0.048	0.118
	(0.212)	(0.193)	(0.275)	(0.263)
Parent	0.006	0.165*	−0.058	0.023
	(0.101)	(0.098)	(0.106)	(0.108)
College Degree	0.366***	0.319***	0.358***	0.279***
	(0.090)	(0.085)	(0.094)	(0.094)
Employed	−0.231**	−0.189*	−0.351***	−0.291***
	(0.105)	(0.101)	(0.106)	(0.107)
Unemployed	0.120	0.175	−0.109	−0.030
	(0.159)	(0.157)	(0.164)	(0.172)
Middle Income (40,000 to 74,999 USD)	0.177	0.185*	0.270**	0.333***
	(0.113)	(0.110)	(0.129)	(0.129)
High Income (> 74,999 USD)	−0.037	−0.097	−0.182	−0.119
	(0.121)	(0.112)	(0.130)	(0.132)
Upper Class	0.234	0.046	−0.119	−0.136
	(0.285)	(0.252)	(0.303)	(0.307)
Republican	−0.544***			
	(0.114)			
Democrat	0.424***			
	(0.092)			
Liberal		0.898***		
		(0.093)		
Conservative		−0.521***		
		(0.115)		
Clinton			0.499**	
			(0.193)	
Trump			−0.492**	
			(0.199)	
Didn't Vote			−0.942***	
			(0.325)	
Trump x Conservative				−0.809***
				(0.134)
Trump x Moderate				−0.564***
				(0.136)
Clinton x Liberal				0.674***
				(0.108)
N	1,198	1,190	822	802
Adj. R^2	0.11	0.15	0.29	0.30

Notes: The table shows regressions of political choices on taxation preferences. The dependent variable for columns (1)-(4) is the categorical variable "TAXRICH" of the GSS 2021, which asks respondents how they would describe taxes in America today for those with high incomes, on a scale from 1 to 5, achieving the lowest value if the answer is "much too high" and the highest value if the answer is "much too low." Regressions (1)-(4) all include controls for sex, age, race, self-perceived income class, being a parent, education, and employment status. The omitted category for income is "Low Income" for columns (1)-(4). For column (1), we omit "Independent"; for column (2), we omit "Moderate"; for column (3), we omit "Other"; and for column (4), we omit "Clinton x Moderate." The regressions are obtained via a survey-weighted generalized linear model using the GSS sampling structure. *p<0.1; **p<0.05; ***p<0.01

Table 11: Regressions on the determinants of redistribution preferences

	Government Redistribution			
	(1)	(2)	(3)	(4)
Female	−0.115	−0.169*	0.124	−0.054
	(0.109)	(0.102)	(0.120)	(0.113)
Age: 30 to 49	0.421***	0.365**	0.202	0.158
	(0.161)	(0.162)	(0.219)	(0.201)
Age: 50 to 69	0.764***	0.582***	0.388*	0.195
	(0.167)	(0.169)	(0.230)	(0.214)
Black/African-American	−0.273	−0.613***	0.021	−0.373*
	(0.170)	(0.175)	(0.196)	(0.192)
Hispanic/Latino	−0.494*	−0.526**	−0.494	−0.569
	(0.264)	(0.217)	(0.388)	(0.430)
Asian, Pacific Islander, or Other	−0.170	−0.292*	−0.130	−0.257
	(0.203)	(0.169)	(0.256)	(0.240)
Indigenous American	−0.265	−0.326	−0.910**	−0.952**
	(0.287)	(0.304)	(0.372)	(0.393)
Parent	0.021	−0.232*	0.078	−0.185
	(0.122)	(0.123)	(0.149)	(0.145)
College Degree	−0.140	−0.110	−0.180	−0.063
	(0.114)	(0.103)	(0.125)	(0.119)
Employed	0.169	0.096	−0.040	−0.011
	(0.136)	(0.129)	(0.152)	(0.145)
Unemployed	−0.444*	−0.482**	−0.624**	−0.580**
	(0.228)	(0.202)	(0.272)	(0.255)
Middle Income (40,000 to 74,999 USD)	0.211	0.202	0.043	0.010
	(0.143)	(0.144)	(0.175)	(0.172)
High Income (> 74,999 USD)	0.420***	0.578***	0.519***	0.479***
	(0.145)	(0.133)	(0.164)	(0.155)
Upper Class	−0.034	0.063	0.253	0.223
	(0.261)	(0.241)	(0.275)	(0.279)
Republican	1.420***			
	(0.151)			
Democrat	−1.053***			
	(0.117)			
Liberal		−1.573***		
		(0.107)		
Conservative		1.733***		
		(0.151)		
Clinton			−1.717***	
			(0.279)	
Trump			0.879***	
			(0.293)	
Didn't Vote			0.051	
			(0.597)	
Trump x Conservative				2.477***
				(0.179)
Trump x Moderate				1.413***
				(0.188)
Clinton x Liberal				−1.464***
				(0.124)
N	1,774	1,762	1,202	1,172
Adj. R^2	0.22	0.27	0.42	0.46

Notes: The table shows regressions of political choices on taxation preferences. The dependent variable for columns (1)-(4) is the categorical variable "EQLWTH" of the GSS 2021, which asks respondents whether the government ought to reduce the differences between the rich and the poor, on a scale from 1 to 7, achieving the lowest value if the answer is "the government should reduce income differences" and the highest value if the answer is "the government should not concern itself with reducing income differences." Regressions (1)-(4) all include controls for sex, age, race, self-perceived income class, being a parent, education, and employment status. The omitted category for income is "Low Income" for columns (1)-(4). For column (1), we omit "Independent"; for column (2), we omit "Moderate"; for column (3), we omit "Other"; and for column (4), we omit "Clinton x Moderate." The regressions are obtained via a survey-weighted generalized linear model using the GSS sampling structure. *p<0.1; **p<0.05; ***p<0.01

Table 12: Regressions on the determinants of share of taxes for high incomes

	Tax Share of High Incomes			
	(1)	(2)	(3)	(4)
Female	−0.030	−0.043	0.096	0.061
	(0.064)	(0.062)	(0.074)	(0.070)
Age: 30 to 49	0.086	0.063	0.092	0.083
	(0.112)	(0.108)	(0.145)	(0.132)
Age: 50 to 69	0.058	−0.010	0.090	0.015
	(0.114)	(0.111)	(0.142)	(0.131)
Black/African-American	0.231*	0.090	0.288***	0.141
	(0.134)	(0.125)	(0.104)	(0.105)
Hispanic/Latino	−0.229	−0.207	−0.163	−0.185
	(0.143)	(0.156)	(0.137)	(0.198)
Asian, Pacific Islander, or Other	0.099	0.029	0.252	0.253
	(0.149)	(0.145)	(0.262)	(0.244)
Indigenous American	−0.376**	−0.436***	−0.412**	−0.484***
	(0.158)	(0.148)	(0.186)	(0.175)
Parent	0.063	−0.057	−0.014	−0.120
	(0.076)	(0.071)	(0.088)	(0.080)
College Degree	−0.176***	−0.135**	−0.187**	−0.136*
	(0.067)	(0.063)	(0.083)	(0.076)
Employed	0.202***	0.165**	0.204***	0.164**
	(0.078)	(0.075)	(0.079)	(0.076)
Unemployed	−0.139	−0.153	−0.005	−0.053
	(0.118)	(0.115)	(0.160)	(0.150)
Middle Income (40,000 to 74,999 USD)	−0.093	−0.096	−0.122	−0.164*
	(0.094)	(0.090)	(0.095)	(0.093)
High Income (> 74,999 USD)	−0.045	0.001	0.127	0.093
	(0.090)	(0.083)	(0.110)	(0.101)
Upper Class	0.197	0.314	0.424*	0.458**
	(0.227)	(0.231)	(0.232)	(0.230)
Republican	0.394***			
	(0.083)			
Democrat	−0.278***			
	(0.074)			
Liberal		−0.635***		
		(0.066)		
Conservative		0.460***		
		(0.101)		
Clinton			−0.510***	
			(0.130)	
Trump			0.209	
			(0.136)	
Didn't Vote			0.301	
			(0.237)	
Trump x Conservative				0.633***
				(0.113)
Trump x Moderate				0.333***
				(0.094)
Clinton x Liberal				−0.590***
				(0.078)
N	1,223	1,215	839	817
Adj. R^2	0.10	0.17	0.28	0.32

Notes: The table shows regressions of political choices on taxation preferences. The dependent variable for columns (1)-(4) is the categorical variable "TAXSHARE" of the GSS 2021, which asks respondents whether they think people with high incomes should pay a larger share of their income in taxes than those with low incomes, on a scale from 1 to 5, achieving the lowest value if the answer is "much larger share" and the highest value if the answer is "much smaller share." Regressions (1)-(4) all include controls for sex, age, race, self-perceived income class, being a parent, education, and employment status. The omitted category for income is "Low Income" for columns (1)-(4). For column (1), we omit "Independent"; for column (2), we omit "Moderate"; for column (3), we omit "Other"; and for column (4), we omit "Clinton x Moderate." The regressions are obtained via a survey-weighted generalized linear model using the GSS sampling structure. *p<0.1; **p<0.05; ***p<0.01