Taxation of Top Incomes and Tax Avoidance*

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Abstract

This paper studies the aggregate and distributional effects of raising the top marginal income tax rate in the presence of tax avoidance. To this end, we develop a quantitative macroeconomic model with heterogeneous agents and occupational choice in which entrepreneurs can avoid taxes in two ways. On the extensive margin, entrepreneurs can choose the legal form of their business organization to reduce their tax burden. On the intensive margin, entrepreneurs can shift their income between different tax bases. In a quantitative application to the US economy, we find that tax avoidance lowers productive efficiency, generates sizable welfare losses, and reduces the effectiveness of the top marginal tax rate at lowering inequality. Tax avoidance reduces the optimal top marginal income tax rate from 47% to 43%.

JEL Classifications: E21, E62, H25, H26, H32.

Keywords: Tax Avoidance, Top Income Tax Rate, Occupational Choice, Legal Form of Organization, Wealth Inequality, Incomplete Markets, Heterogeneous Agents.

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1 Introduction

In the US, increasing top-income shares have stimulated an academic and political debate on how to tax the rich. It is well known that progressive income taxation may induce behavioral responses shaping the trade-off between equity and efficiency. When assessing the economic consequences of taxing top incomes, it is, therefore, crucial to account for the characteristics of rich households and their behavioral responses to marginal tax rates. In this respect, two empirical facts are of key importance. First, there is a high concentration of entrepreneurs with small and medium-sized businesses at the top of the US income distribution (Smith et al., 2019). Second, the estimated response of reported income to marginal tax rates is larger for the top 1% income earners compared to the rest of the population. This difference may be attributed to tax avoidance and suggests that entrepreneurs effectively reduce their tax burden (Mertens and Montiel Olea, 2018; Saez et al., 2012).

These empirical facts highlight the importance of understanding entrepreneurial decisions and tax avoidance when assessing the aggregate and distributional consequences of taxing top incomes. This paper focuses on three main research questions. First, how does tax avoidance by entrepreneurs affect macroeconomic outcomes and welfare? Second, how does the top marginal income tax rate impact the trade-off between equity and efficiency in the presence of tax avoidance? And, third, how does tax avoidance affect the optimal top marginal income tax rate?

To answer these questions, we introduce entrepreneurial tax avoidance in a dynamic general equilibrium model with incomplete markets and occupational choice following Cagetti and De Nardi (2006), Quadrini (2000), and Kitao (2008). Households are heterogeneous in wealth, labor productivity, and entrepreneurial talent and decide every period whether to be a worker or entrepreneur. Entrepreneurs can avoid taxes in two ways. On the extensive margin, entrepreneurs can choose the legal form of their business organization to reduce their tax burden. On the intensive margin, they can shift their income between different tax bases. Entrepreneurs invest in capital, hire labor, and use a decreasing return to scale production technology to produce the consumption good. Entrepreneurs are credit-constrained in their investment decision. That is, they face a borrowing limit proportional to their net wealth, and the limit depends on the legal form of business organization. The government collects personal income, corporate and dividend taxes to finance government spending. Moreover, the government raises a social security tax to provide pension benefits to retirees. In addition to the entrepreneurial sector consisting of small and medium-sized businesses, a non-entrepreneurial sector operates under constant returns to scale using capital and labor competitively to produce the consumption good.

We focus on the tax treatment of three main forms of business organization: sole proprietorship, S-corporations, and C-corporations. Sole-proprietorships are simple to establish and involve no taxation at the entity level. Instead, business income is passed through to the owners and taxed at the personal income tax rate. The advantage of this organizational form is its simplicity, but there is little room for tax avoidance. Alternatively, entrepreneurs can decide to incorporate, which increases the business's complexity and generates operating costs. Like sole proprietors, S-corporations belong to the class of pass-through businesses. They are taxed at the individual level rather than the entity level, and their owners have the option to disguise their wage income as business income to avoid the social security tax (Smith et al., 2022). C-corporations are complex and run at higher operating costs. However, they benefit from better access to credit because there are fewer legal restrictions on the number and the type of investors that would limit the ability to raise external capital (Dyrda and Pugsley, 2019; Chen et al., 2018). C-corporations are taxed at the entity level and face double taxation: business income is subject to the corporate tax and then taxed again when it is paid to the owners as dividends. Like S-corporations, C-corporations can shift their income between different tax bases.

We calibrate the model to the US economy. Our targets include the share of entrepreneurs by legal form, the share of entrepreneurs among the top 1% of the income and wealth distributions, and the employment share by business size. Since the entrepreneurial credit constraint is crucial for our results, we calibrate the borrowing limit of pass-through businesses and C-corporations to match their corresponding wealth shares.

Our model replicates important quantitative features of the US economy in terms of income, wealth, and the legal-form distribution of businesses. Our quantitative analysis highlights that poor entrepreneurs run their businesses as sole proprietors. Despite higher operating costs, richer entrepreneurs switch to S-corporations to avoid the social security tax by declaring business income rather than wage income. In addition, they circumvent double taxation of C-corporations. In line with the empirical evidence, our model predicts that S-corporations are more common than C-corporations among small and medium-sized businesses (Smith et al., 2022). Entrepreneurs choose to organize as C-corporations if they have a high entrepreneurial talent or are very wealthy. The reasons for this choice of the legal form of organization are twofold. First, talented entrepreneurs benefit from the relaxed credit constraint of C-corporations, which allows them to invest more. Second, if entrepreneurs are very wealthy, their credit constraint is not binding anymore, but they benefit from the dividend tax being lower than the top marginal income tax rate they face.

To understand how tax avoidance affects macroeconomic outcomes and welfare, we consider a counterfactual economy in which we eliminate all channels of tax avoidance such that all entrepreneurs are taxed as sole proprietors independent of their legal form of organization. A comparison between the counterfactual economy and the benchmark economy highlights that tax avoidance affects productive efficiency in two opposing ways. First, the intensive margin of tax avoidance increases productive efficiency by minimizing entrepreneurs' tax burdens, relaxing their credit constraints and facilitating higher investments. Second, the extensive margin of tax avoidance reduces productive efficiency because the possibility to avoid taxes induces entrepreneurs to switch their legal form of organization from C-corporation to S-corporation, despite facing a tighter borrowing limit with adverse effects on capital investment. Quantitatively the negative effects of tax avoidance on macroeconomic outcomes strongly dominate, resulting in significant welfare losses for workers and entrepreneurs.

In the next step, we study the impact of the top marginal income tax rate on tax revenues and highlight how tax avoidance affects the trade-off between equity and efficiency. Using our benchmark economy, we find that raising the top marginal tax rate induces entrepreneurs at the top of the income distribution to run their businesses as C-corporations rather than S-corporations to take advantage of the dividend tax rate, which is lower than the top marginal tax rate. Moreover, they engage more in income shifting to minimize their tax burden. As a result, the income share held by the top 1% increases in response to a hike in the top marginal tax rate. Overall, tax avoidance reduces the negative impact of the top marginal income tax rate on aggregate production but makes it ineffective at lowering inequality. In contrast, in the absence of tax avoidance, increasing the top marginal tax rate reduces inequality at the expense of productive efficiency.

The predictions of our model are in line with Lindsey (1987), Feldstein (1995), Dyrda and Pugsley (2019), and Bilicka and Raei (2023) who report that cutting top marginal income tax rates in the 1980s stimulated entrepreneurship in the US and induced a switch from C-corporations to pass-through businesses. Slemrod (1996) argues that these large responses were mainly due to tax avoidance rather than economic activity.

In the final step, we explore how tax avoidance affects the optimal top marginal tax rate that maximizes aggregate welfare. We find that the optimal top marginal tax rate equals 43%, which is about 3.4 p.p. higher than the one implemented in the US tax code. Eliminating entrepreneurial tax avoidance raises the optimal top marginal tax rate by 4 p.p. The additional increase in the top marginal tax rate enhances aggregate welfare because the extra tax revenues can be redistributed to all households.

The rest of the paper is organized as follows. The next subsection discusses the related literature. In Section 2, we provide institutional details on legal forms of organization in the US. Section 3 describes the model. Section 4 explains the calibration procedure. In Section 5, we present the results, discuss how tax avoidance affects aggregate and distributional outcomes, and derive the optimal marginal tax rate. The last section concludes.

Related literature. Our paper builds on different strands of the literature. First, our study contributes to the analysis of optimal top marginal tax rates. Diamond and Saez (2011) consider static models and argue that, in the US, the top marginal tax rate should be raised to 73%. Kindermann and Krueger (2022) analyze a large-scale overlapping generations model with uninsurable labor productivity risk and find an optimal marginal tax rate for top 1% earners of 79%. Badel et al. (2020) and Guner et al. (2016) derive lower optimal marginal tax rates of 42% and 49%, respectively.

The above-mentioned studies abstract from entrepreneurs, who are concentrated at the top of the income distribution. Models that incorporate entrepreneurship and financial frictions can better explain macroeconomic patterns such as wealth inequality and cross-country differences in TFP (Quadrini, 2000; Cagetti and De Nardi, 2006; Buera et al., 2015). Building on this literature, Brüggemann (2021), Imrohoroglu et al. (2018) and Ge (2020) analyze dynamic general equilibrium models with incomplete markets and occupational choice to derive the optimal taxation of top income earners. Brüggemann (2021) reports a welfare-maximizing top marginal tax rate of 60%. Imrohoroglu et al. (2018) argue that raising the progressivity of the income tax schedule is more effective than increasing the top marginal tax rate. Imrohoroglu et al. (2018) is related to the papers by Heathcote and Tsujiyama (2021), Heathcote et al. (2017), Heathcote et al. (2020), Erosa and Koreshkova (2007) and Bakış et al. (2015) who focus on the optimal progressivity of the income tax schedule.

All these papers abstract from tax avoidance, which is the focus of our paper.[1] The important role of tax avoidance has been addressed by Piketty et al. (2014), who provide empirical evidence on the decomposition of the total behavioral response of top incomes to marginal tax rates. Landier and Plantin (2017), Gorea (2014), and Uribe-Teran (2021) address tax avoidance in dynamic models by assuming that agents have access to a costly tax avoidance technology. We contribute to this literature by modeling the micro-foundations of tax avoidance by allowing entrepreneurs to optimally reduce their tax burden.

Our micro-foundation of tax avoidance builds on the earlier literature that studies the entrepreneurial choice of incorporation and the role of taxation and tax distortions in this context, see, among others, Gordon and Slemrod (1998), Mackie-Mason and Gordon (1997), Gordon and MacKie-Mason (1994). Bilicka and Raei (2023) apply an industry equilibrium model in which the legal form of organization is an endogenous choice to study how differential tax treatments distort aggregate output. Chen et al. (2018) analyze the impact of the corporate tax on the entrepreneurial choice of the legal form of organization and unemployment within a dynamic stochastic occupational choice model. Our paper is most closely related to Dyrda and Pugsley (2022), who develop a quantitative dynamic general equilibrium model with a fixed share of entrepreneurs choosing whether to run a pass-through business or a C-corporation. They study the optimal design of the labor and business tax and find that the progressivity of the labor tax scheme should rise and that the uniform business income tax should be set to 31%. We contribute to this literature by focusing on the different channels of tax avoidance. While Chen et al. (2018) and Dyrda

[1] A related literature focuses on tax evasion as an illegal way to reduce tax payments, see Slemrod (2007), Maffezzoli (2011), Kotsogiannis and Mateos-Planas (2019), Di Nola et al. (2021) and the references therein. In this paper, we focus on legal strategies to reduce tax liabilities.

and Pugsley (2022) differentiate between pass-through businesses and C-corporations, we explicitly account for the different tax treatments of sole proprietors, S-corporations, and C-corporations. In addition, we allow for entrepreneurial income shifting between different tax bases as an intensive margin of tax avoidance. Importantly, we focus on how the top marginal tax rate affects the individuals' occupational choice and the entrepreneurial choice of how to run the business in the presence of tax avoidance.

2 Tax Avoidance and Legal Forms of Organization

Tax avoidance. Business owners can avoid taxes through two distinct channels. First, entrepreneurs can reduce their tax burden through the choice of the organizational form of their business. We label this channel the *extensive margin* of tax avoidance. Second, conditional on choosing to incorporate their business, entrepreneurs can reduce their tax liabilities by shifting income between the two tax bases: wage income and business income. This practice of income shifting is the *intensive margin* of tax avoidance.

On the extensive margin of tax avoidance, entrepreneurs may incorporate their business instead of being sole proprietors to avoid social security taxes because the business incomes of corporations are exempt from social security taxation. Once incorporated, they can choose between S-corporations and C-corporations. Even though C-corporations are subject to double taxation (i.e., corporate tax and dividend tax), high-income entrepreneurs may opt for this legal form if the top marginal income tax rate is higher than the tax rate under double taxation.

The intensive margin of tax avoidance is operational only for incorporated business owners. They decide how to distribute their business proceeds between the two tax bases: wage income and business income. S-corporation entrepreneurs are inclined to declare only business income to avoid paying social security taxes. However, the Internal Revenue Service (IRS) requires S-corporations to pay a *reasonable compensation* to shareholders-employees who provide services to the corporations. This restriction inhibits practices to avoid social security taxes (Internal Revenue Service, 2022).

In contrast, C-corporations have incentives to declare wage incomes given the high levels of corporate and dividend taxes on business incomes. This practice of paying dividends concealed as wage income is also discouraged by the IRS (Kirkland, 2013).[2]

Facts about organizational forms. Sole proprietors are the most common form of organization for business owners. Using the sample of active business owners in the 2013 Survey of Consumer Finance (SCF), we find that 67% of the entrepreneurs are sole proprietors, 24% choose to run their business as S-corporations, and 9% choose the C-corporation

[2] As of 2013, the top marginal income tax in the US is 39.6%, while the social security tax is 12.5%. On the other hand, the corporate income tax is 35%, and the top dividend tax rate is 23.8%.

as their legal form of organization.

The predominance of pass-through businesses started after the Tax Reform Act of 1986 (TRA86). The reform reduced the top personal tax rate from 50% to 28%, which was lower than the corporate tax rate, and led to a significant increase in the number of pass-through entities. Dyrda and Pugsley (2019) show that the rise of pass-through firms in the years after the reform is primarily due to the reallocation of existing businesses from C-corporations to pass-through firms.[3] Furthermore, they empirically analyze the effects of the TRA86 reform on firms' employment through the choice of the legal form of organization and document that the reallocation of existing businesses from C-corporations to pass-through firms led to a decrease in their employment growth. Their finding is consistent with fewer investment possibilities for pass-through entities relative to C-corporations.

The top 1% income share grew from 10% in 1980 to 20% in 2012 (Cooper et al., 2016). Much of this growth is due to increased pass-through business incomes from high-income taxpayers, driven by the increased popularity of pass-through businesses. Cooper et al. (2016) show that 41% of the doubling of the income share of the top percentile is due to higher pass-through business income. Using a different decomposition technique, Dyrda and Pugsley (2019) show that the rise of pass-through firms accounts for 39% of the rise of the top 1% income share. As of 2014, Smith et al. (2019) find that 69% of the top 1% and more than 84% of the top 0.01% of the income distribution earn some pass-through business income. These facts highlight the critical role of the choice of legal form in driving the increasing top income share. Motivated by these facts, we incorporate the choice of the legal form of organization in an incomplete market model with entrepreneurs and use it to determine the optimal taxation policy at the very top of the income distribution.

3 The Model

We introduce entrepreneurial tax avoidance in a dynamic stochastic model with incomplete markets and occupational choice building on Cagetti and De Nardi (2006), Quadrini (2000), and Kitao (2008). Time is discrete and infinite. The economy consists of households, firms, and a government. One period in the model corresponds to one year. Each period, households receive a pair of idiosyncratic ability shocks that determine their productivity as workers and entrepreneurs, respectively. Given their working ability, their entrepreneurial talent, and their wealth, households decide whether to become entrepreneurs or workers. Entrepreneurs can avoid taxes in two ways. On the extensive margin, entrepreneurs can choose the legal form of their business organization to reduce their tax burden. On the intensive margin, they can shift their income between different tax bases.

[3]This trend continues decades after the reform. Smith et al. (2022) document that between 2000 and 2012, 183,000 firms switched from C-corporation to S-corporation.

3.1 Demographics, Preferences, and Occupations

Households go through two life stages, young and old. They age stochastically with probability ρ_R. Old households are retired, receive a pension, and die with probability ρ_D. Households that die are immediately replaced by newborn young households so that the fraction of young households is held constant at $\frac{\rho_D}{\rho_R+\rho_D}$.

Households derive utility $u(c,\ell)$ given consumption c and labor supply ℓ. We normalize the total time endowment to 1, so that $\ell \in [0,1]$. Households are heterogeneous in wealth a, working ability ε and entrepreneurial talent θ. ε and θ follow an exogenous stochastic process described by the Markov chain $\Gamma(\varepsilon', \theta' | \varepsilon, \theta)$.

Young households decide every period whether to be a worker (W) or to be an entrepreneur. Entrepreneurs choose from three legal forms of business organization: EP (sole proprietorship), ES (S-corporation), or EC (C-corporation). We refer to businesses of the former two legal forms (EP and ES) as pass-through businesses. The occupational and legal-form choice is denoted by $o \in \{W, EP, ES, EC\}$.

3.2 Technology

The economy consists of two production sectors: an entrepreneurial sector consisting of businesses (EP, ES, and EC) run by entrepreneurial households and a non-entrepreneurial sector consisting of a representative firm.[4]

Entrepreneurs with talent θ produce outputs according to a decreasing returns to scale technology,

$$f(\theta, k, n) = \theta(k^{\gamma} n^{1-\gamma})^{v}, \tag{1}$$

where $\gamma \in (0,1)$ is the share of capital in the production function and $v \in (0,1)$ is the span-of-control parameter. Entrepreneurs invest capital k and hire labor n (in efficiency units of labor supplied by workers). The operating profit is given by

$$f(\theta, k, n) - (r+\delta)\,k - wn,$$

where δ is the capital depreciation rate, r is the rental rate of capital, w is the wage paid for an efficiency unit of hired labor and the price of output is normalized to one.

In the non-entrepreneurial sector, firms operate competitively with a constant returns to scale technology as follows:

$$F(K^C, N^C) = \left(K^C\right)^{\alpha} \left(N^C\right)^{1-\alpha}, \tag{2}$$

where $0 < \alpha < 1$ is the capital share, while K^C and L^C are capital and labor inputs, respectively. The competitive nature of the sector ensures that input prices are determined by their marginal products.

[4]Empirically, entrepreneurial businesses correspond to those with less than \$10 million in receipts and whose owners are active managers. Non-entrepreneurial firms correspond to large public C-corporations without active owner-managers.

3.3 Credit Markets

Given the value of their assets a, households choose their future level of assets a' facing a borrowing-constraint, $a' \geq 0$.

Entrepreneurs can borrow from a single financial intermediary who behaves competitively and earns zero profit. Due to partial enforceability of credit contracts, entrepreneurs pledge their private assets as collateral and can borrow up to a fraction λ of their current wealth a to invest in capital: $k \leq \lambda a$, where λ depends on the legal form of business organization.

It is well documented that C-corporations have better chances of attracting external capital than pass-through businesses (Chen and Qi, 2016; Dyrda and Pugsley, 2019). We capture this stylized fact in a parsimonious way by assuming that the collateral requirement is lower for entrepreneurs who run their businesses as C-corporations, $\lambda^{EP} = \lambda^{ES} \leq \lambda^{EC}$.

3.4 The Government

The government finances public spending G via taxation on personal, corporate, and dividend incomes, and finances pension benefits B via social security taxation. The personal income tax liability after paying social security is given by $T^i(y)$ where y is declared personal income after deductibles. Following Heathcote et al. (2017), we consider the following tax schedule:

$$T^i(y) = \begin{cases} y - \lambda_i y^{1-\tau_i} & \text{if } y < y_h, \\ \tau_h (y - y_h) + y_h - \lambda_i y_h^{1-\tau_i} & \text{if } y \geq y_h. \end{cases} \tag{3}$$

The parameter τ_i specifies the degree of progressivity of the income tax schedule whereas the parameter λ_i determines the average income tax level. τ_h is the marginal tax rate for incomes exceeding y_h.

We consider a flat social security tax $T^s(y_l)$ that is proportional to wage income y_l:[5]

$$T^s(y_l) = \tau_s y_l.$$

The corporate income tax paid on business income is given by

$$T^c(y_c) = \tau_c y_c,$$

where y_c stands for declared business income.

[5]The social security tax in our model corresponds to employer and employee social security contributions and medicare tax. We ignore the social security cap for the following reasons. First, part of the social security tax is medicare tax (FICA), which does not have an income cap. Second, there is a medicare surcharge for high earners. Given these reasons, the social security cap likely has small economic impacts for our analysis, but it would create non-convexity in the budget set and complicates the numerical problem.

Corporate profits paid out as dividends are taxed proportionally as in Dyrda and Pugsley (2022).[6] We denote the taxes collected from dividends d as

$$T^d(d) = \tau_d d.$$

The government budget constraint reads as

$$G = \int \left[T^i\left(y(s)\right) + T^c(y_c(s)) + T^d(d(s))\right] d\mu(s), \tag{4}$$

$$B = \int T^s\left(y_l(s)\right) d\mu(s). \tag{5}$$

where μ is the invariant distribution over state variables $s = (a, \varepsilon, \theta, z)$. The variable z distinguishes workers, entrepreneurs (sole proprietors, S-corporations and C-corporations) and retirees, i.e. $z \in \{W, EP, ES, EC, R\}$. Eq. (4) specifies that total tax revenues from personal income tax, corporate tax, and dividend tax must equal government spending G, and Eq. (5) specifies that total tax revenues from social security tax must equal aggregate pension benefits B.

3.5 Decisions

The sequence of events and decisions in the economy is as follows. At the beginning of each period, young households receive idiosyncratic ability shocks. Given the level of assets a, working ability ε, and entrepreneurial talent θ, the young household makes her occupational and legal-form choice according to:

$$V\left(a, \varepsilon, \theta\right) = \max_{o \in \{W, EP, ES, EC\}} \left\{V^o\left(a, \varepsilon, \theta\right)\right\}, \tag{6}$$

where V^o is the value of choosing o.[7]

Worker. A worker chooses consumption c, labor supply ℓ, and savings a'. The worker's value function is defined as:

$$V^W\left(a, \varepsilon, \theta\right) = \max_{c, a', \ell} \left\{u(c, \ell) + \beta\left(1 - \rho_R\right) \mathbb{E}_{\varepsilon', \theta' | \varepsilon, \theta}\left[V\left(a', \varepsilon', \theta'\right)\right] + \beta \rho_R V^R\left(a'\right)\right\} \tag{7}$$

subject to

$$y^W = (1 - \tau_s) w \varepsilon \ell + ra, \tag{8}$$

$$c + a' = y^W + a - T^i\left(y^W\right), \tag{9}$$

$$a' \geq 0, \tag{10}$$

$$\ell \in [0, 1]. \tag{11}$$

[6] Here we abstract from the fact that in the US tax code the dividend tax is progressive with a cap at the top.

[7] For numerical stability, we introduce a small i.i.d. preference shock to the occupational choice when solving the model, see Appendix A.1.

$V^R(a')$ denotes the value of retirement and is defined later in the text. Eq. (8) defines the worker's personal income y^W consisting of wage income $w\varepsilon\ell$ net of social security taxes and income from renting out assets ra. Personal income y^W is subject to the personal income tax, which is reflected in the budget constraint Eq. (9). Eq. (10) states the worker's borrowing constraint.

Sole proprietor. Entrepreneurs choose consumption, savings, and the capital and labor inputs in production, k and n.[8] Sole sproprietorship is the simplest legal form of business organization and the sole proprietor's value function is given as:

$$V^{EP}(a,\varepsilon,\theta) = \max_{c,a',k,n} \left\{ u(c,0) + \beta(1-\rho_R)\mathbb{E}_{\varepsilon',\theta'|\varepsilon,\theta}\left[V(a',\varepsilon',\theta')\right] + \beta\rho_R V^R(a') \right\} \tag{12}$$

subject to

$$\begin{aligned}
\pi^{EP} &= f(\theta,k,n) - (r+\delta)k - wn, && (13)\\
y^{EP} &= (1-\tau_s)\pi^{EP} + ra, && (14)\\
c + a' &= y^{EP} - T^i\left(y^{EP}\right) + a, && (15)\\
k &\le \lambda^{EP} a,\ a' \ge 0, && (16)\\
n &\ge 0.
\end{aligned}$$

Eq. (13) defines business profits as the difference between revenue and input costs. Business profits are passed through to the sole proprietor and are taxed at the social security tax (Eq. (14)). Personal income y^{EP} is subject to the income tax as reflected in Eq. (15). Eq. (16) states the credit and borrowing constraints.

S-corporation. Owners of S-corporations have the option to report their business proceeds as either wage or business income. Compared to sole proprietors, they also face operating costs κ^{ES}. Their value function is the following:

$$V^{ES}(a,\varepsilon,\theta) = \max_{c,a',k,n,\phi^{ES}} \left\{ u(c,0) + \beta(1-\rho_R)\mathbb{E}_{\varepsilon',\theta'|\varepsilon,\theta}\left[V(a',\varepsilon',\theta')\right] + \beta\rho_R V^R(a') \right\} \tag{17}$$

subject to

$$\begin{aligned}
w^{ES} &= \phi^{ES}\left[f(\theta,k,n) - (r+\delta)k - wn\right], && (18)\\
\pi^{ES} &= \left(1-\phi^{ES}\right)\left[f(\theta,k,n) - (r+\delta)k - wn\right], && (19)\\
y^{ES} &= \pi^{ES} + (1-\tau_s)w^{ES} + ra, && (20)\\
c + a' &= y^{ES} - C\left(1-\phi^{ES}\right) - \kappa^{ES} - T^i\left(y^{ES} - C\left(1-\phi^{ES}\right) - \kappa^{ES}\right) + a, && (21)\\
k &\le \lambda^{ES} a,\ a' \ge 0, && (22)\\
n &\ge 0,\ 0 \le \phi^{ES} \le 1.
\end{aligned}$$

[8] We assume that entrepreneurs manage their business using entrepreneurial talent θ, but they do not supply their own labor as a production input (i.e. $\ell = 0$).

The S-corporation generates gross business proceeds of $f(\theta, k, n) - (r + \delta) k - wn$ and can report a fraction ϕ^{ES} of it as wage income w^{ES} and the remaining part $\left(1 - \phi^{ES}\right)$ as business income π^{ES}. Eq. (20) derives the entrepreneur's taxable income consisting of business income, wage income, and income from renting out assets. Importantly, only wage income is subject to social security taxation. Therefore, the entrepreneur has incentives to report all business proceeds as business income to avoid the social security tax. However, misreporting generates an increasing and convex cost of tax avoidance $C^{ES}\left(1 - \phi^{ES}\right)$.[9] In addition, running the business as S-corporation generates operating costs κ^{ES}. Both of these costs are reflected in the budget set (21). Since a S-corporation is a pass-through business, the entrepreneur's income y^{ES} is subject to the personal income tax. We assume that the operating costs and the costs of tax avoidance are tax-deductible as business expenses.

C-corporation. C-corporations are taxed at the entity level and face double taxation. The maximization problem of an entrepreneur running a C-corporation is given as:

$$V^{EC}(a, \varepsilon, \theta) = \max_{c, a', k, n, \phi^{EC}} \left\{ u(c, 0) + \beta (1 - \rho_R) \mathbb{E}_{\varepsilon', \theta' | \varepsilon, \theta} \left[V(a', \varepsilon', \theta') \right] + \beta \rho_R V^R(a') \right\} \tag{23}$$

subject to

$$\begin{aligned}
w^{EC} &= \phi^{EC} \left[f(\theta, k, n) - (r + \delta) k - wn \right], && (24)\\
\pi^{EC} &= \left(1 - \phi^{EC}\right) \left[f(\theta, k, n) - (r + \delta) k - wn \right], && (25)\\
y^{EC} &= (1 - \tau_c) \pi^{EC} + (1 - \tau_s) w^{EC} + ra, && (26)\\
c + a' &= y^{EC} - \tau_d (1 - \tau_c) \pi^{EC} - C^{EC}\left(\phi^{EC}\right) - \kappa^{EC} \\
&\quad - T^i\left((1 - \tau_s) w^{EC} + ra - C^{EC}\left(\phi^{EC}\right) - \kappa^{EC}\right) + a, && (27)\\
k &\leq \lambda^{EC} a, \ a' \geq 0, && (28)\\
n &\geq 0, \ 0 \leq \phi^{EC} \leq 1.
\end{aligned}$$

The owner of a C-corporation reports a fraction ϕ^{EC} of gross business proceeds $f(\theta, k, n) - (r + \delta) k - wn$ as wage income w^{EC}. The remaining fraction $1 - \phi^{EC}$ is declared as business income π^{EC}. Eq. (26) highlights that wage income is subject to social security taxation while business income is taxed at the corporate tax rate τ_c. Double-taxation occurs because net business income is distributed as dividends to the business owner and then taxed again at the dividend tax rate τ_d (Eq. (27)).[10]

To avoid double taxation, owners of C-corporations may want to declare a large fraction of income as wage income. However, similarly to S-corporations, there is an increasing and convex cost of tax avoidance $C^{EC}\left(\phi^{EC}\right)$. In addition, running the business as a C-corporation generates operating costs κ^{EC}. Eq. (27) describes the resulting budget set of

[9]The cost of tax avoidance reflects the IRS requirement for reasonable compensation of owners-employees (Internal Revenue Service, 2022).

[10]We assume that C-corporations do not retain earnings.

the owner of a C-corporation. As for S-corporations, operating costs and tax avoidance costs are tax-deductible. Eq. (28) summarizes the credit constraints.

Retiree. The problem of a retiree amounts to choosing consumption c and savings a' according to the following maximization problem:

$$V^R(a) = \max_{c,a'} \left\{ u(c,0) + \beta(1-\rho_D) V^R(a') + \beta\rho_D \mathbb{E}_{\varepsilon',\theta'}\left[V(a',\varepsilon',\theta')\right] \right\} \tag{29}$$

subject to

$$c + a' = b\bar{y}_l + (1+r)a - T^i(b\bar{y}_l + ra), \tag{30}$$

$$a' \geq 0. \tag{31}$$

The pension income of the retiree is a fraction b of the average wage income of young households $\bar{y}_l$. Incomes from pension and renting out assets are subject to the personal income tax (Eq. (30)). The expectation operator $\mathbb{E}_{\varepsilon',\theta'}$ signifies the expectation over the value function $V(a',\varepsilon',\theta')$ in terms of productivity shocks ε' and θ' drawn from the stationary distribution of the process $\Gamma(\varepsilon',\theta'|\varepsilon,\theta)$ when the retiree is reborn as young.

3.6 Equilibrium

Let $s \equiv (a,\varepsilon,\theta,z)$ with $z \in \{W, EP, ES, EC, R\}$. A stationary equilibrium is a list of prices $\{r, w\}$, the social security tax τ_s, policy functions $\{c(s), a'(s), \ell(s), k(s), n(s), o(s), \phi(s)\}$, and an invariant distribution over the states, $\mu(s)$, such that

(i) The policy functions $\{c(s), a'(s), \ell(s), k(s), n(s), o(s), \phi(s)\}$ solve the household maximization problem described in Section (3.5).

(ii) Capital and labor markets clear:

$$K_C + \int \mathcal{I}_E(s) k(s) d\mu(s) = \int a d\mu(s),$$

$$N_C + \int \mathcal{I}_E(s) n(s) d\mu(s) = \int \mathcal{I}_W(s) \ell(s) \varepsilon d\mu(s).$$

where $\mathcal{I}_E(s) = 1$ if $z \in \{EP, ES, EC\}$, and $\mathcal{I}_W(s) = 1$ if $z = W$.

(iii) Competitive factor pricing holds:

$$r = \alpha \left(\frac{K_C}{N_C}\right)^{\alpha-1} - \delta, \tag{32}$$

$$w = (1-\alpha)\left(\frac{K_C}{N_C}\right)^{\alpha}. \tag{33}$$

(iv) The government budgets Eq. (4) and (5) are satisfied. Total pension benefits in Eq. (5) can be computed as

$$B = b\bar{y}_l \int \mathcal{I}_R(s)\, d\mu(s),$$

with $\mathcal{I}_R(s) = 1$ if the agent is retired and $\bar{y}_l$ is the average wage income of young households.

(v) The invariant distribution satisfies the fixed point equation

$$\mu = \mathcal{H}(\mu),$$

where $\mathcal{H}$ is a one-period-ahead transition operator such that $\mu' = \mathcal{H}(\mu)$.

4 Calibration and Model Fit

We calibrate our model to replicate important empirical features of the US economy, including *(i)* the share of entrepreneurs and the distribution of legal form of organization in the entire population and at the top of the income and wealth distributions, *(ii)* shares of entrepreneurial income declared as wage income, and *(iii)* share of wealth held by entrepreneurs, and *(iv)* inequality among entrepreneurs. In the remainder of this section, we describe our calibration strategy and results.

4.1 Data

Our main data source is the Survey of Consumer Finance in 2013 (SCF). We restrict our sample to households headed by males age 25 to 64 and define entrepreneurs as active business owners (ABO). We consider three categories of business organizations: (1) Sole proprietors EP, which include both sole-proprietors and partnerships, (2) S-corporations ES, and (3) C-corporations EC, which include C-corporations and other corporations. The SCF data contains rich information on incomes and wealth of workers and entrepreneurs. Our income variable includes wages, self-employment and business income, interest, dividends, realized capital gains, pension, and government transfers.

Since we do not observe tax declarations of entrepreneurs, we have no microeconomic information on the fraction of income that entrepreneurs report as wage income. As a proxy for the wage share ϕ, we use aggregate data from IRS tax return tables in 2013 and calculate the ratio between the compensation of officers to net income.

Our calibration strategy requires information on occupational transitions, for which we use the Panel Study of Income and Dynamics (PSID). We use the Kauffman Firm Survey (KFS), a panel data that follows a cohort of US startups from 2004 to 2011, to construct employment shares of businesses in each employment quartile.

4.2 Calibration Strategy

We first calibrate some parameters externally based on the literature or the US tax code, including those governing demographic transitions, working ability, preferences, corporate production, and taxation. These externally calibrated parameters are summarized in Table 1. The remaining parameters are jointly calibrated by minimizing the distance between a set of data- and model-generated moments. These internally calibrated parameters and their values are shown in Table 2.

Table 1: Externally Calibrated Parameters

Parameter	Description	Value	Source
Demographics			
ρ_R	Prob. of retiring	0.022	Brüggemann (2021)
ρ_D	Prob. of dying	0.089	Brüggemann (2021)
Working ability			
ρ_ε	Persistence	0.94	Kitao (2008)
σ_ε	Standard deviation	0.02	Kitao (2008)
Preferences			
σ_1	Risk aversion	1.50	Standard value
σ_2	Inverse of Frisch elasticity	1.70	Frisch elasticity = 0.6
Production			
α	Capital share (corporate)	0.33	Standard value
δ	Capital depreciation	0.06	Standard value
Taxation			
b	Replacement rate, pensions	0.400	OECD (2013)
τ_c	Corporate tax rate	0.350	US Tax code (2013)
τ_d	Dividend tax rate	0.238	US Tax code (2013)
τ_h	Top marginal tax rate	0.396	US Tax code (2013)

Demographics and endowments. We set the probability of retiring at $\rho_R = 0.022$ and the probability of dying in retirement at $\rho_D = 0.089$ following Brüggemann (2021). The stochastic process governing the evolution of working ability ε is modeled as a first-order linear autoregressive process:

$$\log(\varepsilon_{t+1}) = \rho_\varepsilon \log(\varepsilon_t) + \eta_{\varepsilon,t+1},$$

where $\eta_{\varepsilon,t+1} \sim N(0, \sigma_\varepsilon^2)$ is an i.i.d. innovation term. We take the values for the persistence parameter $\rho_\varepsilon = 0.94$ and the standard deviation of the innovation $\sigma_\varepsilon = 0.02$ from Kitao (2008).

The entrepreneurial talent θ is modeled as an AR1 process:

$$\log(\theta_{t+1}) = \mu_\theta + \rho_\theta \log(\theta_t) + \nu_{\theta,t+1},$$

Table 2: Internally Calibrated Parameters

Parameter	**Description**	**Value**	**Calibration Target**
Preferences			
β	Discount factor	0.92	Interest rate
χ	Disutility from working	28.0	Average hours worked
Production			
ν	Span of control	0.89	Employment share by firm size quartiles
γ	Capital share, entre. sector	0.48	K/Y ratio
Entrepreneurial ability			
μ_θ	Unconditional mean	-0.055	Share of entrepreneurs in population
ρ_θ	Persistence	0.80	Exit rate from entrepreneurship
σ_θ	Dispersion	0.27	Gini income among entrepreneurs
Financial Frictions			
$\lambda^{EP}, \lambda^{ES}$	Collateral constraint (Pass-through)	1.50	Wealth share of pass-throughs
λ^{EC}	Collateral constraint (C-corp.)	2.09	Wealth share of all entrepreneurs
Tax avoidance and corp. costs			
κ^{ES}	Operating cost for S-corp.	0.016	Share of S-corp.
κ^{EC}	Operating cost for C-corp.	0.016	Share of C-corp.
ψ^{ES}	Intercept of $C(\cdot)$ S-corp.	0.14	Share of income declared as wage, S-corp.
ψ^{EC}	Intercept of $C(\cdot)$ C-corp.	4.80	Share of income declared as wage, C-corp.
Superstar shock			
ϵ^*	Value of the shock	14.20	Gini income in population
p_{ϵ^*}	Probability of becoming a superstar	0.65%	Share of entrepreneurs at top 1% income distribution
$\bar{p}_{\epsilon^*}$	Probability of dropping back	19.0%	Share of entrepreneurs at top 1% wealth distribution
Taxation			
λ_i	Income tax, level	0.81	Tax revenue to GDP
τ_i	Income tax, progressivity	0.13	Share in the top income tax bracket

where $\nu_{\theta,t+1} \sim N(0, \sigma_\theta^2)$ is the innovation term. The long-run unconditional mean μ_θ is pinned down by matching the share of entrepreneurs in the data. The persistence parameter ρ_θ and the dispersion parameter σ_θ are calibrated internally to match the exit rate of entrepreneurs and the Gini coefficient of entrepreneurial income, respectively.

Since we study the aggregate and distributional consequences of taxing high income earners, it is important to match the occupational distribution at the top of the income distribution. Although we focus on entrepreneurial responses to tax changes, we also need to match the empirical observation that many top earners are workers. To generate high-income workers in our model, we assume a superstar shock on worker ability following Brüggemann (2021) and Kindermann and Krueger (2022). Specifically, with probability p_{ϵ^*} an ordinary worker becomes a superstar and her ability becomes ϵ^*, which is significantly higher than the mean ability among ordinary workers. With probability $\bar{p}_{\epsilon^*}$ a superstar worker drops back to a random ordinary state. We calibrate the parameters ϵ^*, p_{ϵ^*}, and $\bar{p}_{\epsilon^*}$ to match the Gini coefficient of income and the share of entrepreneurs at the top 1% of the income and wealth distributions.

Preferences. The utility function is of CRRA type and additively separable in consumption and labor:

$$u(c, \ell) = \frac{c^{1-\sigma_1}}{1-\sigma_1} - \chi \frac{\ell^{1+\sigma_2}}{1+\sigma_2}$$

The coefficient of relative risk aversion σ_1 is set to 1.5 which is standard in the macroeconomic literature. The parameter σ_2 is set to 1.7, which corresponds to a Frisch elasticity of 0.6. The weight of the disutility of labor χ is calibrated internally to match the average hours of work which is a 1/3 of total time endowment. The discount factor β pins down the interest rate in the economy.

Technology. The economy has two production sectors. The large corporate sector operates with a Cobb-Douglas production function given in Eq. (2). The parameter α represents the corporate capital share and is set to 0.33 and the capital depreciation δ is 6% which is standard in the macroeconomic literature (Stokey and Rebelo, 1995).

The entrepreneurial sector uses a decreasing returns to scale technology specified in Eq. (1). The share of capital γ is calibrated to match the capital to output (K/Y) ratio. The span of control parameter ν influences the optimal size and profitability of entrepreneurial businesses. A smaller ν implies stronger decreasing returns to scale and less dispersion in the distribution of the business size. We discipline ν by targeting the employment shares across the quartiles of the business size distribution.

The collateral constraint $k \leq \lambda a$ faced by entrepreneurs captures the financial frictions in obtaining debt and raising external equity. We calibrate λ^{EP}, λ^{ES}, λ^{EC} internally. Both sole-proprietors and S-corporations are pass-through businesses and face similar financial constraints. Thus, we assume that $\lambda^{EP} = \lambda^{ES}$. To identify the collateral parameters, we match the C-corporation share of entrepreneurial wealth and the entrepreneurial share of total wealth. The intuition behind this calibration strategy is that a tighter collateral constraint increases the accumulation of wealth by entrepreneurs. The recovered value for pass-through businesses is 1.5, in line with the literature Kitao (2008) and Brüggemann (2021). The value for C-corporations is 2.09; the higher value reflects their better access to credit as documented in the literature.

Tax avoidance and operating costs. We assume that the tax avoidance cost is a quadratic cost of the avoided share of income. The avoidance cost for S-corporations increases in the share of income reported as business profits $C^{ES}(1-\phi) = \psi^{ES}(1-\phi)^2$ whereas the avoidance cost for C-corporations increases in the share of income reported as wages $C^{EC}(\phi) = \psi^{EC}\phi^2$. The parameters ψ^{ES} and ψ^{EC} govern the income declaration of S- and C-corporation owners and, thus, are calibrated internally to match the share of income reported as wage income within S- and C-corporations.

Additionally, we assume that operating an S-corporation or C-corporation leads to additional administrative costs κ^{ES} and κ^{EC}. These costs affect the share of sole-proprietors, S-corporations and C-corporations among entrepreneurs, which we use as internal calibration targets.

Tax schedule. The income tax function is given by Eq. (3). The tax function is non-linear up to some income threshold y_h, and is linear with slope τ_h for incomes greater than y_h. We calibrate the parameter τ_h to the statutory marginal tax rate for the top income bracket, which is equal to 0.396 in 2013.[11] The parameter governing the level of the income tax λ_i is internally calibrated to match the total tax revenue to GDP ratio. The progressivity parameter τ_i is internally calibrated to match the fraction of tax returns reaching the top income bracket and the calibrated value is 0.125.[12]

To determine y_h, we use the following condition that guarantees continuity in the marginal income tax rate (see Ge (2020)):

$$\tau_h = 1 - \lambda_i \left(1 - \tau_i\right) y_h^{-\tau_i}.$$

The corporate tax rate τ_c is set to the 2013 level of 35%. The dividend tax rate τ_d is set to 23.8%, which is the top tax rate on qualified dividends.[13]

The social security tax rate τ_s is an equilibrium object that balances the government's

[11] Since we model tax avoidance explicitly, it is important that τ_h represents statutory top marginal rate.

[12] Our calibrated progressivity of 0.125 falls within the broad range found in the literature. For example, Bakış et al. (2015) find the progressivity to be 0.17 and Guner et al. (2014) find it to be 0.053.

[13] According to the US tax code, dividends are considered part of personal income, but since 2003 qualified dividends are taxed at the preferential tax rate of capital gains. The maximum tax rate for qualified dividends is 20%. There is an additional 3.8% for households with gross income above $200,000.

pension budget. The pension benefit replacement rate b is set to 40% which corresponds to the average replacement rate in the US in 2013 (OECD, 2013).

4.3 Model Fit

Table 3 shows the values of the targeted moments revealing that our model is successful in replicating important empirical dimensions of the US economy in 2013. The share of entrepreneurs in the working population as well as the share of entrepreneurs by each type of legal form are matched very well. Importantly, our model generates shares of income reported as wage income for S- and C-corporations that closely replicate their data counterparts.

Since this paper focuses on the interaction of occupational choice, income shifting, and inequality, it is important that the model generates the observed distributional characteristics within and across occupations. Our model performs well in this regard. Specifically, the model closely matches targeted inequality moments including the Gini coefficient of income in the entire population and among entrepreneurs, the share of wealth owned by entrepreneurs and by entrepreneurial C-corporations, and the occupational choice at the top of the income and wealth distribution.

As a validation, we show that our model replicates moments of the US economy that are not targeted in our calibration procedure (Table 4). In addition to the Gini coefficient of income, our model also matches the observed Gini coefficient of wealth and the income and wealth shares over the entire distribution. Our model generates total tax revenue and tax revenue for each source in line with the data.

Figure 1 shows the equilibrium distribution of the occupational choice by quintiles of income and wealth. The model predicts that the share of entrepreneurs is increasing in income and wealth, which is in line with the data. Overall, the model provides a good match of the occupational choice across income quintiles, in spite of overestimating the share of entrepreneurs in the fifth quintile. A similar pattern appears across quintiles of wealth. Here the model underestimates the share of entrepreneurs in the the lower quintiles.

In Figure 2 we focus on the top quintile of income and wealth and report sole proprietors, S-corporations, and C-corporations as shares of entrepreneurs. The empirical choice of the legal form of business organization is very well matched.

Table 3: Targeted Moments

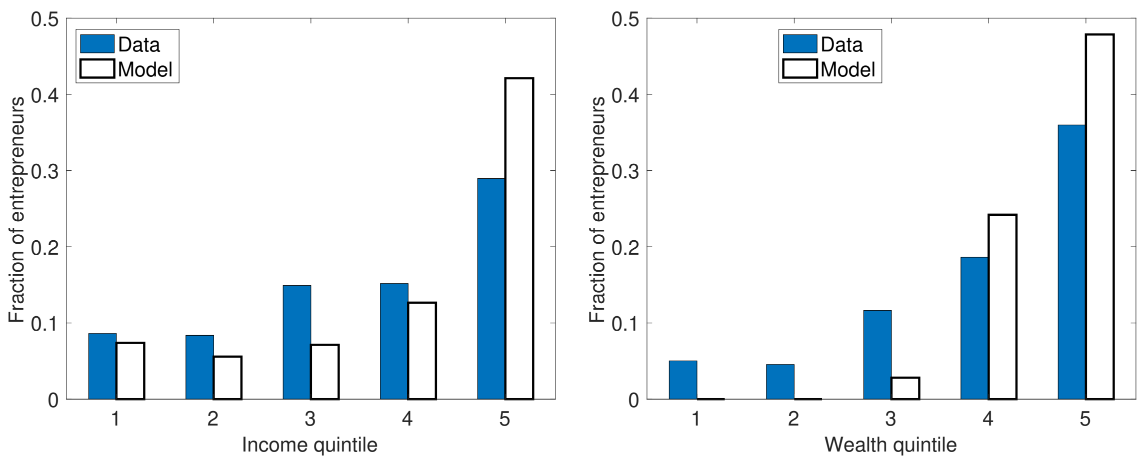
	Data	Model Benchmark	Data Source
Aggregates			
Interest rate	0.019	0.020	FRED (1990-2020)
Average hours worked	0.330	0.330	SCF (2013)
K/Y ratio	2.65	2.73	Brüggemann (2021)
Exit rate from entrepreneurship	0.246	0.239	PSID
Tax-to-GDP (excl. soc. security)	0.170	0.171	CBO
Share of taxpayers in the top income bracket	0.029	0.028	IRS
Occupation and LFO distribution			
Share of entrepreneurs	0.152	0.150	SCF (2013)
Share of sole-prop.	0.674	0.673	SCF (2013)
Share of S-corp.	0.236	0.243	SCF (2013)
Share of C-corp.	0.090	0.084	SCF (2013)
Share of entrepreneurial income declared as wage			
S-corp.	0.363	0.361	IRS (2013)
C-corp.	0.199	0.200	IRS (2013)
Employment share by business size quartiles			
Q1 (smallest)	0.000	0.036	KFS
Q2	0.054	0.081	
Q3	0.162	0.163	
Q4 (largest)	0.805	0.720	
Inequality			
Gini income	0.544	0.547	SCF (2013)
Gini income, entrepreneurs	0.622	0.640	SCF (2013)
Share of entre. in top 1% income	0.668	0.663	SCF (2013)
Share of entre. in top 1% wealth	0.827	0.858	SCF (2013)
Wealth share entre.	0.536	0.536	SCF (2013)
Wealth share C-Corp. (cond. on entre.)	0.199	0.229	SCF (2013)

Table 4: Untargeted Moments

	Data	**Model Benchmark**
Inequality		
Gini wealth	0.842	0.827
Average income ratio: entre. to worker	2.601	2.990
Median income rate: entre. to worker	1.557	1.866
Income shares		
Top 1%	0.191	0.168
Top 10%	0.449	0.531
Top 20%	0.587	0.626
Bottom 40%	0.111	0.140
Wealth shares		
Top 1%	0.335	0.195
Top 10%	0.736	0.682
Top 20%	0.862	0.881
Bottom 40%	0.001	0.000
Tax revenues		
Total tax revenue (incl. social security) to GDP	0.240	0.228
Income tax share of revenue	0.474	0.509
Social security tax share of revenue	0.342	0.251

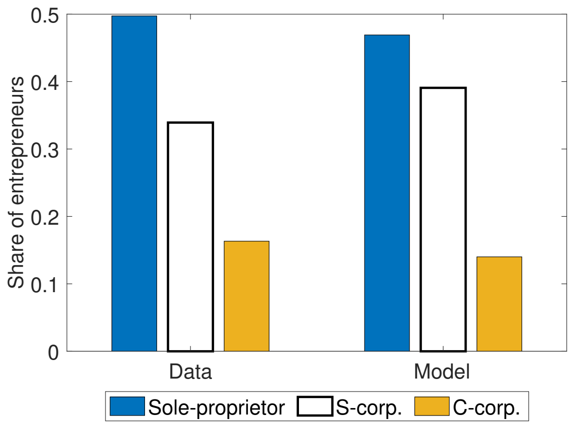
Notes: Moments excluding tax revenues are based on SCF (2013). Tax revenue shares are computed based on CBO 2013 fiscal report.

Figure 1: Occupation by Income and Wealth

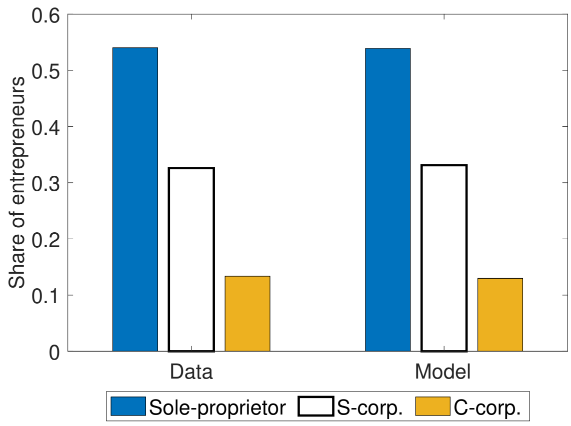


Notes: Shares of entrepreneurs are based on SCF (2013). Model outcomes are based on the benchmark calibration.

Figure 2: Legal Forms of Organization at the Top Quintile



(a) Top income quintile



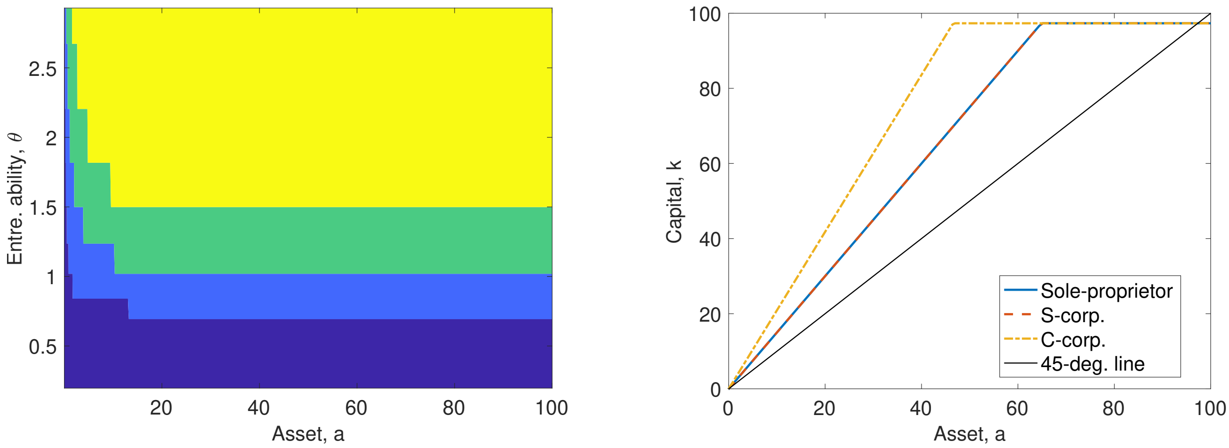
(b) Top wealth quintile

Notes: Sole proprietors, S-corporations, and C-corporations as shares of entrepreneurs are based on SCF (2013). Model outcomes are based on the benchmark calibration.

5 Results

5.1 Entrepreneurial Decisions and Tax Avoidance

Figure 3: Occupation, Legal Form of Organization, and Capital



(a) Occupation and legal form choice

(b) Capital choice

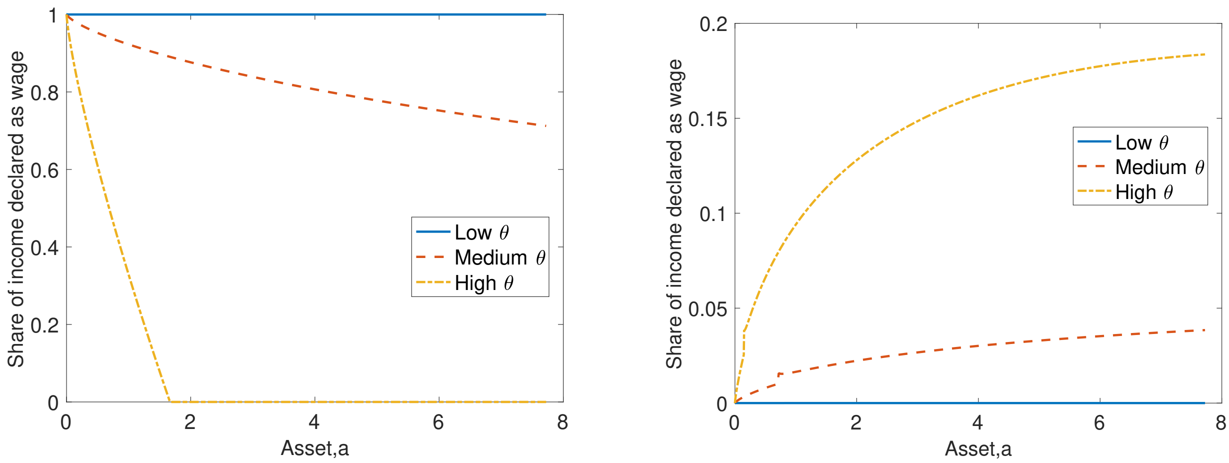
Notes: This figure displays the policy functions for occupational choice and capital. In panel (b): Dark blue = worker, light blue = sole-proprietor, green = S-corporation, yellow = C-corporation. Working ability ε is fixed at its average value. The capital choice is shown for average working ability ε and average entrepreneurial ability θ.

In this section, we analyze the economic mechanisms of tax avoidance and start with a discussion of the policy functions displayed in Figure 3. Households' occupational and legal-form choice depends on entrepreneurial talent θ and wealth a (given the average working ability ε). For a given level of entrepreneurial talent, households become entrepreneurs only if they hold sufficient wealth. Talented but wealth-poor agents choose to be workers because they are credit-constrained and cannot generate sufficient income from running a business.

Next, we turn to the choice of the legal form of organization as the extensive margin of tax avoidance. Among entrepreneurs, only the very talented and wealthy households choose to run their businesses as C-corporations despite higher operating costs and double taxation. There are two explanations for this entrepreneurial decision. First, talented entrepreneurs benefit from the relaxed credit constraint of C-corporations, which allows them to invest more (Panel (b) of Figure 3). Second, if entrepreneurs are very wealthy, their credit constraint is no longer binding, but they take advantage of the capped dividend tax, which is lower than the top marginal income tax rate they face. Less talented entrepreneurs operate their businesses as S-corporations because they can circumvent double taxation and report a fraction of their income as business income to avoid the social security tax. The least talented entrepreneurs are sole proprietors as they cannot afford to pay the operating costs associated with running a S-corporation.

Figure 4 shows how S-corporations and C-corporations use the intensive margin of tax avoidance. The left panel considers the entrepreneurial choice of S-corporations. It depicts the share of total income declared as wage income as a function of wealth for three different realizations of entrepreneurial ability θ. Owners of S-corporations have an incentive to report their income as business income to avoid the social security tax. However, shifting income between tax bases is costly. Consequently, less talented and less wealthy owners of S-corporations report a larger share of their income as labor income. In contrast, wealthy and talented owners of S-corporations declare all of their income as business income. The right panel of Figure 4 shows how owners of C-corporations shift their income. C-corporations have incentives to declare their income as labor income to avoid double taxation. But because income shifting is costly, the talented and wealthier owners of C-corporations declare large shares as labor income. Since poor owners of C-corporations cannot afford the tax avoidance cost, they report a negligible share of their income as labor income.

Figure 4: Income Shifting



(a) S-corporation

(b) C-corporation

Notes: This figure displays the policy functions for the share of gross business proceeds declared as wage income. Working ability ε is fixed at its average value.

5.2 The Impact of Tax Avoidance on Macroeconomic Outcomes and Welfare

To highlight the macroeconomic effects of tax avoidance, we consider a tax reform that removes all channels of tax avoidance such that workers and entrepreneurs face equal tax treatment. Specifically, we eliminate the intensive and the extensive margin of tax avoidance and assume that all entrepreneurs are taxed as sole proprietors. The resulting counterfactual economy corresponds to an extended version of the one studied by Brüggemann (2021), who considers sole proprietors only. However, in our model, despite higher operating costs, entrepreneurs can still choose to run their businesses as C-corporations to benefit from better access to credit.

The change in the policy regime is assumed to take place in period $t = 0$, and all model parameters remain at their values in the benchmark economy. The social security tax τ_s adjusts such that social security contributions equal total pension expenses. Moreover, in the counterfactual economy, the additional tax revenues are redistributed to all households via lump-sum transfers.[14] Figures 5 and 6 show the transition towards the steady state of the counterfactual economy.

Since the tax reform removes all channels of tax avoidance, the government collects more tax revenues and social security contributions. Consequently, the lump-sum transfer increases and the social security tax falls along the transition. In principle, tax avoidance affects productive efficiency in two opposing ways. First, the intensive margin of tax avoidance increases productive efficiency because entrepreneurs can relax their financial constraints by minimizing their tax liabilities, facilitating larger investments. Second, the extensive margin of tax avoidance reduces productive efficiency because the possibility to avoid taxes induces entrepreneurs to switch their legal form of organization from C-corporation to S-corporation, despite facing a tighter borrowing limit with adverse effects on capital investment. In the benchmark economy, only 8.4% of all entrepreneurs run their businesses as C-corporations. Removing all channels of tax avoidance raises the share of C-corporations to 89.7%, and the share of entrepreneurs in the population increases from 15.0% to 17.2%. Moreover, on average, entrepreneurs invest more. Therefore, quantitatively, the negative effect of tax avoidance strongly dominates.[15] Overall, the elimination of tax avoidance raises average income and savings in the economy such that aggregate capital and output strongly increase. Consequently, the wage rises while the interest rate falls as they are determined by their marginal products.

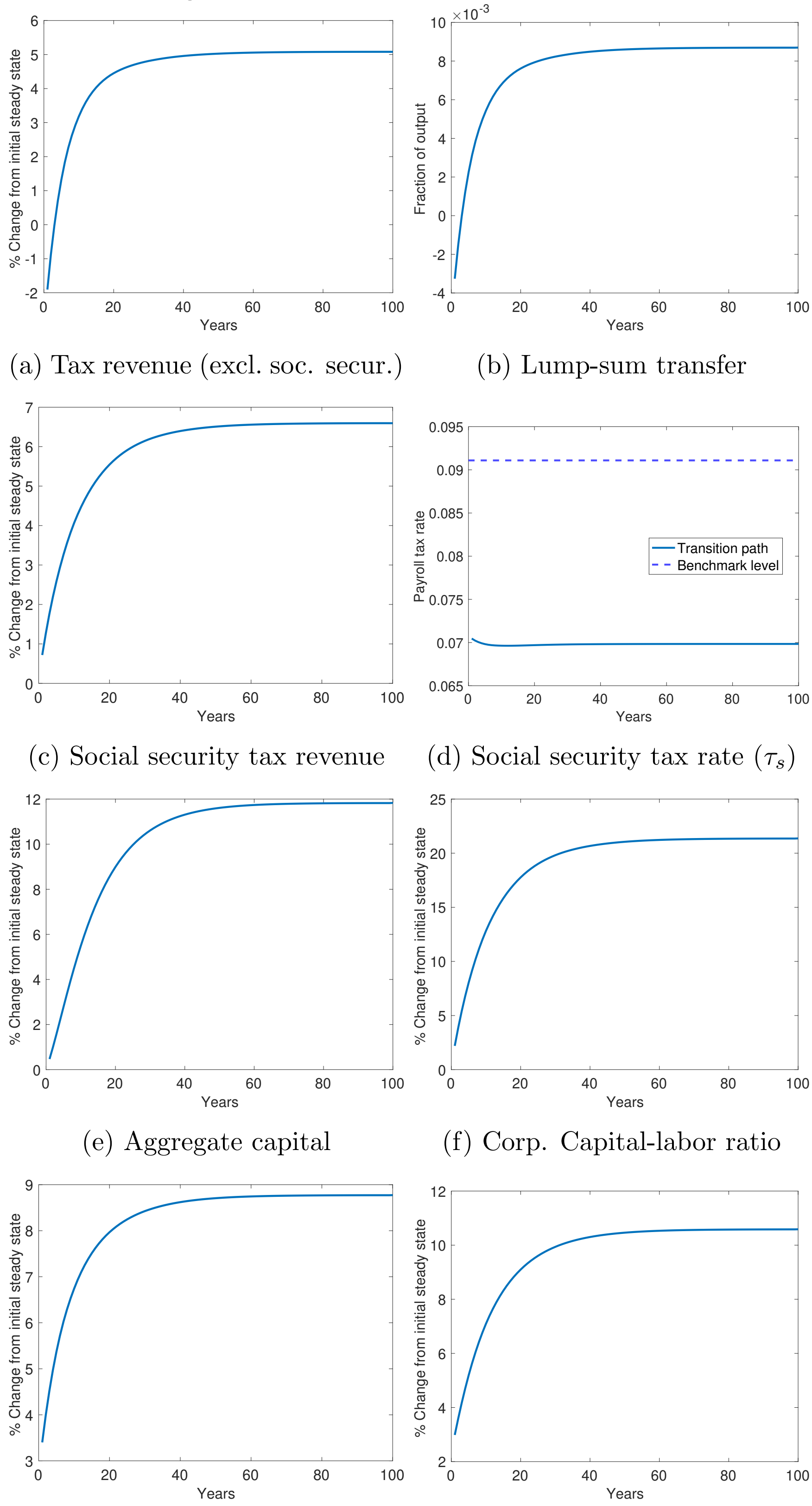
We use consumption equivalent variations (CEV) to measure the welfare effects of implementing such a tax reform compared to the benchmark economy.[16] Our analysis includes the long-run and short-run welfare effects along the transition to the new steady state. In the aggregate, removing tax avoidance leads to a sizable welfare gain of 6.24% in terms of CEV, but there is considerable heterogeneity in the population. Panel (a) of Figure 7 shows the welfare gains by occupation and legal form of organization. Panel (b) plots the welfare gains across deciles of the wealth distribution. Workers benefit from the tax reform due to the higher wage and the lower social security tax. Moreover, they

[14] See further details in Appendix B.2.

[15] In an additional exercise, we remove only the intensive margin of tax avoidance but keep the extensive margin. It turns out that the positive impact of income shifting on productive efficiency is quantitatively small.

[16] Further details of the welfare calculations are given in Appendix A.2.

Figure 5: Tax Reform, Transition Paths



(a) Tax revenue (excl. soc. secur.)

(b) Lump-sum transfer

(c) Social security tax revenue

(d) Social security tax rate (τ_s)

(e) Aggregate capital

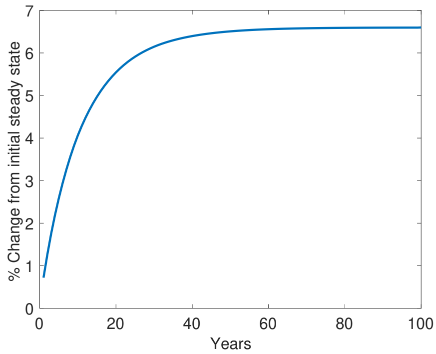
(f) Corp. Capital-labor ratio

(g) Aggregate output

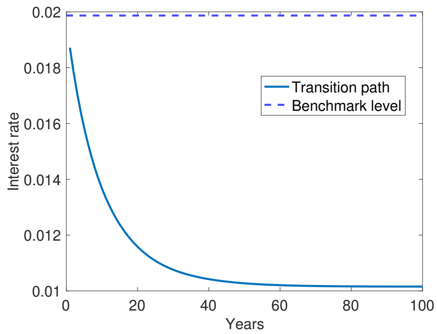
(h) Aggregate consumption

Notes for Figure 5 and 6: These figures show the transitional dynamics assuming that at time $t = 0$ a tax reform is implemented that removes the intensive and extensive margin of tax avoidance. All parameters are kept at the benchmark calibration and additional tax revenues are redistributed as lump-sum transfers to all households.

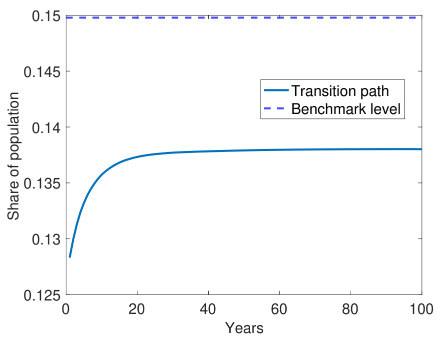
Figure 6: Tax Reform, Transition Paths



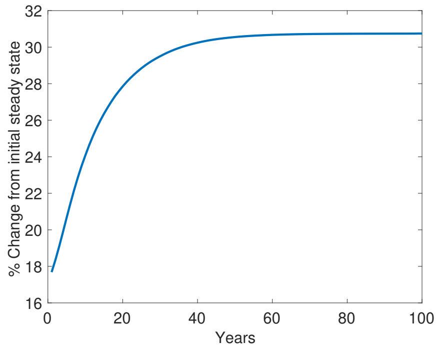
(a) Wage



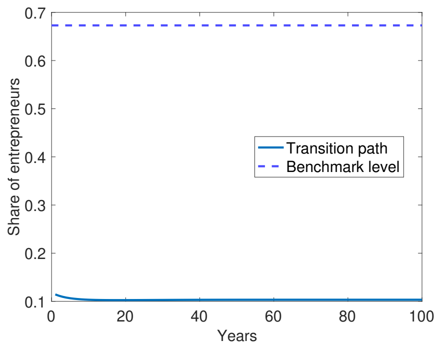
(b) Interest rate



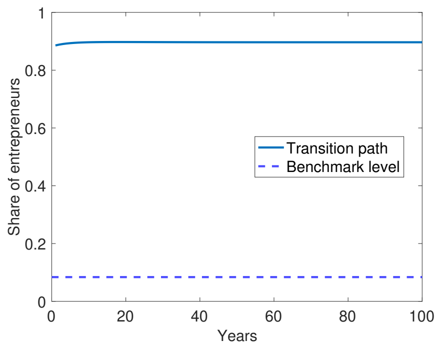
(c) Share of entrepreneurs



(d) Capital per entrepreneur



(e) Share of sole proprietors

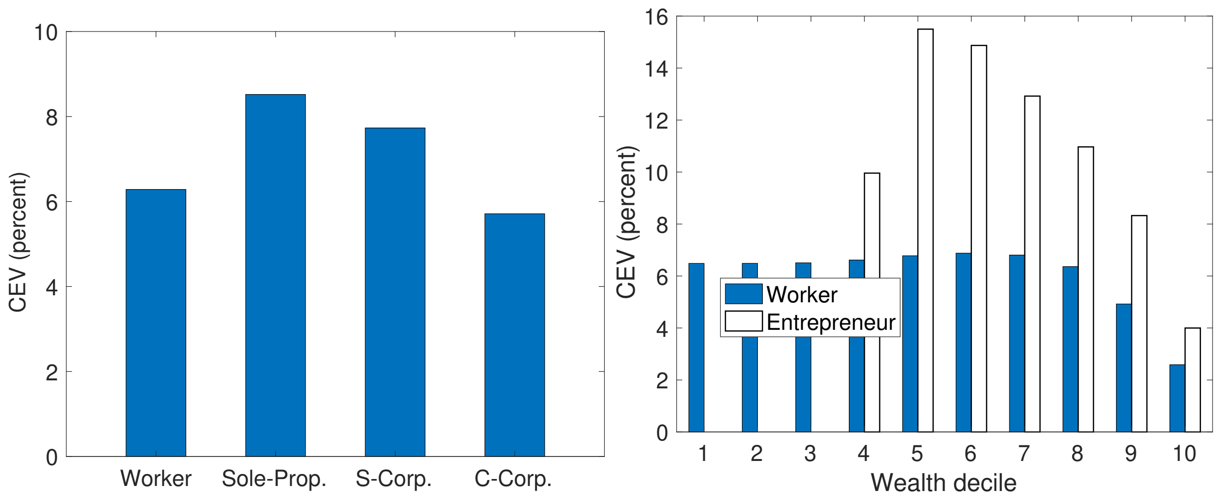


(f) Share of C-corporations

See notes under Figure 5.

receive lump-sum transfers, which are less important for wealthier workers. The tax reform generates positive welfare gains for all entrepreneurs, but the size decreases from the fifth decile of wealth. Those entrepreneurs who chose to be sole proprietors in the benchmark economy exhibit welfare gains. Sole proprietors have not been able to evade taxes before the reform but benefit from the reduced social security tax and lower interest rates after the reform. Entrepreneurs who initially run their businesses as S-corporations change the legal form after the reform. They switch to C-corporations to take advantage of better access to external credit. Entrepreneurs who operate their businesses as C-corporations before the reform do not change their legal form. Still, these entrepreneurs exhibit welfare gains from the tax reform because it removes double taxation.

Figure 7: Tax Reform, Welfare Gains



(a) CEV by occupation and LFO (b) CEV by wealth decile and occupation

Notes: This figure shows the welfare gains of a reform that removes the intensive and extensive margin of tax avoidance. All parameters are kept at the benchmark calibration and additional tax revenues are redistributed as lump-sum transfers to all households. Welfare gains are measured in terms of consumption equivalent variations (CEV) including the transitional dynamics.

5.3 Top Income Taxation, Tax Avoidance, and the Equity-Efficiency Trade-off

Laffer curves. In this section, we derive the top marginal income tax rate that maximizes total tax revenues. To assess how tax avoidance affects the revenue-maximizing top marginal tax rate, we compare the benchmark economy with the counterfactual economy in which all channels of tax avoidance are eliminated. To make the two economies comparable, we re-calibrate selected parameters of the counterfactual economy to reflect similar economic conditions as the benchmark economy. We relegate the details of this calibration in Appendix A.3.

In both economies, we vary τ_h and display the steady states in Figures 8 and 9.[17] The black lines visualize the top marginal tax rate of the baseline setup, which corresponds to 39.6% (US Tax Code, 2013). The dashed lines refer to the tax rates that maximize tax revenues in the benchmark and counterfactual economy.

Let us first analyze the impact of increasing the marginal top tax rate in the counterfactual economy without tax avoidance. Figure 8 highlights the well-known finding that a larger top marginal tax rate may erode the tax base with adverse effects on total tax revenues. A higher tax rate reduces capital and output in the aggregate such that the interest rate increases while the wage falls. The lower wage makes it less attractive for households to become workers such that the share of entrepreneurs in the population increases (Figure 9). Since less talented households become entrepreneurs, they run their businesses as sole proprietors because it does not involve operating costs. Consequently, the share of sole proprietors increases while the share of C-corporations decreases. Total tax revenues follow a Laffer curve, and the revenue-maximizing top marginal tax rate amounts to 48%.

In the benchmark economy, entrepreneurs can minimize their tax burden by choosing the legal form of their business and by shifting income between different tax bases. Figure 9 reveals that in response to a larger marginal tax rate, high-income entrepreneurs switch from S-corporation to C-corporation because the dividend tax is lower than the top marginal income tax rate. Consequently, these entrepreneurs report a smaller share of income as wage income. Since entrepreneurs avoid taxes, the distortionary effects on aggregate capital and output are less pronounced, and the wage and the interest rate react less strongly.

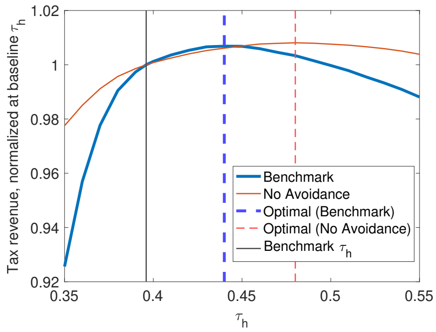
In sum, tax avoidance affects the peak of the Laffer curve: the revenue-maximizing top marginal tax rate amounts to 44%, which is about 4.4 p.p. larger than the one implemented in the US tax code. Our findings suggest that tax avoidance reduces the revenue-maximizing top marginal tax rate by 4 p.p.

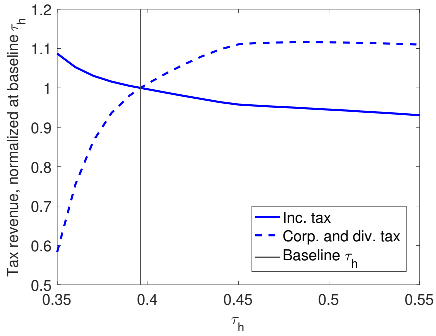
Inequality. Figure 10 displays the long-run impact of increasing the top marginal tax rate on income and wealth inequality in the benchmark economy and in the counterfactual economy without tax avoidance. In the counterfactual economy, a higher top marginal tax rate strongly reduces the Gini coefficient of income and wealth and substantially decreases the income and wealth shares held by the top 1%. These findings highlight the well-known trade-off between equity and efficiency. In the benchmark economy, the impact of the top

[17] For $\tau_h \geq \tau_h^{bench}$, we hold the threshold for the top bracket constant at $y_h = y_h^{bench}$. For $\tau_h < \tau_h^{bench}$ we shift the threshold y_h below y_h^{bench} to ensure that the marginal income tax rate is monotonically increasing:

$$y_h = \left(\frac{\lambda_i (1 - \tau_i)}{1 - \tau_h} \right)^{1/\tau_i}.$$

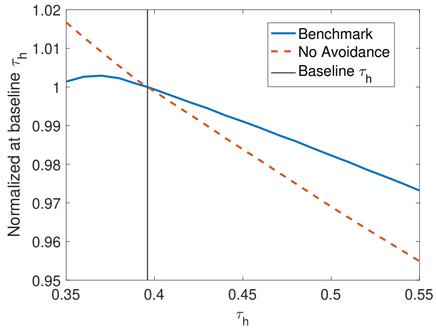
Figure 8: Aggregate Long-Run Effects of the Top Marginal Tax Rate

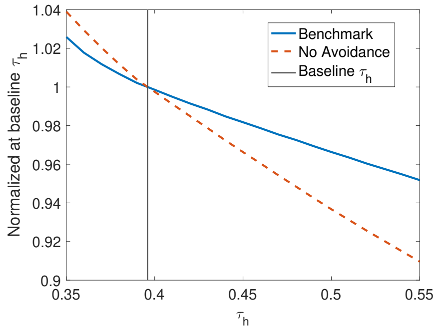




(a) Tax revenue (inc., corp., and div. taxes)

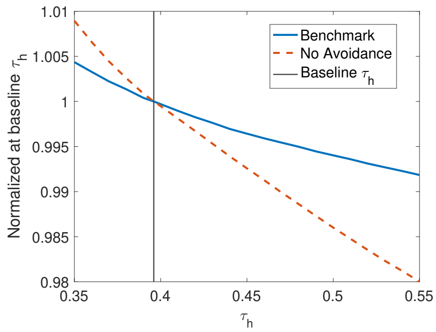
(b) Tax revenue by type, benchmark

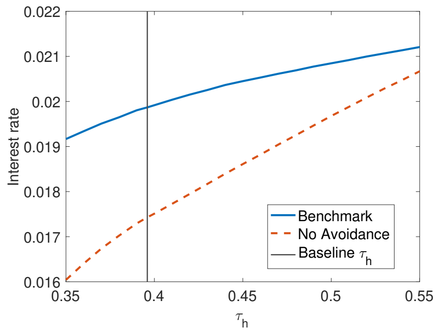




(c) Aggregate output

(d) Aggregate capital





(e) Wage

(f) Interest rate

Notes for Figures 8 and 9: These figures show selected outcomes for different values of the top marginal tax rate τ_h. The counterfactual economy without tax avoidance is re-calibrated to reflect similar economic conditions as the benchmark economy. Panel (b) of Figure 9 shows the share of gross business proceeds declared as wage income. Panels (d), (f) and (g) of Figure 9 refer to the top 5% of income.

Figure 9: Aggregate Long-Run Effects of the Top Marginal Tax Rate

(a) Share of entrepreneurs (b) Share of wage, benchmark

(c) Share of sole prop. (d) Share of sole prop., top

(e) Share of S-corporations (f) Share of S-corporations, top

(g) Share of C-corporations (h) Share of C-corporations, top

See notes under Figure 8.

marginal tax rate on the Gini coefficients of income and wealth is quantitatively much smaller. Notably, the top 1% income and wealth shares increase rather than decrease in response to a tax hike. These findings suggest that tax avoidance reduces the effectiveness of the top marginal tax rate at lowering inequality.

Model validation. We validate our model by simulating the effects of the Tax Reform Act of 1986 (TRA86) in the US. Specifically, TRA86 reduced the top tax rate from 50% to 28%. As discussed in Section 2, the share of C-corporations declined and the share of S-corporation increased since the implementation of TRA86. Dyrda and Pugsley (2019) consider C-corporations and S-corporations that act as employers and find a 5.5 p.p. drop in the share of C-corporations and 6.5 p.p. increase in the share of S-corporations between the period 1980-1984 and the period 1985-1989. Bilicka and Raei (2023) find similar p.p. changes in the shares of C-corporations and S-corporations considering business entities including non-employers.

Table 5 summarizes the long-run distribution of the legal form of organization predicted by our model assuming $\tau_h = 0.5$ and $\tau_h = 0.28$. In the benchmark economy the drop in τ_h leads to a 7.31 p.p. decrease in the share of C-corporations and a 9.99 p.p. increase in share of S-corporations. These numbers are broadly in line with the empirical pattern documented in the literature.

Table 5: Simulated Long-Run Effects of TRA86

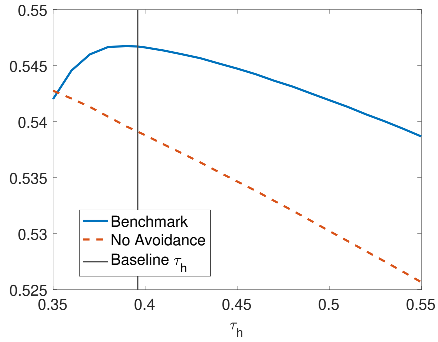
Share of	$\tau_h = 0.5$	$\tau_h = 0.28$	Change in p.p.
C-corporations	8.69	1.38	-7.31
S-corporations	23.93	33.92	9.99
Sole-proprietors	67.38	64.70	-2.68

Notes: C-corporations, S-corporations, and sole proprietors are expressed in percentage shares of entrepreneurs. Outcomes are based on the steady-state equilibrium in which all parameters are kept at their benchmark calibration and additional tax revenues are redistributed to all households.

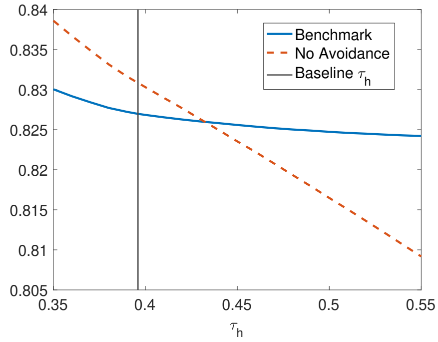
5.4 The Optimal Top Marginal Income Tax Rate

In this section, we derive the optimal top marginal tax rate τ_h that maximizes welfare. As before, we keep government spending fixed and redistribute additional tax revenues via lump-sum transfers to all households. The social security tax adjusts as to balance the social security budget constraint. We compare the optimal top marginal tax rate of the benchmark economy with the one of the re-calibrated counterfactual economy in which all channels of tax avoidance are eliminated.

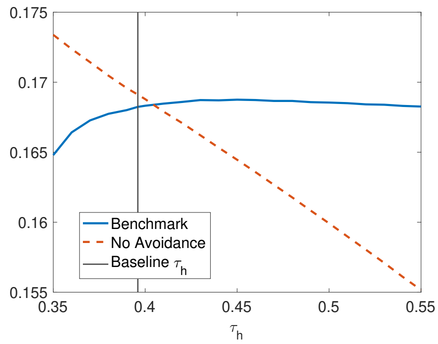
Figure 10: Distributional Long-Run Effects of the Top Marginal Tax Rate



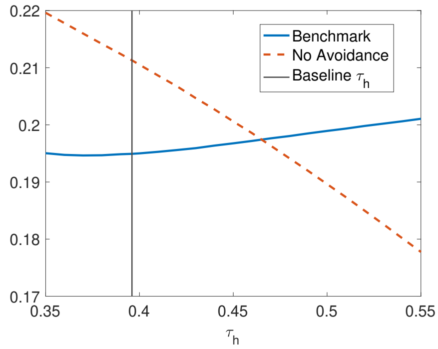
(a) Income Gini



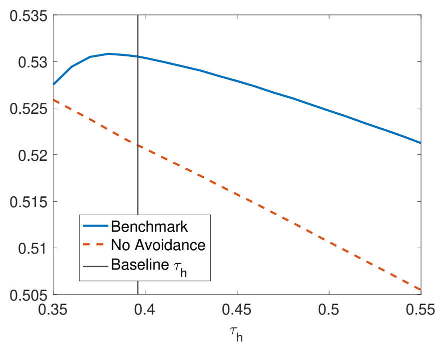
(b) Wealth Gini



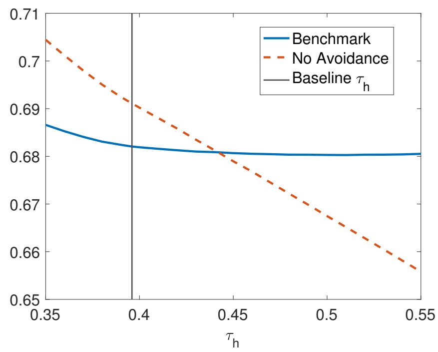
(c) Top 1% income share



(d) Top 1% wealth share



(e) Top 10% income share



(f) Top 10% wealth share

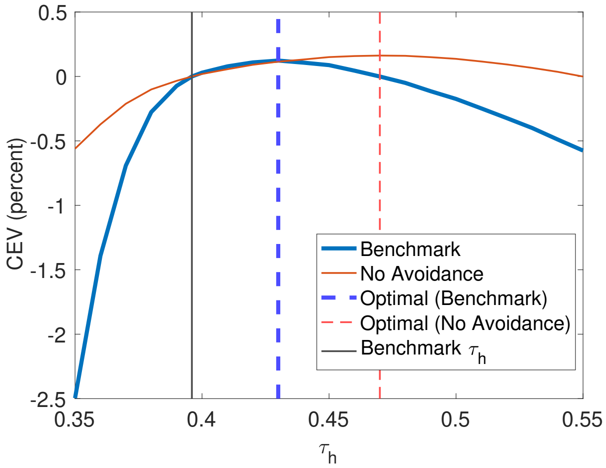
Notes: The figure shows inequality measures for different values of the top marginal tax rate τ_h. The counterfactual economy without tax avoidance is re-calibrated to reflect similar economic conditions as the benchmark economy.

Figure 11 considers the benchmark and the counterfactual economy and displays the welfare gains in the aggregate, by occupation, by legal form of organization, and by deciles of the wealth distribution. Panel (a) shows that the optimal top marginal tax rate equals 43%, which is about 3.4 p.p. higher than the one implemented in the US tax code. Moreover, the counterfactual economy is characterized by an optimal top marginal tax rate of 47%. Thus, tax avoidance reduces the optimal tax at the top by 4 p.p.

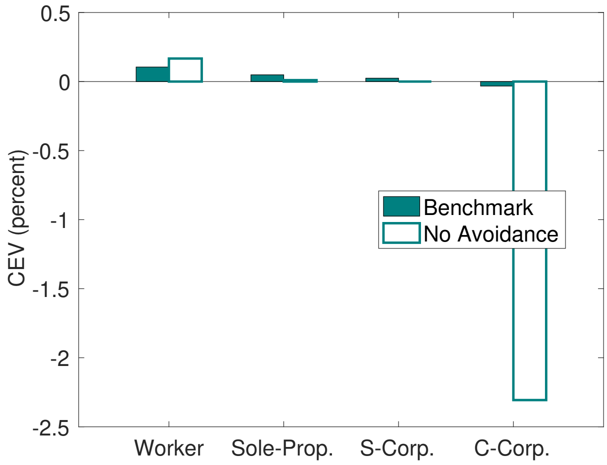
Panel (b) compares the welfare gains of the benchmark economy and the counterfactual economy across occupations. Clearly, without tax avoidance opportunities, owners of C-corporations suffer from substantial welfare losses if the current top marginal tax rate is replaced with the optimal one. In contrast, these entrepreneurs exhibit only small welfare losses in the benchmark economy. Workers enjoy welfare gains as the government collects additional tax revenues, which are redistributed via lump-sum transfers to all households.

Panels (c) and (d) show the welfare gains of implementing the optimal tax rate across deciles of the wealth distribution in the benchmark and the counterfactual economies, respectively. To shed light on the forces behind the welfare gains across occupation and wealth, Figure 12 displays the transitional dynamics assuming that the optimal tax rate is implemented in $t = 0$. First, note that the increase in the top marginal tax rate is higher in the counterfactual economy than in the benchmark economy, generating a larger fall in aggregate output. Because entrepreneurs cannot avoid taxes in the counterfactual economy, the government collects more tax revenues and redistributes them to all households. Therefore, without entrepreneurial tax avoidance, poor workers enjoy larger welfare gains than in the benchmark economy, despite a stronger wage decline. Relatively wealth-poor entrepreneurs also benefit from larger lump-sum transfers. In addition, the wage cut reduces production costs such that these entrepreneurs enjoy larger welfare gains than workers.

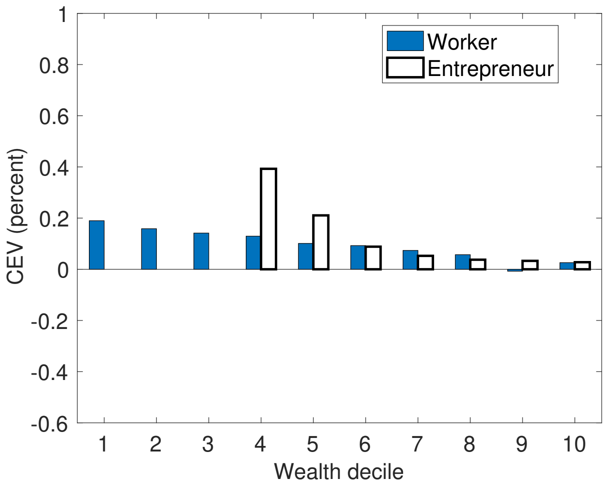
Figure 11: Optimal Top Marginal Tax Rate, Welfare Gains



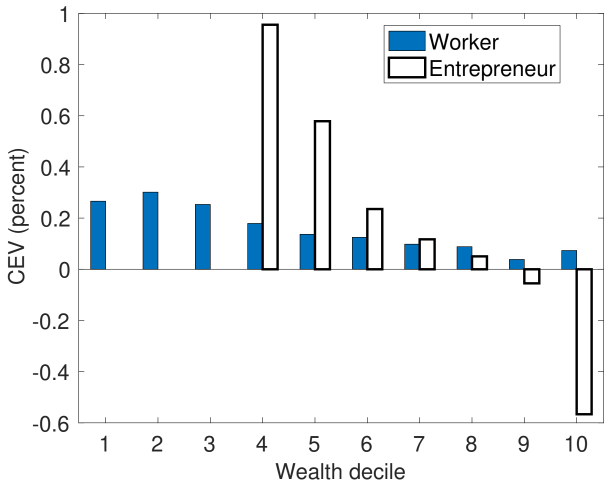
(a) Aggregate CEV



(b) CEV by occupation and LFO



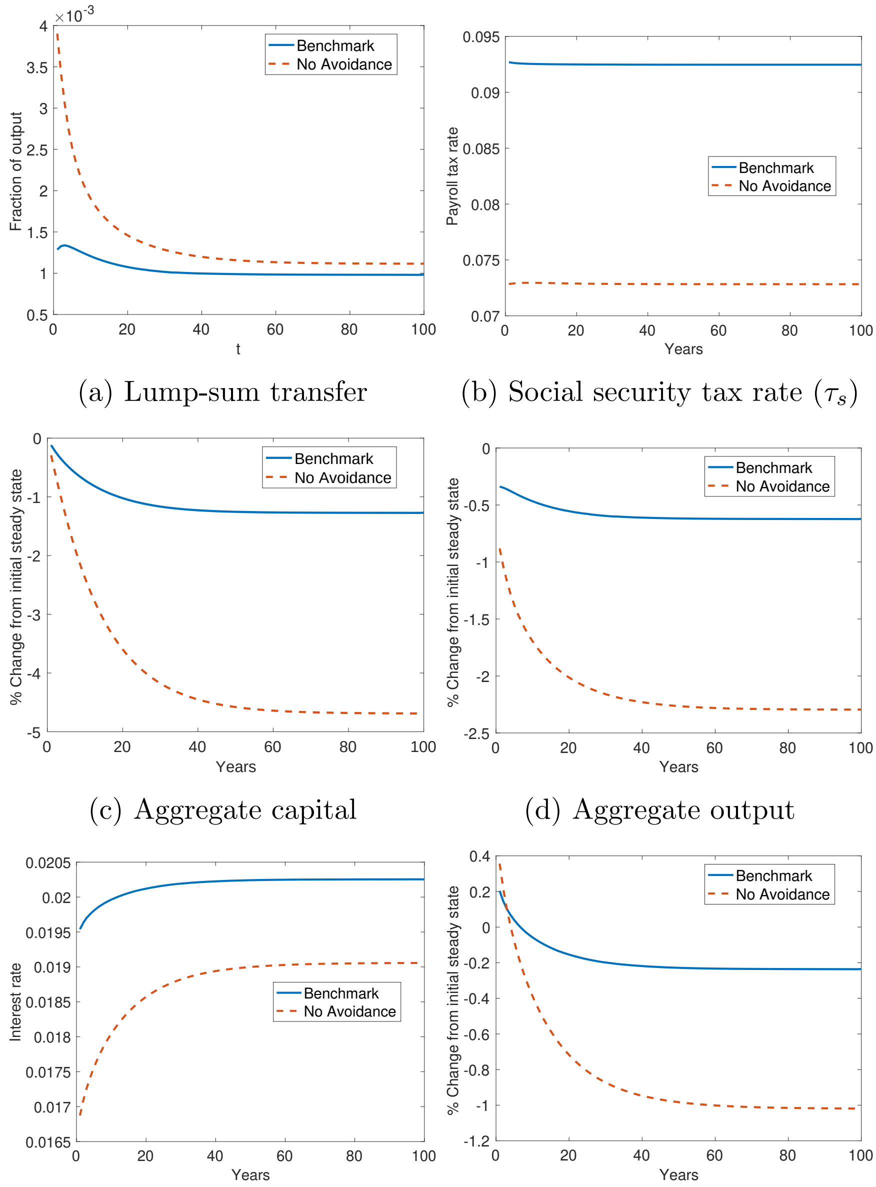
(c) CEV by wealth decile and occupation, benchmark



(d) CEV by wealth decile and occupation, no avoidance

Notes: This figure shows the welfare gains of replacing the current top marginal tax rate with τ_h. The counterfactual economy is re-calibrated to reflect similar economic conditions as the benchmark economy. Additional tax revenues are redistributed as lump-sum transfers to all households. Welfare gains are measured in terms of consumption equivalent variations (CEV) including the transitional dynamics. Panel (a) shows the aggregate CEV. Panels (b) to (d) show the welfare gains of the optimal top marginal tax rate in the benchmark economy and in the counterfactual economy.

Figure 12: Optimal Marginal Tax Rates, Transition Paths



(a) Lump-sum transfer

(b) Social security tax rate (τ_s)

(c) Aggregate capital

(d) Aggregate output

(e) Interest rate

(f) Wage

Notes: This figure shows the transitional dynamics of replacing the current top marginal tax rate with the optimal one. The counterfactual economy is re-calibrated to reflect similar economic conditions as the benchmark economy. Additional tax revenues are redistributed as lump-sum transfers to all households.

6 Conclusions

This paper has aimed to improve our understanding of how entrepreneurial tax avoidance affects aggregate and distributional outcomes and its consequences for the optimal top marginal income tax rate.

To this end, we have developed a dynamic general equilibrium model with incomplete markets and occupational choice in which entrepreneurs can avoid taxes in two ways. On the extensive margin, entrepreneurs can choose the legal form of their business organization to reduce their tax burden. On the intensive margin, entrepreneurs can shift their income between different tax bases.

Our analysis highlights that tax avoidance reduces productive efficiency and generates substantial welfare losses. The possibility of avoiding taxes induces entrepreneurs to run their businesses as S-corporations despite facing a tighter borrowing limit with adverse effects on capital investment. While tax avoidance reduces the negative impact of the top marginal income tax rate on aggregate outcomes, it makes it ineffective at lowering inequality.

Our model implies an optimal top marginal tax rate of 43%, which is about 3.4 p.p. higher than the one implemented in the US tax code. Eliminating tax avoidance and introducing equal tax treatment of workers and entrepreneurs raises the optimal top marginal tax rate by 4 p.p. These findings highlight the importance of taking into account tax avoidance when studying tax reforms.

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A Appendix: Model

A.1 Preference Shock

To smooth out the kinks in the value function caused by the discrete occupational choice, we introduce an i.i.d. preference shock. We extend the model described in Section 3 by assuming that each young agent draws $\epsilon = \{\epsilon^W, \epsilon^{EP}, \epsilon^{ES}, \epsilon^{EC}\}$ each period, where ϵ follows a type-I extreme value distribution with scale parameter σ_ϵ. The occupational choice problem in Eq. (6) becomes

$$V\left(a, \varepsilon, \theta, \epsilon\right) = \max_{o \in \{W, EP, ES, EC\}} \left\{V^o\left(a, \varepsilon, \theta\right) + \sigma_\epsilon \epsilon^o\right\}.$$

The probability of choosing occupation o is given by

$$P^o(a, \varepsilon, \theta) = \frac{\exp\{V^o(a, \varepsilon, \theta)/\sigma_\epsilon\}}{\sum_{o' \in \{W, EP, ES, EC\}} \exp\{V^{o'}(a, \varepsilon, \theta)/\sigma_\epsilon\}},$$

where the occupational value functions $V^o(a, \varepsilon, \theta)$ described in Section 3 need to be modified such that the expectation $\mathbb{E}$ also operates on the next period's ϵ. For example, in the case of a sole-proprietor, the value function becomes

$$V^{EP}\left(a, \varepsilon, \theta\right) = \max_{c, a', k, , n} \left\{u(c, 0) + \beta\left(1 - \rho_R\right) \mathbb{E}_{\varepsilon', \theta' | \varepsilon, \theta}\left[\mathbb{E}_\epsilon V\left(a', \varepsilon', \theta', \epsilon\right)\right] + \beta \rho_R V^R\left(a'\right)\right\}$$

subject to constraints (13) to (16), where

$$\mathbb{E}_\epsilon V\left(a, \varepsilon, \theta, \epsilon\right) = \sigma_\epsilon \log\left(\sum_{o \in \{W, EP, ES, EC\}} \exp\left\{\frac{V^o(a, \varepsilon, \theta)}{\sigma_\epsilon}\right\}\right).$$

The scale parameter σ_ϵ is sufficiently small such that it does not affect the results of the model.

A.2 Welfare

Let $s = \{a, \varepsilon, \theta, \epsilon, age\}$ be the state. Recall that ϵ is the preference shock, and $age \in \{Y, R\}$ (young or retired). We use the conditional consumption equivalent variation (CEV) $\omega(s; \tau)$ to measure the effect of implementing the policy τ on an agent in state s at the period that the policy is implemented. We consider the effect both on the transition path and in the new steady state.

Suppose the economy is originally in a steady state with benchmark policy τ_b. In period $t = 0$, policy τ is implemented. The value conditional on s in period $t = 0$ is

$$V_0(s; \tau) = \mathbb{E}_0\left[\sum_{t=0}^{\infty} \beta^t u\left(c_t(s_t; \tau), \ell_t(s_t; \tau)\right) | s_0 = s; \tau\right],$$

where the expectation is over future states s_t, for all $t = 1, 2, ...$ If $\tau = \tau_b$, $V_0(s; \tau_b)$ is the value conditional on s in the benchmark steady state.

Given the additive separable utility function, $V_0(s; \tau)$ can be rewritten as:

$$V_0(s; \tau) = V_0^c(s; \tau) + V_0^\ell(s; \tau), \tag{34}$$

where

$$\begin{aligned} V_0^c(s; \tau) &= \mathbb{E}_0 \left[\textstyle\sum_{t=0}^{\infty} \beta^t \frac{c_t(s_t;\tau)^{1-\sigma_1}}{1-\sigma_1} | s_0 = s; \tau \right], \\ V_0^\ell(s; \tau) &= \mathbb{E}_0 \left[\textstyle\sum_{t=0}^{\infty} \beta^t \chi \frac{\ell_t(s_t;\tau)^{1+\sigma_2}}{1+\sigma_2} | s_0 = s; \tau \right]. \end{aligned}$$

We define the conditional CEV $\omega(s; \tau)$ such that

$$\mathbb{E}_0 \left[\sum_{t=0}^{\infty} \beta^t u \left((1 + \omega(s; \tau)) c_t(s_t; \tau_b), \ell_t(s_t; \tau_b) \right) | s_0 = s; \tau_b \right] = V_0(s; \tau)$$

Using Eq. (34), we can rewrite the above as

$$\mathbb{E}_0 \left[\sum_{t=0}^{\infty} \beta^t \frac{[(1 + \omega(s; \tau)) c_t(s_t; \tau_b)]^{1-\sigma_1}}{1 - \sigma_1} | s_0 = s; \tau_b \right] + V_0^\ell(s; \tau_b) = V_0(s; \tau)$$

which can be simplified to

$$(1 + \omega(s; \tau))^{1-\sigma_1} V_0^c(s; \tau_b) + V_0^\ell(s; \tau_b) = V_0(s; \tau)$$

or

$$[(1 + \omega(s; \tau))^{1-\sigma_1} - 1] V_0^c(s; \tau_b) + V_0(s; \tau_b) = V_0(s; \tau).$$

The conditional CEV is calculated as:

$$\omega(s; \tau) = \left[\frac{V_0(s; \tau) - V_0(s; \tau_b)}{V_0^c(s; \tau_b)} + 1 \right]^{\frac{1}{1-\sigma_1}} - 1. \tag{35}$$

Note that $V_0(s; \tau_b)$ is the value from the benchmark steady state, and $V_0(s; \tau)$ is the value in period $t = 0$ on the transition path when policy τ is implemented.

The value from consumption in the benchmark steady state $V_0^c(s; \tau_b)$ is calculated using the following fixed-point iteration algorithm:

1. Provide an initial guess for $V_0^c(s; \tau_b)$ for all s in the state space, call it $\tilde{V}_0^c(s; \tau_b)$.

2. For each $i = 1, 2, ...,$ update $\tilde{V}_i^c$ as follows:

   $$\tilde{V}_i^c(s; \tau_b) = \frac{c_b(s; \tau_b)^{1-\sigma_1}}{1 - \sigma_1} + \beta \int Pr_b(s'|s) \tilde{V}_{i-1}^c(s'; \tau_b) ds' \qquad \text{for each } s \in \mathbb{S},$$

   where $c_b(\cdot; \tau_b)$ is the consumption policy function in the benchmark steady state. The probability function $Pr_b(s'|s)$ depends on policy functions in the benchmark steady state as well as the stochastic processes of ability and preference shocks.

3. Repeat the previous step until $\tilde{V}_i^c$ and $\tilde{V}_{i-1}^c$ are sufficiently close.

The aggregate CEV $\omega_{agg}(\tau)$ is given by:

$$\omega_{agg}(\tau) = \int \omega(s;\tau) d\mu(s;\tau_b),$$

where $\mu(s;\tau_b)$ is the distribution in the benchmark steady state and $\omega(s;\tau)$ fulfills Eq. (35). To compute CEV by groups, let $\mathbb{G}$ be a subset of the state space. The average CEV for households $s \in \mathbb{G}$ is

$$\omega_{\mathbb{G}}(\tau) = \frac{\int \mathbf{1}_{\{s\in\mathbb{G}\}} \omega(s;\tau) d\mu(s;\tau_b)}{\int \mathbf{1}_{\{s\in\mathbb{G}\}} d\mu(s;\tau_b)}.$$

A.3 Calibration of the Counterfactual Economy

Table 6 shows the re-calibrated parameters in the counterfactual economy in which all channels of tax avoidance are eliminated. The rest of the parameters take the same values as in the benchmark model. We re-calibrate only five parameters such that the share of entrepreneurs, the share of C-corporations among entrepreneurs, the Gini coefficient of income, the share of households in the top income bracket, and the ratio between total tax revenue (excl. social security taxes) and GDP are similar to those in the benchmark economy. Table 7 compares the moments of the steady states of the two economies.

The re-calibrated parameter values are similar to those in the benchmark model except for the value of κ^{EC}, which is much higher than the benchmark model. This is because C-corporations no longer face corporate and dividend taxes in the counterfactual environment, making it a very attractive legal form for entrepreneurs. Thus, in order to keep the share of C-corporations among the entrepreneurs the same as in the benchmark model, we need to impose a significantly higher operating cost.

Table 6: Re-Calibrated Parameters

Parameter	**Description**	**Value**
μ_θ	Unconditional mean	-0.052
κ^{EC}	Operating cost for C-corps	0.78
ϵ^*	Value of the superstar shock	13.0
λ_i	Income tax, level	0.795
τ_i	Income tax, progressivity	0.117

Table 7: Moments: Counterfactual vs. Benchmark Model

	Counterfactual	**Benchmark**
Aggregates		
Interest rate	0.017	0.020
Average hours worked	0.330	0.330
K/Y ratio	2.72	2.73
Exit rate from entrepreneurship	0.239	0.239
Tax-to-GDP (excl. soc. security)	0.164	0.171
Share of taxpayers in the top income bracket	0.030	0.028
Occupation and LFO distribution		
Share of entrepreneurs	0.150	0.150
Share of sole-prop.	0.915	0.673
Share of S-corp	0	0.243
Share of C-corp	0.085	0.084
Employment share by business size quartiles		
Q1 (smallest)	0.037	0.036
Q2	0.078	0.081
Q3	0.158	0.163
Q4 (largest)	0.727	0.720
Inequality		
Gini income	0.539	0.547
Gini income, entrepreneurs	0.640	0.640
Share of entre in top 1% income	0.672	0.663
Share of entre in top 1% wealth	0.809	0.858
Wealth share entre	0.534	0.536
Wealth share C-Corps (cond. on entre.)	0.237	0.229

B Appendix: Numerical Algorithm

B.1 General Equilibrium Loop

We summarize the main steps to compute the stationary equilibrium defined in Section 3.6 in the benchmark economy.

1. Approximate the stochastic processes of ε and θ using discrete Markov chains following the procedure described in Tauchen (1986). Make a guess for the interest rate r^0 and the social security tax rate τ_s^0.

2. Compute the capital-labor ratio in the non-entrepreneurial sector, $k_C = \frac{K_C}{N_C}$, which satisfies the following condition:
$$r^0 = \alpha \left(k_C\right)^{\alpha-1} - \delta.$$
Compute the wage as
$$w^0 = (1-\alpha)\left(k_C\right)^{\alpha}.$$

3. Given r^0, w^0 and τ_s^0 solve the individual optimization problem described in Section 3.5 and get the relevant policy functions. The individual optimization problem is solved by value function iteration.

4. Compute the invariant distribution μ consistent with the policy functions and the exogenous Markov chains for the shocks ε, θ.

5. Using the distribution and policy functions, compute the aggregate variables and update r and τ_s. The capital market clearing condition determines capital in the non-entrepreneurial sector:
$$K_C = \int a d\mu(s) - \int \mathcal{I}_E(s)\, k(s) d\mu(s).$$
The labor market clearing condition determines labor in the non-entrepreneurial sector:
$$N_C = \int \mathcal{I}_W(s)\varepsilon(s)\,\ell(s)\, d\mu(s) - \int \mathcal{I}_E(s)\, n(s) d\mu(s).$$
$\mathcal{I}_E$ and $\mathcal{I}_W$ are indicator functions (or, if preference shocks are assumed, the probability functions) of being an entrepreneur or a worker given state s. The updated interest rate is:
$$r = \alpha \left(\frac{K_C}{N_C}\right)^{\alpha-1} - \delta.$$
To update τ_s, compute total pension expenditure B and total income subject to the social security tax Inc_s, i.e.
$$B = b\bar{Y} \int \mathcal{I}_R(s) d\mu(s)$$

$$Inc_s = \frac{\int T^s(s)d\mu(s)}{\tau_s^0}$$

The updated social security tax rate is $\tau_s = \frac{B}{Inc_s}$.

6. If $|r^0 - r| < tol_r$ and $|\tau_s^0 - \tau_s| < tol_{\tau_s}$, where tol_r and tol_{τ_s} are predefined tolerance levels, stop and exit the GE loop. Otherwise, return to Step 2.

B.2 Fiscal Neutrality

In counterfactual experiments where we impose fiscal neutrality, we solve for a lump-sum transfer tr that balances the budget constraint

$$\int \left[T^I\left(y(s)\right) + T^c(y_c(s)) + T^d(d(s))\right] d\mu(s) = G^{benchmark} + tr. \tag{36}$$

To solve for the general equilibrium with fiscal neutrality, we make the following modifications to the algorithm described above.

In step 1, in addition to the interest rate and the social security tax rate, we also guess the transfer level tr^0.

In step 3, we solve the household optimization problem given the transfer.

In step 5, we update the transfer tr using Eq. (36).

In step 6, we use $|tr^0 - tr| < tol_{tr}$ as an additional convergence criterion.