Evolution of Tax Progressivity in the U.S.: New Estimates and Welfare Implications*

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Abstract

We provide a statistical description of the evolution of tax progressivity and income inequality in the U.S. for the period 1960-2008, using tax revenue data. We document a large and steady increase of tax progressivity over our sample, with brief exceptions during the early 1980's and early 2000's. We provide flexible – parametric and non-parametric – yearly estimates of the tax distribution. We then use a canonical heterogeneous households model (Aiyagari, 1994) to compare the optimal tax progressivity to the current U.S. tax system. Our findings are threefold. First, under the joint assumptions of a linear capital capital tax and an intensive labor supply choice, the optimal progressivity is very close to the one measured in the data. However, if the labor supply choice is on the extensive margin only, optimal tax progressivity is much larger than in the data. Third, preliminary results suggest that the optimal tax system should allow for a non-zero cross-term between capital and labor income taxes: there are welfare gains in allowing the marginal capital tax rate to be increasing in labor income.

JEL:

Keywords: Tax Progressivity, Optimal Fiscal Policy, Heterogeneous Households.

*The views expressed herein are those of the authors and not necessarily those of the Federal Reserve Board or the Federal Reserve System. Preliminary and incomplete, comments are very welcome: feenberg@nber.org, axelle.ferriere@eui.eu, gaston.m.navarro@frb.gov

1 Introduction

We provide a statistical description of the evolution of tax progressivity and income inequality in the U.S. for the period 1960-2008, using tax revenue data. We document a large and steady increase of tax progressivity over our sample, with brief exceptions during the early 1980's and early 2000's. In line with previous work, we find a larger concentration of income over the last half of the 20^{th} century.[1] We then use a canonical heterogeneous households model (Aiyagari, 1994) to compare the optimal tax progressivity with the one estimated in the data. We argue that, under the joint assumption of linear capital taxes and a labor supply decision on the intensive margin, optimal tax progressivity is very close to the current U.S. tax system. However, if the labor supply choice is on the extensive margin only, optimal tax progressivity is much larger than in the data.

The empirical motivation of this paper is twofold. First, we provide an analysis of the evolution of the U.S. federal tax system, with particular emphasis on *changes in tax progressivity* and the key components underlying these changes. We show that progressivity has varied substantially over the last five decades, and while state level taxes increase the overall progressivity of the tax system, most of the fluctuations in progressivity are driven by changes in the Federal tax system. Second, we contribute to the literature using heterogeneous households models by providing estimates of the distribution of taxes, a key ingredient of these models. Importantly, because of the large changes in tax progressivity we document, our results are of major importance for research on the distributional effects of taxes and transfers.

We then turn to a normative analysis. We use a canonical quantitative heterogeneous households model as in Aiyagari (1994) to compare the optimal steady-state tax progressivity with the current U.S.tax system. We find that optimal tax progressivity crucially depends on the distribution labor supply elasticities.[2] Under the assumption that households make a labor supply choice on the intensive margin, we find that the optimal progressivity is very close to the one measured in the data. However, we show that the empirical distribution of labor supply elasticities is better captured by a model where households make extensive labor supply choice only. The version of the model

[1] See Piketty and Saez (2003) and citations therein.
[2] CITE Saez QJE

with extensive labor supply has strong quantitative implications, with an optimal tax progressivity much larger than in the data. Qualitatively, this result is not surprising, as a less elastic labor supply reduces concerns for efficiency. However, the magnitude of the change is very large and suggest for large welfare gains of increasing tax progressivity. More research should be done to quantify optimal tax progressivity in a model calibrated to match both extensive and intensive labor supply elasticities. Finally, we focus on the interaction between capital and labor incomes taxes. Preliminary results suggest that the optimal tax system should allow for a non-zero cross-term for capital and labor income taxes: there are welfare gains in allowing the marginal capital tax rate to be increasing in labor income.

Our data source for income and taxes comes from IRS public files, which are part of the TAXSIM program at the NBER.[3] The sample is annual for 1960-2008, and has approximately $100,000$ observations per year. We first report results regarding distribution of pre-tax income across taxpayers. In line with the literature, we find an increasing concentration of income over the past fifty years, with the income share of the top-10% tax-filers rising from about 30% in the 60s to a peak of 45% in 2006. Interestingly, this concentration is also observable when excluding capital income, with a labor income share rising from 27% to 38% on the same period. Then, we turn to the distribution of taxes. First, we report significant changes over time in the fraction of taxes paid by each deciles, both regarding the capital and the labor income taxes. Second, we estimate the distribution of taxes using the well-known log-linear tax function. We find that progressivity has been increasing over the past fifty years, with brief exceptions during the early 1980s and 2000s. Interestingly, the increase in tax progressivity in the last thirty years is mostly driven by tax credits: excluding those, we find that tax progressivity has remained roughly flat since 1990. Adding state taxes increase the overall progressivity of the tax system, but does not influence the variations: the dynamics of tax progressivity are essentially driven by federal taxes. Finally, we provide estimates using alternative tax functions, together with non-parametric estimates of labor and capital federal taxes.

Our work complements earlier contributions of Gouveia and Strauss (1994), and Guner, Kay-

[3]See http://users.nber.org/∼taxsim/

gusuz, and Ventura (2014) more recently, who provide tax estimates for given years.[4] Similarly, we estimate tax functions typically used in the literature, which can be used by other research. Our work differ in two dimensions. First, we also provide -more flexible- non-parametric estimates that can guide future applications. Second, and most importantly, we offer a systematic dynamic analysis from 1960 to 2008; as such, we discuss changes in tax progressivity measures over time, which are of crucial importance when evaluating heterogeneous households models; see Ferriere and Navarro (2015) and Guvenen, Kuruscu, and Ozkan (2014) for recent examples.

The rest of the paper is organized as follow. Section 2 provides some statistics about the distribution of taxes and income over time. Section 3 provides estimates of the U.S. tax system. We estimate tax functions typically used in the literature, and compares their performance; we also report non-parametric estimates. Section 4 derives normative implications for tax progressivity using a canonical heterogeneous households model. Section 5 concludes.

2 U.S. Households Taxes and Income Distribution: 1960-2008

Our data source for income and taxes comes from IRS public files, which are part of the TAXSIM program at the NBER.[5] The sample is annual for 1960-2008, and has approximately 100,000 observations per year.[6] Importantly, the data is not top coded which makes it particularly useful to analyze tax distributions at the very top.[7] Unfortunately, we do not have identification data and can only construct repeated cross-sections over time but not a panel. For the same reason, an observation in our sample is a tax filling 1040 form, which could be a joint or a single filling.[8] Finally, and most importantly, we observe a relatively large change in propensity to file of low taxpayers, which increases the volatility of the lowest-income households include in TAXSIM over the years.

[4]See Feenberg and Poterba (2000) for a discussion of the evolution of U.S. federal taxes for high income households. For a discussion of taxes in European countries, see Guvenen, Kuruscu, and Ozkan (2014) and references therein.

[5]See http://users.nber.org/∼taxsim/

[6]The minimum and maximum number of observations are 59,037 for year 1986 and 171,751 for year 1979, respectively.

[7]CITE Daniel's paper.

[8]SOMETHING MORE HERE?

Our measure of total income corresponds to *Adjusted Gross Income* (AGI) ignoring losses and adding capital gain deductions.[9] Regarding taxes, we observe the dollar amount that a taxpayer owes in federal taxes; and starting from 1979 we also observe state level taxes.[10] Let y_{it} be the income of household i in year t, and T_{it}^f and T_{it}^s be the amount paid in federal and state taxes respectively. We compute *federal tax rates* as $\tau_{it}^f = T_{it}^f / y_{it}$, and total *total tax rates* as $\tau_{it} = \left(T_{it}^f + T_{it}^s\right)/y_{it}$.

We also compute a measure of labor income that subtracts all declared capital income from the original household income measure. In particular, we compute labor income only as the sum of [EXPLAIN]. Let y_{it}^ℓ be the resulting labor income for household i in year t. We then use the TAXSIM calculator to obtain the amount of taxes that household i would have paid if he had only made labor income y_{it}^ℓ that year. Let $T_{it}^{\ell,f}$ be the resulting federal tax amount paid, and $T_{it}^{\ell,s}$ be the state tax amount paid. We compute *federal labor tax rates* as $\tau_{it}^{\ell,f} = T_{it}^{\ell,f}/y_{it}^\ell$, and total *total labor tax rates* as $\tau_{it}^\ell = \left(T_{it}^{\ell,f} + T_{it}^{\ell,s}\right)/y_{it}^\ell$.

Income inequality has increased over the last 50 years, with a steady increase of the highest income decile participation on total households' income. Figure 1 documents this well-known fact by plotting mean income for several income groups (top panel) and each groups' income relative share (bottom panel).[11] [CITE Piketty & Saez and Feenberg & Poterba. Briefly discuss about the top 1%.] Figure 2 shows that inequality of labor income followed a similar path over this period, although the increase of top income earners is less in this case.

The U.S. Federal tax system, as well as the State one, has always been progressive with higher tax rates for higher income deciles. Figure 3 plots average *federal tax rates* (left panel) for several income groups. [add social security] Interestingly, as we discuss in more detailed below, differences in tax rates across income groups varied substantially over time. For instance, the average tax rate for lowest 50% of income earners has been negative since the early 1990's. In addition, state taxes increase the average tax rates of the top deciles, while roughly do not affect the lower deciles, increasing the overall progressivity of the whole tax system. [Figure for state taxes tba].

[9] ADD MORE DETAILS HERE.

[10] We also have social security taxes, to be added.

[11] Each group is computed by income using the weights provided by TAXSIM. See Appendix B for computational details.

Figure 1: Income Distribution

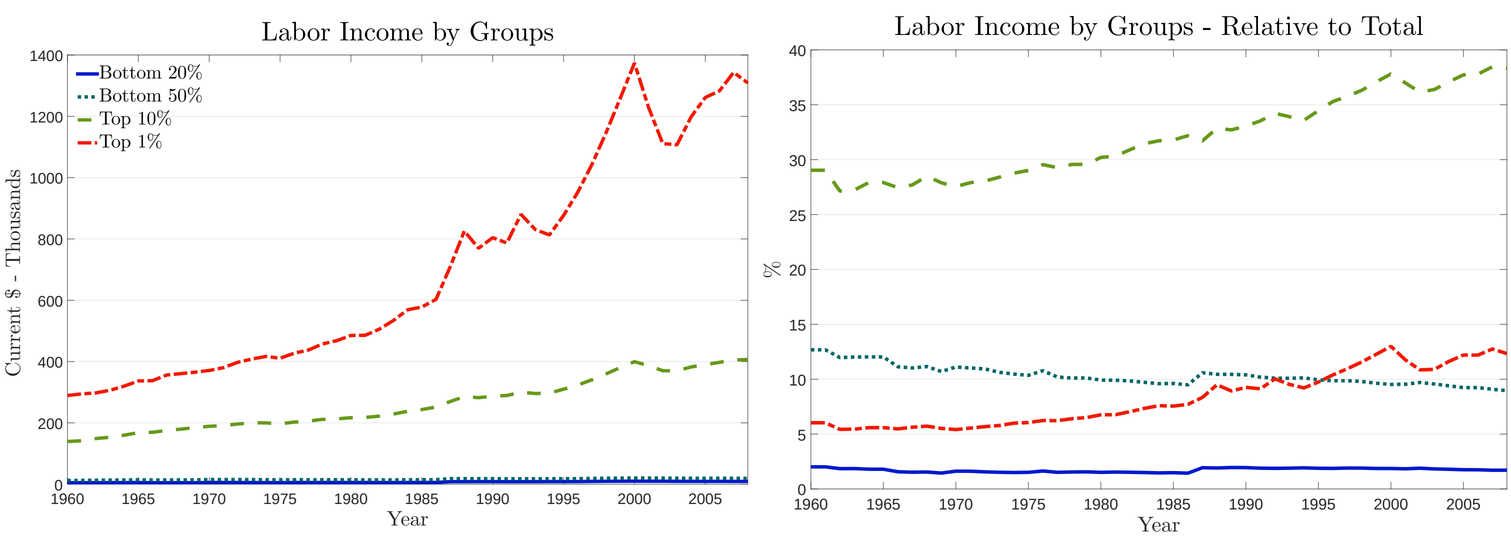


Figure 2: Labor Income Distribution

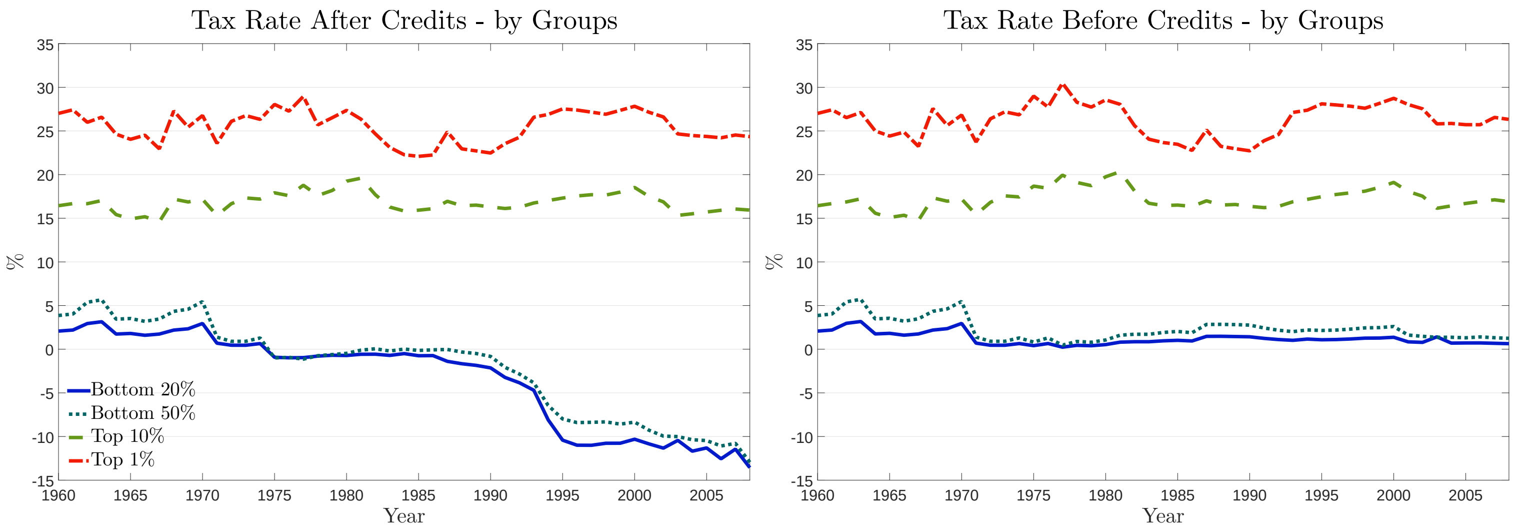


Figure 3: Income Tax Rates - Distribution

Since the early 1990's, tax credits have been a crucial component of the progressivity of the tax system. While tax credits barely affect tax rates at the top, it significantly declines them at the bottom of the distribution. This is shown in Figure 3, which plots what tax rates would in the absence of credits (right panel).

3 Tax Progressivity: Parametric and Non-Parametric Estimates

In this section, we provide estimates of parametric tax functions commonly used in quantitative models with heterogeneous households. We exploit the cross-sectional dimension of our data to provide year by year estimates of these tax functions. Consequently, these estimations provide a simple framework to describe how the tax system has evolved over time. We also discuss the fit of these different functions, and where they fail to match data.

Interestingly, most of these functions provide clean measures of progressivity as a combination of its parameters. Thus, estimating these tax functions over time provides historical measures of changes in tax progressivity.

3.1 The HSV Specification

The first parametric tax function we estimate comes from Heathcote, Storesletten, and Violante (2014) (HSV henceforth), and is given by

$$\tau(y) = 1 - \lambda y^{-\gamma} \tag{1}$$

where y is the income level, and $\tau(\cdot)$ is the tax rate.[12] The function is fully described by two parameters, with γ measuring the progressivity of the tax schedule, and λ reflecting the tax level. In particular, when $\gamma = 0$ the tax function implies an affine tax: $\tau(y) = 1 - \lambda$; while $\gamma = 1$ implies complete redistribution: after-tax income $(1 - \tau(y))\, y = \lambda$ for any pre-tax income y. The second parameter, λ, measures the level of the taxation scheme: one can think of $1 - \lambda$ as a quantitatively-close measure of the average tax rate.[13]

More generally, γ is the elasticity of one minus the tax rate with respect to income

$$\frac{\partial 1 - \tau(y)}{\partial y} \frac{y}{1 - \tau(y)} = -\gamma$$

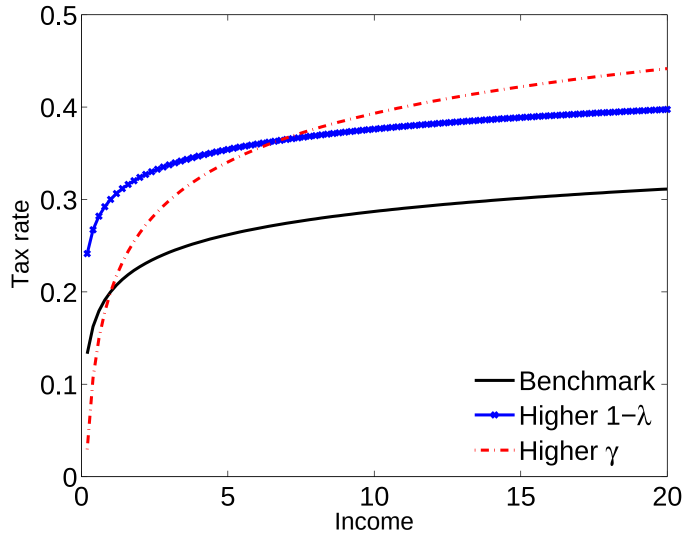
Thus, an increase in $1 - \lambda$ captures an increase in the level of the taxation scheme (it shifts the entire tax function up), while a higher γ implies that rate increases faster with income, and thus the system is more progressive: it turns the entire tax function counter-clockwise. Figure 4 shows how the tax function changes for different values of γ and λ.

Figure 5 shows the estimate of γ in equation 1 using only Federal taxes as well as Federal plus State taxes. We find a large and steady increase of tax progressivity over our sample, with brief exceptions during the early 1980's and early 2000's. Interestingly, including state taxes increase the progressivity of the whole tax system, but the dynamics of tax progressivity are essentially driven by federal taxes. Note that, excluding tax credits, tax progressivity remains roughly stable since the early 1990s: the increase in tax progressivity in the past thirty years has been mostly driven by tax credits. [plot to be added; comment more on the capture of progressivity]. In Appendix C

[12] This tax function, which is log linear, is also called constant rate of progressivity.

[13] When $\gamma = 0$, $1 - \lambda$ is exactly the tax rate.

Figure 4: Non-linear tax as a function of two parameters (λ, γ).



Notes: Plots for the tax function $\tau(y) = 1 - \lambda y^{-\gamma}$, for different values (λ, γ). The parameter γ measures progressivity, while $1 - \lambda$ measures the level of the tax function.

we provide more details about the estimation, but the R^2 fluctuates between 45% and 65% (see Figure 9). [Labor vs capital tba]

3.1.1 Capital and labor taxes

Finally, we estimate the following tax function, which allows heterogeneity in the progressivity of labor and capital income tax, together with a cross term for these two sources of income:

$$T(y_L + y_K) = y_L + y_K - \lambda_L {y_L}^{1-\gamma_L} - \lambda_K {y_K}^{1-\gamma_K} + \lambda_{KL} y_K y_L \tag{2}$$

where y_L and y_K stand for labor and capital income respectively.

RESULTS COMING SOON

3.2 Tax Progressivity: Non-Parametric Estimates

COMING SOON

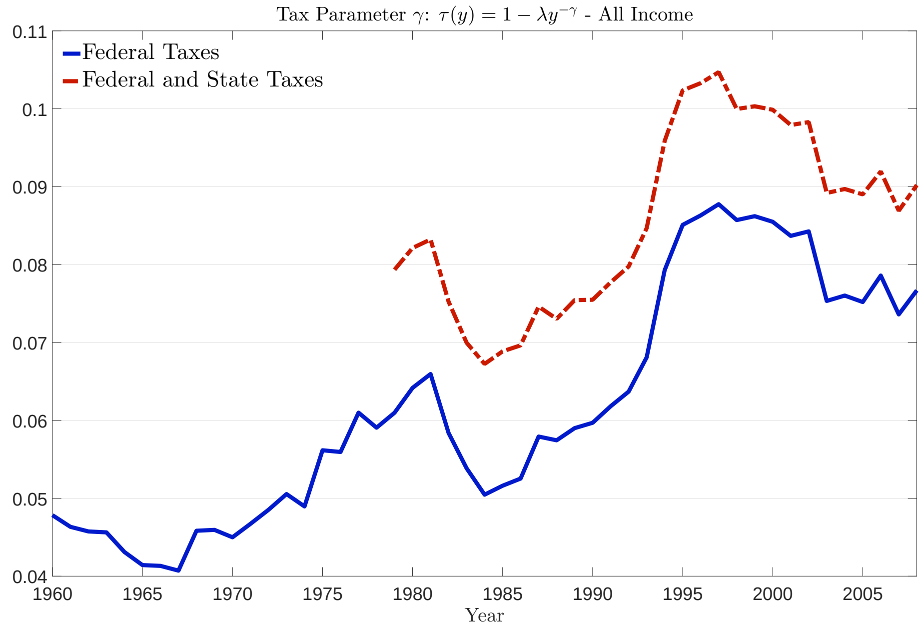


Figure 5: γ estimate. All income - years 1960:2008

4 Optimal Tax Progressivity in a Heterogeneous Households Model

We use a canonical heterogeneous households model as in Aiyagari (1994), to determine the optimal level of tax progressivity. We perform our analysis in a stationary economy and use a parametric tax function as described in Heathcote, Storesletten, and Violante (2014). Assuming a stationary economy allows us to focus on the interaction between tax progressivity and households' idiosyncratic states, removing the effects of business cycle fluctuations.[14] We focus on the *HSV* tax function because, as shown in Section 3, it is a tractable function with a reasonably good fit to the U.S. federal income tax system during the last 50 years.

We compute the optimal tax progressivity for two versions of the model: one in which households make an intensive labor supply choice (a *divisible labor supply* model), and one in which households can only make an extensive labor supply decisions (an *indivisible labor supply* model). Comparing results for both models provides insights on how labor supply elasticity affects the optimal tax progressivity. We find that current U.S. tax code has a tax progressivity close to the optimal one in the *divisible labor supply* model, while the *indivisible labor supply* model suggests that higher

[14]See **??** for a discussion of how tax progressivity should be optimally set over the business cycle.

progressivity would be desirable.

4.1 Environment

Time is discrete and indexed by $t = 0, 1, 2, \ldots$. The economy is populated by a continuum of households, a representative firm, and a government. The firm has access to a constant return to scale technology in labor and capital given by $Y = K^{1-\alpha} L^{\alpha}$, where K, L and Y stand for capital, labor, and output, respectively. Both factor inputs are supplied by households. We assume constant total factor productivity.

Households: Households have preferences over sequences of consumption and hours worked given as follows:

$$\mathbb{E}_o \sum_{t=0}^{\infty} \beta^t \left[\frac{c_t^{1-\sigma}}{1-\sigma} - B \frac{h_t^{1+\varphi}}{1+\varphi} \right]$$

where c_t and h_t stand for consumption and hours worked in period t. Households have access to a one period risk-free bond, subject to a borrowing limit $\underline{a}$. Their idiosyncratic labor productivity x follows a Markov process with transition probabilities $\pi_x(x', x)$.

Let $V(a, x)$ be the value function of a worker with level of assets a and idiosyncratic productivity x. Then,

$$\begin{aligned} V(a,x) &= \max_{c,a',h} \left\{ \frac{c^{1-\sigma}}{1-\sigma} - B \frac{h^{1+\varphi}}{1+\varphi} + \beta \mathbb{E}_{x'} \left[V(a', x') | x \right] \right\} \qquad (3) \\ \text{subject to} & \\ c + a' &\leq wxh + (1+r)a - \tau(wxh, ra) \\ a' &\geq \underline{a} \\ h &\in \mathcal{H} \end{aligned}$$

where w stands for wages, r for the interest rate and $\underline{a}$ is an exogenous borrowing limit. Notice that labor supply is constrained to be in the set $\mathcal{H}$, which we use to incorporate different restrictions on the extensive/intensive labor supply decisions. In the case of the *divisible labor supply* model, the set takes the form of $\mathcal{H} = [0, h_{\max}]$, where $h_{\max}$ is the maximum number of hours a household can work in a period. In the case of *indivisible labor supply* model, the set takes the form of $\mathcal{H} = \{0, \bar{h}\}$, so that households can only choose whether to work $\bar{h}$ hours or not to work at all.[15]

Finally, note that households face a distortionary tax $\tau(wxh, ra)$, which depends on labor income wxh and capital earnings ra separately. We use the function $\tau(\cdot)$ to accommodate different progressive tax schemes and analyze the optimal tax progressivity choice. Section 4.2 below discusses the function we use in more detail.

Every period, households face the problem in (3) and make optimal labor, consumption and saving decisions accordingly. Let $h(a, x), c(a, x)$ and $a'(a, x)$ denote his optimal policies.

Firms: Every period, the firm chooses labor and capital demand in order to maximize current profits,

$$\Pi = \max_{K,L} \left\{ K^{1-\alpha} L^{\alpha} - wL - (r + \delta)K \right\} \tag{4}$$

where δ is the depreciation rate of capital. Optimality conditions for the firm are standard: marginal productivities are equalized to the cost of each factor.

Government: The government's budget constraint is given by:

$$G + (1 + r)D = D + \int \tau(wxh, ra) d\mu(a, x) \tag{5}$$

where D is government's debt and $\mu(a, x)$ is the measure of households with state (a, x) in the economy. Notice that government spending G, as well as the fiscal policies $\tau(\cdot)$ and D, are kept constant. At the end of the section, we will analyze the welfare effect of different tax functions $\tau(\cdot)$.

Equilibrium: Let A be the space for assets and X the space for productivities. Define the state space $S = A \times X$ and $\mathcal{B}$ the Borel $\sigma-$algebra induced by S. A formal definition of the competitive equilibrium for this economy is provided below.

[15]With indivisible labor, it is redundant to have two parameters B and φ. We keep this structure to ease the comparison with an environment with divisible labor in a later section.

Definition 1 *A **recursive competitive equilibrium** for this economy is given by: value function $V(a,x)$ and policies $\{h(a,x), c(a,x), a'(a,x)\}$ for the household; policies for the firm $\{L, K\}$; government decisions $\{G, B, \tau\}$; a measure μ over $\mathcal{B}$; and prices $\{r, w\}$ such that, given prices and government decisions: (i) Household's policies solve his problem and achieve value $V(a,x)$, (ii) Firm's policies solve his static problem, (iii) Government's budget constraint is satisfied, (iv) Capital market clears: $K + D = \int_{\mathcal{B}} a'(a,x)d\mu(a,x)$, (v) Labor market clears: $L = \int_{\mathcal{B}} xh(a,x)d\mu(a,x)$, (vi) Goods market clears: $Y = \int_{\mathcal{B}} c(a,x)d\mu(a,x) + \delta K + G$, (vii) The measure μ is consistent with household's policies: $\mu(\mathcal{B}) = \int_{\mathcal{B}} Q((a,x),\mathcal{B})d\mu(a,x)$ where Q is a transition function between any two periods defined by: $Q((a,x),\mathcal{B}) = \mathbb{I}_{\{a'(a,x)\in\mathcal{B}\}} \sum_{x'\in\mathcal{B}} \pi_x(x',x)$.*

4.2 A Progressive Labor Tax Scheme

We firstassume a tax function $\tau(wxh, ra)$ that is linear in capital income ra and non-linear in labor income wxh. Thus, total taxes paid by the household are given as $\tau(ra, wxh) = \tau_k ra + \tau_L(wxh)whx$; where τ^k is the tax rate capital and $\tau_L(\cdot)$ is the non-linear (progressive) tax on labor income.

4.2.1 Calibration

Some of the model's parameters are standard and we calibrate them to values typically used in the literature. A period in the model is a quarter. We set the exponent of labor in the production function to $\alpha = 0.64$, the depreciation rate of capital to $\delta = 0.025$. Similarly, we set households' coefficient of risk-aversion to $\sigma = 2$ and the Frisch-elasticity of labor supply to $\varphi = 2.5$.[16] We follow Chang and Kim (2007) and set the idiosyncratic labor productivity x shock to follow an AR(1) process in logs: $\log(x') = \rho_x \log(x) + \varepsilon'_x$, where $\varepsilon_x \sim \mathcal{N}(0, \sigma_x)$. Using PSID data on wages from 1979 to 1992, they estimate $\sigma_x = 0.287$ and $\rho_x = 0.989$. To obtain the transition probability function $\pi_x(x', x)$, we use the Tauchen (1986) method. The borrowing limit is set to $\underline{a} = -2$, which is approximately equal to a wage payment and delivers a reasonable distribution of wealth (add Table below). We set capital taxes to $\tau_K = 0.35$, following Chen, Imrohoroglu, and Imrohoroglu (2007).

[16]Notice that the parameter φ is only relevant for the *divisible labor supply* model. See discussion below.

The remaining parameters are calibrated within the model to match several moments. To this end, we need to take a stand on a benchmark value for the tax progressvity γ. Heathcote, Storesletten, and Violante (2014) find a value of $\gamma = 0.15$ by using PSID data on labor income for the years 2001 to 2005; while **?** find a value of $\gamma = 0.065$ using IRS data on total income for the year 2000. We set $\gamma = 0.1$, an intermediate value between these two estimates and close to our estimates in Section 3. The value of λ is computed so that the government's budget constraint is met in equilibrium.

Finally, we jointly calibrate preference parameters β and B, and policy parameters G and D to match an interest rate of 0.01, a government spending over output ratio of 0.15, a government debt-to-output ratio of 2.4, and an employment rate of 60 percent in the model with indivisible labor, which is the average of the Current Population Survey (CPS) from 1964 to 2003.[17] We conduct a similar exercise in the divisible labor model, where we calibrate B such that aggregate output is equal to the one in the indivisible labor steady-state, to avoid possible size effects. Table [ADD TABLE] summarizes the parameter values.

4.2.2 Optimal Tax Progressivity

In order to obtain the optimal tax progressivity, we solve the economy for different levels of γ. In performing these exercises, we keep the level of government debt and spending constant.[18] As Figure 6 shows, we find that assuming divisible labor, the optimal level of progressivity is about $\gamma^\star = 0.08$, very close to the one found in data (see Figure 5). This result is also roughly the same as what is found in the literature. When assuming indivisible labor, results are strikingly different. Figure 7 shows that the optimal level of progressivity is almost one order of magnitude larger, with $\gamma^\star$ around 0.6.[19]

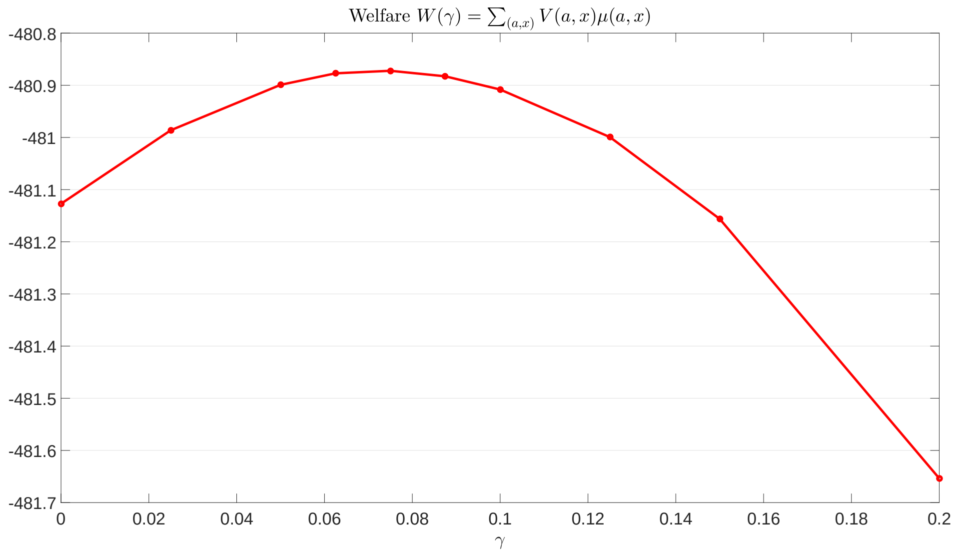
Note that the fact that we find higher optimal progressivity under indivisible labor is not surprising, as labor elasticity is smaller in the model with extensive margin. However, the magnitude

[17] We target an average 60% participation rate as observed in the CPS. As a robustness check, we compare the distribution of participation in our model with PSID data for the 1984 survey. The average participation rate in PSID is 65%, which is close to our target.

[18] [WHAT HAPPENS WITH DEFICIT?]

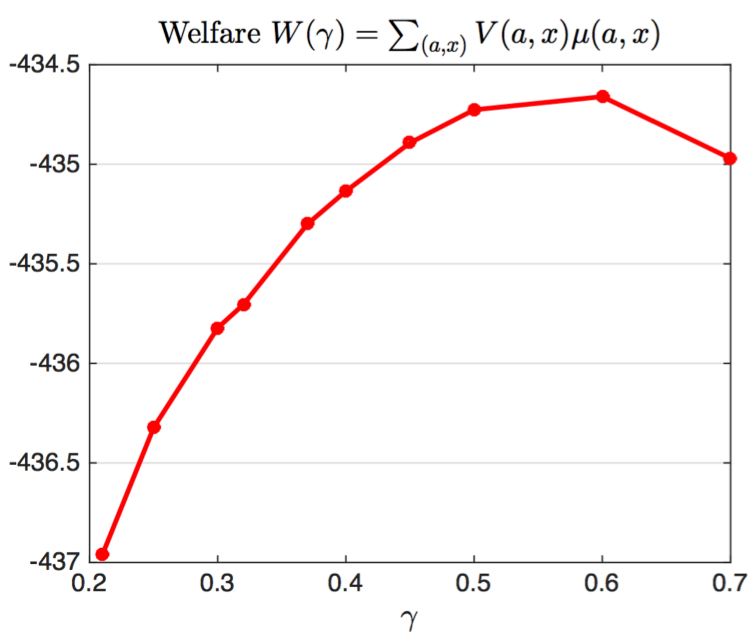
[19] More statistics to compare the differences in γ tba.

Figure 6: Divisible labor: Welfare for different value of tax progressivity γ.



Notes: Welfare obtained under different levels of the tax progressivity parameter γ.

Figure 7: Indivisible labor: Welfare for different value of tax progressivity γ.



Notes: Welfare obtained under different levels of the tax progressivity parameter γ.

of the change is large, despite elasticities in the extensive margin environment being still larger than what is typically found using microdata. In the divisible labor environment, the Frisch elasticity is equal to $\varphi = 2.5$. In the indivisible labor case, we find an aggregate elasticity of hours worked of 1.38. At the heterogenous asset-quintile level, this elasticity ranges from 1 to 2, as shown on the left panel of Figure 8. Translated into efficient labor units, this elasticity falls to around 0.7.

In the US a large part of aggregate fluctuations in hours worked is made at the extensive margin; thus, focusing on the intensive margin only may lead to a significant under-evaluation of the optimal level of tax progressivity in the US.

4.3 Progressive Labor and Capital Tax Scheme

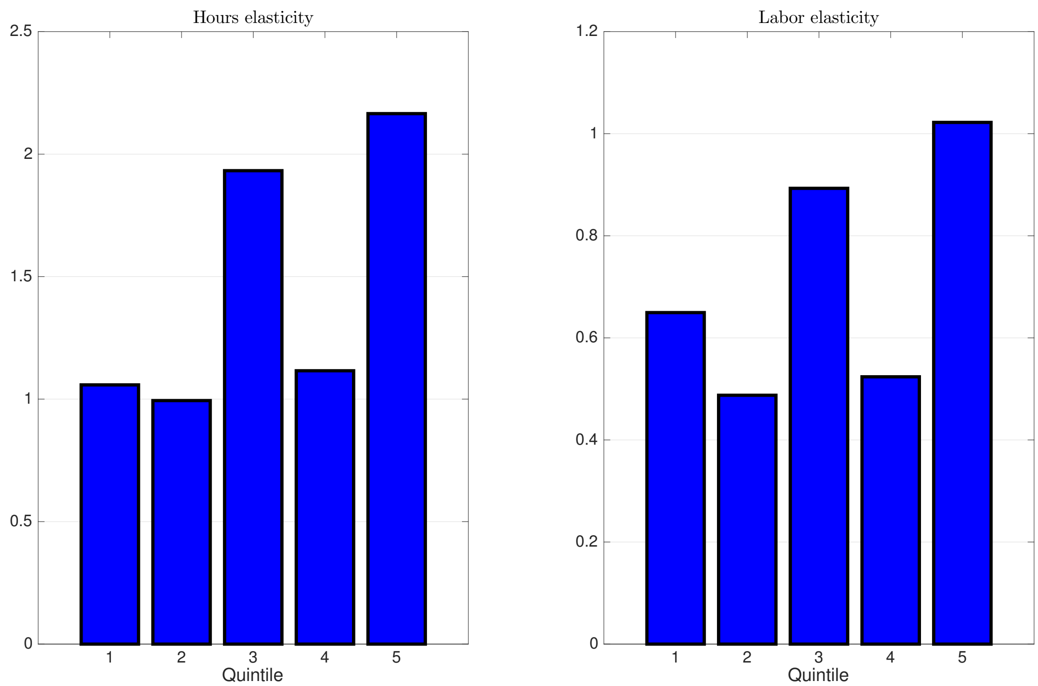
In this section, we conduct a similar exercise using the following tax scheme, previously estimated in our empirical section:

$$T(y_L + y_K) = y_L + y_K - \lambda_L {y_L}^{1-\gamma_L} - \lambda_K {y_K}^{1-\gamma_K} + \lambda_{KL} y_K y_L \tag{6}$$

Calibration and results tba

5 Conclusions

Figure 8: Indivisible labor: Hours worked and Efficient labor elasticities.



Notes: Left panel: hours worked response per asset quintile to a change of 1% in pre-tax wage. Left panel: efficient labor response per asset quintile to a change of 1% in pre-tax wage.

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A Data Description

B Data Computations

C Estimation: Additional Details

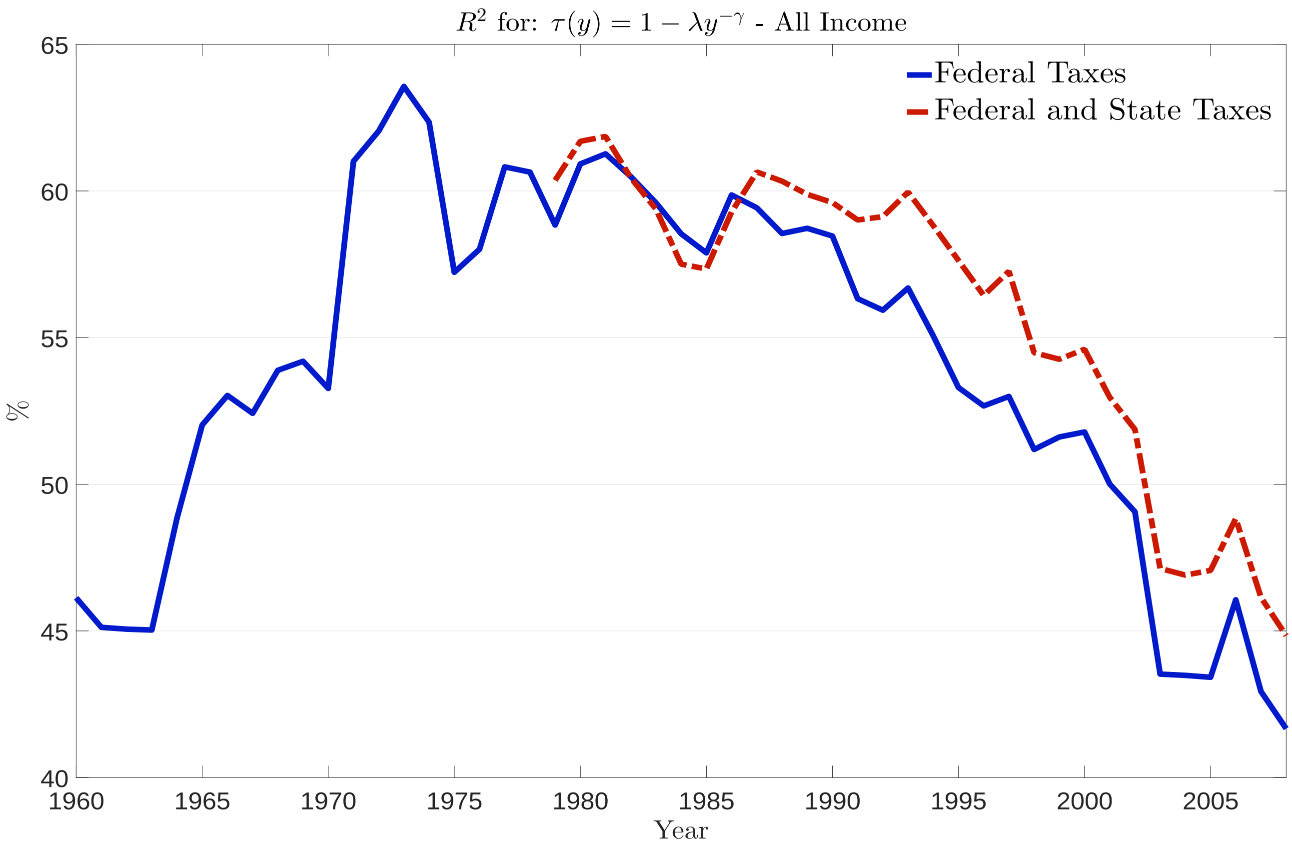

Figure 9: R^2 estimate. All income - years 1960:2008