The political economy of joint taxation*

Felix J. Bierbrauer Pierre C. Boyer Andreas Peichl Daniel Weishaar

February 26, 2025

Abstract

Joint taxation of married couples represents a puzzle for welfare economics. We investigate whether political economy forces can explain its persistence. We develop sufficient statistics to determine whether a reform towards individual taxation would garner majority support and apply this framework to the U.S. tax system since the 1960s. Our findings indicate that support for individual taxation has increased over time. As of today, 50% of all married individuals would benefit from such a reform. Among those worse off are poor single-earner couples. A reform that reduces marriage bonuses also for them is rejected by a social welfare function that concentrates weights at the bottom of the distribution.

Keywords: Taxation of couples; Tax reforms; Optimal taxation; Political economy; Non-linear income taxation.

JEL classification: C72; D72; D82; H21.

*__Bierbrauer__: CMR - Center for Macroeconomic Research, University of Cologne, Germany (bierbrauer@wiso.uni-koeln.de); __Boyer__: CREST, École Polytechnique, Institut polytechnique de Paris, France (pierre.boyer@polytechnique.edu); __Peichl__: ifo Munich, LMU Munich, CESifo, IHS and IZA (peichl@econ.lmu.de); __Weishaar__: LMU Munich (daniel.weishaar@econ.lmu.de).
We are extremely grateful to Dan Feenberg for granting us access to the NBER TAXSIM model and providing feedback on our simulations. This paper uses TAXSIM v32 in combination with the Current Population Survey (CPS) data. We thank Micael Castanheira, Philippe Choné, Bram De Rock, Antoine Ferey, Mikhail Golosov, Emanuel Hansen, Hilary Hoynes, Bas Jacobs, Laurence Jacquet, Étienne Lehmann, Tidiane Ly, Jean-Baptiste Michau, Barbara Petrongolo, Dominik Sachs, Emmanuel Saez, Stefanie Stantcheva, Guido Tabellini, Dmitry Taubinsky, Michèle Tertilt, Alain Trannoy, and Nicolas Werquin. We also appreciate the comments of seminar and conference audiences at CREST-École Polytechnique, Mannheim, Paris Fiscal Study Group, CESifo Area Conference on Public Sector Economics, Public economics Workshop at LMU Munich, IIPF 2022, ifo Institute, UC Berkeley, Marseille, Paris School of Economics, Seminar Economic theory CES, University of Bristol, ECARES, Collège de France-PSE-INSEAD. Manuel Pannier provided excellent research assistance. The authors gratefully acknowledge support by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) under Germany's Excellence Strategy – EXC2126/1 – 390838866 as well as via CRC TRR 190 (project number 280092119) and the Investissements d'Avenir (ANR-11-IDEX-0003/Labex Ecodec/ANR-11-LABX-0047), ANR-19-CE41-0011-01 and ANR-20-CE41-0013-01. Weishaar gratefully acknowledges support from the Joachim Herz Foundation and the Fritz Thyssen Foundation.

1 Introduction

A basic lesson from the theory of optimal taxation is that the intensity of behavioral responses matters for the design of taxes. The larger the elasticities that capture those behavioral responses, the greater the distortionary effects of taxation. Consequently, whatever the welfare function, optimal taxes are lower when elasticities are larger. As has been noted by Boskin and Sheshinski (1983), when applied to the taxation of married couples, this implies that primary earnings should be taxed at a higher rate than secondary earnings. Secondary earners are more likely to work part-time, if at all, and these choices are more responsive to tax incentives than those of primary earners who mostly work full time. Recent literature has moreover shown that tax incentives play an important role in explaining differences in female labor force participation across countries.[1] In some countries – including France, Germany and the US – the incomes of the spouses in a couple are taxed jointly; that is, the tax base is the sum of primary and secondary earnings. A direct implication is that the marginal tax rates on primary and secondary earnings are equal. This suggests that it is possible to improve welfare and raise more tax revenue by a reform that leads away from *joint taxation.* Such a reform would also bring more women to the labour market and improve the earnings incentives of those women who already are on the labour market. If all that is so clear, why are these reforms not taking place?

In this paper, we want to see whether political economy forces can provide an explanation. There is a rich body of literature on the political economy of taxation, which we discuss in more detail below. A focal question of this literature has been how changes in the inequality of market incomes affect the demand for redistributive policies.[2] To the best of our knowledge, there is no

[1] See, e.g., Gustafsson (1992), Blundell and MaCurdy (1999), Blau and Kahn (2007), Eissa and Hoynes (2004), LaLumia (2008), Kaygusuz (2010), Bargain, Orsini and Peichl (2014), Selin (2014), and Neisser (2021).

[2] The Meltzer-Richard hypothesis is a well-known result from this literature: If the gap between mean and median income goes up, the size of government is predicted to go up as a result.

prior literature on the political economy of joint taxation. A contribution of this paper therefore is to add gender and marital status to the political economy of taxation. In recent decades, the population shares of unmarried individuals and of individuals living in dual-earner couples have gone up, whereas the population share of single earner couples has gone down. Consequently, the population share of those who benefit the most from the marriage bonuses that are implied by joint taxation has gone down. This leads to the question whether the support for alternatives to joint taxation has increased over time and whether such alternatives might eventually become politically feasible.

In the theory part, we develop tools for such an analysis. These tools can be used for an analysis of hypothetical reforms, in particular for reforms that, in line with the prescriptions of optimal tax theory, lower marginal tax rates for secondary earners and increase them for primary earners. Getting there requires a detailed analysis of how primary and secondary earners respond to changes of the tax system, and an aggregation that allows us to keep track of implications for tax revenue. We then exploit the mathematical properties of functional derivatives to determine the extent to which marginal tax rates on secondary earnings can be reduced if the marginal tax rates on primary earnings are slightly increased, ensuring the reform remains revenue-neutral. Once we have all of this available, we can draw the line between couples who are made better off and couples who are made worse off if such a reform is undertaken. This constitutes the paper's methodological contribution.[3] While it focusses on the marginal effects of reforms that stay in a vicinity of the status quo, we show that our approach can be extended to large reforms and this enables us to evaluate not just hypothetical reforms, but also reforms that actually took place. We use these insights in the empirical part of the paper.

[3]This approach of first constructing revenue-neutral reforms and then checking their political feasibility or their implications for social welfare can also be applied to other policy design problems. Thus, the paper's methodological contribution is not tied to an analysis of joint taxation. It could, for instance, be used, to analyze changes of the mix between direct and indirect taxes. Bierbrauer (2024) uses a related approach for an evaluation of emission-neutral changes of climate policy.

Specifically, we analyze what the major reforms of the federal income tax in the US since the 1960s implied for the relative tax treatment of singles, single-earner and dual-earner couples. This empirical analysis of joint taxation in the US is the paper's substantive contribution.

Theory. We consider a status quo tax system with joint taxation. Couples are assumed to maximize their joint surplus, defined as the difference between the couples' disposable income and the spouses' effort costs. There are both fixed and variable costs of productive effort so that behavioral responses to taxation are at the intensive and at the extensive margins. As we formally show, with joint and progressive taxation as the status quo, there is an interdependency of primary and secondary earnings. If, say, the marginal tax rate on secondary earnings goes down, and secondary earnings increase as a response, then joint earnings go up and hence also the tax rate faced by the primary earner, who now has an incentive to adjust his or her earnings in response. We provide a detailed analysis of such behavioral responses to tax reforms and their implications for overall tax revenue.

We assume that revenue changes are rebated lump-sum. Consequently, a reform is politically feasible – in the sense of being preferred by a majority of individuals over the status quo – if the extra tax revenue outweighs increases of the tax burden for at least half of the population. A reform is desirable according to some measure of social welfare if the gains of the reform winners are weighted higher than the losses of the reform losers.

Revenue-neutral reforms towards individual taxation are of particular interest to us. These are reforms that reduce marriage bonuses: Marginal tax rates on secondary earnings are decreased and marginal tax rates on primary earnings are increased, with the tax changes calibrated such that the reform is revenue-neutral overall. We derive simple, intuitive, and easily applicable sufficient-statistics formulas that can be used to evaluate such reforms from both from a political economy and a social welfare perspective.

The political economy of joint taxation in the US. Our empirical analysis of past reforms in the US makes use of the Current Population Survey (CPS) and of NBER's TAXSIM microsimulation model. We go through the eleven major reforms of the federal income tax since the 1960s and present a detailed analysis of how marriage penalties and bonuses were affected.[4]

We do not identify systematic changes in the tax treatment of married couples relative to singles from 1960 to today. The distribution of marriage bonuses in the recent past looks, by and large, very much like the distribution of marriage bonuses in the early 1960s. Moreover, none of those reforms led away from joint taxation. As of today and as of 1960, the tax base for married couples is the joint income.

Our analysis of hypothetical reforms that lead away from joint taxation provides a potential explanation. We show that the share of married individuals who would benefit from a revenue-neutral reform towards individual taxation has been increasing since the 1960. The share was 20 percent in 1960 and surpassed the 50 percent threshold only recently. Thus, even today, moving away from joint taxation may provoke substantial political backlash.

It is also not clear that such a reform would be desirable from a welfare perspective. Revenue-neutral reforms towards individual taxation create winners and losers. Losers are couples with the lion's share of the joint income being due to the primary earner. For such couples, the increase of the tax rates on primary earnings is the dominant effect. The lower rates on secondary earnings can mitigate, but not offset, this effect. Winners, by contrast, are couples with secondary earnings close to primary earnings.

Single-earner couples are more concentrated in the bottom deciles of the couples' income distribution. Consequently, a Rawlsian social welfare function would not approve a revenue-neutral reform towards individual taxation. By contrast, an "Affirmative Feminist" social welfare function – one that assigns

[4]We present a more detailed analysis of theses reforms in part C of the Appendix. There, we analyze separately for singles and for married couples where the reform winners and the reform losers were located in the income distribution. We also look into whether the reform winners formed a majority and we check whether social welfare measures went up or down.

greater weight to couples where the woman has higher earnings – would approve it. This shows that, given a status quo with joint taxation, a reduction of marriage bonuses may be controversial also from a welfare perspective.

The reforms discussed so far reduce marriage bonuses in a particular way: They drive a wedge between the marginal tax rate of the primary earner and the marginal tax rate of the secondary earner. This wedge is the same everywhere in the income distribution. We also explore reform directions that break with individual taxation in a different way. Specifically, we show that a revenue-neutral reform that increases marginal tax rates on primary earnings only in the upper half of the income distribution and lowers the tax rates on secondary earnings across the board, would make roughly 70 percent of all married individuals better off. The reform would moreover be approved both by a Rawlsian and by a Feminist welfare measure.

Finally, we investigate reform directions that are inspired by reforms that took place in Sweden in 1971 and the UK in 1990. Both reforms introduced individual taxation. In Sweden, the reform was accompanied by tax cuts at the bottom of the income distribution. In the UK, there were tax cuts for all incomes. We find that, as of today, a "Swedish reform" would achieve majority support in the US, whereas a "British reform" would not.

The general insight that emerges from these analyses is that breaking with joint taxation can be a hardship for single-earner couples at the bottom of the income distribution. A reform towards individual taxation that seeks to achieve both majority support and an unambiguous welfare improvement therefore needs to make sure that these couples are not made worse off.

Outline. The next section discusses related literature. Section 3 introduces a conceptual framework to analyze tax reforms, given a status quo with joint taxation. We present an empirical analysis of historical tax reforms in the US in Section 4. We develop tools for an analysis of revenue-neutral reforms towards individual taxation in Section 5 and apply them to data in Section 6. Concluding remarks can be found in Section 7. Formal proofs, additional empirical findings and robustness checks are relegated to Appendices.

2 Related literature

Seminal contributions to the political economy of taxation have focused on linear taxes, see Roberts (1977) and Meltzer and Richard (1981), and established median-voter results.[5] More recent contributions have focused on the complications associated with non-linear income taxation while maintaining an emphasis on redistribution from "the rich" to "the poor".[6]

We bring a political economy perspective to the rich literature that studies the optimal taxation of couples. The literature following Boskin and Sheshinski (1983) has covered non-linear taxes and a wide range of behavioral responses.[7] We analyze potential reform directions in the vicinity of a status quo tax system that has been inherited from the past.[8] Kleven et al. (2009) and Golosov and Krasikov (2023) approach the optimal taxation of couples as a problem of multi-dimensional screening. Bierbrauer, Boyer, Peichl and Weishaar (2024) study a related setup using a dual rather than a primal approach and provide conditions under which Pareto- or welfare improving reforms can be found.[9]

[5]See, for a review, Acemoglu, Naidu, Restrepo and Robinson (2015).

[6]See, e.g., Farhi, Sleet, Werning and Yeltekin (2012), Scheuer and Wolitzky (2016), Acemoglu, Golosov and Tsyvinski (2008), Acemoglu, Golosov and Tsyvinski (2010), Bierbrauer and Boyer (2016), Brett and Weymark (2017), and Bierbrauer, Tsyvinski and Werquin (2022). See, for a review, Berliant and Boyer (2024).

[7]See, e.g., Kleven, Kreiner and Saez (2009), Immervoll, Kleven, Kreiner and Verdelin (2011), Cremer, Lozachmeur and Pestieau (2012), Gayle and Shephard (2019), Malkov (2020), Alves, da Costa, Lobel and Moreira (2021), Ales and Sleet (2022), and Golosov and Krasikov (2023).

[8]This perturbation approach is frequently used in optimal tax theory. References include Piketty (1997), Saez (2001), Golosov, Tsyvinski and Werquin (2014), Saez and Stantcheva (2016), Lorenz and Sachs (2016), Sachs, Tsyvinski and Werquin (2020), Jacquet and Lehmann (2021b), Jacquet and Lehmann (2021a), Bergstrom and Dodds (2021), Bierbrauer, Boyer and Hansen (2023b), Ferey, Lockwood and Taubinsky (2024), or Spiritus, Lehmann, Renes and Zoutman (forthcoming). Gender-based taxation, see Alesina, Ichino and Karabarbounis (2011), is a related topic.

[9]A complementary strand of literature examines the implications of joint taxation in quantitative dynamic models see, e.g. Guner, Kaygusuz and Ventura (2012), Guner, Kaygusuz and Ventura (2014), Bick and Fuchs-Schündeln (2017), Borella, De Nardi, Pak, Russo and Yang (2022), Borella, De Nardi and Yang (2023), and Olsson (forthcoming). Holter,

This paper is related to Bierbrauer, Boyer and Peichl (2021) in that it does not provide a game-theoretic analysis of political competition over non-linear taxes. Instead, it focuses on the existing status quo tax system and examines whether reforms to this system could garner majority support. There are also important differences, however. Here, we bring in heterogeneity in marital status and in the composition of joint earnings, whereas Bierbrauer et al. (2021) only distinguish "tax units" that differ in income. Moreover, they focus on a class of monotonic tax reforms, which have the property that majority support coincides with support from tax units with incomes close to the median. This characterization does not apply to the reforms which are at the center in this paper.

Theorem 1 and Proposition 1 below constitute this paper's theoretical contribution. Together these results clarify the conditions under which revenue-neutral reforms towards individual taxation are politically feasible and /or desirable from a social welfare perspective. The proofs use some insights from Bierbrauer et al. (2024). Otherwise, the papers do not overlap.

We complement our theoretical analysis with an empirical approach using the TAXSIM microsimulation model and CPS microdata.[10] The microsimulation model leverages detailed data on individual characteristics, allowing us to determine the implications of tax reforms on individual welfare at the tax-unit level.

3 The model

The status quo. We consider a status quo tax system in which married couples are taxed according to their joint income. Formally, the status quo tax

Krüger and Stepancuk (2023) use such a framework to show that the transition from joint to individual taxation comes with an increase in the government's ability to generate tax revenue.

[10] Our empirical approach builds on and extends work by Eissa, Kleven and Kreiner (2008), Bargain, Dolls, Immervoll, Neumann, Peichl, Pestel and Siegloch (2015) and Bierbrauer et al. (2021). Similar approaches have also been used for the purpose of ex-ante policy evaluation, see Immervoll, Kleven, Kreiner and Saez (2007) for a prominent example.

system consists of two tax functions. The tax function that applies to singles is denoted by $T_{s0} : y_s \mapsto T_{s0}(y_s)$, where y_s is a single's before-tax income. Married couples are taxed according to the function $T_{m0} : y_m \mapsto T_{m0}(y_m)$, where $y_m = y_1 + y_2$ is the couple's joint income, y_1 is the income of the primary earner and y_2 is the income of the secondary earner.[11] We assume that T_{0s} and T_{0m} are increasing, continuous and convex.

A tax reform replaces the status quo tax functions (T_{s0}, T_{m0}) by new tax functions (T_{s1}, T_{m1}). We introduce a formalism for the analysis of such tax reforms below. Before that, we clarify how we measure marriage penalties and bonuses.

Marriage penalties and bonuses. Given a tax system (T_s, T_m), we define the splitting function $y_m \mapsto \sigma(y_m)$ so that $\sigma(y_m)$ is the solution to

$$T_m(y_m) \quad = \quad \sigma(y_m)\, T_s\left(\frac{y_m}{\sigma(y_m)}\right) . \tag{1}$$

For instance, the tax system in Germany has $\sigma(y_m) = 2$, for all y_m. That is, all married couples are taxed as if they consisted of two singles who each contribute fifty percent to the joint income. The splitting function $\sigma : y_m \mapsto \sigma(y_m)$ allows for more general forms of income splitting. The interpretation is that married couples are taxed is as if each partner was assigned a fraction $\frac{1}{\sigma(y_m)}$ of the couple's joint income, and then the couple is treated as if it had a number of $\sigma(y_m)$ individuals who are all taxed according to the schedule for singles. We can then say that a couple with joint income y_m benefits from a marriage bonus if

$$\sigma(y_m)\, T_s\left(\frac{y_m}{\sigma(y_m)}\right) \quad < \quad T_s(y_1) + T_s(y_2) ,$$

and suffers from a marriage penalty with the reverse inequality. With progressive taxation, $\sigma(y_m) \geq 2$ implies a marriage bonus and $\sigma(y_m) \leq 1$ implies

[11] For the purposes of the theory, "primary" and "secondary" are labels that carry no further meaning. In our empirical application, we assign the label "primary earner" to the spouse whose earnings are higher.

a marriage penalty, for all possible triplets (y_m, y_1, y_2) with $y_1 > y_2$. When $\sigma(y_m) \in (1,2)$, there is an intermediate value $\bar{\sigma}(y_m)$ which solves

$$\bar{\sigma}(y_m)\, T_s\left(\frac{y_m}{\bar{\sigma}(y_m)}\right) = T_s(y_1) + T_s(y_2)\ ,$$

so that there is neither a bonus nor a penalty. The intermediate value not only depends on the married couple's total income but also on the income share of the primary earner. Specifically, for given y_m, $\bar{\sigma}(y_m)$ decreases in the income share of the primary earner.[12] Thus, given y_m and $\sigma(y_m) \in (1,2)$, spouses with rather unequal incomes benefit from a marriage bonus and spouses with more equal incomes suffer from a marriage penalty.

In our empirical analysis of joint taxation in the US, we first estimate the splitting function and then document how it has shifted over time, with upward shifts implying that more couples benefited from marriage bonuses and downward shifts implying that more couples suffered from marriage penalties (see Figure 2 below).[13]

Tax reforms. We introduce a framework for an analysis of tax reforms in this setting. We then distinguish reforms *in* this system and reforms *of* this system. Reforms *in* the system yield changes of tax rates while the tax base for married couples does not change. It's the joint income. Consequently, the primary and the secondary earner face the same marginal tax rate both before and after the reform. Reforms *of* the system, by contrast, drive a wedge between the marginal tax rates on primary earnings and those on secondary earnings.

[12] To see this, let $\pi = \frac{y_1}{y_m}$ be the income share of the primary earner and write

$$\bar{\sigma}(y_m)\, T_s\left(\frac{y_m}{\bar{\sigma}(y_m)}\right) = T_s(\pi\ y_m) + T_s((1-\pi)y_m)\ .$$

Employing the implicit function theorem and using the convexity of T_s makes it possible to verify that $\bar{\sigma}(y_m)$ is decreasing in π.

[13] For details on the estimation of the empirical splitting function and its ingredients, see Appendix B.3.2.

A tax reform replaces the status quo tax functions (T_{s0}, T_{m0}) by new tax functions (T_{s1}, T_{m1}) so that

$$T_{s1}(y_s) = T_{s0}(y_s) + \tau_s \, h_s(y_s) \ , \quad \text{and}$$

$$T_{m1}(y_1, y_2) = T_{m0}(y_m) + \tau_m \, h_m(y_1, y_2) \ .$$

We refer to the functions $h_s : y_s \mapsto h_s(y_s)$ and $h_m : (y_1, y_2) \mapsto h_m(y_1, y_2)$ as reform directions, whereas the scalars $\tau_s \geq 0$ and $\tau_m \geq 0$ are measures of reform intensity. For some of our analysis, we focus on reforms that stay in the vicinity of the status quo. Then, τ_s and τ_m are close to zero.

A reform *in* the system is such that h_m is a function of $y_m = y_1 + y_2$. All changes in marriage penalties and bonuses that occurred in the US since the 1960s were implied by reforms *in* the system, in particular by changes in the relative tax treatment of couples and singles. A reform *of* the system, by contrast, breaks with joint taxation. To give an example, let

$$h_m(y_1, y_2) = \tau_1 \, y_1 + \tau_2 \, y_2 \ ,$$

with $\tau_1 > 0$ and $\tau_2 < 0$. Then, after the reform, the marginal tax rate on primary earnings is higher than in the status quo, and the marginal tax rate on secondary earnings is lower:

$$\begin{aligned} \frac{\partial T_{m1}(y_1, y_2)}{\partial y_1} &= T'_{m0}(y_1 + y_2) + \tau_m \, \tau_1 > T'_{m0}(y_1 + y_2) \ , \quad \text{and} \\ \frac{\partial T_{m1}(y_1, y_2)}{\partial y_2} &= T'_{m0}(y_1 + y_2) + \tau_m \, \tau_2 < T'_{m0}(y_1 + y_2) \ . \end{aligned}$$

Earnings choices. We assume that there is a bounded set of feasible earnings levels $\mathcal{Y} = [0, \bar{y}]$, where $\bar{y}$ can be arbitrarily large. Singles choose $y_s \in \mathcal{Y}$ so as to maximize $C_0(y_s) - K_s(y_s, \theta_s)$, where a single's disposable income is given by

$$C_s(y_s) = b_s + y_s - \Big(T_{s0}(y_s) + \tau_s \, h_s(y) \Big)$$

and a single's costs of productive effort is given by

$$K_s(y_s, \theta_s) = k_s(y_s, \omega_s) + \phi_s \, \mathbf{1}(y_s > 0) \ .$$

We let $T_{0s}(0) = h_s(0) = 0$. Hence, b_s is the intercept of the consumption schedule that singles are facing, or, equivalently, the transfer to a single with no earnings. To allow for behavioral responses to taxation both at the intensive and the extensive margin, we assume that the generation of earnings comes with fixed and variable costs. The latter are captured by the function k_s which is increasing in the first argument, $k_{s,1} > 0$, satisfies the usual Inada conditions and, moreover, is such that $k_{s,12} < 0$, i.e., marginal effort costs decrease in ω_s. We refer to ω_s also as a single's productive ability. The fixed cost of generating positive earnings is denoted by ϕ_s. We write $\theta_s = (\omega_s, \phi_s)$ for a single's type and denote the utility-maximizing earnings choice by $y_s^*(\tau_s, h_s, \theta_s)$. We denote the pre-reform choice by $y_s^0(y_s) = y_s^*(0, h_s, \theta_s)$. The distribution of θ_s in the subpopulation of singles is represented by a *cdf* F_s.

The spouses in a married couple solve the following problem: Choose $y = (y_1, y_2)$ to maximize $C_m(y) - K(y, \theta)$, where the couple's disposable income is given by

$$C_m(y) \quad = \quad b_m \; + \; y_1 + y_2 \; - \; \Big(T_{m0}(y_1 + y_2) + \tau_m \; h_m(y_1, y_2) \Big) \; .$$

and its costs of productive effort are given by

$$K(y, \theta) \quad = \quad k_1(y_1, \omega_1) \; + \; \varphi_1 \, \mathbf{1}(y_1 > 0) \; + \; k_2(y_2, \omega_2) \; + \; \varphi_2 \, \mathbf{1}(y_2 > 0) \; .$$

Again, we assume that $T_{0m}(0, 0) = h_m(0) = 0$. The spouses costs functions are defined analogously to the ones for singles. Note, however, that the cost functions k_s, k_1 and k_2 are not assumed to be the same. A couple is characterized by a pair $\omega = (\omega_1, \omega_2)$ of productive abilities and a pair of fixed costs $\varphi = (\varphi_1, \varphi_2)$. We will sometimes write for short $\theta = (\omega, \varphi)$ with $\theta_1 = (\omega_1, \varphi_1)$ and $\theta_2 = (\omega_2, \varphi_2)$. We denote the utility-maximizing earnings choices by $y^*(\tau_m, h_m, \theta)$ and write $y^0(\theta) = (y_1^0(\theta), y_2^0(\theta))$ for earnings in the status quo. The joint distribution of θ_1 and θ_2 is denoted by F_θ.

Under the additional assumption that disposable income is a public good for the spouses, the assumption that couples maximize their joint surplus is consistent with them engaging in Nash bargaining to determine their respective

contributions to the couples' joint income.[14]

The mass of tax units is normalized to 1, with the shares of singles and married couples denoted respectively by ν_s and $\nu_m = 1 - \nu_s$. The mass of individuals is therefore $\nu_s + 2\,\nu_m$.

Preferences over tax reforms. A generic tax reform is henceforth represented by (τ, h) with $h = (h_1, h_2)$ and $\tau = (\tau_s, \tau_m)$. We derive preferences over tax reforms from indirect utility functions. Let $V_s(\tau, h, \theta_s)$ be the indirect utility realized by a single of type θ_s after a tax reform (τ, h) has taken place. We denote the pre-reform level by $V_{0s}(\theta_s)$. Then $V_s(\tau, h, \theta_s) - V_{0s}(\theta_s)$ is the reform-induced change in indirect utility for a single with characteristics θ_s. Analogously, $V(\tau, h, \theta) - V_0(\theta)$ is the reform-induced change in indirect utility experienced by the spouses in a married couple with characteristics θ.

We denote by $R(\tau, h)$ the change in overall tax revenue due to the reform. This is an endogenous object that will be more fully characterized below. We assume that changes in tax revenue, if any, are rebated lump-sum at the tax unit level. Together with the assumption that the joint after-tax income is a public good for the spouses in a married couple, this implies that all individuals draw the same benefits from changes in overall tax revenue. Differences in preferences over tax reforms are therefore entirely due to differences in how a reform affects individual tax burdens.[15]

Political feasibility. Given a tax reform (τ, h), we measure the support amongst singles by

$$S_s(\tau, h) \quad := \quad \mathbf{E}_{\theta_s}\left[\mathbf{1}\Big(V_s(\tau, h, \theta_s) - V_{0s}(\theta_s) > 0\Big)\right] \ ,$$

i.e., by the fraction of singles who are made better off. Analogously, the opposition amongst singles is given by

$$O_s(\tau, h) \quad := \quad \mathbf{E}_{\theta_s}\left[\mathbf{1}\Big(V_s(\tau, h, \theta_s) - V_{0s}(\theta_s) < 0\Big)\right] \ .$$

[14] See Appendix A.10 of Bierbrauer et al. (2024).

[15] A more general formalism that entails the possibility of different tax rebates for singles and for married couples can be found in Bierbrauer, Boyer, Peichl and Weishaar (2023a).

We define support and opposition amongst married individuals analogously and write $S(\tau, h)$ for the fraction of married couples that benefit from a reform and $O(\tau, h)$ for the fraction of married couples that are made worse off. We say that a reform achieves, respectively, majority support amongst singles or married individuals if $S_s(\tau, h) > O_s(\tau, h)$ or $S(\tau, h) > O(\tau, h)$. We say that a reform is politically feasible if the reform winners outnumber the reform losers, i.e. if

$$\nu_s\Big(S_s(\tau, h) - O_s(\tau, h)\Big) \; + \; 2\nu_m\Big(S(\tau, h) - O(\tau, h)\Big) \quad > \quad 0 \; .$$

This notion of political feasibility requires that a reform be preferred by a sufficiently large fraction of individuals over the status quo. For concreteness, we identify "sufficiently large" with "majority support". Political feasibility then holds provided that the reform would win a majority against the status quo if there was a referendum with universal participation by all taxpayers. In part C.2 of the Appendix we provide detailed information on which of the major tax reforms in the US achieved (i) majority support amongst singles, (ii) majority support amongst married individuals, and (iii) majority support amongst all taxpayers. The next section contains a summary of this analysis.

Social welfare. The change in welfare due to a tax reform is given by

$$\begin{aligned} \mathcal{W}(\tau, h) \;\; &= \;\; \nu_s \, \mathbf{E}_{\theta_s}\Big[g_s(\theta_s)\Big(V_s(\tau, h, \theta_s) - V_{0s}(\theta_s)\Big)\Big] \\ &\quad + 2\nu_m \mathbf{E}_{\theta}\Big[g(\theta)\Big(V(\tau, h, \theta_m) - V_0(\theta)\Big)\Big] \; , \end{aligned} \tag{2}$$

where the functions $\theta_s \mapsto g_s(\theta_s)$ and $\theta \mapsto g(\theta)$ specify, reflectively, welfare weights for singles and married individuals as functions of their characteristics θ_s and $\theta = (\theta_1, \theta_2)$.

In part C.3 of the Appendix, we present a detailed evaluation of the major tax reforms in the US using various social welfare functions. We summarize the results below.

Marginal effects. The derivatives of V_s and V with respect to τ, evaluated at $\tau = 0$ give respectively, the marginal effect of reform in direction h on the

utility realized by singles and couples. By the envelope theorem (see Milgrom and Segal (2002)):

$$\frac{\partial}{\partial \tau} V_s(\tau, h, \theta_s)_{|\tau=0} \;:=\; V_{s,\tau}(h, \theta_s) \;=\; R_\tau(h) - h_s(y_s^0(\theta_s)) \;, \tag{3}$$

and

$$\frac{\partial}{\partial \tau} V(\tau, h, \theta)_{|\tau=0} \;:= V_\tau(h, \theta) \;=\; R_\tau(h) - h_m(y^0(\theta)) \;, \tag{4}$$

where $R_\tau(h) := \frac{\partial}{\partial \tau} R(\tau, h)_{\tau=0}$ is the reform's marginal impact on tax revenue, evaluated at the status quo, i.e. for $\tau = 0$. These equations show that whether a tax unit benefits from a reform simply depends on how the change of transfers compares to the change in the tax obligation due to the reform. A single benefits when $R_\tau(h) - h_s(y_s^0(\theta_s)) > 0$ and is made worse off otherwise. Likewise, the spouses in a married couple benefit if $R_\tau(h) - h_m(y^0(\theta)) > 0$ and lose otherwise.

Normalizing welfare weights so that $\nu_s \, \mathbf{E}_{\theta_s} [g_s(\theta_s)] + \, 2\nu_m \mathbf{E}_\theta [g(\theta)] = 1$, the marginal effect on welfare associated with reform direction h is given by

$$\begin{aligned} \mathcal{W}_\tau(h) \;=\; & R_\tau(h) - \nu_s \, \mathbf{E}_{\theta_s} [g_s(\theta_s) h_s(y_s^0(\theta_s)] \\ & - 2\nu_m \mathbf{E}_\theta [g(\theta) h_m(y^0(\theta))] \quad . \end{aligned} \tag{5}$$

An extension of our framework that enables an analysis of large reforms can be found in part A.3 of the Appendix. From our analysis of small reforms, we know the marginal effects of a given reform *direction* on the indirect utilities of singles and couples. We then integrate over these marginal effects, with the bounds of integration reflecting the *scale* of the reform. We thereby obtain upper and lower bounds for a large reform's impact on individual welfare. From there, an analysis of the political economy and the welfare implications of large reforms is straightforward.

4 Marriage penalties and bonuses in the US since the 1960s

In the following, we use data from the Annual Social and Economic Supplement of the Current Population Survey (CPS-ASEC) combined with the TAXSIM (v32) microsimulation model.[16] Thereby, we obtain detailed information on the characteristics of tax units, such as their sources of income or their number of children. This detailed information enables us to compute what taxes a single or a married couple has to pay under a given tax system T_0. It also makes it possible to compute what taxes they would have to pay under an alternative tax system T_1 and hence, the change in the tax burden associated with a reform that replaces T_0 by T_1.

Demographic trends. Since the 1960s, the share of singles relative to married couples has increased in the US. Also, the share of dual earner couples has increased relative to single-earner couples. These changes have taken place continuously (see Figure 1) and have implications for the taxation of families, which we discuss below.

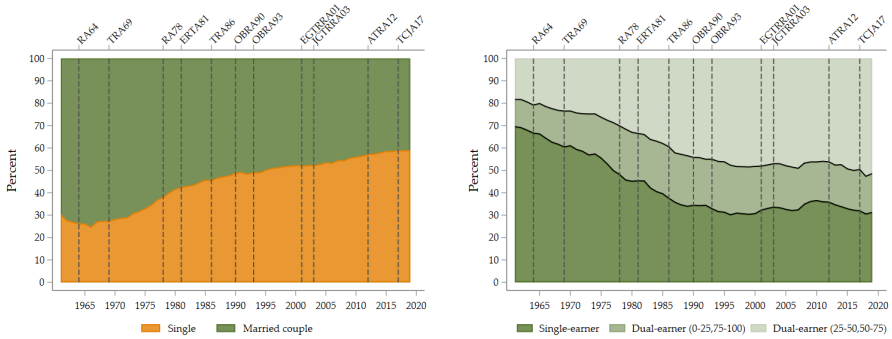
The splitting function over time. Figure 2 shows the splitting-function σ in selected years – years close to reforms that had a significant impact on marriage penalties and bonuses – to give an indication of how marriage bonuses and penalties have evolved over time due to changes in the tax system.[17] The

[16] See Flood, King, Rodgers, Ruggles, Warren and Westberry (2021) and `https://cps.ipums.org` for a detailed description of CPS data. Appendix B.1 provides details on the data preparation. We use CPS data because it provides separate demographic and earnings information for both spouses. In contrast, the tax return microdata (SOI-PUF) from the Internal Revenue Service (IRS) used in Bierbrauer et al. (2021) does not contain this information (except for the year 1974; see Figure B.1 for a comparison). See Feenberg and Coutts (1993) and `https://users.nber.org/~taxsim/` for detailed information on the TAXSIM microsimulation model.

[17] The estimated σ-function relates the mean average tax rates across *all* singles (baseline) to the mean average tax rates across all couples (comparison). However, average tax rates

Figure 1: Demographic change over time

(a) Tax unit types (b) Couple types

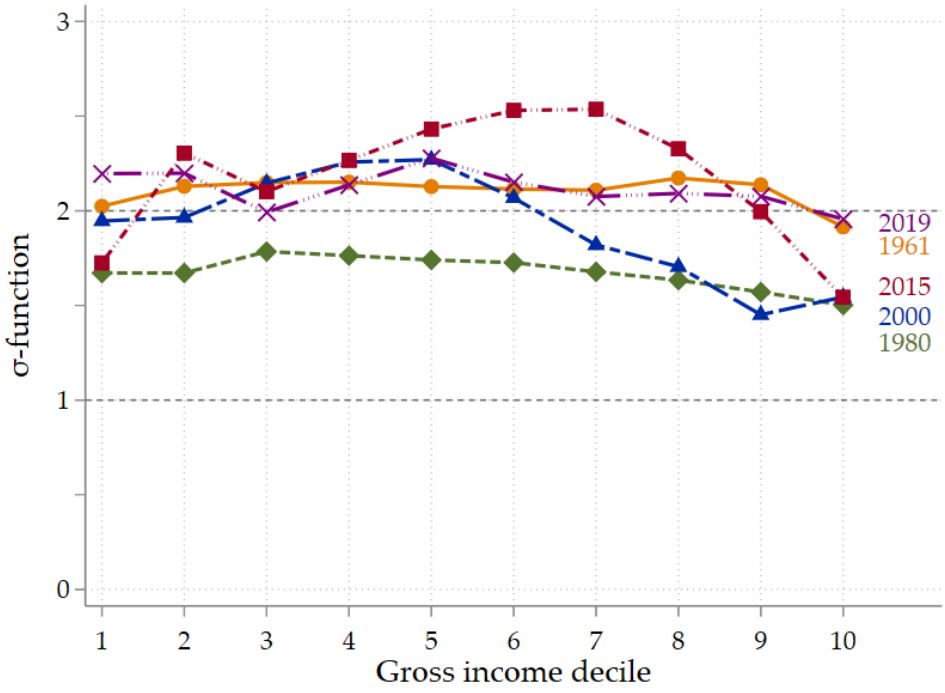


Notes: This figure shows the distribution of tax unit types over time. Figure 1a displays the share of single tax units (orange area) and the share of couple tax units (green area). Figure 1b displays the share of single-earner and dual-earner couples. A single-earner couple refers to a married couple, in which one spouse is not employed (dark green area). The figure further displays the share of dual-earner couples in which both spouses are employed and (i) one spouse earns between 0 and 25 percent (mid green area) and (ii) between 25 and 50 percent of total earnings (light green area). Earnings shares are computed on the basis of wage, business and farm income. Reforms of the federal income tax code are displayed as vertical lines. All estimates are based on tax units with strictly positive gross income in which both spouses are between 25 and 55 years old. Figure E.38 replicates this figure for the full adult population.
Source: Authors' calculations based on CPS-ASEC.

fact that σ is nowhere below one indicates that, throughout, couples with very unequal incomes benefited from a marriage bonus, irrespective of whether they belonged to the upper or the lower part of the income distribution. Interestingly, the splitting function in the recent past looks similar to the one from the early 1960s: it is, by and large, close to 2 for all levels of income, indicating that the occurrence of penalties and bonuses does not systematically vary with income. In between, there have been pronounced departures from this pattern. For instance, in 2015 there were larger marriage bonuses in the upper middle class. In 2000, there were marriage penalties for "rich" dual

can vary within the group of couples and singles, most notably due to the presence of children. Figure B.10 explicitly differentiates between different baseline and comparison groups by estimating σ while varying the number of children in the baseline and comparison group. For details, see Appendix B.3.2.

Figure 2: The splitting function σ over time

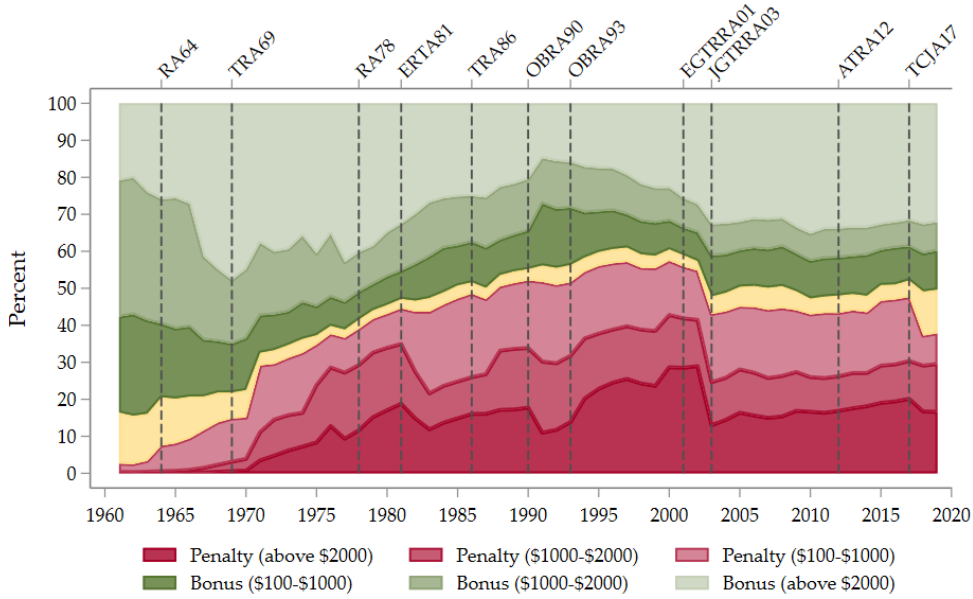


Notes: This figure shows estimates of the splitting function σ for selected years. The σ-function is calculated for tax units by estimating mean average tax rates of couples and singles (see Figure B.9). Mean average tax rates are used to solve numerically for σ (see Appendix B.3.2). Deciles refer to the gross income distribution of couples in the respective year. All estimates are based on tax units with strictly positive gross income in which both spouses are between 25 and 55 years old. Figure E.39 replicates this figure for the full adult population.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

earner couples with high secondary earnings. In Appendix C.1, we show how specific tax reforms shifted the splitting function, and how marriage bonuses and penalties changed in particular parts of the income distribution.

The fact that σ in the recent past looks, by and large, very much like the one in the early 1960s does not mean that the distribution of marriage bonuses have been constant. Since the 1960s, Figure 3 illustrates that the share of couples experiencing a marriage bonus has decreased, while the share of couples facing a marriage penalty has increased. The picture mirrors the change in couple types displayed in Figure 1b.

Figure 3: Distribution of marriage bonuses and penalties in USD over time



Notes: This figure shows how the distribution of absolute marriage bonuses and penalties changed over time. Marriage bonuses and penalties have been constructed by estimating for every married couple a counterfactual tax burden of two singles with their respective individual incomes. The counterfactual tax burden is an average over two tax burdens that allocate dependent to either spouse. Absolute marriage bonuses are CPI-adjusted and measured in 2019 US dollars. Reforms of the federal income tax code as described in Table B.4 are displayed as vertical lines. All estimates are based on tax units with strictly positive gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Political economy and welfare implications. Figure 4 reports the change in tax liability net of tax revenue changes, accounting for behavioral responses and lump-sum adjustment of any loss or gain in tax revenue (top panel) for four selected reforms. It also documents, respectively, the shares of singles and couples who benefited from various tax reforms (bottom panel). In addition, it shows the positions of the reform winners and losers in the income distribution.[18] In part C.2 of the Appendix we report in detail – i.e. separately for

[18]Figure C.29 in the Appendix contains a robustness check for the analysis in this section. It assumes that tax is rebated lump sum at the individual level, rather than at the tax unit level. While this modification leads to changes in political support among different tax unit

each of the 11 major reforms – how much support they had amongst singles and amongst married individuals. Here we summarize the key results.

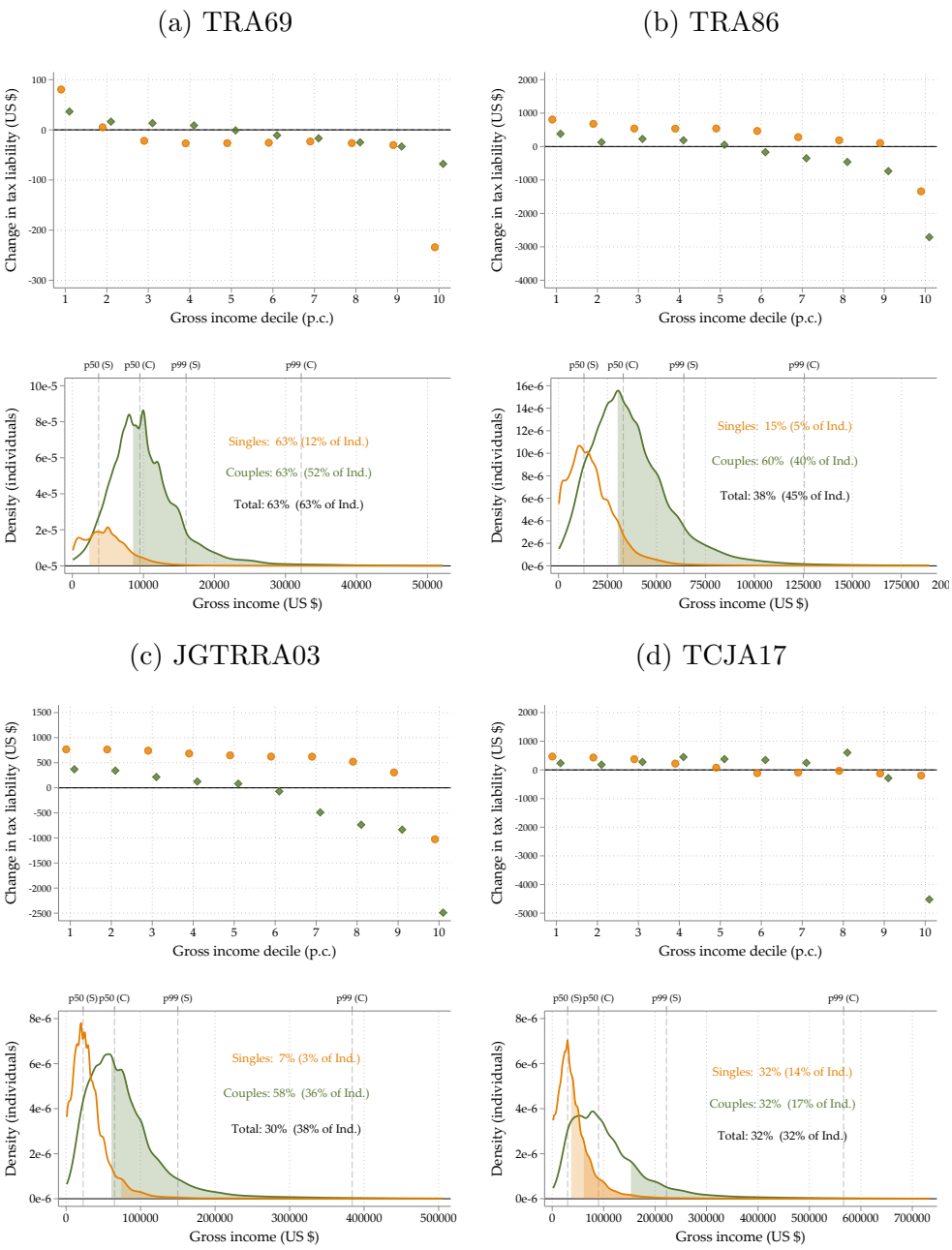
Most tax reforms – nine out of eleven – reduced marginal tax rates. They, moreover, reduced marginal tax rates in a monotonic way, i.e., richer taxpayers benefitted from larger tax savings than poorer taxpayers. Under our baseline assumptions about the elasticities that govern the behavioral responses to taxation, those reforms made both singles and married individuals in the upper deciles of the income distribution better off, whereas individuals in the bottom deciles of the income distribution were made worse off. Exceptions from this pattern are two tax reforms by the Clinton and Obama administrations. These reforms led to higher marginal tax rates at the top of the income distribution. They made individuals in the bottom deciles of the income distribution better off and individuals in the top deciles worse off.

Out of the eleven tax reforms between 1964 and 2017, six received majority support under our baseline assumptions. While tax reforms that increased tax rates received high levels of political support, the picture is mixed for reforms that cut tax rates. For instance, the 1969 tax cut by the Nixon administration made 63 percent of all individuals better off, with political support coming from the upper parts of the income distribution (see Figure 4a). Other reforms like the Reagan tax cut in 1986 or the 2003 tax reform by the Bush administration did achieve majority support among couples, but failed to obtain support in the electorate at large, in particular because only few single households benefited from the reform (see Figures 4b and 4c). In contrast, as shown by Figure 4d, the Trump tax cut did not achieve majority support in either of the two groups and only benefited rich households.

We also evaluate these reforms with various measures of social welfare (see Appendix C.3). The reforms involving tax cuts are rejected by Rawslsian social welfare functions, i.e. by welfare functions that concentrate welfare weights at the bottom of the income distribution. They are approved, however, by a welfare function with equal weights. The reforms by the Clinton and Obama administrations show the reverse pattern.

types, aggregate support is qualitatively similar.

Figure 4: Political feasibility



Notes: This figure shows the change in tax liability net of tax revenue changes (upper panel) and winners of the reform (lower panel) for singles (orange shaded area) and couples (green shaded area). The upper panel shows the average change in tax liability per capita (PC) for each of the 10 per capita gross income deciles. The location of winners and losers across the income distribution are visualized by evaluating the average tax liability change for 25 gross income quantiles. The share of winners among tax units and the corresponding share of individuals is shown next to the distribution. We account for behavioral responses at the intensive margin (baseline elasticity scenario from Table C.5) and the extensive margin. Tax revenues are rebated lump sum at the tax unit level. Figures for all reforms are shown in Figure C.27. Figure C.28 shows an alternative analysis based on lump-sum adjustments at the individual level. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old. Figure E.40 replicates this figure for the full adult population.

Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

We evaluate reforms also using feminist welfare measures, i.e., welfare measures that concentrate weights on women and, for married women, have weights that are increasing in the woman's share in the couple's joint income. These measures can, in particular, be used to trade-off the welfare of single mothers at the bottom of the income distribution and the welfare of married women. We find that some of the tax cutting reforms are approved by feminist welfare measures when we consider pronounced behavioral responses to taxation. The stronger the behavioral responses, the lower is the loss of tax revenue associated with a tax cut. Thus, with strong behavioral responses, the poor single mothers do not suffer too much when married women in the upper deciles of the income distribution benefit from a tax cut.

Summary. Over time there has not been a fundamental change in marriage penalties and bonuses in the United States. While there have been significant adjustments in between, the distribution of marriage penalties and bonuses in the recent past resembles their counterpart from the early 1960s. As we document in part F of the Appendix, marriage penalties and bonuses have been an important topic in election campaigns and, more broadly, the public discourse about tax policy. In the following section we explore a potential explanation for why despite of all these debates the tax base continued to be the sum of primary and secondary earnings: Reforms towards individual taxation lack political feasibility.

5 Reforms towards individual taxation

We focus on a particular class of reforms that we refer to as *revenue neutral reforms towards individual taxation*. We study how the political support for such reforms has evolved since the 1960s and we also study their appeal from a welfare perspective. Subsequently, we discuss other ways of reforming the status quo tax system towards individual taxation.

One-bracket reforms. Two classes of reforms play a significant role in our analysis. We refer to them, respectively, as one-bracket reforms affecting primary or secondary earnings. More general tax reforms can be interpreted as combinations of several such reforms. So, as a preliminary step, we introduce these particular classes of reforms.

A one-bracket reform of primary earnings can represented by a pair (τ_1, h_1) with

$$\tau_1 \; h_1(y_1') = \begin{cases} 0, & \text{for} \quad y_1' \leq y_1 \; , \\ \tau_1(y_1' - y_1), & \text{for} \quad y_1' \in (y_1, y_1 + \ell) \; , \\ \tau_1 \; \ell, & \text{for} \quad y_1' \geq y_1 + \ell \; . \end{cases}$$

Thus, when primary earnings y_1' are in a bracket of length ℓ that starts at y_1, then the marginal tax rate on primary earnings is increased by τ_1. When primary earnings are smaller than y_{1s} the couples' tax burden is unaffected. When they exceed $y_1 + \ell$, there is no change of the marginal tax rate, but the couples tax burden is larger. A "small" one-bracket reform has τ_1 and ℓ close to zero. We denote by $\mathcal{R}_1 : y_1 \mapsto \mathcal{R}_1(y_1)$ the revenue implications of such a small reform.[19]

One bracket reforms that alter marginal tax rates only for secondary earnings are denoted by (τ_2, h_2) and defined in the analogous way. Their revenue implications are captured by the function $\mathcal{R}_2 : y_2 \mapsto \mathcal{R}_2(y_2)$. Characterization of the functions $\mathcal{R}_1$ and $\mathcal{R}_2$ via sufficient statistics formulas can be found below (Proposition 1); i.e. these functions can be computed computed using data on the status quo tax system, income distribution, and intensive and extensive margin elasticities that capture behavioral responses to taxation. In part B.5 of the Appendix we explain in detail how we obtain the calibrations of these functions that we use in our empirical analysis.

[19] More formally, let $R_1(\tau_1, \ell, y_1)$ be the revenue from a one-bracket reform, as a function of y_1 where the relevant bracket starts, the length ℓ of the bracket, and the change of marginal tax rates within the bracket, τ_1. Then,

$$\mathcal{R}_1(y_1) \quad := \quad \lim_{\ell \to 0} \frac{\partial}{\partial \ell} \lim_{\tau_1 \to 0} \frac{\partial}{\partial \tau_1} R_1(\tau_1, \ell, y_1) \; .$$

From simple reforms to more general ones. When the functions $\mathcal{R}_1$ and $\mathcal{R}_2$ are known, the revenue implication of any continuous reform direction $y_1 \mapsto h_1(y_1)$ or $y_2 \mapsto h_2(y_2)$ can be computed via[20]

$$R_\tau(h_1) = \int_{\mathcal{Y}} h_1'(y_1)\mathcal{R}_1(y_1)\, dy_1 \quad \text{and} \quad R_\tau(h_2) = \int_{\mathcal{Y}} h_2'(y_2)\mathcal{R}_2(y_2)\, dy_2 \,. \quad (6)$$

Revenue-neutral reforms towards individual taxation. A revenue-neutral reform towards individual taxation raises the marginal tax rates on primary earnings and lowers the marginal tax rates on secondary earnings. Moreover, the increased revenue from the higher taxes on primary earnings is used to finance the tax cuts for secondary earners. Revenue neutrality implies, in particular, that such a reform is without consequence for singles. It has distributive effects only among married couples. It tends to make couples with a rather equal within-couple distribution better off at the expense of couples with a dominant primary earner. Formally, we consider reform directions so that

$$h_m(y_1, y_2) = \tau_1\, h_1(y_1) + \tau_2\, h_2(y_2) \,,$$

with τ_1 and τ_2 chosen such that

$$\begin{aligned} R_\tau(h_m) &= \tau_1 \int_{\mathcal{Y}} h_1'(y_1)\mathcal{R}_1(y_1)\, dy_1 \;+\; \tau_2 \int_{\mathcal{Y}} h_2'(y_2)\mathcal{R}_2(y_2)\, dy_2 \\ &= 0 \,. \end{aligned}$$

The uniform case. A special case of interest is that marginal tax rates are increased for all primary earners and decreased for all secondary earners: $h_1(y_1) = y_1$, for all y_1 and $h_2(y_2) = y_2$, for all y_2. If the status quo has joint taxation, such a reform drives a wedge between the marginal tax rate on primary earnings and the marginal tax rate on secondary earnings which is the same for all possible combinations of primary and secondary earnings. For now, we focus on this special, but discuss alternative specifications below. Such a reform is revenue neutral if

$$\frac{\tau^2}{\tau^1} \quad = \quad -\frac{\int_{\mathcal{Y}} \mathcal{R}_1(y_1)dy_1}{\int_{\mathcal{Y}} \mathcal{R}_2(y_2)dy_2} \quad := \quad -r \,. \quad (7)$$

[20] A formal proof can be found in Appendix A.3 of Bierbrauer et al. (2024).

We will repeatedly refer to the ratio on the right hand side of Equation (7) in the following. For ease of reference, we use r as a shorthand.

Political feasibility. A married couple that has earnings of y_1^0 and y_2^0 in the status quo is made better off if $\tau_1\, y_1^0 + \tau_2\, y_2^0 < 0$ or, equivalently, if $y_1^0 < r\, y_2^0$. This inequality will prove useful for our analysis of whether reforms towards individual taxation would have had majority support in the US since the 1960s. Specifically, we will plot the line $y_1^0 = r\, y_2^0$ in a y_2^0-y_1^0-diagram. All couples with (y_2^0, y_1^0) below the line are reform winners, all couples with (y_2^0, y_1^0) above are reform losers. To determine political feasibility, we simply need to check whether the households above the line outnumber those below the line. To check how political feasibility has evolved, we look into how this line and the distribution of primary and secondary earnings has shifted over time.[21]

Welfare implications. We also examine the implications for social welfare, employing various welfare functions. We will focus on welfare functions with high weights on "the poor" and on welfare functions with weights that increase in secondary earnings.

We use Equation (5) for the welfare evaluation. Since the reform is revenue-neutral and affects only married individuals, such a reform raises social welfare if and only if

$$\mathbf{E}_\theta[g(\theta)h_m(y^0(\theta))] = \tau_1 Y_1^g \;+\; \tau_2 Y_2^g > 0,$$

where $Y_1^g := \mathbf{E}_\theta[g(\theta)y_1^0(\theta)]$ and $Y_2^g := \mathbf{E}_\theta[g(\theta)y_2^0(\theta)]$. Thus, from the perspective of a generic welfare function, a revenue neutral reform with $h_m(y_1, y_2) = \tau_1 y_1 + \tau_2 y_2$ is desirable if and only if $Y_1^g < rY_2^g$. The following Theorem summarizes these results (the proof is in Appendix A.1).

[21] Note that r shifts with the behavioral responses that shape the functions $\mathcal{R}_1 : y_1 \mapsto \mathcal{R}_1(y_1)$ and $\mathcal{R}_2 : y_2 \mapsto \mathcal{R}_2(y_2)$. The less elastic primary earnings are relative to secondary earnings, the larger is r.

Theorem 1 *Consider a revenue neutral reform towards individual taxation with $h_1(y_1) = y_1$, for all y_1, and $h_2(y_2) = y_2$, for all y_2.*

(i) Such a reform direction is politically feasible if the share of married couples with $y_1^0 < r\, y_2^0$ exceeds $\frac{1}{2}$.

(ii) Such a reform direction is welfare-improving if $Y_1^g < r\, Y_2^g$.

While the reform considered in Theorem 1 is, by construction, revenue neutral, if $Y_1^g < rY_2^g$, then it is also possible to design a reform that extracts positive revenue, without violating the condition $Y_1^g < rY_2^g$. Since the reform, moreover, lowers the marginal tax rates for secondary earners, it also increases female labor supply. If (ii) holds and (i) fails then such a reform is desirable according to the given social welfare function, but not politically feasible. If (i) and (ii) both hold, then reform is both desirable and politically feasible.

Revenue functions: From theory to empirics. In order to bring our theory to data, we state the revenue functions under two further assumptions in the following Proposition: First, the tax system is piecewise linear, as is the case in the US. Second, the primary and the secondary earners' effort costs are, respectively, represented by isoleastic functions and the Frisch elasticities governing the primary and secondary earners' intensive margin responses are denoted by ε_1 and ε_2. Extensive margin responses are captured by $\bar{\pi}_{dec}(y_2 \mid y_1)$ and $\bar{\pi}_{sec}(y_2)$, defined respectively as average extensive margin elasticities for dual-earner and single-earner couples.

Proposition 1 *When the tax system is piecewise linear and effort costs functions are iso-elastic, then the revenue functions are*

$$\mathcal{R}_2(y_2) \;=\; \mathcal{I}_2(y_2) + \mathcal{X}_{2,sec}(y_2) + \mathcal{X}_{2,dec}(y_2)\;,$$

where

$$\mathcal{I}_2(y_2) \;=\; -y_2\varepsilon_2 f_2(y_2)\mathbf{E}_{y_1}\left[\tfrac{T_m'(y_1+y_2)}{1-T_m'(y_1+y_2)} \;\middle|\; y_2\right]\;,$$

$$\mathcal{X}_{2,sec}(y) \;=\; F^{y_1}(0)\;\textstyle\int_{y_2}^{\bar{y}} \frac{T^0(y_2)}{y_2 - T^0(y_2)}\;\bar{\pi}_{sec}(y_2)\;f(y_2 \mid 0)\;dy_2\;,$$

and

$$\mathcal{X}_{2,dec}(y) = (1 - F^{y_1}(0))\, \mathbf{E}_{y_1}\left[\int_{y_2}^{\bar{y}} \frac{T^0(y_1+y_2)}{y_1+y_2-T^0(y_1+y_2)} \bar{\pi}_{dec}(y_2 \mid y_1) f(y_2 \mid y_1) dy_2 \mid y_1 > 0\right].$$

Analogously for $\mathcal{R}_1(y_1)$.

6 Empirical Analysis of reforms towards individual taxation

We first study hypothetical revenue-neutral reforms towards individual taxation. These reforms have distributive effects only among married couples. The empirical analysis shows us the location of the line that separates the more "modern" couples that benefit from such a reform from the more "traditional" couples that are made worse off. Moreover, we check whether the conditions for political feasibility and welfare improvements in Theorem 1 are satisfied at different points in U.S. history. Second, we turn to real-world reforms towards individual taxation implemented in Sweden and the United Kingdom. We show how our setup can be used to analyze such reforms. Specifically, we check how much political support such reforms would generate in the U.S. today.

Calibration. In Appendix B.5, we explain in detail how we calibrate the revenue functions $\mathcal{R}_1$ and $\mathcal{R}_2$. Here we elaborate on what we assume about the elasticities that capture the behavioral responses to taxation. Our assumptions shown in Table 1 are guided by the empirical literature that finds stronger behavioral responses to taxation for secondary earners (see, e.g., Eissa and Hoynes (2004) and Bargain et al. (2014)) while acknowledging the variation of estimates (see, e.g., Blau and Kahn (2007), Saez, Slemrod and Giertz (2012), Neisser (2021)).

In our baseline scenario, we assume that intensive margin elasticities are constant over time and equal 0.25 for primary earners in couples, and 0.75

for secondary earners.[22] We also consider a scenario with elasticities that are higher than the ones in the baseline, and one with lower elasticities. We finally assume that the extensive margin elasticities are homogeneous across different types of couples, and decrease with income from 0.65 to 0.25 until the 90th percentile of the gross income distribution, and stays constant in the top decile (see Figure B.18).

Table 1: Assumptions about Labor Supply Elasticities

	Primary Earner	Secondary Earner
Low Elasticity Scenario	0.15	0.35
Baseline Elasticity Scenario	0.25	0.75
High Elasticity Scenario	0.5	1.5

Notes: This table displays our assumptions about the labor supply elasticities for primary and secondary earners in married couples. Assumptions are guided by the range of estimates found in the literature, e.g. Gustafsson (1992), Blundell and MaCurdy (1999), Blau and Kahn (2007), Eissa and Hoynes (2004), LaLumia (2008), Kaygusuz (2010), Saez et al. (2012), Bargain et al. (2014), and Neisser (2021).

Revenue neutral reforms towards individual taxation: Political feasibility. Figures 5 and 6 show how the population shares of reform winners and losers have changed over time. In these graphs, winners from a reform towards individual taxation are those couples, whose primary earnings are below the (green) line. In 1961, only a fifth of all married couples would have benefited from the reform. Couples with high secondary earnings were rare and hence a reform towards individual taxation would not have been politi-

[22]Note that even though elasticities are constant for primary and secondary earners, the average elasticity for couples can vary across the income distribution and across years since it is a weighted average based on the income shares of the primary and secondary earner (see Appendix Figure B.14).

cally feasible.[23] The behavioral responses of primary and secondary earners govern the slope of the green line. Larger elasticities of primary earners tilt the lines to the right and thus tend to decrease the number of reform winners. Under our baseline assumptions about behavioral responses to taxation, support has risen from approximately 23 percent in the 1960s to 55 percent today.[24] Even under the extreme assumption of an implausibly high elasticity of primary earnings to taxation, the reform is with 45 percent close to the majority threshold. Thus, while reforms towards individual taxation were not politically feasible in the past, they may become so if the trend continues.

Revenue neutral reforms towards individual taxation: Welfare. By Theorem 1, a generic social welfare function approves a revenue-neutral reform towards individual taxation if $Y_1^g < r\ Y_2^g$. With the reverse inequality it is welfare-damaging. Figure 8 presents results for various social welfare functions under different assumptions about behavioral responses.[25] If welfare-evaluation dots locate above (resp. below) the respective green line, the reform is considered welfare decreasing (resp. welfare improving).

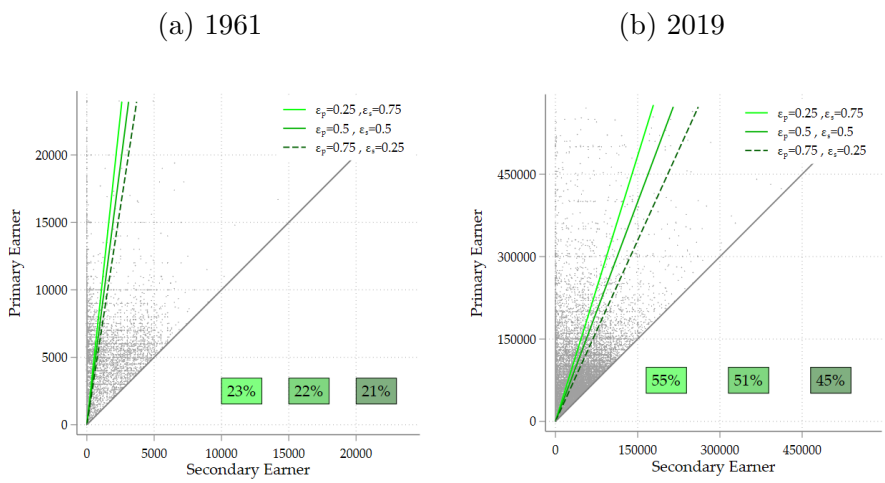
A striking feature is that a Rawlsian welfare function (with welfare weights concentrated on low income couples) and an Affirmative Feminist social welfare function (with weights that are increasing in the women's income share) are on different sides of the line that separates winners and losers. The reason is that among low-income couples the share of primary earnings tends to be high (see Figure 7). Therefore, only few low-income couples benefit from lower taxes on secondary earnings, and all are harmed by the higher taxes on primary earnings.

[23] In 1961, around sixty percent of couples had no secondary earnings at all. These couples lie exactly on the vertical axis of Figure 5 and represent a large fraction of reform losers.

[24] As of 2019, married couples represent 37 (54) percent of all tax units (individuals). Since singles are unaffected, around 30 percent of individuals would benefit from the reform, 24 percent would be made worse off, and 46 percent would remain unaffected.

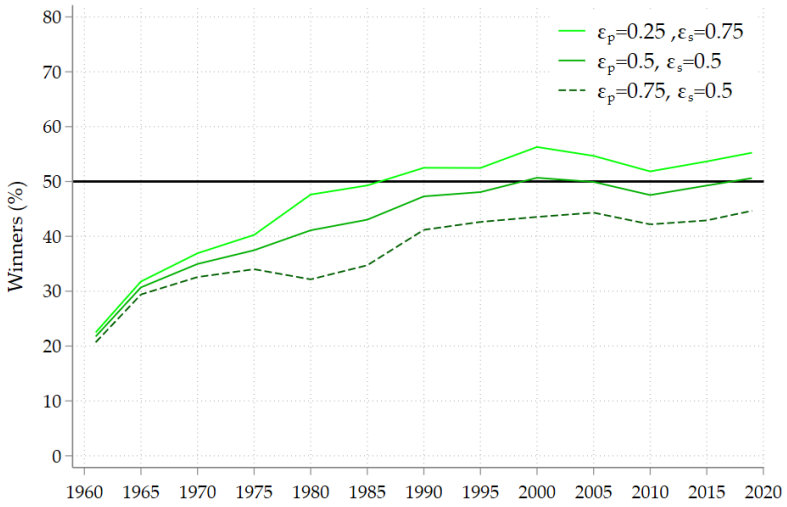
[25] See Table D.12 in the Appendix for the formal specification of these welfare functions.

Figure 5: Reform towards individual taxation: Political economy



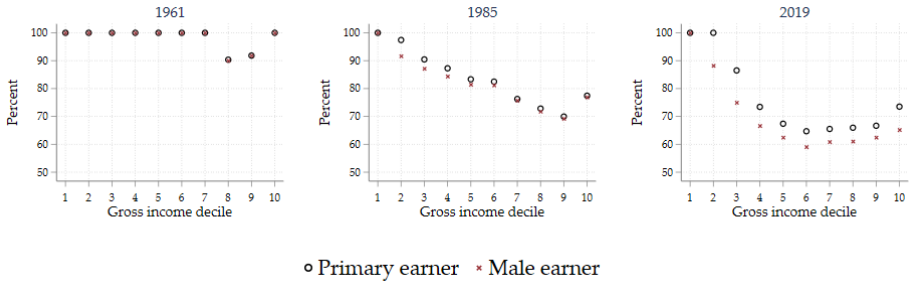
Notes: This figure shows for 1961 and 2019, how the political support for a revenue neutral reform towards individual taxation among married couples varies with behavioral responses to taxation. Each gray dot represents a couple in the data, with the income of the primary (secondary) earner displayed on the vertical (horizontal) axis. Couples that lie below (above) the green line are winners (losers) from a reform towards individual taxation. The light green solid line refers to the baseline elasticity scenario of Table 1 in which the primary (resp. secondary) earner has an elasticity of 0.25 (resp. 0.75). For illustrative purposes, the dark green solid line refers to the case where primary and secondary earners' elasticities coincide (0.5) while the dashed green line shows the results under the assumption that the primary earner's elasticity (0.75) is higher than for the secondary earner (0.25). All results are displayed including extensive margin responses. The figure also displays the respective share of couples than benefits from a reform towards individual taxation. Note that couples with no secondary earnings lie exactly on the vertical axis and constitute around 60 percent in 1961 and 25 percent in 2019. Figures for more years are displayed in Appendix Figure D.31. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old. Figure E.41 replicates this figure for the full adult population.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure 6: Reform towards individual taxation: Share of winners over time



Notes: This figure shows how the political support for a revenue neutral reform towards individual taxation among married couples evolved over time. All results are displayed including extensive margin responses. The light green solid line illustrates the result under the baseline elasticity scenario of Table 1 in which the primary (resp. secondary) earner has an elasticity of 0.25 (resp. 0.75). For illustrative purposes, the dark green solid line refers to the case where primary and secondary earners' elasticities coincide (0.5) while the dashed green line shows the results under the assumption that the primary earner's elasticity (0.75) is higher than for the secondary earner (0.25). All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old. Figure E.42 replicates this figure for the full adult population.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure 7: Median share of primary and male earner

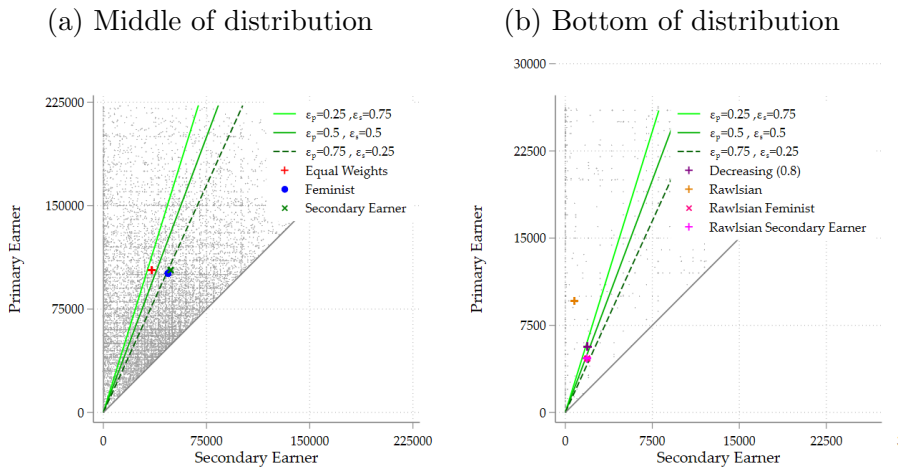


Notes: This figure shows the median income share of the primary earner in the couple by income decile. Earnings shares are computed on the basis of non-negative wage, business and farm income. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old. Figure E.43 replicates this figure for the full adult population.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Discussion. The insight that reforms towards individual taxation may give rise to a conflict between the welfare of "the poor" and the welfare of "working women" is without precedence in the literature. It raises two questions. First, are there alternative reforms towards individual taxation that do not give rise to such a conflict? Second, are such conflicts empirically plausible? When we do an evaluation of actual – as opposed to hypothetical – tax reforms, do we also find such conflicts?

To answer the first question, we consider an alternative reform towards individual taxation. We suppose that marginal tax rates are lowered for all secondary earners, as before, but marginal tax rates are increased only for primary earners from the upper half of the income distribution. By construction, Rawlsian welfare will not decrease following such a reform. Poor couples with positive secondary earnings benefit, and poor couples without secondary earnings are not harmed. The reform does not collect as much revenue as one that taxes all primary earnings at a higher rate, with the implication that the tax rates on secondary earnings cannot be reduced as much. As shown in Appendix Figure D.34, an affirmative feminist welfare function still goes up under such a reform. The reform is, moreover, politically feasible. There is one group that is harmed: couples from the upper part of the income dis-

Figure 8: Reform towards individual taxation: Welfare (2019)



Notes: This figure shows for the current tax system, how a reform towards individual taxation is evaluated from a welfare perspective under different exogenous welfare weights. Figure 8a (8b) displays welfare implications for welfare weights centered in the middle (bottom) of the income distribution. Each gray dot represents a couple in the data with specific income of the primary (secondary) earner displayed on the vertical (horizontal) axis. Couples that lie below (above) the green line are winners (losers) from a reform towards individual taxation. Welfare evaluations with different welfare weights are plotted as a colored dot the location of which is defined via the average welfare-weighted primary earnings (vertical axis) and the average welfare-weighted secondary earnings (horizontal axis). Welfare evaluations below (above) the green line indicate that the reform is welfare increasing (decreasing). The light green solid line illustrates the result under the baseline elasticity scenario of Table 1 in which the primary (secondary) earner has an elasticity of 0.25 (0.75). For illustrative purposes, the dark green solid line refers to the case where primary and secondary earners' elasticities coincide (0.5) while the dashed green line shows the results under the assumption that the primary earner's elasticity (0.75) is higher than for the secondary earner (0.25). All results are displayed including extensive margin responses. For detailed information on welfare weight specification, see Table D.12. The specific percentile used for Rawlsian weights is P5 and $a = 0.8$ for decreasing welfare weights. Illustrations for other years are shown in Appendix Figures D.32 and D.33. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old. Figure E.44 replicates this figure for the full adult population.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

tribution with low secondary earnings. The complementary group of reform beneficiaries accounts for more than 70 percent of the population.

The reforms that we discuss above are just two exemplary reforms out of a large set of conceivable reforms *towards individual taxation*. To answer the second question, we discuss how policymakers dealt with distributive conflicts in Sweden (1971) and the United Kingdom (1990). Specifically, we (i) analyze the shape of the respective reform, and (ii) evaluate whether a reform towards individual taxation of this shape would achieve majority support in the US as of today.

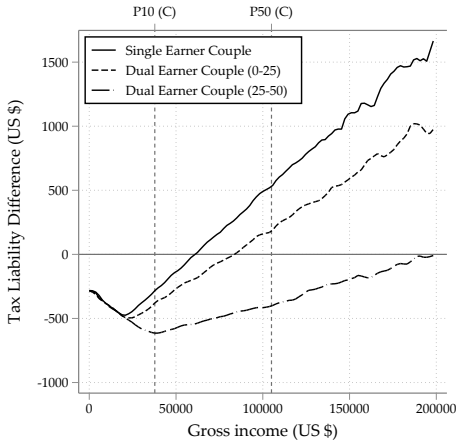
The precise definitions of the reforms can be found in Appendix D.2. There, we also explain how we interpret these reforms through the lens of our framework, which requires to distill a reform direction h and reform intensity τ.

The reform in Sweden (1971) did not give rise to a conflict between the welfare of "the poor" and the welfare of "working women". On top of the move to individual taxation, the reform included a tax reduction at the bottom of the income distribution for single-earner couples. These reductions are paid primarily by rich single-earner households. There are also net contributors among rich dual-earner couples, but they are further up in the income distribution. Overall, the reform would generate large political support if done in the US today (63% of winners).

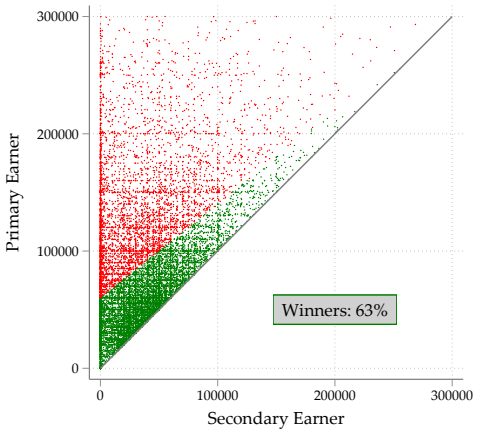
By contrast, the reform in the UK gave rise to a conflict between the welfare of "the poor" and the welfare of "working women". The reform included tax cuts which were larger for richer people and which led to a loss of overall tax revenue. Moreover, the tax cuts increased with secondary earnings. As a consequence, those with low-earnings were made worse off. To benefit from the reform a couple had to be rich or have substantial secondary earnings. Overall, if such a reform were implemented in the U.S. today, it would generate more opposition than support (43% winners).

Figure 9: Swedish reform to individual taxation (1971) applied to US (2019)

(a) Average Tax Liability Difference



(b) Winners and Losers

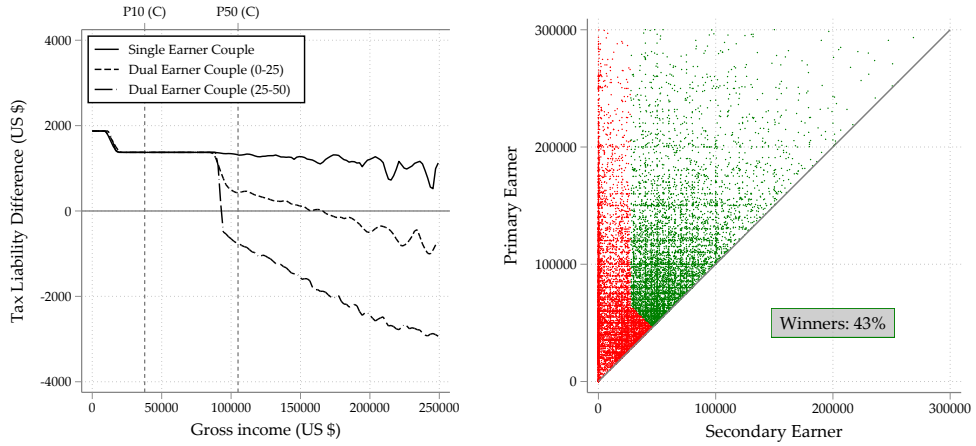


Notes: The figure shows the average change in tax liabilities (Figure 9a) as well as winners and losers (Figure 9b) for a reform towards individual taxation that replicates the Swedish reform in the United States as of 2019. For details on the properties of the Swedish reform in 1971, and how we interpret it in our framework using primary and secondary earner revenue functions, see Appendix D.2.1. Revenue functions are estimated under both extensive and intensive margin behavioral responses and baseline values for intensive margin elasticities for primary (0.25) and secondary earners (0.75). Average tax liabilities across income levels are calculated using a local polynomial regression for three different couple types. Any revenue gain or loss is redistributed lump-sum across all married couples. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old.

Source: Authors' calculations based on NBER TAXSIM, CPS-ASEC, and Selin (2014).

Figure 10: UK reform to individual taxation (1990) applied to US (2019)

(a) Average Tax Liability Difference (b) Winners and Losers



Notes: The figure shows the average change in tax liabilities (Figure 10a) as well as winners and losers (Figure 10b) for a reform towardindividual taxation that replicates the UK reform in the United States as of 2019. For details on the properties of the UK reform in 1990, and how we interpret it in our framework using primary and secondary earner revenue functions, see Appendix D.2.2. Revenue functions are estimated under both extensive and intensive margin behavioral responses and baseline values for intensive margin elasticities for primary (0.25) and secondary earners (0.75). Average tax liabilities across income levels are calculated using a local polynomial regression for three different couple types. Any revenue gain or loss is redistributed lump-sum across all married couples. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old.

Source: Authors' calculations based on NBER TAXSIM, CPS-ASEC, and Stephens and Ward-Batts (2004).

7 Concluding Remarks

This paper examines the joint taxation of married couples from a political economy perspective. We show empirically that, in the United States, marriage bonuses and penalties have remained largely unchanged since the 1960s when holding incomes constant. However, the number of individuals benefiting from joint taxation has steadily declined. We demonstrate that this trend has led to growing support for reforms towards individual taxation. As of today, such reforms are on the brink of achieving majority support. At the same time, we show that these reforms can have significant distributive consequences, potentially creating tensions between the welfare of "the poor" and the welfare of "working women." In the final part of the paper, we analyze how policymakers have addressed this potential conflict in practice. We evaluate the implementation of individual taxation in Sweden and the United Kingdom. The Swedish reform mitigated the conflict by limiting losses for single-earner couples at the lower end of the income distribution, whereas the UK reform exacerbated it: to benefit from the UK reform, one had to be relatively wealthy or have high secondary earnings.

References

Acemoglu, D., M. Golosov, and A. Tsyvinski, "Political Economy of Mechanisms," *Econometrica*, 2008, *76*, 619–641.

——, ——, and ——, "Dynamic Mirrlees Taxation under Political Economy Constraints," *Review of Economic Studies*, 2010, *77*, 841–881.

——, S. Naidu, P. Restrepo, and J.A. Robinson, "Democracy, Redistribution, and Inequality," *Handbook of Income Distribution*, 2015, pp. 1885–1966.

Ales, L. and C. Sleet, "Optimal Taxation of Income-Generating Choice," *Econometrica*, 2022, *90* (5), 2397–2436.

Alesina, A., A. Ichino, and L. Karabarbounis, "Gender-Based Taxation and the Division of Family Chores," *American Economic Journal: Economic Policy*, 2011, *3* (2), 1–40.

Alves, C. B., C. E. da Costa, F. Lobel, and H. Moreira, "Intrahousehold inequality and the joint taxation of household earnings," *Mimeo*, 2021.

Armour, P., R. V. Burkhauser, and J. Larrimore, "Using the Pareto distribution to improve estimates of topcoded earnings," *Economic Inquiry*, 2016, *54* (2), 1263–1273.

Bargain, O., K. Orsini, and A. Peichl, "Comparing labor supply elasticities in europe and the united states new results," *Journal of Human Resources*, 2014, *49* (3), 723–838.

___ , M. Dolls, H. Immervoll, D. Neumann, A. Peichl, N. Pestel, and S. Siegloch, "Tax policy and income inequality in the United States, 1979–2007," *Economic Inquiry*, 2015, *53* (2), 1061–1085.

Bergstrom, K. and W. Dodds, "Optimal taxation with multiple dimensions of heterogeneity," *Journal of Public Economics*, 2021, *200*, 104442.

Berliant, M. and P. C. Boyer, "Politics and income taxes: Progress and progressivity," *Journal of Public Economic Theory*, 2024, *26* (4), e12704.

Bick, A. and N. Fuchs-Schündeln, "Taxation and Labour Supply of Married Couples across Countries: A Macroeconomic Analysis," *Review of Economic Studies*, 10 2017, *85* (3), 1543–1576.

Bierbrauer, F. J., "Is a uniform price on Carbon desirable?," *CEPR Discussion Paper No. 19202*, 2024.

___ , A. Tsyvinski, and N. Werquin, "Taxes and turnout: when the decisive voter stays at home," *American Economic Review*, 2022, *112* (2), 689–719.

___ and P. C. Boyer, "Efficiency, Welfare, and Political Competition," *Quarterly Journal of Economics*, 2016, *131* (1), 461–518.

___ , ___ , A. Peichl, and D. Weishaar, "The taxation of couples," *CEPR Discussion paper*, 2023.

___ , ___ , ___ , and ___ , "Pareto-improvements, welfare trade-offs and the taxation of couples," *CEPR Discussion paper*, 2024.

___ , ___ , and ___ , "Politically feasible reforms of nonlinear tax systems," *American Economic Review*, January 2021, *111* (1), 153–91.

___ , ___ , **and E. Hansen**, "Pareto-improving tax reforms and the Earned Income Tax Credit," *Econometrica*, 2023, *91* (3), 1077–1103.

Blanchet, T., B. Garbinti, J. Goupille-Lebret, and C. Martínez-Toledano, "Applying generalized Pareto curves to inequality analysis," *AEA Papers and Proceedings*, 2018, *108*, 114–18.

Blau, F. D. and L. M. Kahn, "Changes in the labor supply behavior of married women: 1980–2000," *Journal of Labor economics*, 2007, *25* (3), 393–438.

Blundell, R., A. Duncan, and C. Meghir, "Estimating Labor Supply Responses Using Tax Reforms," *Econometrica*, 1998, *66* (4), 827–861.

___ **and T. MaCurdy**, "Labor supply: A review of alternative approaches," *Handbook of labor economics*, 1999, *3*, 1559–1695.

Borella, M., M. De Nardi, and F. Yang, "Are Marriage-Related Taxes and Social Security Benefits Holding Back Female Labour Supply?," *Review of Economic Studies*, 2023, *90* (1), 102–131.

___ , ___ , **M. Pak, N. Russo, and F. Yang**, "The Importance of Modeling Income Taxes Over time. US Reforms and Outcomes," *National Bureau of Economic Research*, 2022.

Boskin, M. J. and E. Sheshinski, "Optimal tax treatment of the family: Married couples," *Journal of Public Economics*, 1983, *20* (3), 281–297.

Brett, C. and J.A. Weymark, "Voting over selfishly optimal nonlinear income tax schedules," *Games and Economic Behavior*, 2017, *101*, 172–188.

Cremer, H., J.-M. Lozachmeur, and P. Pestieau, "Income taxation of couples and the tax unit choice," *Journal of Population Economics*, 2012, *25* (2), 763–778.

Crossley, T. F. and S.-H. Jeon, "Joint taxation and the labour supply of married women: evidence from the Canadian tax reform of 1988," *Fiscal Studies*, 2007, *28* (3), 343–365.

Eissa, N. and H. W. Hoynes, "Taxes and the labor market participation of married couples: the Earned Income Tax Credit," *Journal of Public Economics*, 2004, *88*, 1931–1958.

___ , **H. J. Kleven, and C. T. Kreiner**, "Evaluation of four tax reforms in the United States: Labor supply and welfare effects for single mothers," *Journal of Public Economics*, 2008, *92* (3), 795 – 816.

Farhi, E., C. Sleet, I. Werning, and S. Yeltekin, "Non-linear Capital Taxation Without Commitment," *Review of Economic Studies*, 2012, *79* (4), 1469–1493.

Feenberg, D. R. and E. Coutts, "An Introduction to the TAXSIM Model," *Journal of Policy Analysis and Management*, 1993, *12* (1), 189–194.

Ferey, A., B. B. Lockwood, and D. Taubinsky, "Sufficient statistics for nonlinear tax systems with general across-income heterogeneity," *American Economic Review*, 2024, *114* (10), 3206–3249.

Flood, S., M. King, R. Rodgers, S. Ruggles, J. R. Warren, and M. Westberry, "Integrated Public Use Microdata Series, Current Population Survey: Version 9.0 [dataset]," 2021.

Fuenmayor, A., R. Granell, and M. Mediavilla, "The effects of separate taxation on labor participation of married couples. An empirical analysis using propensity score," *Review of Economics of the Household*, 2018, *16*, 541–561.

Gayle, G.-L. and A. Shephard, "Optimal taxation, marriage, home production, and family labor supply," *Econometrica*, 2019, *87* (1), 291–326.

Golosov, M., A. Tsyvinski, and N. Werquin, "A Variational Approach to the Analysis of Tax Systems," *NBER Working Paper 20780*, 2014.

___ **and I. Krasikov**, "The Optimal Taxation of Couples," *NBER Working Paper 31140*, 2023.

Guner, N., R. Kaygusuz, and G. Ventura, "Taxation and household labour supply," *Review of Economic Studies*, 2012, *79* (3), 1113–1149.

___ , ___ , **and** ___ , "Income taxation of U.S. households: Facts and parametric estimates," *Review of Economic Dynamics*, 2014, *17* (4), 559–581.

Gunnarsson, A. and M. Eriksson, "Eliminating the secondary earner bias. Policy lessons from the introduction of partial individual taxation in Sweden in 1971," *Nordic Tax Journal*, January 2017, *2017* (1), 89–99.

Gustafsson, S., "Separate taxation and married women's labor supply: a comparison of West Germany and Sweden," *Journal of Population Economics*, 1992, *5* (1), 61–85.

Holter, H., D. Krüger, and S. Stepancuk, "Until the IRS Do Us Part: (Optimal) Taxation of Households," *Mimeo, University of Pennsylvania*, 2023.

Immervoll, H., H. J. Kleven, C. T. Kreiner, and E. Saez, "Welfare reform in European countries: a microsimulation analysis," *Economic Journal*, 2007, *117* (516), 1–44.

——, ——, ——, and N. Verdelin, "Optimal tax and transfer programs for couples with extensive labor supply responses," *Journal of Public Economics*, 2011, *95* (11), 1485–1500.

Jacquet, L. and E. Lehmann, "How to tax different Incomes?," *CEPR Discussion Paper*, 2021.

——— and ——— , "Optimal income taxation with composition effects," *Journal of the European Economic Association*, 2021, *19* (2), 1299–1341.

Kalíšková, K., "Labor supply consequences of family taxation: Evidence from the Czech Republic," *Labour Economics*, 2014, *30*, 234–244.

Kaygusuz, R., "Taxes and female labor supply," *Review of Economic Dynamics*, 2010, *13* (4), 725–741.

Kleven, H. J., C. T. Kreiner, and E. Saez, "The Optimal Income Taxation of Couples," *Econometrica*, 2009, *77* (2), 537–560.

LaLumia, S., "The effects of joint taxation of married couples on labor supply and non-wage income," *Journal of Public Economics*, 2008, *92* (7), 1698–1719.

Larrimore, J., R. V. Burkhauser, S. Feng, and L. Zayatz, "Consistent cell means for topcoded incomes in the public use March CPS (1976–2007)," *Journal of Economic and Social Measurement*, 2008, *33* (2-3), 89–128.

Lorenz, N. and D. Sachs, "Identifying Laffer Bounds: A Sufficient-Statistics Approach with an Application to Germany," *Scandinavian Journal of Economics*, 2016, *118* (4), 646–665.

Malkov, E., "The optimal taxation of singles and couples," *Unpublished Manuscript*, 2020.

Meltzer, A. and S. Richard, "A Rational Theory of the Size of Government," *Journal of Political Economy*, 1981, *89*, 914–927.

Milgrom, P. and I. Segal, "Envelope Theorems for Arbitrary Choice Sets," *Econometrica*, 2002, *70* (2), 583–601.

Neisser, C., "The elasticity of taxable income: A meta-regression analysis," *The Economic Journal*, 2021, *131* (640), 3365–3391.

Olsson, J., "Singles, Couples, and Their Labor Supply: Long-Run Trends and Short-Run Fluctuations," *American Economic Journal: Macroeconomics*, forthcoming.

Piketty, T., "La redistribution fiscale face au chômage," *Revue française d'économie*, 1997, *12*, 157–201.

___ , "Income Inequality in France, 1901-1998," *Journal of Political Economy*, 2003, *111* (5), 1004–1042.

___ **and E. Saez**, "Income Inequality in the United States, 1913-1998," *Quarterly Journal of Economics*, 2003, *CXVIII (1)*, 1–39.

Roberts, K., "Voting over Income Tax Schedules," *Journal of Public Economics*, 1977, *8*.

Sachs, D., A. Tsyvinski, and N. Werquin, "Nonlinear tax incidence and optimal taxation in general equilibrium," *Econometrica*, 2020, *88* (2), 469–493.

Saez, E., "Using Elasticities to Derive Optimal Income Tax Rates," *Review of Economic Studies*, 2001, *68*, 205–229.

___ **and S. Stantcheva**, "Generalized Social Marginal Welfare Weights for Optimal Tax Theory," *American Economic Review*, 2016, *106* (1), 24–45.

___ **, J. Slemrod, and S. H. Giertz**, "The elasticity of taxable income with respect to marginal tax rates: A critical review," *Journal of Economic Literature*, 2012, *50* (1), 3–50.

Scheuer, F. and A. Wolitzky, "Capital taxation under political constraints," *American Economic Review*, 2016, *106* (8), 2304–2328.

Selin, H., "The rise in female employment and the role of tax incentives. An empirical analysis of the Swedish individual tax reform of 1971," *International Tax and Public Finance*, 2014, *21*, 894–922.

Spiritus, K., E. Lehmann, S. Renes, and F. Zoutman, "Optimal taxation with multiple incomes and types," *Theoretical Economics*, forthcoming.

Stephens, M. and J. Ward-Batts, "The impact of separate taxation on the intra-household allocation of assets: evidence from the UK," *Journal of Public Economics*, 2004, *88* (9-10), 1989–2007.

van de Ven, J. and N. Hérault, "The evolution of tax implicit value judgements in the UK: 1968–2018," *Oxford Economic Papers*, 2022, *74* (2), 594–609.

Online Appendix (for online publication only)

A Appendix: Theoretical analysis

A.1 Proof of Theorem 1

A reform *of* the system lowers marginal tax rates for secondary earners or increases them for primary earners. Let

$$h_m(y_1, y_2) = \tau_1 \, h_1(y_1) + \tau_2 \, h_2(y_2) \; .$$

Then, the function $y_1 \mapsto \tau_1 \, h_1'(y_1)$ gives the change of marginal tax rates on primary earnings and the function $y_2 \mapsto \tau_2 \, h_2'(y_2)$ gives the change of marginal tax rates on secondary earnings.

By Theorem 3 in Bierbrauer et al. (2024), the marginal impact on overall tax revenue that is due to secondary earners is given by

$$\tau_2 \int_{\mathcal{Y}} h_2'(y_2) \mathcal{R}_2(y_2) \, dy_2 \; , \tag{A.1}$$

where $\mathcal{R}_2(y_2)$ is the revenue impact of a small one-bracket reform that changes the tax rate for secondary earnings close to y_2. Analogously, the revenue change due to primary earnings is given by

$$\tau_1 \int_{\mathcal{Y}} h_1'(y_1) \mathcal{R}_1(y_1) \, dy_1 \; , \tag{A.2}$$

where $\mathcal{R}_1(y_1)$ gives the marginal change in tax revenue when tax rates are increased for all primary earners with an income close to y_1.

By Equations (A.1) and (A.2), revenue neutrality requires that

$$\frac{\tau^1}{\tau^2} = -\frac{\int_{\mathcal{Y}} h_2'(y_2) \mathcal{R}_2(y_2) \, dy_2}{\int_{\mathcal{Y}} h_1'(y_1) \mathcal{R}_1(y_1) \, dy_1} \; . \tag{A.3}$$

A special case of interest is that marginal tax rates are increased for all primary earners and decreased for all secondary earners. In this case $h_1(y_1) = y_1$, for all y_1 and $h_2(y_2) = y_2$, for all y_2. Such a reform is revenue neutral if

$$\frac{\tau^1}{\tau^2} = -\frac{\int_{\mathcal{Y}} \mathcal{R}^2(y_2) dy_2}{\int_{\mathcal{Y}} \mathcal{R}^1(y_1) dy_1} \; . \tag{A.4}$$

A married couple that has earnings of y_1^0 and y_2^0 in the status quo is made better off if

$$\tau_1 h_1(y_1^0) + \tau_2 h_2(y_2^0) \quad = \quad \tau_1\, y_1^0 + \tau_2\, y_2^0 \quad < \quad 0\,,$$

or, equivalently, if

$$y_1^0 \quad < \quad \frac{\int_{\mathcal{Y}} \mathcal{R}^1(y_1) dy_1}{\int_{\mathcal{Y}} \mathcal{R}^2(y_2) dy_2}\; y_2^0\,.$$

From the perspective of a generic social welfare function, a revenue neutral reform with $h_m(y_1, y_2) = \tau_1\, y_1 + \tau_2\, y_2$ is desirable if and only if

$$\mathbf{E}_{(\theta_m,\gamma_m)}\left[\mathbf{g}_m(\gamma_m,\theta_m)\; y_1^0(\gamma_m,\theta_m)\right]$$

$$< \left(\frac{\int_{\mathcal{Y}} \mathcal{R}^1(y_1) dy_1}{\int_{\mathcal{Y}} \mathcal{R}^2(y_2) dy_2}\right)\; \mathbf{E}_{(\theta_m,\gamma_m)}\left[\mathbf{g}_m(\gamma_m,\theta_m)\; y_2^0(\gamma_m,\theta_m)\right]\;.$$

A.2 Revenue functions

We derive a characterization of the revenue functions $\mathcal{R}_1$ and $\mathcal{R}_2$. The proof of Proposition 1 builds on Proposition 1 in Bierbrauer et al. (2024).

In Bierbrauer et al. (2024), we analyze simple tax reforms that affect the marginal tax rate of one spouse, conditional on the income of the other spouse being in a narrow range of incomes. This yields conditional revenue functions. The revenue functions $\mathcal{R}_1$ and $\mathcal{R}_2$ considered in this paper are obtained by integrating over the conditioning variable. We now introduce these objects more formally.

A reform that raises the marginal tax rate on the earnings of spouse 2, conditional on the earnings of spouse 1 belonging to a bracket $B_1(y_{1s}, \ell_1) = [y_{1s}, y_{1s} + \ell_1]$ and the earnings of spouse 2 belonging to a bracket $B_2(y_{2s}, \ell_2) = [y_{2s}, y_{2s} + \ell_2]$ can be represented by a scalar τ and a function $y \mapsto h(y)$ such that

$$h(y) \quad = \quad \begin{cases} y_2 - y_{2s}, & \text{if} \quad y \in B_1(y_{1s}, \ell_1) \times B_2(y_{2s}, \ell_2)\,, \\ \ell_2, & \text{if} \quad y_1 \in B_1(y_{1s}, \ell_1) \quad \text{and} \quad y_2 \geq y_{2s} + \ell_2\,, \\ 0, & \text{otherwise}\,. \end{cases}$$

Consequently, the marginal tax rates on the earnings of spouse 2 change when the earnings of the spouses belong to the relevant brackets and do not change otherwise,

$$T^1_{y_2}(y) - T^0_{y_2}(y) = \begin{cases} \tau, & \text{if} \quad y \in B_1(y_{1s}, \ell_1) \times B_2(y_{2s}, \ell_2) \ , \\ 0, & \text{otherwise} \ . \end{cases}$$

Reforms so that B_1 and B_2 are brackets with positive length affect the earnings incentives of dual-earner couples. We use different notation for reforms that affect the earnings incentives of single-earner couples. For instance, a pair (τ, h^{s1}), with

$$h^{s1}(y) \quad = \quad \begin{cases} y_1 - y_{1s}, & \text{if} \quad y_1 \in B_1(y_{1s}, \ell_1) \quad \text{and} \quad y_2 = 0 \ , \\ \ell_1, & \text{if} \quad y_1 \geq y_{1s} + \ell_1 \quad \text{and} \quad y_2 = 0 \ , \\ 0, & \text{otherwise} \ , \end{cases}$$

raises marginal tax rates on the earnings of spouse 1 conditional on $y \in B_1(y_{1s}, \ell_1)$ and spouse 2 having no earnings, $y_2 = 0$.

Proposition A.2 *Consider an increase of the marginal tax rates on the earnings of spouse 2 conditional on $y \in B_1(y_{1s}, \ell_1) \times B_2(y_{2s}, \ell_2)$. For the limit case $\ell_1 \to 0$ and $\ell_2 \to 0$, the revenue effect of this reform is given by*

$$\mathcal{R}(y_{2s} \mid y_{1s}) \quad = \quad f_{y_1}(y_{1s}) \left(\bar{\beta}^d_{I,2}(y_{1s}, y_{2s}) + (1 - F_{y_2}(y_{2s} \mid y_{1s})) \left(1 - \mathcal{E}^d_x(y_{2s} \mid y_{1s}) \right) \right) \ ,$$

where $y_1 \mapsto f^{y_1}(y_1)$ is the density associated with the marginal distribution of y_1 and $y_2 \mapsto F^{y_2}(y_{2s} \mid y_{1s})$ is the cdf of y_2, conditional on y_1 being equal to y_{1s}.

The proof of Proposition A.2 corresponds to the proof of Proposition 1 in Bierbrauer et al. (2024).

The revenue function simplifies further under an additional assumption: When the tax system is piecewise linear, effort-cost functions are iso-elastic

$$k_2(y_2, \omega_2) \quad = \quad \frac{1}{1 + \frac{1}{\varepsilon_2}} \left(\frac{y_2}{\omega_2} \right)^{1 + \frac{1}{\varepsilon_2}} \ ,$$

and earnings choices are characterized by first order conditions, then

$$\bar{\beta}^d_{I,2}(y_{1s}, y_{2s}) \quad = \quad -f_{y_2}(y_{2s} \mid y_{1s}) \, \frac{T^0_{y_2}(y_{1s}, y_{2s})}{1 - T^0_{y_2}(y_{1s}, y_{2s})} \, y_{2s} \, \varepsilon_2 \, . \tag{A.5}$$

Rewriting the equation in Proposition A.2, we get

$$\mathcal{R}(y_{2s} \mid y_{1s}) \quad = \quad f_{y_1}(y_{1s}) \left(\bar{\beta}^d_{I,2}(y_{1s}, y_{2s}) + (1 - F_{y_2}(y_{2s} \mid y_{1s})) \right)$$

$$-f_{y_1}(y_{1s}) \left(1 - F_{y_2}(y_{2s} \mid y_{1s})\right) \mathcal{E}^d_x(y_{2s} \mid y_{1s}) \, .$$

$$\mathcal{R}(y_{2s}) \quad = \int_{y_{1s}} \mathcal{R}(y_{2s} \mid y_{1s}) dy_{1s}$$

$$= \underbrace{\int_{y_{1s}} f_{y_1}(y_{1s}) \left(\bar{\beta}^d_{I,2}(y_{1s}, y_{2s}) + (1 - F_{y_2}(y_{2s} \mid y_{1s})) \right) dy_{1s}}_{:=\mathbf{A}}$$

$$\underbrace{- \int_{y_{1s}} f_{y_1}(y_{1s}) \left(1 - F_{y_2}(y_{2s} \mid y_{1s})\right) \mathcal{E}^d_x(y_{2s} \mid y_{1s}) dy_{1s}}_{:=\mathbf{B}} \quad .$$

Rewriting A.

$$\mathbf{A} = \int_{y_{1s}} f_{y_1}(y_{1s}) \left(\bar{\beta}^d_{I,2}(y_{1s}, y_{2s}) + (1 - F_{y_2}(y_{2s} \mid y_{1s})) \right) dy_{1s}$$

$$= \mathbf{E}_{y_{1s}} \left[\bar{\beta}^d_{I,2}(y_{1s}, y_{2s}) + (1 - F_{y_2}(y_{2s} \mid y_{1s})) \right]$$

$$= \mathbf{E}_{y_{1s}} \left[\bar{\beta}^d_{I,2}(y_{1s}, y_{2s}) \right] + 1 - F_{y_2}(y_{2s}) \quad .$$

Using Equation (A.5), we get

$$\mathbf{A} = \mathbf{E}_{y_{1s}} \left[-f_{y_2}(y_{2s} \mid y_{1s}) \, \frac{T^0_{y_2}(y_{1s}, y_{2s})}{1 - T^0_{y_2}(y_{1s}, y_{2s})} \, y_{2s} \, \varepsilon_2 \right] + 1 - F_{y_2}(y_{2s})$$

$$= -y_{2s}\ \varepsilon_2 \mathbf{E}_{y_{1s}} \left[f_{y_2}(y_{2s}) \frac{f_{y_2}(y_{2s} \mid y_{1s})}{f_{y_2}(y_{2s})} \ \frac{T^0_{y_2}(y_{1s}, y_{2s})}{1 - T^0_{y_2}(y_{1s}, y_{2s})} \right] + 1 - F_{y_2}(y_{2s})$$

$$= -\varepsilon_2 y_{2s}\ f_{y_2}(y_{2s}) \mathbf{E}_{y_{1s}} \left[\frac{T^0_{y_2}(y_{1s}, y_{2s})}{1 - T^0_{y_2}(y_{1s}, y_{2s})} \ \mid y_2 = y_{2s} \right] + 1 - F_{y_2}(y_{2s}) \quad .$$

When the status quo has joint taxation, $T^0_{y_2}(y_{1s}, y_{2s}) = T'_m(y_{1s} + y_{2s})$, hence

$$\mathbf{A} = -\varepsilon_2 y_{2s}\ f_{y_2}(y_{2s}) \mathbf{E}_{y_{1s}} \left[\frac{T'_m(\cdot)}{1 - T'_m(\cdot)} \ \mid y_2 = y_{2s} \right] + 1 - F_{y_2}(y_{2s}) \quad .$$

Rewriting of B.

$$\mathbf{B} = -\int_{y_{1s}} f_{y_1}(y_{1s}) \left(1 - F_{y_2}(y_{2s} \mid y_{1s})\right) \mathcal{E}^d_x(y_{2s} \mid y_{1s}) dy_{1s}$$

$$-\mathbf{B} = F_{y_1}(0) \left(1 - F_{y_2}(y_{2s} \mid 0)\right) \mathcal{E}^d_x(y_{2s} \mid 0) + \mathbf{E}_{y_{1s}} \left[\left(1 - F_{y_2}(y_{2s} \mid y_{1s})\right) \mathcal{E}^d_x(y_{2s} \mid y_{1s}) \mid y_{1s} > 0 \right]$$

We can rewrite the first part of this expression as

$$F_{y_1}(0) \left(1 - F_{y_2}(y_{2s} \mid 0)\right) \mathcal{E}^d_x(y_{2s} \mid 0) = F_{y_1}(0) \int_{y_{2s}}^{\bar{y_2}} f y_2(y_{2s} \mid 0) \mathcal{E}^d_x(y_{2s} \mid 0) dy_{2s}$$

where $\mathcal{E}^d_x(y_{2s} \mid 0)$ is an average elasticity capturing an extensive margin response when for all couples with $y_2 \geq y_{2s}$ and $y_1 = 0$ the tax burden increases by a marginal unit. Up writing,

$$\mathcal{E}^d_x(y_{2s} \mid 0) = \frac{T^0(0, y_{2s})}{y_{2s} - T^0(0, y_{2s})} \bar{\pi}_{sec}(y_{2s})$$

we obtain

$$F_{y_1}(0) \left(1 - F_{y_2}(y_{2s} \mid 0)\right) \mathcal{E}^d_x(y_{2s} \mid 0) = F_{y_1}(0) \int_{y_{2s}}^{\bar{y_2}} \frac{T^0(0, y_{2s})}{y_{2s} - T^0(0, y_{2s})} \bar{\pi}_{sec}(y_{2s}) f y_2(y_{2s} \mid 0) dy_{2s},$$

where $\bar{\pi}_{sec}(y_{2s})$ is now interpreted as an elasticity with respect to the participation tax.

Similarly, we rewrite the second part of expression $-\mathbf{B}$ as

$$\mathbf{E}_{y_{1s}}\left[\left(1-F_{y_2}(y_{2s}\mid y_{1s})\right)\mathcal{E}_x^d(y_{2s}\mid y_{1s})\mid y_{1s}>0\right]$$

$$=\left(1-F_{y_1}(0)\right)\mathbf{E}_{y_{1s}}\left[\int_{y_{2s}}^{\bar{y_2}}\mathcal{E}_x^d(y_{2s}\mid y_{1s})f(y_{2s}\mid y_{1s})dy_{2s}\mid y_{1s}>0\right]$$

$$=\left(1-F_{y_1}(0)\right)\mathbf{E}_{y_{1s}}\left[\int_{y_{2s}}^{\bar{y_2}}\frac{T^0(y_{1s},y_{2s})}{y_{1s}+y_{2s}-T^0(y_{1s},y_{2s})}\bar{\pi}_{dec}(y_{2s}\mid y_{1s})fy_2(y_{2s}\mid y_{1s})dy_{2s}\mid y_{1s}>0\right].$$

Summing up the terms $\mathbf{A}$ and $\mathbf{B}$ gives the expression of $\mathcal{R}(y_{2s})$ in Proposition 1.

Appendix B.5 provides insights on how revenue functions are estimated in the data.

A.3 Evaluating "large" reforms

Recall that, for a given tax reform (τ,h), we defined $V_s(\tau,h,\rho_s,\theta_s)-V_s(0,h,\rho_s,\theta_s)$ as the reform-induced change in indirect utility for a single with characteristics θ_s. Analogously, $V_i(\tau,h,\rho_m,\theta_m,\gamma_m)-V_i(0,h,\rho_m,\theta_m,\gamma_m)$ is the reform-induced change in indirect utility for spouse i in a married couple with characteristics θ_m and intra-family bargaining weights γ_m. Equations (3) and (4) above characterize the derivatives of these expressions with respect to the reform intensity τ and evaluate them at the status quo, i.e. at $\tau=0$. We now generalize this and consider the effects of a change of the reform intensity also away from the status quo. Specifically, we denote the marginal effect of a further increase of the reform intensity – starting from intensity τ' – on the indirect utility of spouse i by $V_{i,\tau}(\tau',h,\rho_m,\theta_m,\gamma_m)$. We define $V_{s,\tau}(\tau',h,\rho_s,\theta_s)$ analogously. Obviously,

$$V_s(\tau,h,\rho_s,\theta_s)-V_s(0,h,\rho_s,\theta_s)=\int_0^{\tau}V_{s,\tau}(\tau',h,\rho_s,\theta_s)\,d\tau'\,, \tag{A.6}$$

and

$$V_i(\tau,h,\rho_m,\theta_m,\gamma_m)-V_i(0,h,\rho_m,\theta_m,\gamma_m)=\int_0^{\tau}V_{i,\tau}(\tau',h,\rho_m,\theta_m,\gamma_m)\,d\tau'\,. \tag{A.7}$$

By the envelope theorem,

$$V_{s,\tau}(\tau', h, \rho_s, \theta_s) = u_{s1}(\tau', \theta_s)\Big[\rho_s R_\tau(\tau', h) - h_s(y_s^*(\tau', \theta_s))\Big] , \tag{A.8}$$

where $u_{s1}(\tau', \theta_s)$ is the marginal utility of consumption evaluated at reform intensity τ', $R_\tau(\tau', h)$ is the derivative of aggregate tax revenue with respect to further increases of the reform intensity at τ', and finally, $y_s^*(\tau', \theta_s)$ is the utility maximizing earnings level of a type θ_s single when the reform intensity equals τ'. Analogously, we obtain

$$\begin{aligned} \tfrac{\partial}{\partial \tau} V_i(\tau', h, \rho_m, \theta_m, \gamma_m) \;\; = \;\; & u_{i1}^0(\tau', \theta_m, \gamma_m)\alpha_{i1}^0(\tau', \theta_m, \gamma_m) \times \\ & \Big[\rho_m R_\tau(\tau', h) - h_m(y_m^*(\tau', \theta_m, \gamma_m))\Big] . \end{aligned} \tag{A.9}$$

We now impose the simplifying assumptions that preferences are quasi-linear in consumption and that household consumption is a public good. Equations (A.8) and (A.9) then become

$$\frac{\partial}{\partial \tau} V_s(0, h, \rho_s, \theta_s) = \rho_s R_\tau(\tau', h) - h_s(y_s^*(\tau', \theta_s)) , \tag{A.10}$$

and

$$\frac{\partial}{\partial \tau} V_i(0, h, \rho_m, \theta_m, \gamma_m) = \rho_m R_\tau(\tau', h) - h_m(y_m^*(\tau', \theta_m, \gamma_m)) . \tag{A.11}$$

We impose a further assumption, namely that tax revenue is rebated lump-sum at the tax unit level. This implies that $\rho_s = \rho_m = \frac{1}{\nu_s + \nu_m} = 1$. Thus,

$$\rho_s R_\tau(\tau', h) = \rho_m R_\tau(\tau', h) = R_\tau(\tau', h) . \tag{A.12}$$

With this assumption, heterogeneity in preferences over tax reforms is then entirely due to heterogeneity in the change of individual tax burdens. We view this as a natural benchmark.[26] Together Equations (A.6), (A.7), (A.10), (A.11) and (A.12) imply that

$$V_s(\tau, h, \rho_s, \theta_s) - V_s(0, h, \rho_s, \theta_s) = \Delta R - \int_0^\tau h_s(y_s^*(\tau', \theta_s))\, d\tau' , \tag{A.13}$$

[26] A conceivable alternative would be to assume that tax revenue is rebated lump-sum at the individual level, so that

$$\rho_s = \frac{\nu_s}{\nu_s + 2\nu_m} \quad \text{and} \quad \rho_m = \frac{2\nu_m}{\nu_s + 2\nu_m} .$$

and

$$V_i(\tau, h, \rho_m, \theta_m, \gamma_m) - V_i(0, h, \rho_m, \theta_m, \gamma_m) = \Delta R - \int_0^\tau h_m(y_m^*(\tau', \theta_m, \gamma_m))\, d\tau' \,, \tag{A.14}$$

where $\Delta R := R(\tau, h) - R(0, h)$. Finally, to estimate

$$\int_0^\tau h_s(y_s^*(\tau', \theta_s))\, d\tau' \quad \text{and} \quad \int_0^\tau h_m(y_m^*(\tau', \theta_m, \gamma_m))\, d\tau'$$

we impose following assumptions:

Assumption A.1 *The functions h_s and h_m are monotonic functions of income.*

Assumption A.2 *The functions y_s^* and y_m^* are monotonic functions of τ.*

Assumption A.1 holds provided that tax reforms are monotonic in the sense that the changes of the tax burdens of singles and couples,

$$\tau_s h_s(y_s) = T_{s1}(y_s) - T_{s0}(y_s) \quad \text{and} \quad \tau_m h_m(y_m) = T_{s1}(y_m) - T_{s0}(y_m)\,,$$

are monotonic functions of y_s and y_m, respectively. This property is satisfied by most tax reforms (see Figure C.23 in the Appendix and the discussion in Bierbrauer et al. (2021)). Assumption A.2 postulates that behavioral responses are monotonic in the intensity of reforms. Intuitively, if the gap between the new and the old schedule becomes larger, the behavioral adjustment does not become smaller. Under these assumptions, one can show that

$$\int_0^\tau h_s(y_s^*(\tau', \theta_s)) \quad \in \quad [\Delta T_s(y_s^1(\theta_s)), \Delta T_s(y_s^0(\theta_s))]\,, \tag{A.15}$$

When household consumption is treated as a public good, this amounts to the assumption that a married individual benefits from an increase of tax revenue twice as much as a single, i.e., both the "own" transfer and the spouse's transfer are sources of utility. When we assume that tax revenue is rebated lump sum at the tax unit level, this effectively amounts to the assumption that all individuals value additional tax revenue in the same way; that is, we suppress heterogeneity in preferences for the level and the composition of public expenditures.

where $y_s^1(\theta_s)$ is the post-reform income of type θ_s, $y_s^0(\theta_s)$ is the pre-reform income and, for any y_s,

$$\Delta T_s(y_s) = T_1(y_s) - T_0(y_s)$$

is the mechanical change in the tax burden. Likewise,

$$\int_0^\tau h_m(y_m^*(\tau', \theta_m, \gamma_m))\, d\tau' \quad \in \quad [\Delta T_m(y_m^1(\theta_m, \gamma_m)), \Delta T_m(y_m^0(\theta_m, \gamma_m))] \,. \tag{A.16}$$

Thus, the impact of the tax reform on individual welfare has an upper bound and a lower bound, with one bound being the mechanical change of the tax burden holding income fixed at the pre-reform level and one bound being the mechanical effect holding income fixed at the post-reform level.

Using (A.13) and (A.15) we say that a type θ_s single benefits from a tax reform if

$$\Delta R \;-\; \max\{\Delta T_s(y_s^1(\theta_s)), \Delta T_s(y_s^0(\theta_s))\} \quad \geq \quad 0 \,, \tag{A.17}$$

and loses if

$$\Delta R \;-\; \min\{\Delta T_s(y_s^1(\theta_s)), \Delta T_s(y_s^0(\theta_s))\} \quad \leq \quad 0 \,, \tag{A.18}$$

According to (A.17), a single is identified as a beneficiary of a tax reform if the change in tax revenue outweighs two measures of how the reform affects the single's tax burden: one is the change of the tax burden holding income fixed at the pre-reform level, the other is the change of the tax burden holding income fixed at the pre-reform level. Note that the two measures coincide when there are no behavioral responses to the tax reform. We identify a single as a loser of a tax reform is both these measures exceed the reform's revenue implications. If neither (A.17) nor (A.18) holds, our approach leaves open whether a type θ_s single is a reform beneficiary or a reform loser.

Analogously, we say that the spouses in a couple are reform beneficiaries if

$$\Delta R \;-\; \max\{\Delta T_m(y_m^1(\theta_m, \gamma_m)), \Delta T_m(y_m^0(\theta_m, \gamma_m))\} \quad \geq \quad 0 \,, \tag{A.19}$$

and reform losers if

$$\Delta R \;-\; \min\{\Delta T_m(y_m^1(\theta_m,\gamma_m)), \Delta T_m(y_m^0(\theta_m,\gamma_m))\} \quad \leq \quad 0\,. \qquad \text{(A.20)}$$

In Appendix B.4, we explain of how we make use of the TAXSIM microsimulation model to obtain, for every tax unit, an estimate of all the terms that enter in the left-hand sides of inequalities (A.17) - (A.20). This enables us to tell for every such tax unit whether or not its members benefited from the reform. This is used for our analysis of political feasibility in Section 4 which rests on a comparison of the number of individuals that benefitted from a reform to the number of individuals that were made worse off.

For the welfare analysis in Section C.3 we aggregate the gains of reform winners and the losses of reform losers using various social welfare functions. We use these social welfare functions as descriptive tools. For instance, an evaluation with a Rawlsian social welfare function will tell us whether or not "the poor" benefitted from a reform. An evaluation with an "Affirmative Feminist" welfare function will tell us whether or not working women benefitted from a reform. Table C.8 contains a description of all the welfare functions that we use in our analysis. Any such social welfare function involves the computation of a weighed average of individual welfare gains and losses. In the main text, we use

$$\Delta R \;-\; \max\{\Delta T_s(y_s^1(\theta_s)), \Delta T_s(y_s^0(\theta_s))\}$$

and

$$\Delta R \;-\; \max\{\Delta T_m(y_m^1(\theta_m,\gamma_m)), \Delta T_m(y_m^0(\theta_m,\gamma_m))\}\,.$$

as measures of individual welfare changes. Thus, we are using money-metric welfare functions with a "conservative" estimate of welfare gains, as our measure is lower bound on the welfare gains that reform beneficiaries actually realize.

A conceivable alternative is to have a "conservative" estimate of welfare losses based on

$$\Delta R \;-\; \min\{\Delta T_s(y_s^1(\theta_s)), \Delta T_s(y_s^0(\theta_s))\}$$

and

$$\Delta R \;\; - \;\; \min\{\Delta T_m(y_m^1(\theta_m, \gamma_m)), \Delta T_m(y_m^0(\theta_m, \gamma_m))\} \; .$$

As we show in the Appendix, which of these two approaches is taken is without consequence for our conclusions (see in particular Figure C.30).

B Appendix: From theory to empirics

B.1 Data

The Current Population Survey (CPS) is conducted by the US Census Bureau and the Bureau of Labor Statistics and contains nationally representative cross-sectional survey data from 1962 onward. We use data from the Annual Social and Economic Supplement of the Current Population Survey (CPS-ASEC).[27] The sample size of CPS-ASEC increased from around 30,000 households in 1962 to more than 90,000 in the most recent wave. In contrast to tax return micro data such as the public use files (IRS-SOI PUF) from the Statistics of Income (SOI) division of the Internal Revenue Service (IRS), as, e.g., used by Bargain et al. (2015) or Bierbrauer et al. (2021), the CPS data contain exact information about the incomes of primary and secondary earners of the tax unit.[28]

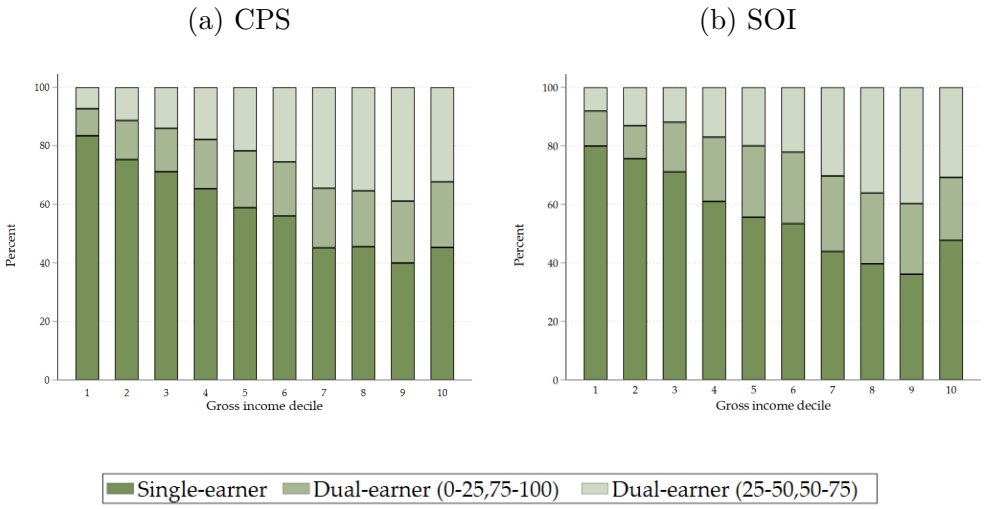
To adapt the CPS to the input requirements of the microsimulation model, we transform the CPS from a household-level data set to a tax unit level data set. For this purpose, we form tax units by joining all married spouses with their dependent children. Single individuals and unmarried spouses form

[27] See Flood et al. (2021) and `https://cps.ipums.org` for a detailed description of CPS data.

[28] In the IRS-SOI PUF, the relevant information on salaries and wages from the W2-form of the primary and secondary earner is only available for the year 1974 and imputed for all other years using an undocumented procedure. For 1974, in which reliable information is available, the distribution of different couple types across per capita income distribution is very similar to the CPS data (see Figure B.1). Moreover, Bargain et al. (2015) compare inequality measures as well as the direct policy effect, ΔT, based on CPS and SOI-PUF data and show that results are very similar (except for the very top of the distribution).

separate tax units. Children of single individuals are in most cases allocated to the household head. Adult individuals with a total income below the year-specific personal exemption threshold are assumed to reflect dependents of the household head. Table B.1 illustrates in detail the correspondence between variables utilized in NBER TAXSIM and variables in the CPS data.

Figure B.1: Comparison of CPS and SOI data (1974), couple types



Notes: This figure displays for the tax year of 1974 the distribution of married couple types across deciles of the per capita income distribution. The figure compares the distribution based on the CPS data (Figure B.1a) to the distribution based on the IRS-SOI PUF tax return micro data (Figure B.1b). All estimates are based on tax units with strictly positive gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on CPS-ASEC and SOI PUF.

Treatment of top incomes In the CPS data, information on top incomes is limited by (i) public topcoding, and (ii) internal censoring. We address both limitations by harmonizing the treatment of top incomes across the different survey years and by following Piketty and Saez (2003) and Piketty (2003) in assuming that top incomes are well represented by a Pareto distribution.

In a first step, we address the challenge that public topcoding methods vary over time. In most recent years (since 2011), the Census Bureau uses a rank proximity swapping procedure to preserve the privacy for top income earners while maintaining the internal distribution of top incomes. In this

procedure, values at or above a specific swap threshold are switched against other top income values within a bounded interval. For previous years, however, the CPS data originally contains top income values that are based on different procedures, in particular traditional topcoding (1962-1995), and a replacement value system procedure (1996-2010). To be able to consistently analyze the effect of tax reforms over the full time horizon, we apply the most recent method of rank proximity swapping also to previous years using supplementary files provided by IPUMS.[29] Thereby, we preserve the internally used distribution of top incomes whenever possible.

In a second step, we address the challenge that top incomes are also internally censored based on the value range limits of the income variables. As shown by Larrimore, Burkhauser, Feng and Zayatz (2008), since these censoring thresholds have changed discretely at specific points in time, the share of individuals affected by censoring varies and can reach up to one percent in specific years. To address the unequal representation of censored incomes, we replace censored incomes by random draws from a Pareto distribution. In particular, we first identify for every year and every income type the highest possible income T assigned in a given year. Based on this censoring threshold, we generate for every year and every income type the parameter α of a Pareto distribution with density $f(Y) = \alpha * T^{\alpha} * Y^{-\alpha-1}$. We thereby assume that incomes above the 99th percentile follow a Pareto distribution and thus estimate the shape parameter α as

$$\alpha = \frac{ln\left(\frac{N_{Y \geq p99}}{N_{Y=T}}\right)}{ln\left(\frac{Y_T}{Y_{p99}}\right)}$$

where $N_{Y \geq p99}$ is the number of individuals with an income above the 99th percentile of the income distribution, $N_{Y=T}$ is the number of individuals at the highest income, and Y_T and Y_{p99} are the top income and the income at the 99th percentile respectively.[30] Finally, we use the distribution to replace the

[29]For details on the treatment of top incomes in general and the data used for rank proximity swapping, see `https://cps.ipums.org/cps/topcodes_tables.shtml` and `https://cps.ipums.org/cps/income_cell_means.shtml`.

[30]Discussions of different estimation methods for the shape parameter of the Pareto distri-

top incomes T by random draws from this calibrated distribution.[31]

Sample restrictions We are mainly interested in the differences between married couples and single individuals. We thereby assume that married couples always file jointly. While married couples can also file separately, this filing status is usually not beneficial (see Figure B.3) and is chosen by less than two percent of all tax units (see Figure B.2).[32] Similarly, we abstract from the qualifying widow(er) filing status that gives widowed individuals a preferential tax treatment in the two years following the spouses' death. Given our sample restriction, the occurrence of widow(er)s is negligible (see also Figure B.2). If not indicated otherwise, we restrict the sample to tax units in which primary and secondary taxpayer are between 25 and 55 years old and have non-negative gross income. This sample restriction is guided by (i) our model that considers neither education nor retirement decisions, and (ii) the assumptions on labor supply responses to taxation that are not valid for young and old people with weak labor force attachment. In Section E we replicate all main results for an alternative sample restriction focusing on the full adult population.

Throughout the analysis, we calculate tax payments as well as average and marginal tax rates based on the federal income tax and abstract from state income tax and social security payroll taxes. Our pre-tax gross income variable of interest contains wage income, farm income, business income, income from dividends, income from interest, income from rent, and retirement income.

---

bution can be found in Armour, Burkhauser and Larrimore (2016) and Blanchet, Garbinti, Goupille-Lebret and Martínez-Toledano (2018).

[31] To reduce the impact of random sampling on our results, we use quantiles of the distribution. The number of quantiles utilized depends on the number of individuals at the top income. For instance, if we observe 25 individuals at the top income, we assign these individuals income levels that correspond to the 25 quantiles of the randomly drawn values from the calibrated Pareto distribution. Thereby, we preserve the information of the distribution while limiting the influence of random draws.

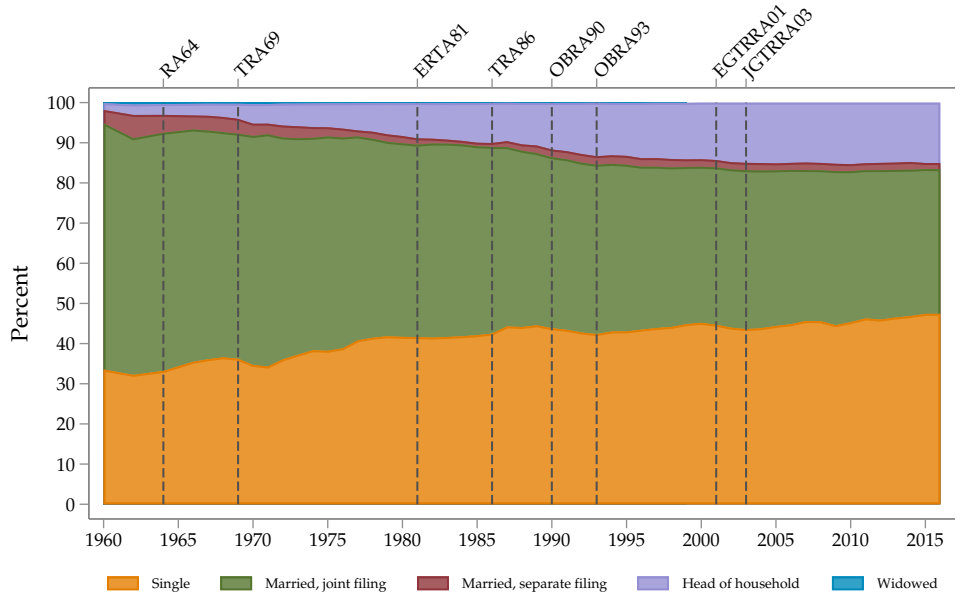
[32] Filing separately can be beneficial in very particular circumstances that we do not observe, i.e., in the case of substantial itemizable deductions (e.g. high medical expenses or student loan repayments).

Table B.1: TAXSIM variables and CPS application

TAXSIM Variable	Explanation	CPS Application
taxsimid	Case ID	N/A
year	Tax year	ASEC income reference year
state	State	State of residence
mstat	Marital Status	Marital status (married vs. unmarried)
page	Age of primary taxpayer	Age of husband
sage	Age of spouse	Age of spouse
depx	Number of dependents	Number of children below and of age 18 + additional dependents
dep13	Number of children under 13	Number of children under 13
dep17	Number of children under 17	Number of children under 17
dep18	Number of qualifying children for EITC.	Number of children below and of age 18
pwages	Wage and salary income of Primary Taxpayer	Wage income + business income + farm income of husband
swages	Wage and salary income of Spouse	Wage income + business income + farm income of spouse
dividends	Dividend income	Income from dividends
intrec	Interest Received	Income from interest
stcg	Short Term Capital Gains or losses	N/A
ltcg	Long Term Capital Gains or losses.	Capital gains - capital losses
otherprop	Other property income	Income from rent
nonprop	Other non-property income	Income from other Source not specified + income from alimony
pensions	Taxable Pensions and IRA distributions	Retirement income
gssi	Gross Social Security Benefits	Social Security income
ui	Unemployment compensation received	Income from unemployment benefits
transfers	Other non-taxable transfer Income	Welfare (public assistance) income + income from worker's compensation + income from veteran benefits + income from survivor benefits + income from disability benefits + income from child support + income from educational assistance + income from SSI + income from assistance
rentpaid	Rent Paid	N/A
proptax	Real Estate taxes paid	Annual property taxes
otheritem	Other Itemized deductions	Indirect calculation via difference between adjusted gross income and taxable income calculated by the Census Bureau's taxy model.
childcare	Child care expenses	N/A
mortgage	Deductions not included in otheritem	N/A

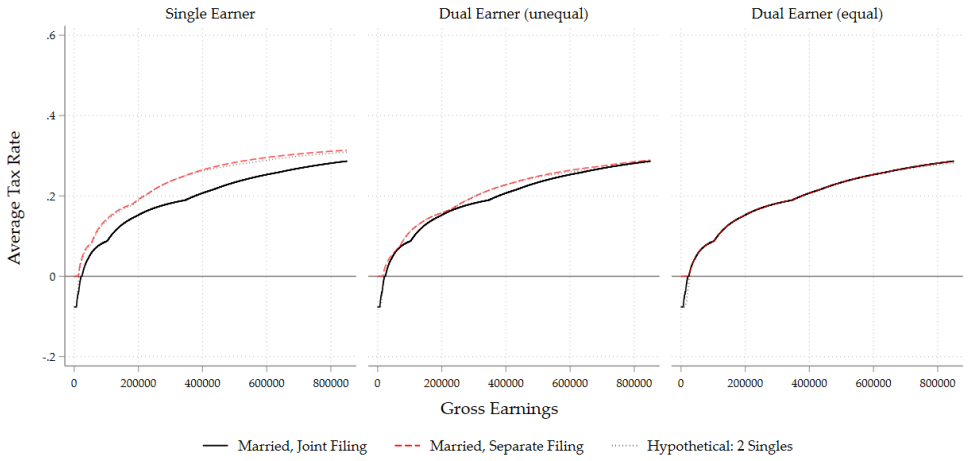
Notes: This table displays the variables utilized as part of the tax calculation via the NBER TAXSIM (v32) microsimulation model and the corresponding information from the CPS used for the respective variables. For details on TAXSIM (v32) see Feenberg and Coutts (1993) and `https://users.nber.org/~taxsim/`.
Source: NBER TAXSIM and CPS-ASEC.

Figure B.2: Filing status according to SOI data



Notes: This figure shows the distribution of filing status from 1960 to 2016. Filing statuses are based on the IRS-SOI PUF administrative tax return micro data.
Source: Authors' calculations based on SOI PUF.

Figure B.3: Married couples filing jointly and separately (2019)



Notes: This figure shows how the average tax rate of a couple with specific gross earnings differs between whether this couple files separately or jointly. In addition, the figure also shows the average tax rate of two singles with the same joint income. The figure differentiates further by the type of couple: single earner couples (95% / 5%), unequal dual earner couples (75% / 25%) and dual earner couples with equal incomes (50% / 50%).
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

B.2 Tax systems and tax reforms

In this section, we provide (i) a brief overview of the tax treatment of couples around the world, (ii) outline the broad changes in the tax treatment of couples and singles in the US federal income tax system (see also the review in Borella et al. (2022)), and (iii) describe the main aspects of specific US tax reforms that we analyze. In the Appendix F we also discuss narratives about a selection of tax reforms using textual analyses.

Tax treatment of couples around the world. The tax treatment of couples and singles around the world can be mainly differentiated by the tax unit, to which the tax code in the respective countries applies to. As shown in Table B.2, a large majority of countries treats the individual as the relevant tax unit, while only few nowadays either treat the household as the tax unit or allow for a choice between individual and household level taxation. This has not always been the case, as many countries that feature nowadays individual-level or optional tax treatment previously had household level taxation. Some of these changes have been analyzed, among others, for Canada, the Czech Republic, Spain, Sweden, and the United Kingdom (see Crossley and Jeon (2007), Kalíšková (2014), Fuenmayor, Granell and Mediavilla (2018), Selin (2014), and Stephens and Ward-Batts (2004)). For the United States, LaLumia (2008) analyzes a reform in 1948 that introduced joint taxation across the United States, but affected only a subset of states (see also discussions below).

It is also important to note that the tax unit type is not sufficient to evaluate the tax treatment of couples, because even though the tax unit might be the individual, there are often particular rules in place, that account for the presence of spouses in the household like spousal allowances or spousal tax credits.

Tax treatment of singles and couples in the US. The federal income tax code in the United States consists of a tax schedule which is differentiated

Table B.2: Tax treatment of couples around the world

Country	Tax unit	Particularities tax treatment of couples	Exemplary reforms of couples taxation	
Argentina	individual			
Australia	individual			
Austria	individual	tax credit for spouse	1973	Introduction of individual tax treatment.
Belgium	household			
Brazil	optional			
Canada	individual	tax credit for spouse	1988	Reduction of the "jointness" of the income tax system.
Costa Rica	individual			
Croatia	individual			
Czech Republic	individual		2008	Introduction of individual tax treatment.
Denmark	individual		1970	Introduction of individual tax treatment.
Estonia	individual	flat rate, allowance for spouse		
Finland	individual		1970	Introduction of individual tax treatment.
France	household			
Germany	optional		1958	Introduction of optional individual tax treatment.
Greece	individual			
Hungary	individual	flat rate		
Iceland	household			
Indonesia	household			
Ireland	optional	allowance / tax credit for spouse	2000	Introduction of individual tax treatment.
Israel	individual			
Italy	individual	allowance / tax credit for spouse	1973	Introduction of individual tax treatment.
Japan	individual	allowance for spouse	1950	Introduction of individual tax treatment.
Kenya	individual			
Latvia	individual	allowance for spouse		
Luxembourg	optional	allowance for spouse	2018	Introduction of optional tax treatment.
Mexico	individual			
Malaysia	optional		1977 (1990)	Introduction of (automatic) individual tax treatment.
Montenegro	individual			
Netherlands	optional		1970	Introduction of individual tax treatment.
New Zealand	individual		1973	Introduction of individual tax treatment.
Norway	individual		1970	Introduction of individual tax treatment.
Peru	individual			
Portugal	optional		2015	Introduction of optional tax treatment.
Romania	individual	flat rate		
San Marino	individual			
Slovakia	individual	allowance for spouse		
Slovenia	individual			
South Africa	individual			
South Korea	individual	allowance for spouse	1954	Introduction of individual tax treatment
Spain	optional		1988	Introduction of optional tax treatment.
Sweden	individual		1970	Introduction of individual tax treatment.
Switzerland	household	allowance for spouse	-	
Tunisia	individual			
Turkey	individual	tax credit for spouse		
Ukraine	optional	flat rate		
United Kingdom	individual	allowance for spouse	1990	Introduction of individual tax treatment.
United States	household		see detailed analysis below	

Notes: This table provides an overview on the tax treatment of couples in selected countries around the world by displaying information on the relevant tax unit, the progressivity of the tax system, and particularities associated with the tax treatment of couples. In addition, if available, the table displays information about exemplary reforms of the tax treatment of couples in the respective country.
Source: OECD, 2022, PWC Tax Summaries, 2022.

by four filing statuses referring to (i) married individuals filing jointly,[33] (ii) heads of households,[34] (iii) unmarried individuals, and (iv) married individuals filing separately. While the objective of this differentiation is to balance out conflicting goals (tax progressivity, equal treatment of married couples, equal treatment of married and unmarried couples), it results in a complex system of marriage bonuses and penalties across the income distribution.[35]

The history of joint taxation in the US can be broadly separated into four periods (see Table B.3). Between 1913 and 1948, the US *formally* had a federal income tax system based on individual income taxation.[36]

With the Revenue Act of 1948, the United States introduced a system of joint taxation, in which the couples' tax liability was calculated by applying the tax schedule to the average income of the couple and by multiplying the resulting tax liability by two. The resulting system resembles very closely the current system of joint taxation in Germany. The system of joint taxation with income splitting was replaced in 1954 with the introduction of two separate tax schedules for couples filing jointly and couples filing separately (also applied to single filers). However, the de-facto treatment of couples stayed the same, because marginal tax rates were not differentiated and all tax brackets for joint filers were set to be twice as large compared to those of separate filers (see Figure B.4).[37]

[33]This filing status also refers to qualifying widow(er)s, i.e. taxpayers whose spouse died during the last two years, who maintains a household with dependent children and who has not remarried.

[34]Unmarried taxpayers who are not a surviving spouse and who maintain a household with dependent persons (e.g. children, father/mother), if a deduction for these persons is possible.

[35]See, for instance, the arguments discussed in a study by the Congressional Budget Office in 1997.

[36]For some states - mostly community property law states - couples' income was assigned in equal terms to both spouses already before 1948. For details, see LaLumia (2008).

[37]In order to give some of the splitting benefits of joint taxation to widows, widowers, and single persons with dependents in their households, the Revenue Act of 1951 introduced a separate tax schedule for heads of households. While this was implemented using a separate tax schedule with both different marginal tax rates and different tax brackets, it was designed to result at any given income level in a tax liability which lies halfway between the tax paid by couples and singles. For details, see General Explanation of the Tax Reform Act of 1969.

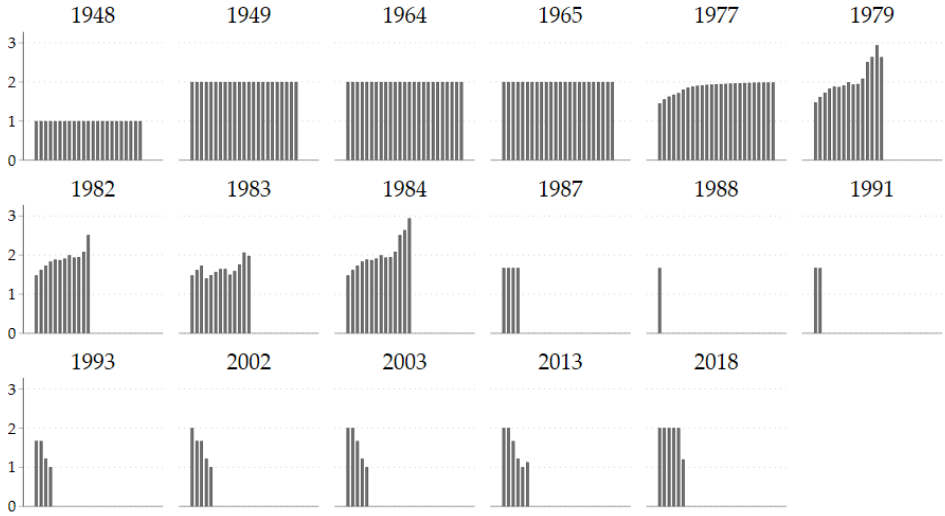
The de-facto splitting system led to tax liabilities for singles which were up to 42 percent higher compared to couples with the same income level. While some of this marriage bonus was considered to be justified on the basis of different living expenses, the size of the penalty for singles was considered to be too high. Therefore, the Tax Reform Act of 1969 (TRA69) installed a new tax schedule for unmarried persons (not falling under the head of household filing status), which had both lower marginal tax rates and different tax brackets. It was designed specifically to reduce the difference in tax liability between singles and couples with the same income. Both at very low and high incomes, the marriage bonus gradually decreased. Since the tax schedule for couples filing separately was still in place, married couples now faced a higher tax liability than two singles with the same joint income. This was justified on the grounds that even though a married couple plausibly has higher living expenses than a single with the same income and should therefore pay less taxes, the couple might well have less living expenses than *two* singles (unmarried couple) with the same joint income. In this third period, the fixed relationship between bracket lengths across the income distribution was broken (see Figure B.4).

The fourth period started with the Tax Reform Act of 1986 (TRA86) which harmonized marginal tax rates for all filing statuses and only treated them differently with respect to the length of tax brackets. This relationship between brackets across singles and couples has changed significantly over time. From 1987 to 1992, although the number of tax brackets varied, the relationship between upper bracket limits for couples and singles was constant. The Omnibus Budget Reconciliation Act of 1993 (OBRA93) differentiated this relationship with the newly introduced tax brackets and thereby increased the potential for marriage penalties at higher incomes. The Economic Growth and Tax Relief Reconciliation Act of 2001 (EGTRRA01) eliminated the marriage penalty for the lowest bracket but strengthened the potential of marriage penalties at the upper tail of the distribution by the newly introduced upper bracket. Starting with the tax year 2003, the marriage penalty in the second tax bracket (15 percent marginal tax rate) was eliminated. Furthermore, the Tax Cuts and Jobs Act of 2017 (TCJA17) eliminated marriage penalties for brackets 3 to 5.

Table B.3: US tax treatment of singles and couples

Tax Year	Difference
1913-1948	Income splitting in community law states (Washington, Idaho, Nevada, California, Arizona, New Mexico, Texas, Louisiana), individual taxation in common law states
1949-1970	Income splitting
1971-1986	Difference in tax brackets and differences in marginal tax rates
1987-2020	Only difference in tax brackets, same marginal tax rates

Figure B.4: Upper Limit of Tax Bracket, Single/Couple



Notes: This figure shows the relation between the upper tax bracket limit of the tax schedule of couples and singles for all tax brackets in the respective tax year. We display those years, in which the number or relation of brackets changed. In all years, the highest bracket is excluded since it has no upper limit.
Source: Historical U.S. Federal Individual Income Tax Rates and Brackets.

Major US tax reforms. We analyze all major changes in the US personal income tax system from 1964 until 2017. Table B.4 provides an overview of the 11 reforms that we identified and analyze. We concentrate on large legislative changes which drive the tax policy effect. These reforms are the Revenue

Act of 1964 (RA64), the Tax Reform Act of 1969 (TRA69), the Revenue Act of 1978 (RA78), the Economic Recovery Tax Act of 1981 (ERTA81), the Tax Reform Act of 1986 (TRA86), the Omnibus Budget Reconciliation Act of 1990 and 1993 (OBRA90 and OBRA93), the Economic Growth and Tax Relief Reconciliation Act of 2001 (EGTRRA01), the Jobs and Growth Tax Relief Reconciliation Act of 2003 (JGTRRA03), the American Taxpayer Relief Act of 2012 (ATRA12) and the Tax Cuts and Jobs Act of 2017 (TCJA17).

Table B.4: Overview of US reforms

Tax reform	pre	post	key features of the reform
RA64	1963	1966	Tax cut (top rate from 91% to 70%)
TRA69	1968	1971	Introduction of Alternative Minimum Tax and new tax schedule for single taxpayers
RA78	1978	1979	Widening of tax brackets (and reducing their number)
ERTA81	1980	1984	Tax cut (top rate from 70% to 50%)
TRA86	1985	1988	Broadening of tax base and reductions in MTRs (top rate from 50% to 28%)
OBRA90	1990	1991	Increase of top tax rate from 28% to 31%
OBRA93	1992	1993	Expansion of EITC and increase of top tax rate from 31% to 39.6%
EGTRRA01	2000	2002	Reductions in marginal tax rates
JGTRRA03	2002	2003	Reductions in marginal tax rates
ATRA12	2012	2013	Increase of tax rates for high income earners
TCJA17	2016	2018	Tax cuts (top rate from 39.6% to 37%)

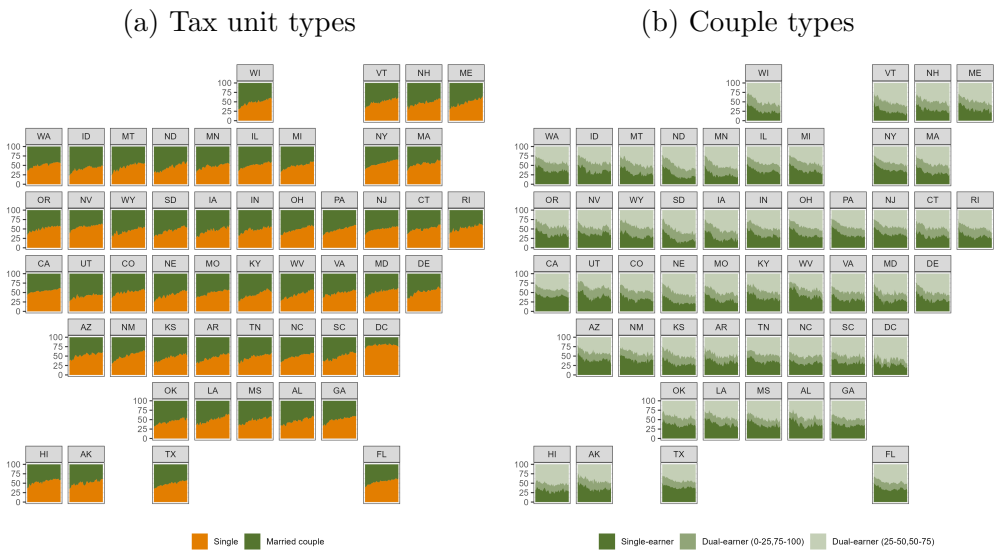
Notes: Table B.4 lists the major reforms of the federal income tax in the US after WWII: the Revenue Act of 1964 (RA64), the Tax Reform Act of 1969 (TRA69), the Revenue Act of 1978 (RA78), the Economic Recovery Tax Act of 1981 (ERTA81), the Tax Reform Act of 1986 (TRA86), the Omnibus Budget Reconciliation Act of 1990 and 1993 (OBRA90 and OBRA93), the Economic Growth and Tax Relief Reconciliation Act of 2001 (EGTRRA01), the Jobs and Growth Tax Relief Reconciliation Act of 2003 (JGTRRA03), the American Taxpayer Relief Act of 2012 (ATRA12) and the Tax Cuts and Jobs Act of 2017 (TCJA17). The pre reform year is always the last year before any change was implemented while the post reform year is the one after all changes are phased in. See Appendix H of Bierbrauer et al. (2021) for more details and the distributional implications of these reforms.

B.3 Descriptives

Section 4 of the main text provides information about demographic trends, the evolution of marriage penalties and bonuses, and shifts in the splitting function. In the following, we provide supplementary results and explanations.

Demographic trends Figure 1 in the main text shows that there was an expansion of singles and dual-earner couples since the 1960s. This demographic change holds broadly across different US states (see Figure B.5). The expansion of singles has been particularly prominent in the lower part of the income distribution while dual earner couples are particularly relevant at the top of the income distribution (see Figure B.6).

Figure B.5: Demographic change, by state



Notes: This figure displays the distribution of tax unit types over time for all states starting in 1976. Figure B.5a displays the share of single tax units (orange area) and the share of couple tax units (green area). Figure B.5b displays the share of single-earner and dual-earner couples. A single-earner couple refers to a married couple, in which one spouse is not employed (dark green area). The figure further displays the share of dual-earner couples in which both spouses are employed and (i) one spouse earns between 0 and 25 percent (mid green area) and (ii) between 25 and 50 percent of total earnings (light green area). Earnings shares are computed on the basis of wage, business and farm income. Reforms of the federal income tax code as described in Table B.4 are displayed as vertical lines. All estimates are based on tax units with strictly positive gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on CPS-ASEC.

Figure B.6: Demographic change, by income decile

Notes: This figure displays the distribution of tax unit types by deciles of the per-capita gross income distribution. Figure B.6a displays the share of single tax units and the share of couple tax units. Figure B.6b displays the share of single-earner and dual-earner couples. A single-earner couple refers to a married couple, in which earnings of one spouse are zero. The figure further displays the share of dual-earner couples, in which one spouse earns between 0 and 25 percent (25 and 50 percent) of total earnings. Earnings shares are computed on the basis of wage, business and farm income. Reforms of the federal income tax code are displayed as vertical lines. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on CPS-ASEC.

B.3.1 Marriage penalties and bonuses

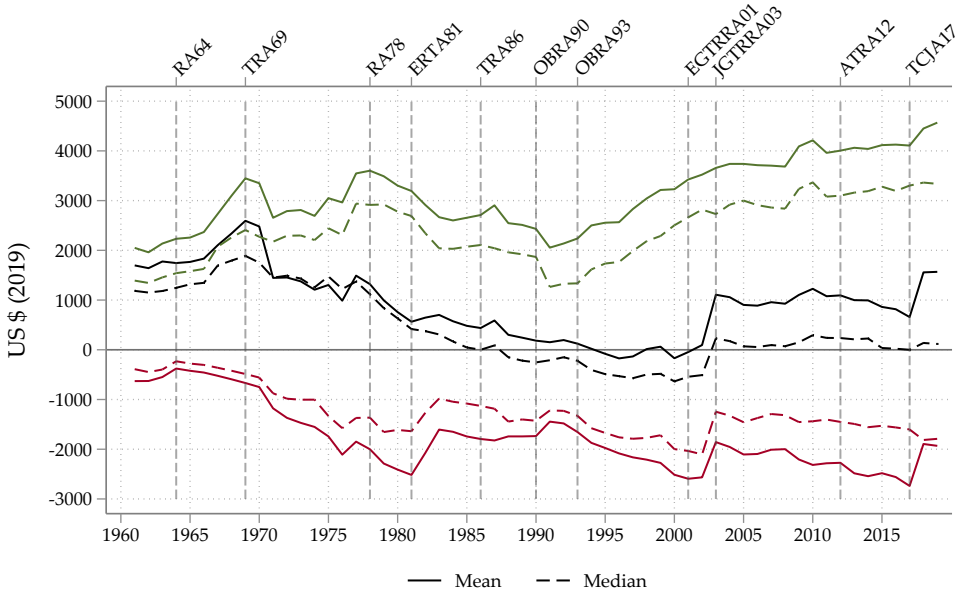
Figure 3 in the main text illustrates that since the 1960s, the share of couples experiencing a marriage bonus decreased while the share of couples facing a marriage penalty increased. Figure B.7 shows how that the magnitude of bonuses and penalties has increased over time. Here we briefly explain, how we construct these measures based on information from the TAXSIM microsimulation model. The microsimulation model allows us to compare for every couple in the data its actual tax liability ($T^{act} = T_m(y_1 + y_2)$) in the status quo tax system with a hypothetical tax liability in a situation in which the cou-

ple would not be married and thus file as two singles ($T^{hyp} = T_s(y_1) + T_s(y_2)$). In the case of dependent children, we must allocate dependents to either one of the two spouses. The counterfactual tax burden is an average over two hypothetical tax burdens in which dependents are allocated to either one of the spouses. Based on actual and hypothetical tax payments, we can construct

Absolute marriage bonus: $B^{abs} = T^{hyp} - T^{act}$,

Relative marriage bonus: $B^{rel} = \frac{B^{abs}}{y_1+y_2}$.

Figure B.7: Absolute marriage bonuses and penalties over time



Notes: This figure shows how the magnitude of the absolute marriage bonus (penalty) B^{abs} changed over time. Mean bonuses / penalties are CPI-adjusted. Marriage bonuses and penalties have been constructed by estimating for every married couple a counterfactual tax burden of two singles with their respective individual incomes. The counterfactual tax burden is an average over two tax burdens that allocate dependent to either spouse. Absolute marriage bonuses are CPI-adjusted and measured in 2019 US dollars. Reforms of the federal income tax code as described in Table B.4 are displayed as vertical lines. All estimates are based on tax units with strictly positive gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

B.3.2 Empirical splitting function σ

The evolution of marriage penalties and bonuses is driven by (i) the change in demographics towards a larger share of dual earner couples and (ii) changes in the relative treatment of couples and singles in the tax system. As discussed in the main text, σ allows us to describe changes in this relative treatment in a constructive manner. We can reformulate Equation (1) as an implicit relationship between the average tax rates of couples and singles

$$\bar{\tau}_m(y_m) = \bar{\tau}_s\left(\frac{y_m}{\sigma(y_m)}\right) \ , \tag{B.21}$$

where

$$\bar{\tau}_m(y_m) \ := \ \frac{T_m(y_m)}{y_m} \quad \text{and} \quad \bar{\tau}_s\left(\frac{y_m}{\sigma(y_m)}\right) \ := \ \frac{\sigma(y_m)}{y_m} T_s\left(\frac{y_m}{\sigma(y_m)}\right) \ .$$

Figure B.8 illustrates that the expression in terms of average tax rates is instrumental to the empirical estimation of the function $\sigma : y_m \mapsto \sigma(y_m)$. For the empirical estimation of σ, we proceed in two steps. First, since in the baseline we abstract from heterogeneity beyond income and filing status, we estimate the mean average tax rate for couples and singles at every income level z:

$$\bar{\tau}_i^*(z) = \mathbb{E}\big[\bar{\tau}_i(z,.)\big] \ \ , \ \ i \in \{s,m\} \ . \tag{B.22}$$

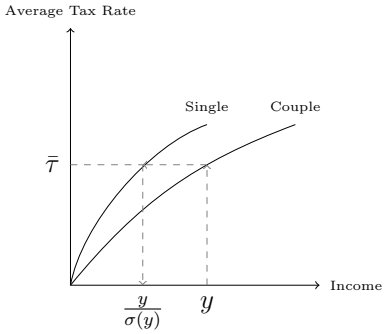
This is reported in Figure B.9. Second, we solve the following equation for $\sigma(z)$:

$$\bar{\tau}_m^*(z) = \bar{\tau}_s^*\left(\frac{z}{\sigma(z)}\right) \ . \tag{B.23}$$

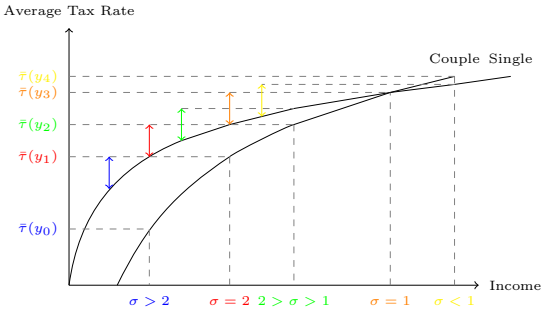
Figure B.10 provides evidence on the heterogeneity of σ when we do not consider the mean average tax rate of all singles and all couples jointly but make separate comparisons of σ by conditioning on the number of children in a household.

Figure B.8: Illustration of σ-function

(a) σ-function

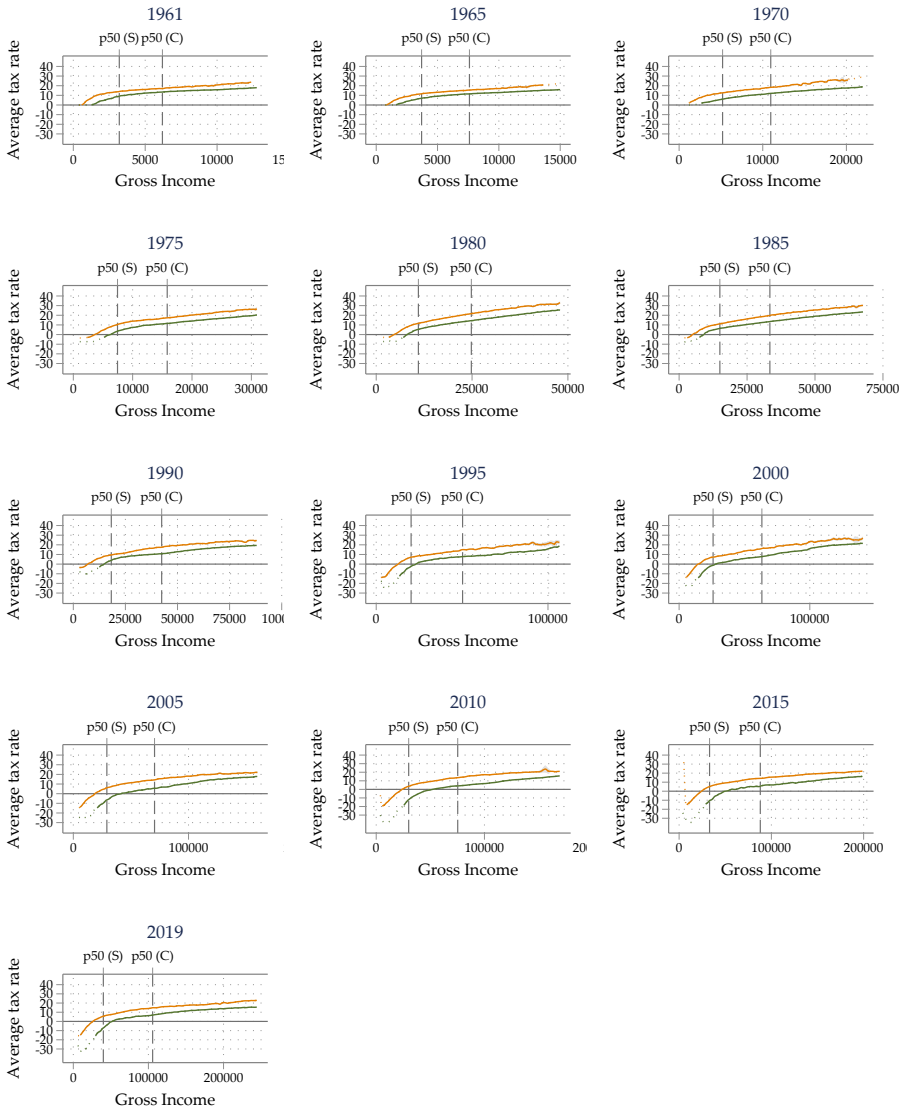


(b) Marriage Penalties and Bonuses



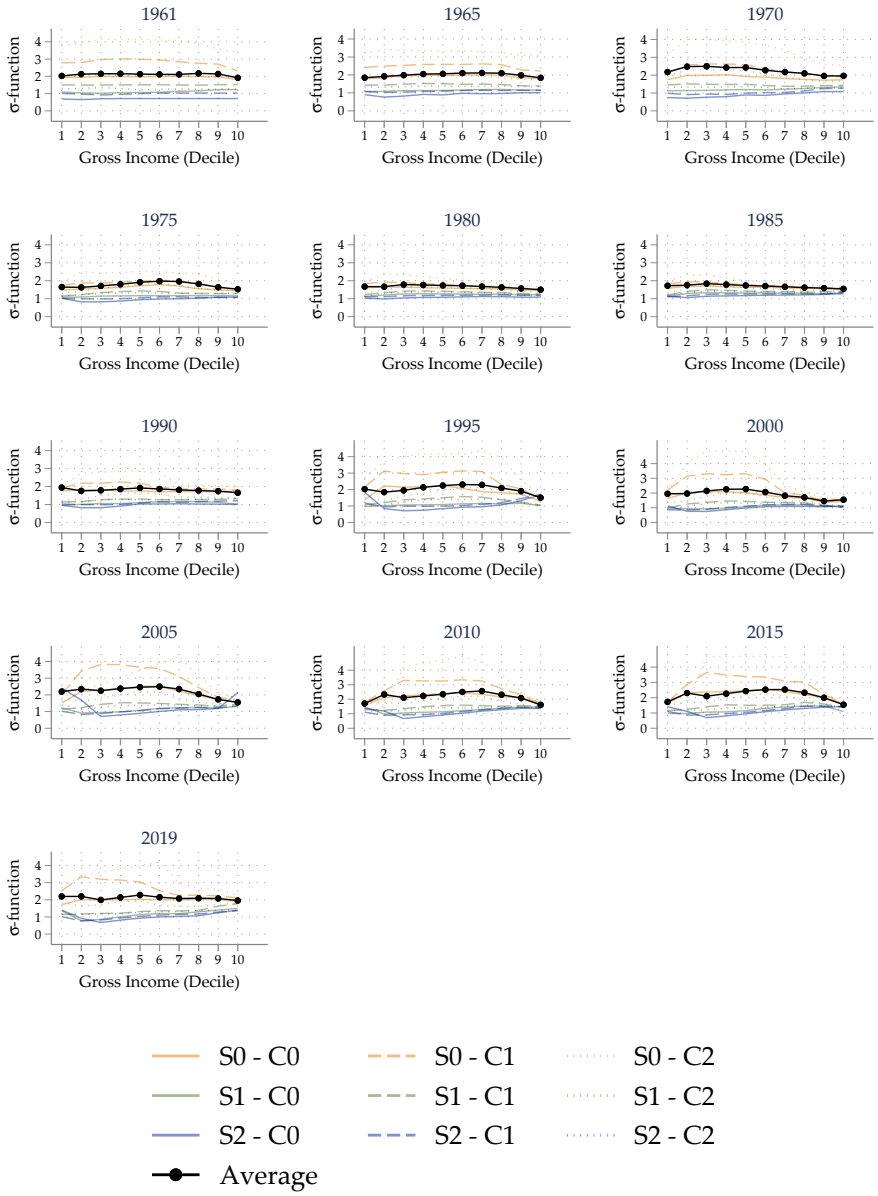
Notes: This figure illustrates the reasoning behind the estimation of the splitting function σ (Figure B.8a) and relates it to the possibilities of marriage bonuses and penalties (Figure B.8b). Figure B.8b shows average tax rates of couples filing jointly at different income levels, where the splitting function is greater than 2 (blue), equal to 2 (red), between 1 and 2 (green), equal to 1 (orange) and smaller than one (yellow). The vertical colored arrows indicate the corresponding range of average tax rates for two singles with the same joint income like the couple filing jointly.

Figure B.9: Average tax rates



Notes: This figure displays average tax rates for married couples and single individuals for selected years. Average tax rates have been estimated using a kernel weighted local mean estimation. The solid part of the estimated average tax rate function satisfies the conditions for which σ-functions can be estimated uniquely (see Figure 2 and Figure B.10). All estimates are based on tax units with strictly positive gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure B.10: Heterogeneity analysis of the empirical splitting function σ



Notes: This figure explores the heterogeneity behind the empirical splitting function σ (see Figure 2). The baseline (comparison) tax unit is always a single tax unit (S) to a couple tax unit (C) accounting for different number of children (0 - no children, 1 - one child, 2 - more than one child) in both the baseline and the comparison tax unit. The σ-function is calculated for tax units by estimating mean average tax rates of couples and singles with different number of children. Deciles refer to the gross income distribution of couples in the respective year. All estimates are based on tax units with strictly positive gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

B.4 Political feasibility and welfare

In Section 4 of the main text, we summarize our analysis of past reforms from a political economy and a welfare perspective. Here we explain in detail, how we evaluate large reforms like the reforms in the past empirically.

For each tax unit j, we observe gross income y_0^j prior to the reform. Moreover, we observe whether a couple is a single earner couple or a dual earner couple. Based on the information from the CPS, we use the TAXSIM microsimulation model to calculate the person's tax payment $T_0(y_0^j)$, the average tax rate t_0^j and the marginal tax rate τ_0^j that are relevant for this tax unit prior to the reform. Finally, we observe the post-reform counterparts t_1^j and τ_1^j. We do not use the post-reform income y_1^j. Instead, we construct a (counterfactual) measure of the change in a taxpayer's tax burden that is only due to the reform, holding all individual characteristics, including the person's income, fixed, i.e. we compute the so-called "tax policy effect" (see, e.g., Eissa et al. (2008), Bargain et al. (2015), or Bierbrauer et al. (2021)).

We first explain how we would estimate the quantities of interest on the assumption that a tax reform takes place in an instant. In a second step, we take account of the complication that arises when a reform, such as the Reagan tax cuts, is phased in over several years.

Approximating the revenue implications of tax reforms. For each tax unit, we compute the change in taxes paid due to the reform. The change in taxes paid for a tax unit j is given by

$$\Delta T^j = t_1^j \; y_1^j - t_0^j \; y_0^j \; . \tag{B.24}$$

Behavioral responses to taxation imply that y_1^j will in general be different from y_0^j.

We take account of behavioral responses both at the extensive and the intensive margin. To do so, we think of every tax unit as being representative of a group of tax units with similar characteristics. Tax units similar to j are split into two groups. One group opts out and has $y_1^j = 0$ after the reform. The other groups stays in, $y_1^j > 0$. Remember that the extensive margin

elasticity at an income of y measures the percentage share of tax units with an initial income close to y that choose zero earnings in response to a one percent decrease of their disposable income. Possibly, these elasticities differ not only by income, but also depend on marital status – i.e., on whether the tax unit is a single, a single earner couple, or a dual earner couple. Let π^j be the extensive margin elasticity that applies to tax units similar to j. The reform induced percentage change in disposable income for tax units j is given by

$$\frac{y_0^j - T_1(y_0^j) - (y_0^j - T_0(y_0^j))}{y_0^j - T_0(y_0^j)} = \frac{T_1(y_0^j) - T_0(y_0^j)}{y_0^j - T_0(y_0^j)} = \frac{(t_j^1 - t_j^0)y_0^j}{y_0^j - t_0^j\, y_0^j} = \frac{t_j^1 - t_j^0}{1 - t_0^j} \ . \tag{B.25}$$

Thus, the fraction dropping out of the labor market is given by $\pi^j \ \frac{t_j^1 - t_j^0}{1 - t_0^j}$. The complementary fraction is staying in. For those who stay in, there are behavioral responses at the intensive margin. Our assumptions on preferences imply that such behavioral responses are driven entirely by changes of the marginal tax rates that tax units face. Thus, using a first order Taylor approximation,

$$y_1^j = y_0^j + (\tau_1^j - \tau_0^j)\ y_\tau^j \ ,$$

where y_τ^j is the marginal effect that an infinitesimal change of the marginal tax rate has on j's taxable income (in the status quo). Using that $y_\tau^j = -y_{1-\tau}^j$, we can express this also via the marginal effect associated with a change of the net of tax rate $1 - \tau$. Hence,

$$y_1^j = y_0^j - (\tau_1^j - \tau_0^j)\ y_{1-\tau}^j \ ,$$

Using the definition of the elasticity of taxable income (ETI), $\varepsilon^j := y_{1-\tau}^j \ \frac{1-\tau_0^j}{y_0^j}$, we can rewrite this as well as

$$y_1^j = \left(1 - \frac{\tau_1^j - \tau_0^j}{1 - \tau_0^j}\ \varepsilon^j\right) y_0^j \ .$$

Thus, for tax units that stay in, we have that

$$t_1^j\ y_1^j = t_1^j \left(1 - \frac{\tau_1^j - \tau_0^j}{1 - \tau_0^j}\ \varepsilon^j\right) y_0^j \ .$$

Collecting terms, overall we have that

$$\Delta T^j = \left(1 - \pi^j \, \frac{t_j^1 - t_j^0}{1 - t_0^j}\right) t_1^j \left(1 - \frac{\tau_1^j - \tau_0^j}{1 - \tau_0^j} \, \varepsilon^j\right) y_0^j - t_0^j \, y_0^j \, . \tag{B.26}$$

By summing across all tax units, we obtain an estimate for the aggregate change of tax revenue $\sum_j \Delta T^j$. Dividing by the number of tax units J yields an estimate for the revenue change per tax unit

$$\Delta R = \frac{1}{J} \sum_j \Delta T^j \, . \tag{B.27}$$

Implications for individual welfare: Number of winners and losers. The analysis of political feasibility in Section 4 rests on a comparison of the number of individuals that benefit from a reform to the number of individuals that are made worse off. We now explain how we get to these number. We use conditions (A.17)-(A.20) to determine whether or not tax units benefit from a reform. When we bring these conditions to the data, we say that an individual tax unit j is a reform beneficiary if

$$\Delta R \;\; - \;\; (t_1^j - t_0^j) \; \max\{y_1^j, y_0^j\} \quad \geq \quad 0 \, , \tag{B.28}$$

and loses if

$$\Delta R \;\; - \;\; (t_1^j - t_0^j) \; \min\{y_1^j, y_0^j\} \quad \leq \quad 0 \, . \tag{B.29}$$

However, and as explained above, we think of an individual tax unit j as being representative of a group of tax units with similar characteristics. Thus, when average tax rates go up, $t_1^j - t_0^j > 0$, a fraction

$$\pi^j \, \frac{t_j^1 - t_j^0}{1 - t_0^j}$$

of this group has $y_1^j = 0$ and the complementary fraction with mass

$$1 - \pi^j \, \frac{t_j^1 - t_j^0}{1 - t_0^j}$$

has

$$y_1^j = \left(1 - \frac{\tau_1^j - \tau_0^j}{1 - \tau_0^j}\, \varepsilon^j\right) y_0^j \,.$$

By contrast, when average tax rates go down $t_1^j - t_0^j > 0$, we have tax units with $y_0^j = 0$ who now opt in at an income level of

$$y_1^j = \left(1 - \frac{\tau_1^j - \tau_0^j}{1 - \tau_0^j}\, \varepsilon^j\right) y_0^j \,.$$

and tax units with $y_0^j > 0$ who also choose this income level after the reform. The mass of tax units opting in equals

$$-\pi^j\, \frac{t_j^1 - t_j^0}{1 - t_0^j}$$

and the mass of tax units with a post-reform income of y_j^1 is then equal to

$$1 - \pi^j\, \frac{t_j^1 - t_j^0}{1 - t_0^j} \,.$$

Implications for individual welfare: Gains and losses. For the welfare analysis in Section C.3 we aggregate the gains of reform winners and the losses of reform losers using various social welfare functions. The expressions on the left-hand sides of (B.28) and (B.29), respectively, are alternative measures of by how much individuals are affected. In the main text we present an analysis using the left-hand sides of (B.28). This makes it demanding to find welfare gains. In Appendix C we compare this baseline welfare measure against the alternative measure that uses the left-hand sides of (B.29), which makes it demanding to find welfare losses.

Adjusting for the time gap between pre- and post-reform years. The need of adjustment comes from the fact that the pre- and the post-reform tax systems apply in different calendar years. In case of the Reagan tax cuts, the reform was gradually implemented over several years, and we take 1985 as the

last year with pre-reform schedule and 1988 as the first year with the post-reform schedule. We want an answer to a ceteris paribus question: All else equal, what is the effect of replacing the 1985-schedule by the 1988-schedule? To answer this question, we will have to compute an inflation adjusted version of y_0^j that we will denote by $\hat{y}_0^j$. If y_0^j is pre-reform income in 1985 USD, we think of $\hat{y}_0^j$ as the same pre-reform income, but expressed in 1988 USD.[38] Put differently, in moving from y_0^j to $\hat{y}_0^j$ we keep real income constant. We now explain how this adjustment modifies the above formulas.

First, note that we can express τ_0^j and τ_1^j also as

$$\tau_0^j = T_0'(y_0^j) \quad \text{and} \quad \tau_1^j = T_1'(\hat{y}_0^j) \ ,$$

and t_0^j and t_1^j also as

$$t_0^j = \frac{T_0(y_0^j)}{y_j^0} \quad \text{and} \quad t_1^j = \frac{T_1(\hat{y}_0^j)}{\hat{y}_0^j} \ .$$

The *direct policy effect* of the reform is then given by

$$\Delta T^j = T_1(\hat{y}_0^j) - T_0(y_0^j). \tag{B.30}$$

The reform induced percentage change in disposable income for tax units j – see Equation (B.25) – is now given by

$$\frac{\hat{y}_0^j - T_1(\hat{y}_0^j) - (y_0^j - T_0(y_0^j))}{y_0^j - T_0(y^j)} = \frac{\hat{y}_0^j - T_1(\hat{y}_0^j)}{y_0^j - T_0(y^j)} - 1 := r^j \ . \tag{B.31}$$

The fraction opting out when this expression is positive is given by $\pi^j \ r^j$. For those who stay in,

$$y_1^j = \hat{y}_0^j + (\tau_1^j - \tau_0^j) \ y_\tau^j \ .$$

Again, using the definition of the elasticity, $\varepsilon^j := y_{1-\tau}^j \ \frac{1-\tau_0^j}{y_0^j}$, we can rewrite this as well as

$$y_1^j = \left(1 - \frac{\tau_1^j - \tau_0^j}{1 - \tau_0^j} \ \varepsilon^j\right) \hat{y}_0^j \ .$$

[38] As Bierbrauer et al. (2021), we use the Consumer Price Index research series using current methods (CPI-U-RS) from the Bureau of Labor Statistics as an uprating factor to inflate/deflate incomes.

Thus, for tax units that stay in, we have that

$$t_1^j \; y_1^j = t_1^j \left(1 - \frac{\tau_1^j - \tau_0^j}{1 - \tau_0^j} \, \varepsilon^j \right) \hat{y}_0^j \; .$$

Collecting terms, overall we have that

$$\Delta T^j = \left(1 - \pi^j \, \frac{t_j^1 - t_j^0}{1 - t_0^j} \right) t_1^j \left(1 - \frac{\tau_1^j - \tau_0^j}{1 - \tau_0^j} \, \varepsilon^j \right) \hat{y}_0^j - t_0^j \; y_0^j \; . \tag{B.32}$$

By summing across all tax units we obtain an estimate for the aggregate change of tax revenue $\sum_j \Delta T^j$. Dividing by the number of tax units J yields an estimate for the revenue change per tax unit

$$\Delta R = \frac{1}{J} \sum_j \Delta T^j \; . \tag{B.33}$$

We say that an individual tax unit j is a reform beneficiary if

$$\Delta R \;\; - \;\; (t_1^j - t_0^j) \; \max\{y_1^j, \hat{y}_0^j\} \quad \geq \quad 0 \; , \tag{B.34}$$

and loses if

$$\Delta R \;\; - \;\; (t_1^j - t_0^j) \; \min\{y_1^j, \hat{y}_0^j\} \quad \leq \quad 0 \; . \tag{B.35}$$

and we use the left-hand sides of (B.34) and (B.35) as measures of how much individuals gain or lose due to a tax reform.

Hypothetical reforms. Our methodology is not only valid for reforms that were implemented in the past. We can also apply it to the analysis of hypothetical tax reforms that did not take place. Given our focus on the tax treatment of couples and singles, one such hypothetical reform type is one in which we take the change in taxes for singles through a particular historical reform as given but translate that observed tax change for singles according to the pre-reform σ-function to couples.

In particular, we replace the post-reform tax function for couples by a hypothetical one that is linked via the pre-reform σ-function to the post-reform

tax schedule for singles. For instance, the hypothetical mechanical change in tax payments for couples is then given by

$$\Delta T^j = T^{hyp}_{m1}(\hat{y}_{m0}) - T_{m0}(y_{m0}), \tag{B.36}$$

$$\Delta T^j = \sigma_0 \, T_{s1}\left(\frac{\hat{y}_{m0}}{\sigma_0}\right) - T_{m0}(y_{m0}). \tag{B.37}$$

B.5 Calibration of revenue functions

We explain, how we calibrate the revenue functions characterized in Proposition 1.

The main ingredients of these equations are (i) estimates of the gross income distribution through the cumulative distribution function and the probability density function, (ii) an approximation of marginal and participation tax rates, and (iii) assumptions about intensive margin behavioral responses.

We estimate gross income distributions for couples and singles from the CPS data using an adaptive kernel density estimator with a Gaussian kernel on an equally spaced grid between the first percentile and a value equal to the 99.9th percentile of the gross income distribution. Subsequently, we adjust the estimated distribution to the share of tax units without any income. Figures B.11 and B.12 show the resulting cumulative distribution functions (CDF) and probability density functions (PDF).

We estimate effective marginal tax rates based on the TAXSIM microsimulation model for every tax unit in the data. To approximate effective marginal tax rates at a given income level, we estimate a kernel-weighted local polynomial using the same grid and bandwidth as for the estimation of the income distributions. Figure B.13 shows the estimated marginal tax rates.

Based on the assumptions about behavioral responses at the intensive margin illustrated in Table 1, we assign every single tax unit the respective intensive margin elasticity and every couple a weighted average based on the income

shares of the primary and secondary earner. In line with the estimation of average effective marginal tax rates, we approximate the intensive margin elasticity at a given income level using a kernel weighted local polynomial. Note that even though elasticities are constant for primary and secondary earners, the average elasticity for couples can vary across the income distribution and across years due to the change in the earnings share of primary and secondary earners. Figure B.14 shows for the baseline assumptions about the elasticity of taxable income, how the average elasticities assigned to couples varies across the income distribution.

The additional ingredients with respect to the ones used above are (i) the share of dual and single earner couples, (ii) separate income distributions for dual and single earner couples - see Figures B.15 and B.16, (iii) estimates of the participation tax rate - see Figure B.17, and (iv) assumptions about the participation elasticity. For the latter, we assume that the participation elasticity does not vary across tax unit types, but vary across the income distribution, i.e. it decreases from 0.65 to 0.25 between a gross income of zero and the 90th percentile of the gross income distribution (see Figure B.18).

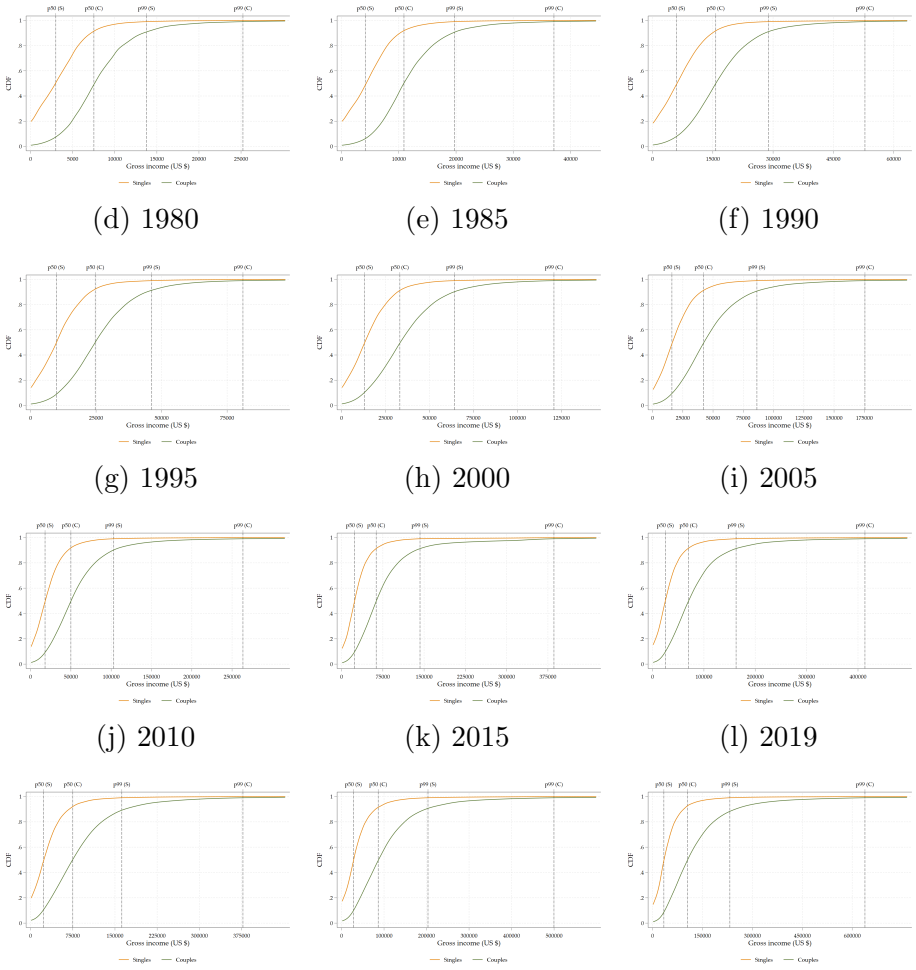
Beyond the elasticities for primary and secondary earners, the estimation of these revenue functions requires (i) separate income distributions for the primary and the secondary earner - see Figures B.19 and B.20, and (ii) an estimate of the couples' marginal tax rate at a given primary and secondary earnings level (see Figures B.21 and B.22).

For the consideration of extensive margin responses, we assume that the extensive margin reaction of dual earner couples does not differ of whether the tax treatment of primary or secondary earnings are modified, or whether they are single earner couples or dual earner couples, i.e. $\pi_{dec,1} = \pi_{dec,2} = \pi_{dec} = \pi_{sec}$.

Again, we assume that participation responses are larger at the bottom of the income distribution, i.e. the participation elasticities decrease from 0.65 to 0.25 between a gross income of zero and the 90th percentile of the gross income distribution (see Figure B.18). Note that in contrast to intensive margin responses, we cannot put the participation elasticity in front of the

expectation operator, because the participation elasticity is assumed to be income dependent. Therefore, we first compute the term inside the expectation operator at the tax unit level, and estimate the average of this term across varying levels of primary and secondary earnings.

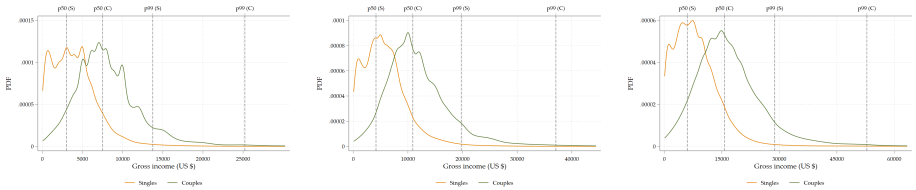
Figure B.11: Cumulative distribution function



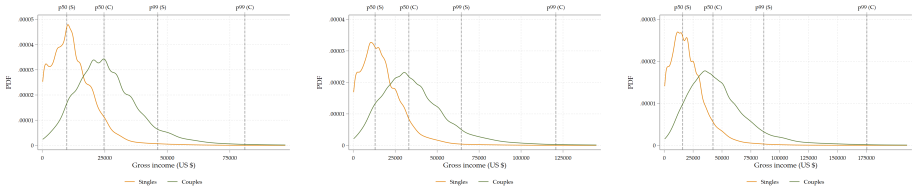
Notes: This figure displays estimates of the cumulative distribution function of gross income for singles (orange line) and couples (green line) in the respective year. Distributions are estimated using an adaptive kernel density estimator with a Gaussian kernel on an equally spaced grid between the first percentile and a value equal to the 99.9th percentile of the gross income distribution.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure B.12: Probability density function

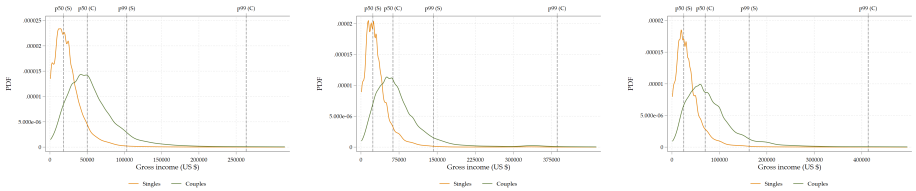
(a) 1965 (b) 1970 (c) 1975



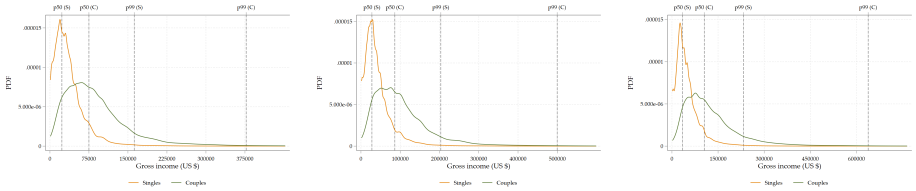
(d) 1980 (e) 1985 (f) 1990



(g) 1995 (h) 2000 (i) 2005

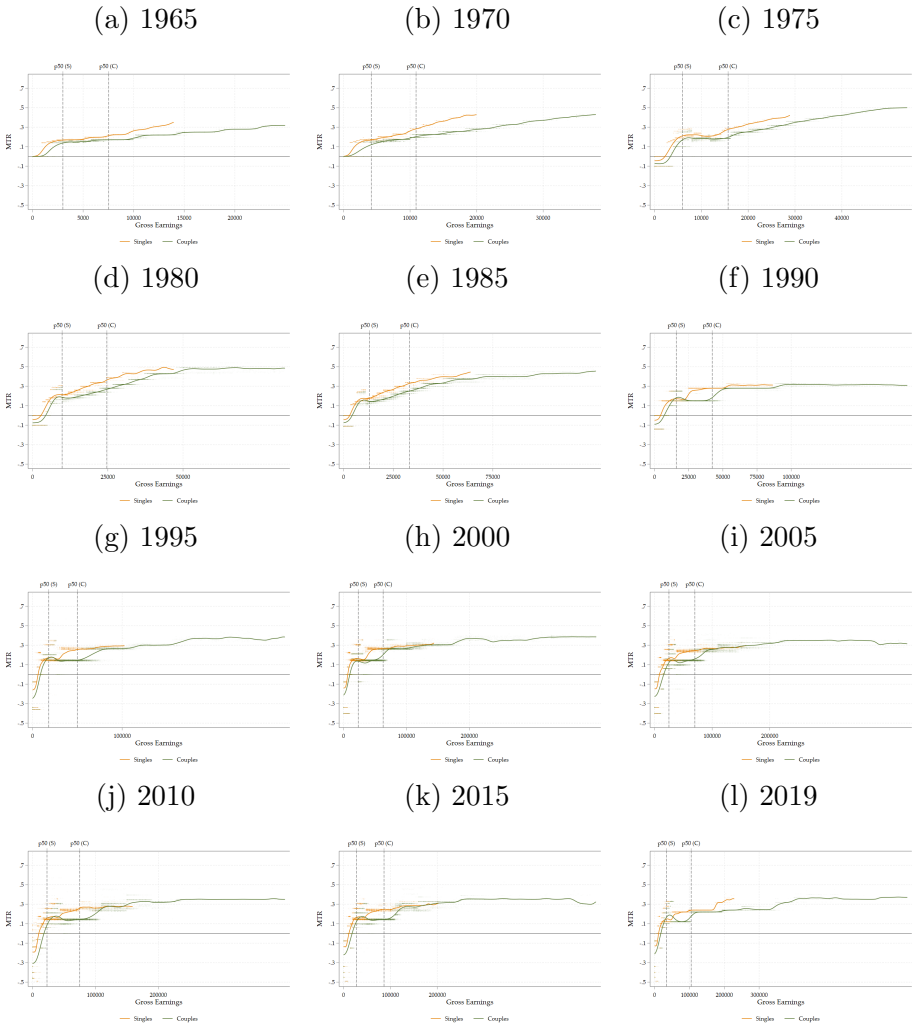


(j) 2010 (k) 2015 (l) 2019



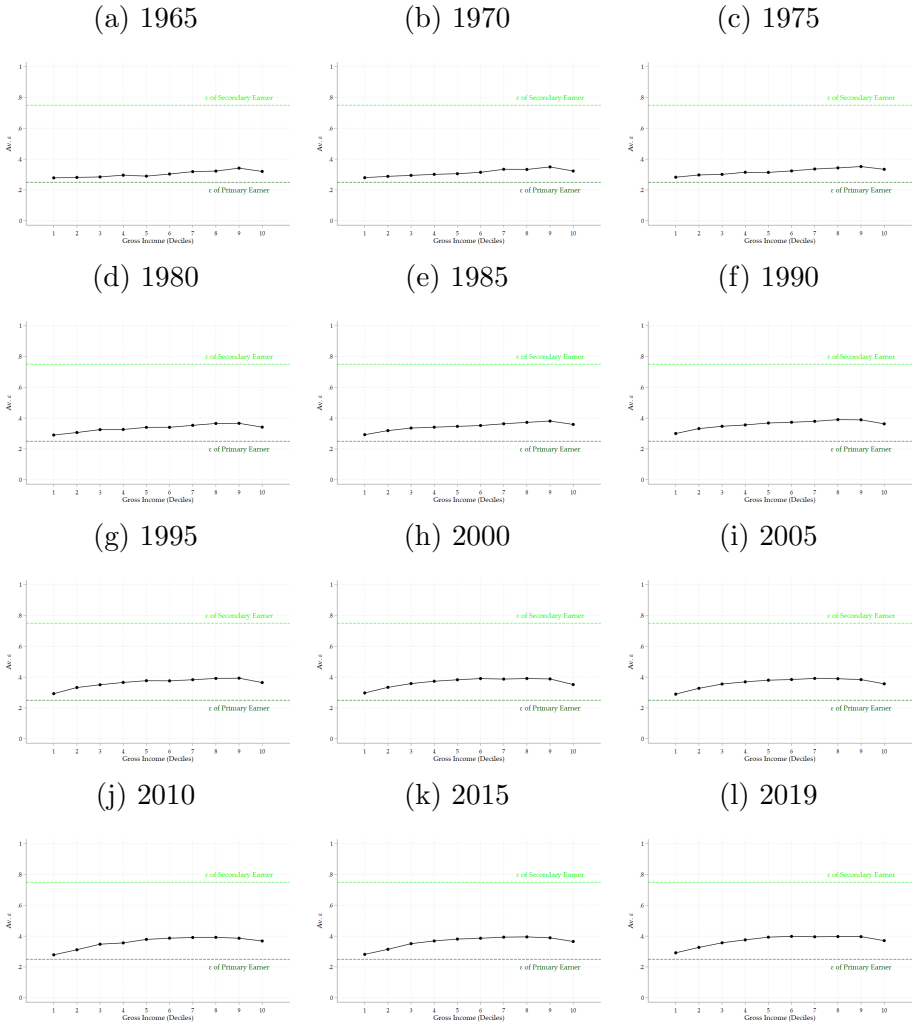
Notes: This figure displays estimates of the probability density function of gross income for singles (orange line) and couples (green line) in the respective year. Distributions are estimated using an adaptive kernel density estimator with a Gaussian kernel on an equally spaced grid between the first percentile and a value equal to the 99.9th percentile of the gross income distribution.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure B.13: Effective marginal tax rates



Notes: This figure displays average effective marginal tax rates for singles (orange lines) and couples (green lines) before the reform (solid lines) and after the reform (dashed lines). Average marginal tax rates at a given gross income level are estimated with a kernel-weighted local polynomial using the same grid and bandwidth as for the estimation of the income distributions (see Figure B.11 and B.12). *Source:* Authors' calculations based on NBER TAXSIM and CPS-ASEC.

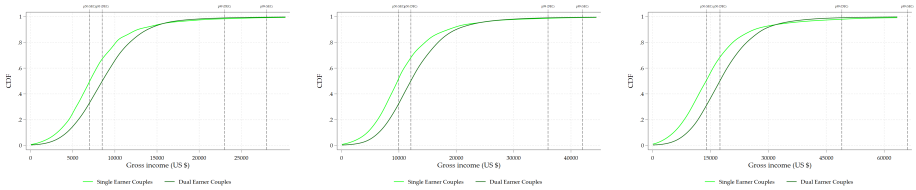
Figure B.14: Average elasticities of couples



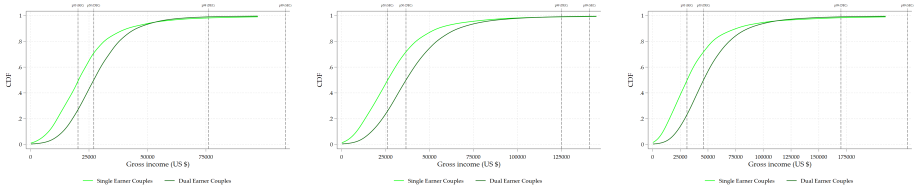
Notes: This figure displays the average intensive margin elasticity of taxable income for couples across gross income deciles in the respective year. Elasticities are calculated for every couple based on an income-share weighted elasticity of 0.25 for the primary earner and 0.75 for the secondary earner (see Table 1). Deciles are computed based on the gross income distribution of couples. Earnings shares are based on wage, business and farm income.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure B.15: CDF, single earner and dual earner couples

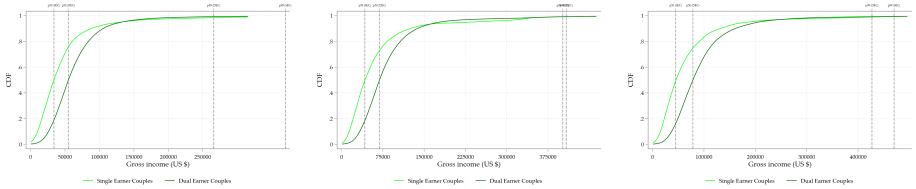
(a) 1965 (b) 1970 (c) 1975



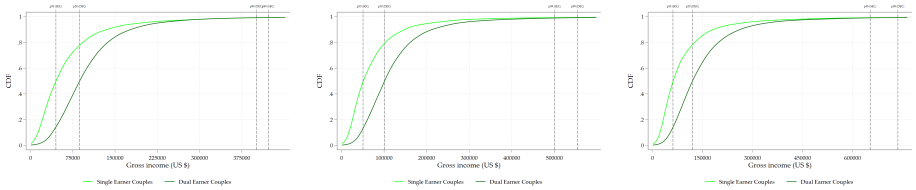
(d) 1980 (e) 1985 (f) 1990



(g) 1995 (h) 2000 (i) 2005

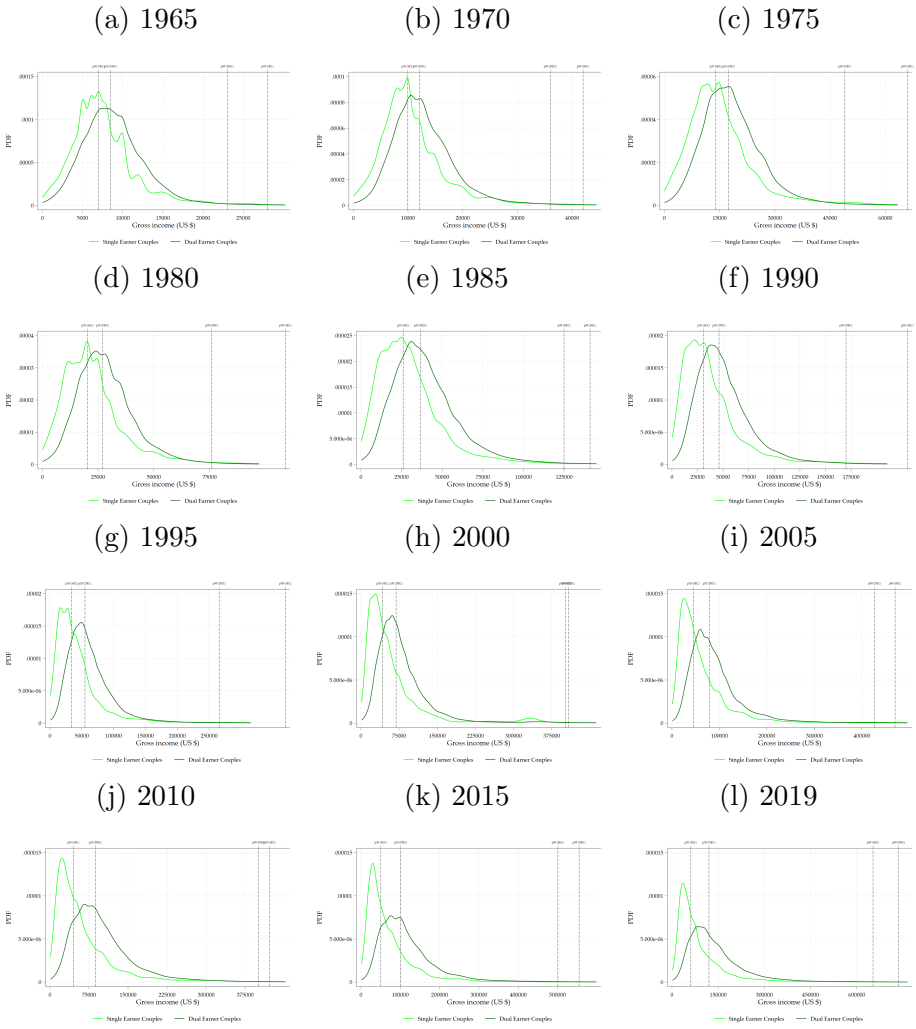


(j) 2010 (k) 2015 (l) 2019



Notes: This figure displays estimates of the cumulative distribution function of gross income for single earner (light green line) and dual earner couples (dark green line) in the respective year. Distributions are estimated using an adaptive kernel density estimator with a Gaussian kernel on an equally spaced grid between the first percentile and a value equal to the 99.9th percentile of the gross income distribution.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

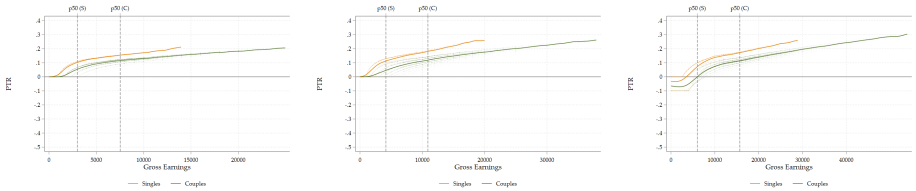
Figure B.16: PDF, single earner and dual earner couples



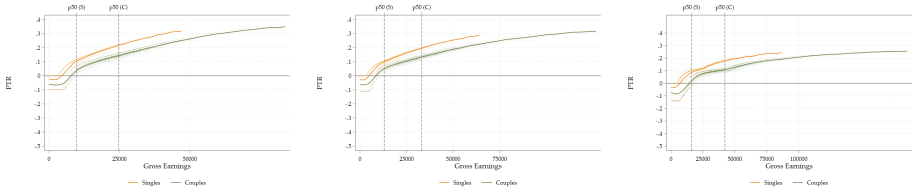
Notes: This figure displays estimates of the probability density function of gross income for single earner (light green line) and dual earner couples (dark green line) in the respective year. Distributions are estimated using an adaptive kernel density estimator with a Gaussian kernel on an equally spaced grid between the first percentile and a value equal to the 99.9th percentile of the gross income distribution. *Source:* Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure B.17: Participation tax rates

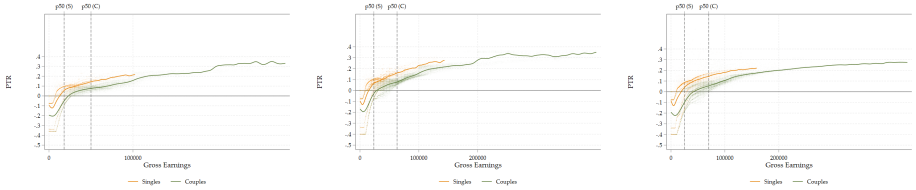
(a) 1965 (b) 1970 (c) 1975



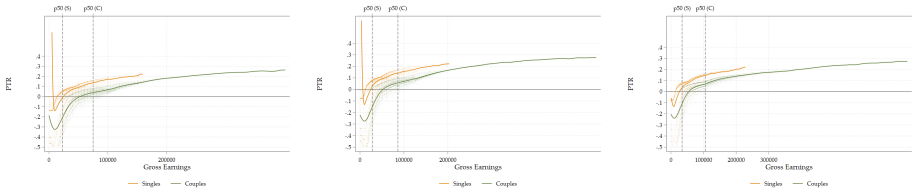
(d) 1980 (e) 1985 (f) 1990



(g) 1995 (h) 2000 (i) 2005

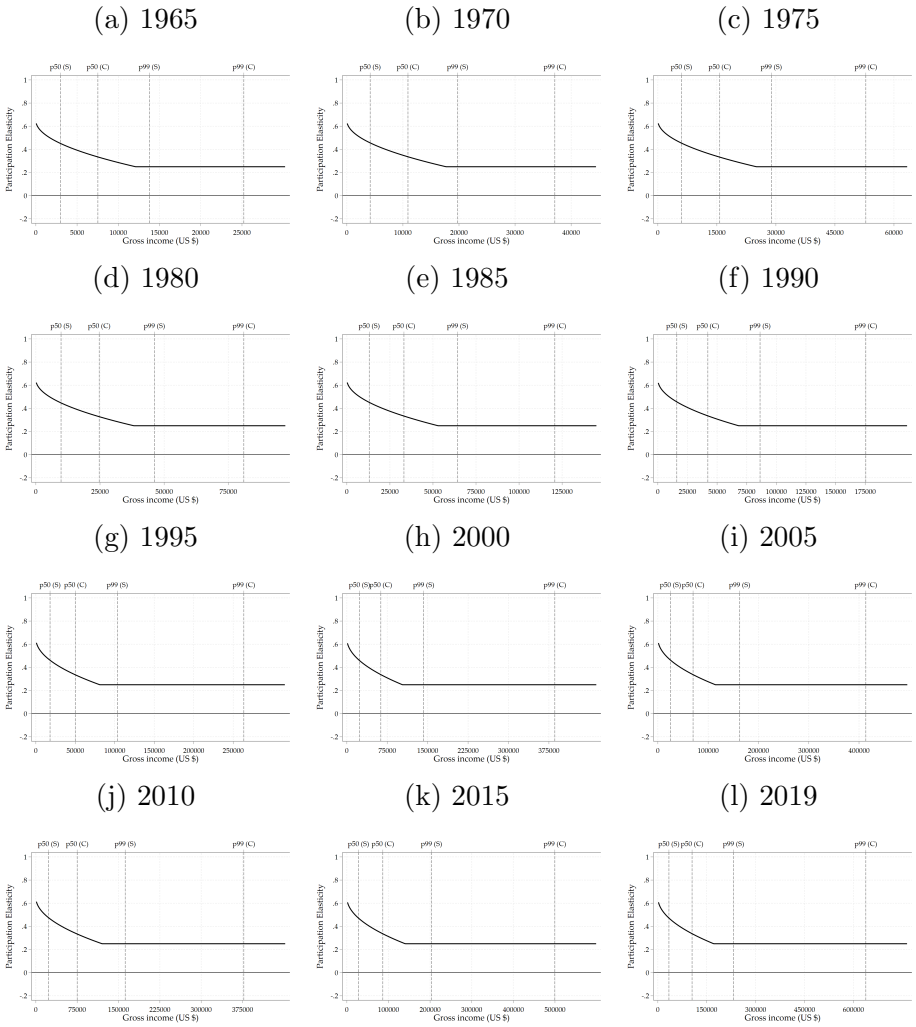


(j) 2010 (k) 2015 (l) 2019



Notes: This figure displays participation tax rates for every single (light orange dots) and every couple (light green dots) in the respective year. Solid orange (green) lines represent estimates of the average marginal tax rate schedule for singles (couples). Average participation tax rates at a given gross income level are estimated with a kernel-weighted local polynomial using the same bandwidth as for the estimation of the income distributions (see Figure B.11 and B.12).
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

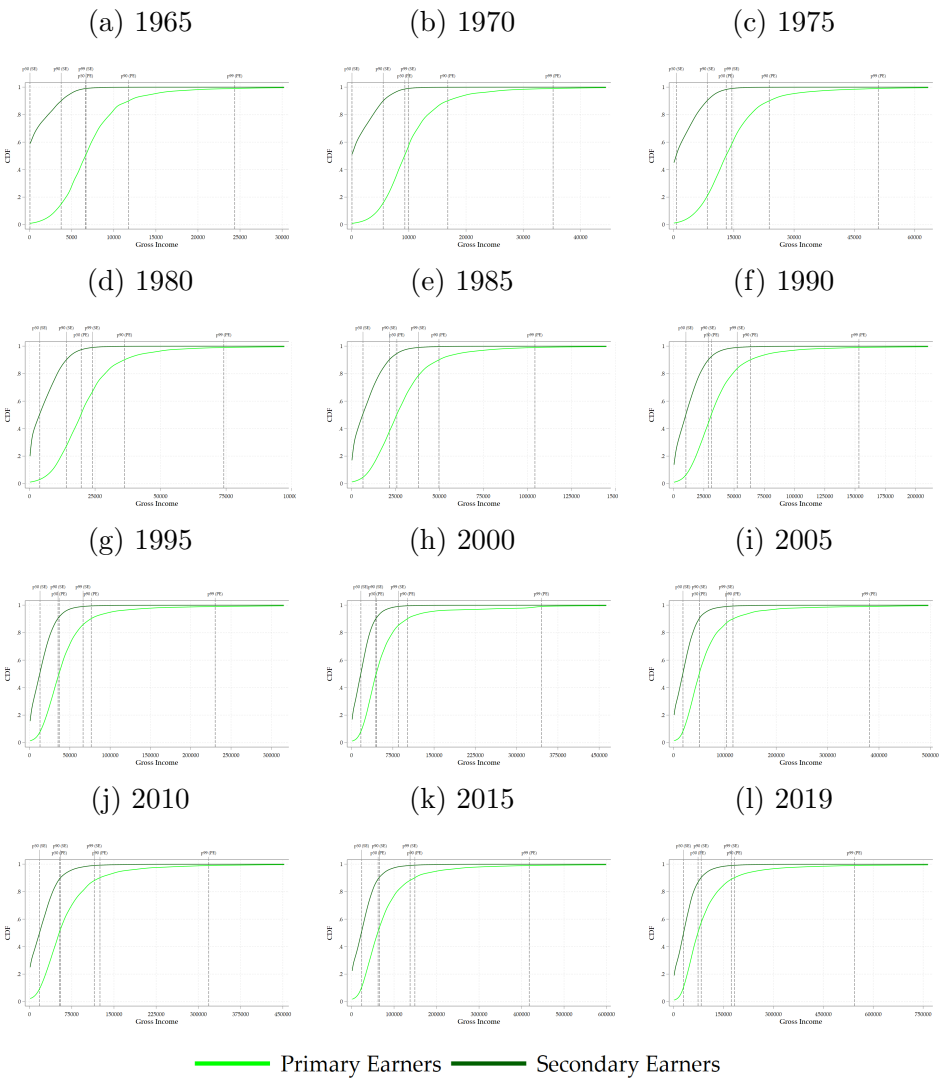
Figure B.18: Participation elasticities



Notes: This figure displays for every year the evolution of the participation elasticity over income. The participation elasticity is assumed to decrease from 0.65 to 0.25 between zero and the 90th percentile of the gross income distribution based on the formula $\pi = 0.65 - 0.4\left(\frac{y}{y_{P90}}\right)^{\frac{1}{2}}$.

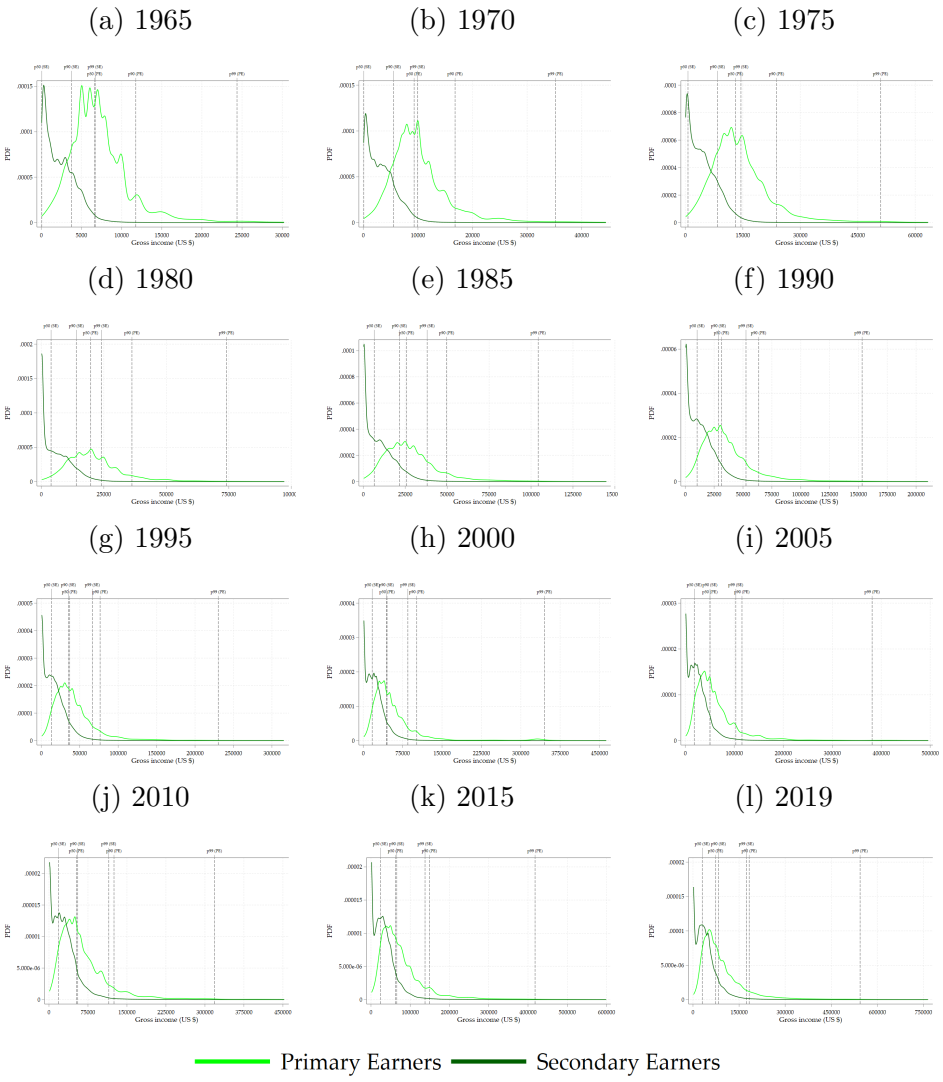
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure B.19: Cumulative distribution function, primary and secondary earners



Notes: This figure shows for selected years the cumulative density function of primary and secondary earnings. Distributions are estimated using an adaptive kernel density estimator with a Gaussian kernel on an equally spaced grid between the first percentile and a value equal to the 99.9th percentile of the gross income distribution.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

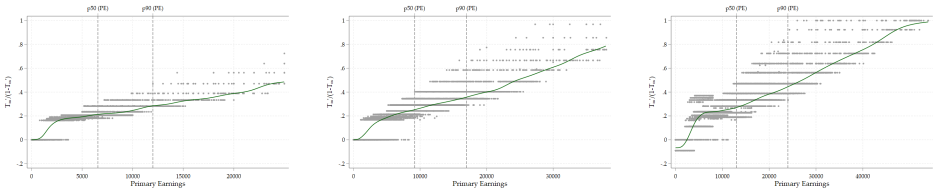
Figure B.20: Probability density function, primary and secondary earners



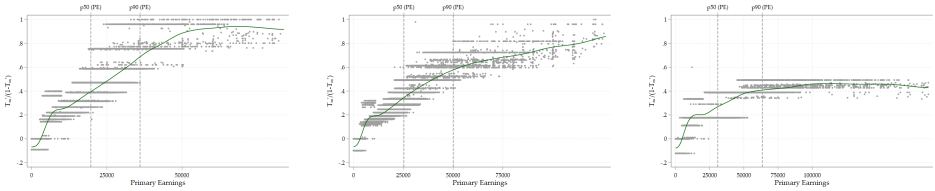
Notes: This figure shows for selected years the probability density function of primary and secondary earnings. Distributions are estimated using an adaptive kernel density estimator with a Gaussian kernel on an equally spaced grid between the first percentile and a value equal to the 99.9th percentile of the gross income distribution.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure B.21: Average marginal tax rates by primary earnings

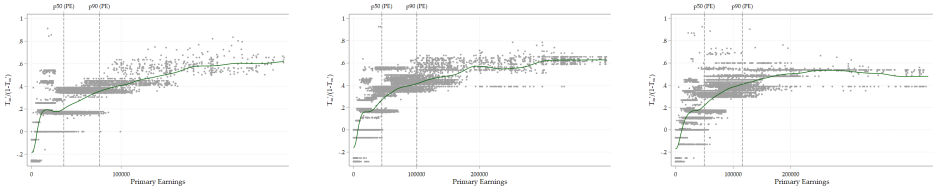
(a) 1965 (b) 1970 (c) 1975



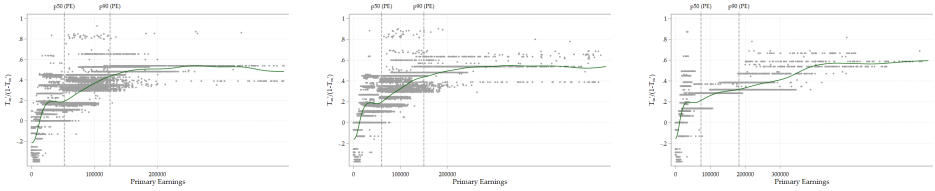
(d) 1980 (e) 1985 (f) 1990



(g) 1995 (h) 2000 (i) 2005



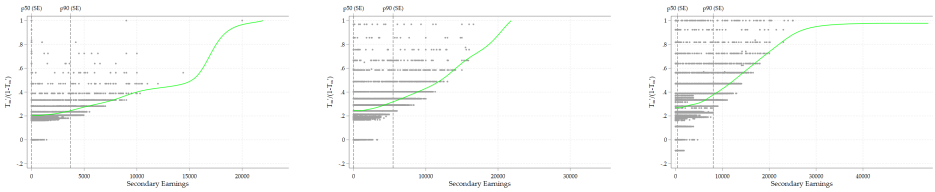
(j) 2010 (k) 2015 (l) 2019



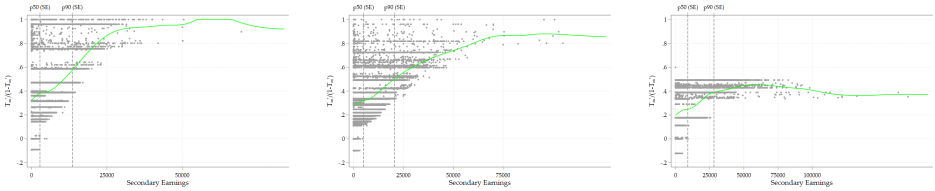
Notes: This figure shows for selected years the marginal tax rate ratio $\frac{T'}{1-T'}$ across primary earnings. The solid line represents an average calculated using a local polynomial regression.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure B.22: Average marginal tax rates by secondary earnings

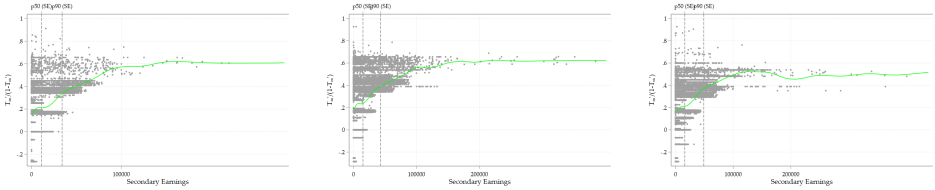
(a) 1965 (b) 1970 (c) 1975



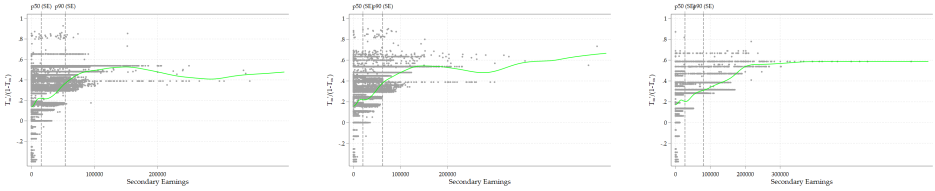
(d) 1980 (e) 1985 (f) 1990



(g) 1995 (h) 2000 (i) 2005



(j) 2010 (k) 2015 (l) 2019



Notes: This figure shows for selected years the marginal tax rate ratio $\frac{T'}{1-T'}$ across secondary earnings. The solid line represents an average calculated using a local polynomial regression.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

C Supplementary material: Reforms *in* the system

This part of the appendix provides additional explanations and supplementary results for the analysis of reforms in the system, i.e., the analysis of past reforms in Section 4 of the main text. We illustrate supplementary results on how past tax reforms affected the splitting function and marriage bonuses (Appendix C.1), and on the political feasibility (Appendix C.2) and welfare effects (Appendix C.3) of past reforms.

C.1 Marriage bonuses and penalties

In Section 4, we show, how the splitting function and marriage bonuses and penalties changed over time. In this part of the appendix, we provide details on how each of the eleven reforms between 1964 and 2017 directly affected penalties and bonuses through reforms in the system, i.e., reforms that differed in the tax treatment of couples and singles, but left the tax base as the sum of total household income untouched.

For this purpose, Figure C.23 first shows the mechanical effect of each tax reform for different household types. Some of the reforms provided very similar per-capita changes in tax liabilities for singles and couples, e.g., RA64. Other reforms stand out, since they affected singles and couples very differently. For instance, TRA69 provided much larger per-capita tax cuts to singles than for couples, while JGTRRA03 shows the reverse pattern. Under a constant splitting function, tax cuts for couples would thus have been much larger in the former, and much smaller under the latter reform.

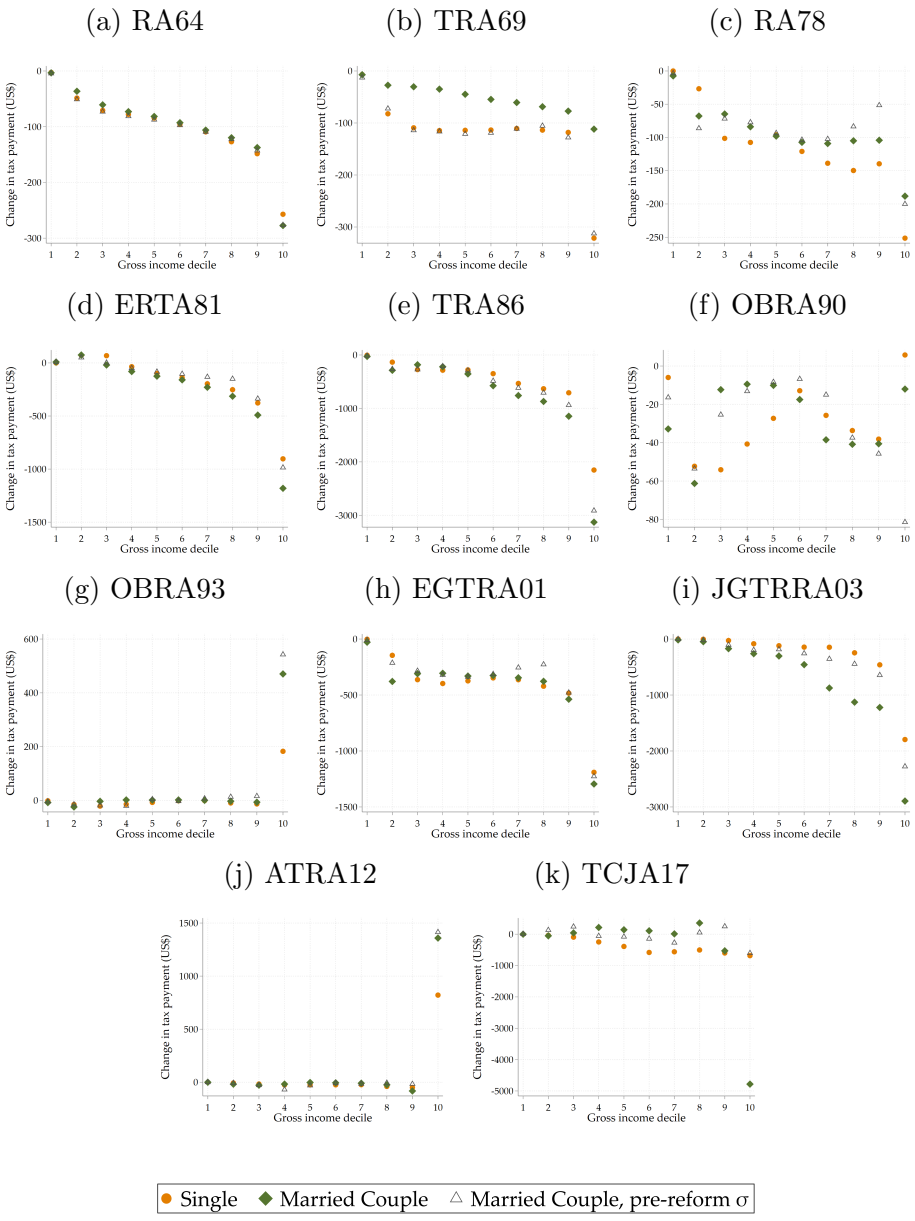
This differential tax changes for singles and couples therefore implicitly shifted the splitting function (see Figure C.24). In particular, TRA69 shifted the splitting function downwards, thereby increasing the potential for marriage penalties. In contrast, JGTRRA03 shifted the splitting function upwards and thereby increased the potential for marriage bonuses and made penalties less frequent. This is confirmed by a direct evaluation of the changes in marriage

benefits and bonuses in Figure C.25. This figure also again illustrates that marriage penalties tend to occur when incomes of the two spouses are relatively equal while bonuses are particularly frequent for couples with very unequal incomes. Over time, the median couple has moved from the area associated with marriage bonuses to the area of marriage penalties.

Importantly, reforms did not always change marriage penalties across the board. For instance, the Trump tax cut in 2017 provided particularly large tax cuts for married couples at the top of the income distribution while singles in the middle of the distribution received larger per capita tax cuts than couples (see Figure C.23k). This translated in an asymmetric shift of the splitting function (see Figure C.24k), and correspondingly particularly eliminations of marriage penalties for incomes at the very top (see Figure C.26e).

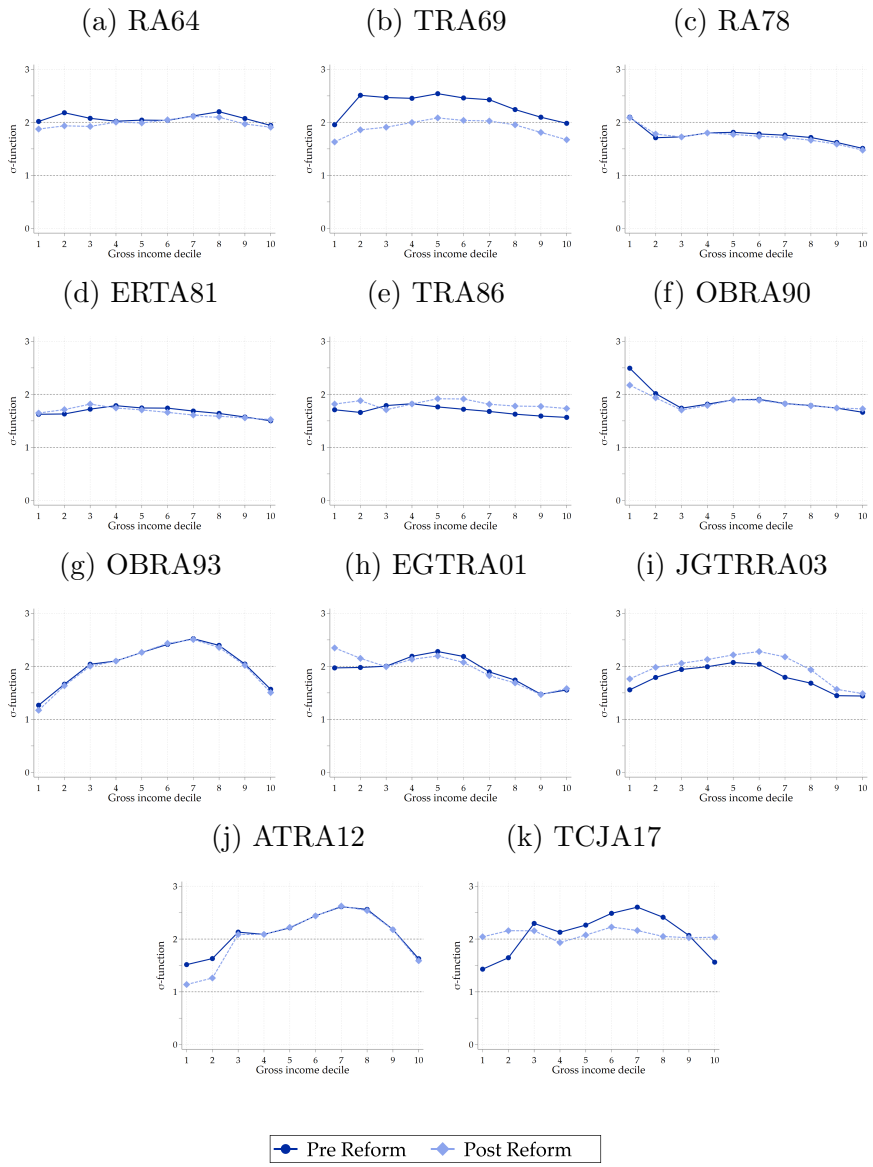
Through the 2017 reform, the splitting function became constant again and is now close to two across all income levels. It thereby returned to their original position at the beginning of the 1960s.

Figure C.23: Mechanical effect of tax reform



Notes: This figure shows how tax reforms affected the per-capita tax burden of singles (orange circles) and couples (green diamonds), holding their income fixed at the pre-reform level, by deciles of the per capita gross income distribution. At the tax unit level, the change is equal to $T_{s1}(\hat{y}_{s0}) - T_{s0}(y_{s0})$ for singles and $T_{m1}(\hat{y}_{m0}) - T_{m0}(y_{m0})$ for couples. Post-reform tax payments $T_1(\hat{y}_0)$ are calculated based on the inflation-adjusted pre-reform income $\hat{y}_0$ using the CPI-U-RS deflator as uprating factor. In addition, the figure displays the hypothetical change in tax liability for couples under the assumption that observed tax changes of singles would have translated according to the empirical pre-reform splitting function σ to couples, i.e. $\sigma_0\ T_{s1}\left(\frac{\hat{y}_{m0}}{\sigma_0}\right) - T_{m0}(y_{m0})$ (grey triangles). For details on the methodology on the analysis of actual and hypothetical tax reforms, see Appendix B.4. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

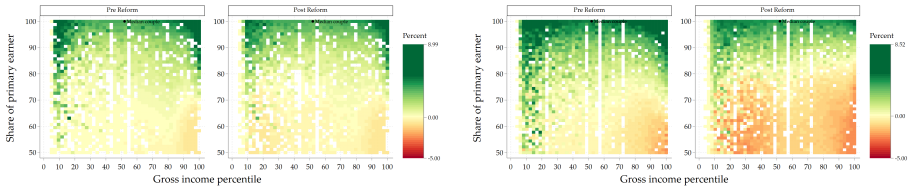
Figure C.24: Change of σ



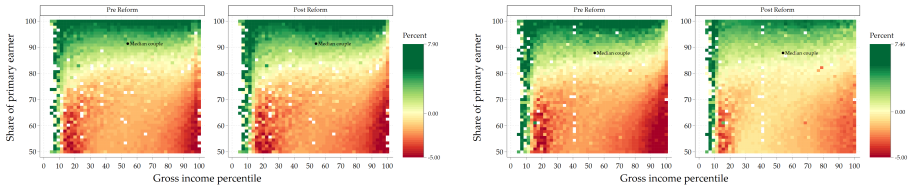
Notes: This figure shows the effects on the splitting function σ, holding incomes fixed at the pre-reform level. Pre-reform (dark blue circles) and post-reform (light blue diamonds) splitting functions are calculated by estimating mean average tax rates of couples and singles in the respective year. Mean average tax rates are used to solve numerically for σ (see Appendix B.3.2)). Deciles refer to the gross income distribution of couples in the respective year. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure C.25: Change of marriage bonuses and penalties

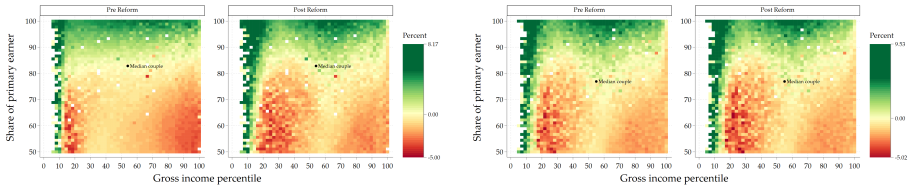
(a) RA64 (b) TRA69



(c) RA78 (d) ERTA81



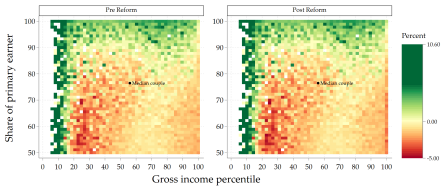
(e) TRA86 (f) OBRA90



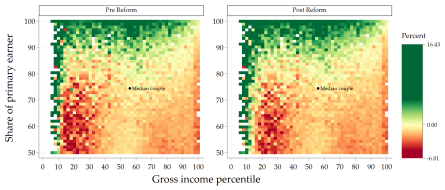
Notes: This figure shows marriage bonuses and penalties relative to gross income. Each square in a figure represents an average of marriage bonuses (green) or penalties (red) for a group of tax units at a particular income percentile (horizontal axis) and with a particular primary earner income share (vertical axis). Relative marriage bonuses/penalties relate the absolute monetary advantage from filing as a married couple to the total income of the couple, i.e. $\frac{T_m(y_1+y_2)-(T_s(y_1)+T_s(y_2))}{y_1+y_2}$ (see Appendix B.3.1 for details). The distribution of marriage penalties and bonuses is shown for the pre-reform year (left panel) and the post-reform year (right panel). Income percentiles at the horizontal axis refer to the per capita income distribution of the full sample, i.e. individuals in couples are assigned half of the joint income. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure C.26: Change of marriage bonuses and penalties (cont.)

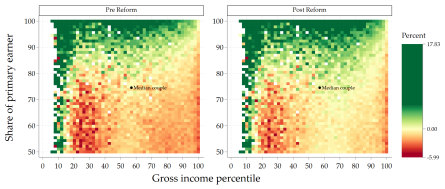
(a) OBRA93



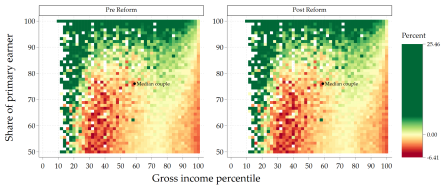
(b) EGTRA01



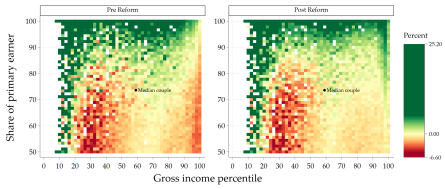
(c) JGTRRA03



(d) ATRA12



(e) TCJA17



Notes: This figure shows marriage bonuses and penalties relative to gross income. Each square in a figure represents an average of marriage bonuses (green) or penalties (red) for a group of tax units at a particular income percentile (horizontal axis) and with a particular primary earner income share (vertical axis). Relative marriage bonuses/penalties relate the absolute monetary advantage from filing as a married couple to the total income of the couple, i.e. $\frac{T_m(y_1+y_2)-(T_s(y_1)+T_s(y_2))}{y_1+y_2}$ (see Appendix B.3.1 for details). The distribution of marriage penalties and bonuses is shown for the pre-reform year (left panel) and the post-reform year (right panel). Income percentiles at the horizontal axis refer to the per capita income distribution of the full sample, i.e. individuals in couples are assigned half of the joint income. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old. *Source:* Authors' calculations based on NBER TAXSIM and CPS-ASEC.

C.2 Political economy

In Section 4 of the main text, we summarize the results from an evaluation of past reforms from a political economy perspective. In the baseline scenario, we assume behavioral responses at the intensive and extensive margin. Intensive margin elasticities are displayed in Table C.5. We assume that the extensive margin elasticities are homogeneous across different types of households, but vary across the income distribution. In particular, we assume that participation elasticities decrease with income from 0.65 to 0.25 until the 90th percentile of the gross income distribution, and stays constant in the top decile (see Figure B.18). In the baseline analysis, we also assume that revenue is redistributed lump-sum at the tax unit level.

In this part of the appendix, we illustrate the political support for all reforms (see Figure C.27), and illustrate how political support in different groups changes under different assumptions about behavioral responses (see Table C.6). Finally, we also replicate the political economy analysis under the assumption that tax revenue is redistributed lump-sum at the individual level in per-capita terms (see Figure C.28) and compare the corresponding levels of political support to the baseline analysis (see Figure C.29).

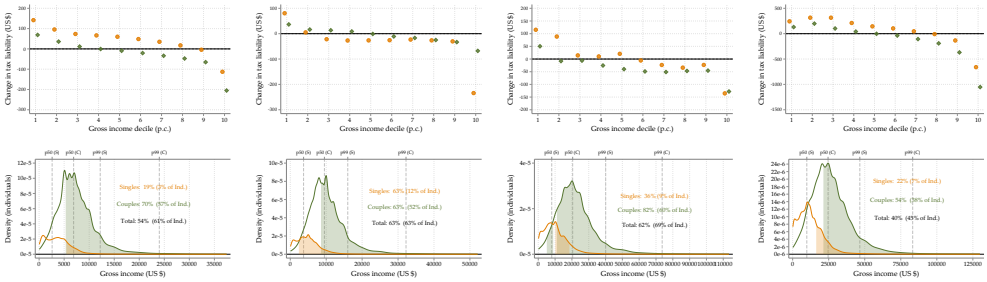
Table C.5: Assumptions about Labor Supply Elasticities

	Single	Couples	
		Prim. Earner	Sec. Earner
Low Elasticity Scenario	0.25	0.15	0.35
Baseline Elasticity Scenario	0.5	0.25	0.75
High Elasticity Scenario	1	0.5	1.5

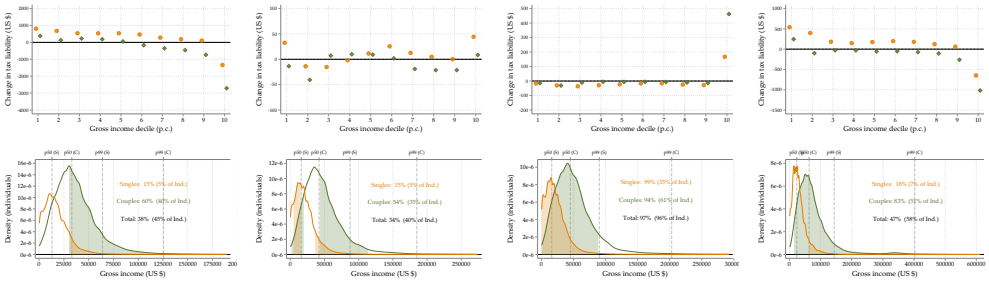
Notes: This table displays our assumptions about the labor supply elasticities for singles, as well as for primary and secondary earners in couples. Assumptions are guided by the range of estimates found in the literature, e.g. Gustafsson (1992), Blundell and MaCurdy (1999), Blau and Kahn (2007), Eissa and Hoynes (2004), LaLumia (2008), Kaygusuz (2010), Saez et al. (2012), Bargain et al. (2014), and Neisser (2021).

Figure C.27: Political feasibility

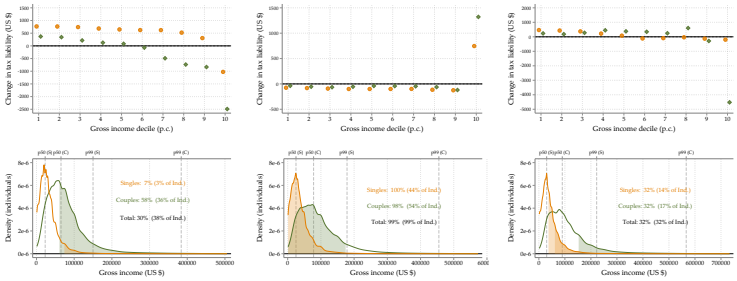
(a) RA64 (b) TRA69 (c) RA78 (d) ERTA81



(e) TRA86 (f) OBRA90 (g) OBRA93 (h) EGTRA01



(i) JGTRRA03 (j) ATRA12 (k) TCJA17



Notes: This figure replicates Figure 4 for all reforms. It shows the change in the tax liability (upper panel) and winners of the reform (lower panel) for singles (orange shaded area) and couples (green shaded area). The change in tax liability represents the average change in tax liability per capita (PC) for each of the 10 per capita gross income deciles. The location of winners and losers across the gross income distribution are identified by evaluating the tax liability change for each of the 25 gross income quantiles. The share of winners among tax units and the corresponding share of individuals is shown next to the distribution. We account for behavioral responses at both the intensive margin (baseline elasticity scenario from Table C.5) and the extensive margin. It is assumed that tax revenues are rebated lump sum at the tax unit level. Figure C.28 shows an alternative analysis based on lump-sum adjustments at the individual level. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Table C.6: Political economy of past reforms (part 1)

1. Reform	2. Behavioral Responses		3. Couple Shares		4. Winners (TU)			5. Winners (Ind.)		
	Extensive	Intensive	TU	Ind.	Singles	Couples	All	Singles	Couples	All
RA64	Yes	low	68.9%	81.6%	16.7%	63.6%	49.0%	3.1%	51.9%	55.0%
	Yes	baseline	68.9%	81.6%	18.4%	69.8%	53.8%	3.4%	56.9%	60.3%
	Yes	high	68.9%	81.6%	26.0%	75.0%	59.8%	4.8%	61.2%	66.0%
	No	low	68.9%	81.6%	15.5%	59.1%	45.5%	2.9%	48.2%	51.0%
	No	baseline	68.9%	81.6%	16.6%	63.0%	48.6%	3.1%	51.4%	54.5%
	No	high	68.9%	81.6%	19.5%	71.9%	55.6%	3.6%	58.7%	62.3%
TRA69	Yes	low	68.7%	81.4%	60.8%	58.5%	59.2%	11.3%	47.7%	58.9%
	Yes	baseline	68.7%	81.4%	62.6%	63.0%	62.9%	11.6%	51.3%	62.9%
	Yes	high	68.7%	81.4%	64.7%	72.6%	70.1%	12.0%	59.1%	71.1%
	No	low	68.7%	81.4%	58.9%	54.1%	55.6%	10.9%	44.1%	55.0%
	No	baseline	68.7%	81.4%	60.8%	58.4%	59.2%	11.3%	47.6%	58.9%
	No	high	68.7%	81.4%	63.3%	69.0%	67.2%	11.8%	56.2%	67.9%
RA78	Yes	low	58.2%	73.6%	29.6%	76.5%	56.9%	7.8%	56.3%	64.1%
	Yes	baseline	58.2%	73.6%	34.9%	80.9%	61.7%	9.2%	59.6%	68.8%
	Yes	high	58.2%	73.6%	46.1%	87.3%	70.1%	12.2%	64.3%	76.5%
	No	low	58.2%	73.6%	21.8%	68.6%	49.0%	5.8%	50.5%	56.2%
	No	baseline	58.2%	73.6%	29.8%	76.9%	57.2%	7.9%	56.6%	64.5%
	No	high	58.2%	73.6%	40.3%	84.9%	66.3%	10.6%	62.5%	73.1%
ERTA81	Yes	low	55.0%	71.0%	19.5%	48.8%	35.6%	5.7%	34.6%	40.3%
	Yes	baseline	55.0%	71.0%	22.2%	53.6%	39.5%	6.4%	38.1%	44.5%
	Yes	high	55.0%	71.0%	37.2%	65.8%	52.9%	10.8%	46.7%	57.5%
	No	low	55.0%	71.0%	18.6%	46.5%	33.9%	5.4%	33.0%	38.4%
	No	baseline	55.0%	71.0%	21.0%	50.9%	37.4%	6.1%	36.1%	42.2%
	No	high	55.0%	71.0%	33.7%	61.6%	49.0%	9.8%	43.7%	53.5%
TRA86	Yes	low	50.8%	67.4%	10.5%	54.4%	32.8%	3.4%	36.7%	40.1%
	Yes	baseline	50.8%	67.4%	13.4%	58.0%	36.0%	4.4%	39.1%	43.4%
	Yes	high	50.8%	67.4%	20.2%	66.5%	43.7%	6.6%	44.8%	51.4%
	No	low	50.8%	67.4%	9.5%	52.5%	31.3%	3.1%	35.4%	38.5%
	No	baseline	50.8%	67.4%	12.1%	55.9%	34.3%	4.0%	37.7%	41.6%
	No	high	50.8%	67.4%	17.1%	63.5%	40.7%	5.6%	42.8%	48.4%
OBRA90	Yes	low	48.1%	64.9%	15.4%	53.5%	33.7%	5.4%	34.7%	40.1%
	Yes	baseline	48.1%	64.9%	15.4%	53.5%	33.7%	5.4%	34.7%	40.1%
	Yes	high	48.1%	64.9%	15.4%	53.5%	33.7%	5.4%	34.8%	40.2%
	No	low	48.1%	64.9%	15.4%	53.5%	33.7%	5.4%	34.7%	40.1%
	No	baseline	48.1%	64.9%	15.4%	53.5%	33.7%	5.4%	34.8%	40.1%
	No	high	48.1%	64.9%	15.4%	53.7%	33.8%	5.4%	34.9%	40.3%

Notes: This table shows whether there was majority support for past reforms of the US federal income tax (column 1) under different assumptions regarding behavioral responses (column 2). Column 3 shows the share of married couples among all tax units and the share of individuals living in married couples. Column 4 shows the share of winners among tax units while column 5 shows the share of winners among individuals. Lump-sum adjustments are at the tax unit level. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old.

Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

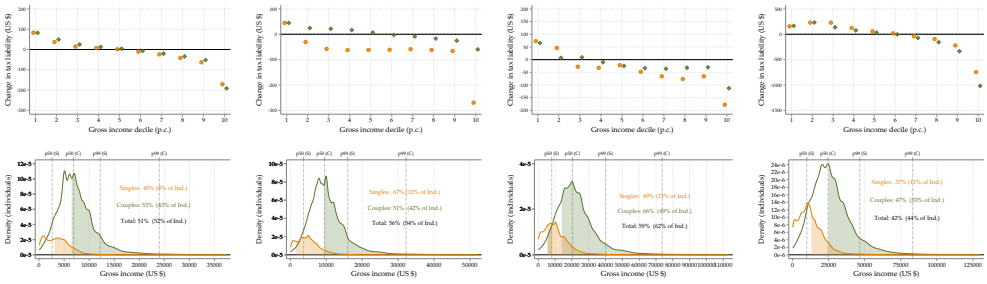
Table C.7: Political economy of past reforms (part 2)

1. Reform	2. Behavioral Responses		3. Couple Shares		4. Winners (TU)			5. Winners (Ind.)		
	Extensive	Intensive	TU	Ind.	Singles	Couples	All	Singles	Couples	All
OBRA93	Yes	low	48.1%	65.0%	99.1%	95.4%	97.3%	34.7%	62.0%	96.7%
	Yes	baseline	48.1%	65.0%	99.0%	93.8%	96.5%	34.7%	61.0%	95.6%
	Yes	high	48.1%	65.0%	29.0%	34.4%	31.6%	10.1%	22.3%	32.5%
	No	low	48.1%	65.0%	99.2%	95.6%	97.4%	34.7%	62.1%	96.8%
	No	baseline	48.1%	65.0%	99.1%	95.1%	97.2%	34.7%	61.8%	96.5%
	No	high	48.1%	65.0%	29.7%	34.9%	32.2%	10.4%	22.7%	33.1%
EGTRRA01	Yes	low	45.0%	62.0%	16.0%	80.8%	45.1%	6.1%	50.1%	56.2%
	Yes	baseline	45.0%	62.0%	16.9%	81.8%	46.1%	6.4%	50.7%	57.1%
	Yes	high	45.0%	62.0%	19.0%	83.2%	47.9%	7.2%	51.6%	58.8%
	No	low	45.0%	62.0%	13.4%	74.3%	40.8%	5.1%	46.1%	51.2%
	No	baseline	45.0%	62.0%	15.9%	80.6%	45.0%	6.0%	50.0%	56.1%
	No	high	45.0%	62.0%	17.9%	82.3%	46.8%	6.8%	51.0%	57.8%
JGTRRA03	Yes	low	44.5%	61.6%	6.6%	56.3%	28.7%	2.5%	34.7%	37.2%
	Yes	baseline	44.5%	61.6%	6.9%	56.9%	29.2%	2.7%	35.0%	37.7%
	Yes	high	44.5%	61.6%	9.0%	61.1%	32.2%	3.4%	37.6%	41.1%
	No	low	44.5%	61.6%	6.4%	55.6%	28.3%	2.5%	34.2%	36.7%
	No	baseline	44.5%	61.6%	6.6%	56.3%	28.7%	2.5%	34.7%	37.2%
	No	high	44.5%	61.6%	8.0%	60.4%	31.3%	3.1%	37.2%	40.2%
ATRA12	Yes	low	38.4%	55.5%	99.6%	98.3%	99.1%	44.3%	54.5%	98.9%
	Yes	baseline	38.4%	55.5%	99.6%	97.9%	98.9%	44.3%	54.3%	98.7%
	Yes	high	38.4%	55.5%	99.3%	95.5%	97.8%	44.2%	53.0%	97.2%
	No	low	38.4%	55.5%	99.7%	98.4%	99.2%	44.3%	54.6%	98.9%
	No	baseline	38.4%	55.5%	99.6%	98.2%	99.1%	44.3%	54.5%	98.9%
	No	high	38.4%	55.5%	99.5%	96.7%	98.4%	44.3%	53.7%	98.0%
TCJA17	Yes	low	37.8%	54.9%	27.9%	29.9%	28.7%	12.6%	16.4%	29.0%
	Yes	baseline	37.8%	54.9%	31.1%	31.4%	31.2%	14.0%	17.2%	31.3%
	Yes	high	37.8%	54.9%	38.6%	36.4%	37.8%	17.4%	20.0%	37.4%
	No	low	37.8%	54.9%	27.1%	29.2%	27.9%	12.2%	16.0%	28.3%
	No	baseline	37.8%	54.9%	29.3%	30.7%	29.8%	13.2%	16.8%	30.1%
	No	high	37.8%	54.9%	37.1%	35.5%	36.5%	16.7%	19.5%	36.3%

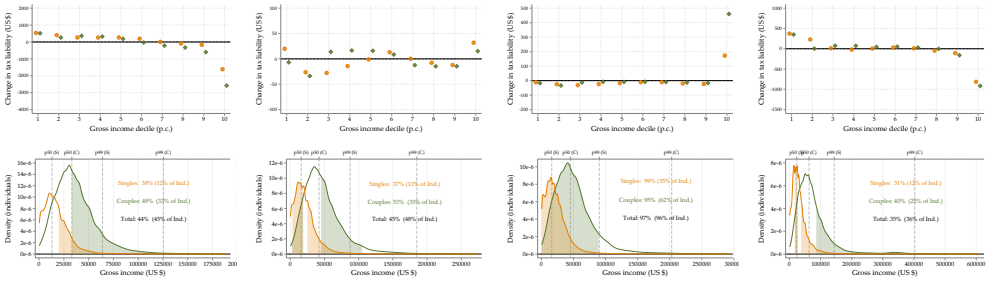
Notes: This table shows the majority support for past reforms of the US federal income tax (column 1) under different assumptions regarding behavioral responses (column 2). Column 3 shows the share of married couples among all tax units and the share of individuals living in married couples. Column 4 shows the share of winners among tax units while column 5 shows the share of winners among individuals. Lump-sum adjustments are at the tax unit level. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure C.28: Political feasibility, lump-sum adjustment per-capita

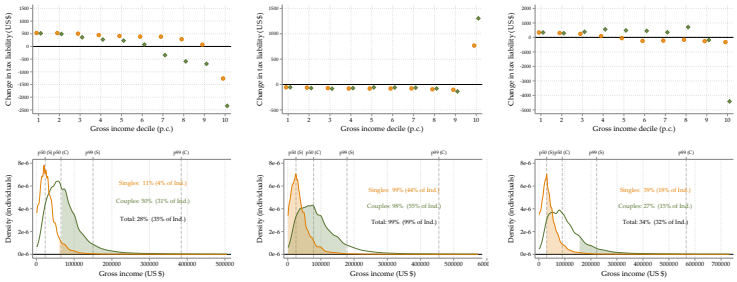
(a) RA64 (b) TRA69 (c) RA78 (d) ERTA81



(e) TRA86 (f) OBRA90 (g) OBRA93 (h) EGTRA01

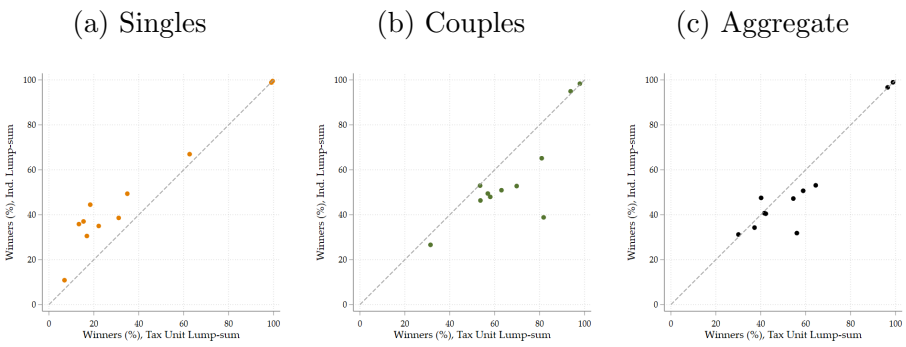


(i) JGTRRA03 (j) ATRA12 (k) TCJA17



Notes: This figure replicates Figure C.27 using lump-sum adjustment at the individual level instead of the tax unit level. It shows the change in the tax liability (upper panel) and winners of the reform for singles (orange shaded area) and couples (green shaded area). The change in tax liability represents the average change in tax liability per capita (PC) for each of the 10 per capita gross income deciles. The location of winners and losers across the gross income distribution are identified by evaluating the tax liability change for each of the 25 gross income quantiles. The share of winners among tax units and the corresponding share of individuals is shown next to the distribution. We account for behavioral responses at the intensive margin (baseline elasticity scenario from Table C.5) and extensive margin responses. Further, reforms are made revenue neutral by distributing any gains or losses lump-sum. Lump-sum adjustments are implemented at the per capita level. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure C.29: Choice of lump-sum adjustment, political economy



Notes: This figure displays how majority support among singles, couples, and in the aggregate population under lump-sum adjustment at the tax unit level compares to majority support under a per-capita lump-sum adjustment. Every dot represents a specific reform. The figure displays majority support under extensive and intensive margin responses using the baseline elasticity scenario from Table C.5). Detailed graphical analyses on the majority support under tax-unit (individual) lump-sum adjustment are shown in Figure C.27 (C.28). All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

C.3 Welfare implications

In Section 4 of the main text, we summarize the results from an evaluation of past reforms from a welfare perspective. Here, we show, which exact specification of social welfare weights are used for the evaluation (see Table C.8), and provide detailed results for all reforms (see Table C.9).

Table C.8: Welfare weights for reforms *in* the system

Welfare weights	Singles	Couples
Equal	$\forall y_s,\ g_s(y_s) = 1$	$\forall y_m,\ g_m(y_m) = 2$
Singles Only	$\forall y_s,\ g_s(y_s) = 1$	$\forall y_m,\ g_m(y_m) = 0$
Single Women Only	$\forall y_s,\ g_s(y_s) = \begin{cases} 1, & \text{for } female \\ 0, & \text{for } male \end{cases}$	$\forall y_m,\ g_m(y_m) = 0$
Couples Only	$\forall y_s,\ g_s(y_s) = 0$	$\forall y_m,\ g_m(y_m) = 2$
Decreasing	$\forall y_s,\ g_s(y_s) = y_s^{-a}$	$\forall y_m,\ g_m(y_m) = 2\left(\frac{y_m}{2}\right)^{-a}$
Rawlsian	$\forall y_s,\ g_s(y_s) = \begin{cases} 1, & \text{for } y_s \leq \text{P} \\ 0, & \text{for } y_s \geq \text{P} \end{cases}$	$\forall y_m,\ g_m(y_m) = \begin{cases} 2, & \text{for } \frac{y_m}{2} \leq \text{P} \\ 0, & \text{for } \frac{y_m}{2} \geq \text{P} \end{cases}$
Rawlsian (Single Only)	$\forall y_s,\ g_s(y_s) = \begin{cases} 1, & \text{for } y_s \leq \text{P} \\ 0, & \text{for } y_s \geq \text{P} \end{cases}$	$\forall y_m,\ g_m(y_m) = 0$
Rawlsian (Single Women Only)	$\forall y_s,\ g_s(y_s) = \begin{cases} 1, & \text{for } y_s \leq \text{P and } female \\ 0, & \text{for } y_s \geq \text{P or } male \end{cases}$	$\forall y_m,\ g_m(y_m) = 0$
Rawlsian (Couples Only)	$\forall y_s,\ g_s(y_s) = 0$	$\forall y_m,\ g_m(y_m) = \begin{cases} 2, & \text{for } \frac{y_m}{2} \leq \text{P} \\ 0, & \text{for } \frac{y_m}{2} \geq \text{P} \end{cases}$
Affirmative Action Feminist	$\forall y_s,\ g_s(y_s) = \begin{cases} 1, & \text{for } female \\ 0, & \text{for } male \end{cases}$	$\forall y_m,\ g_m(y_m) = \frac{y_{woman}}{y_{man}+y_{woman}}$
Rawlsian Affirmative Action Feminist	$\forall y_s,\ g_s(y_s) = \begin{cases} 1, & \text{for female and } y_s \leq \text{P} \\ 0, & \text{for male or } y_s > \text{P} \end{cases}$	$\forall y_m,\ g_m(y_m) = \begin{cases} \frac{y_{woman}}{y_{man}+y_{woman}}, & \text{for } \frac{y_m}{2} \leq \text{P} \\ 0, & \text{for } \frac{y_m}{2} > \text{P} \end{cases}$

Notes: This table shows different specifications of welfare weights to evaluate reforms *in* the system. The sum of weights over the whole population is normalized to 1. P refers to specific percentiles of the per capita income distribution and the parameter a is strictly positive.

The "Equal" welfare function assigns equal weights to all individuals. The welfare function "Couples" ("Singles") assigns equal weights to all couples (singles), and none to singles (couples). It is meant to be descriptive, not normatively appealing. Welfare goes up if and only if the social surplus among the respective group (total output minus total effort costs) goes up. These welfare functions are all maximized by a *laissez-faire* outcome without distortionary taxation in the group. Thus, a positive evaluation by such a welfare function indicates that tax distortions have gone down, and a negative evaluation indicates that the tax system has become more distortionary in the considered

group. In contrast, the Rawlsian welfare function concentrates welfare weights at the bottom of the income distribution while the Affirmative Action Feminist welfare function concentrates weights on those households with a high female income share. We also include a welfare function that we refer to as "Rawlsian Affirmative Feminist". This measure concentrates weights at the bottom. For couples at the bottom, moreover, weights increase in the female income share.

Table C.9 contains an evaluation of all tax reforms since the 1960s according to these welfare weights. Some of the reforms, e.g. RA64, TRA86, and ERTA81, reduced distortions in the system: the "Equal" welfare function approves them. It also shows that these reforms are unambiguously rejected by Rawlsian welfare functions and the ones with weights that are decreasing functions of income. Thus, with inequality aversion, the loss of tax revenue trumps the effect that some taxpayers benefit from a tax cut. Possibly, such reform are approved, however, by an Affirmative Feminist social welfare measure, e.g. TRA69 and ERTA81. Reducing distortions in the system may be desirable from the perspective of secondary earners who face high marginal tax rates under joint taxation. However, since the gains from the reduction in the distortion among dual earner couples needs to outweigh the negative effects on single women (about which the Affirmative Action Feminist also cares a lot), strong behavioral responses are needed for an approval of the Affirmative Action Feminist. Some reforms like OBRA93 and ATRA12 show the reverse pattern. By raising marginal tax rates, these reforms increased distortions of the system, and are therefore rejected by the welfare function putting equal weight on all individuals. However, these reforms are unanimously supported by Rawlsian welfare measures, since the distortionary effects are for them outweighed by the increase in tax revenue that benefits poor households.

In Appendix A.3 and Appendix B.4, we show that there are two different measures of individual welfare that can be used for an evaluation of large tax reforms. Figure C.30 shows that the choice of welfare measure is relevant for assessing the magnitude of the welfare effect, but is not consequential for an assessment of the direction of the welfare effect of a specific reform under a particular set of welfare weights.

Table C.9: Welfare implications of past reforms (part 1)

Reform	Welfare Weights	Int. Margin			Ext. + Int. Margin		
		Low	Baseline	High	Low	Baseline	High
RA64	Equal	>	>	>	>	>	>
	Singles Only	<	<	<	<	<	<
	Single Women Only	<	<	<	<	<	<
	Couples Only	>	>	>	>	>	>
	Decreasing, a=.8	<	<	<	<	<	<
	Decreasing, a=2	<	<	<	<	<	<
	Rawlsian, p10	<	<	<	<	<	<
	Rawlsian, p5	<	<	<	<	<	<
	Rawlsian (Single Only), p10	<	<	<	<	<	<
	Rawlsian (Single Only), p5	<	<	<	<	<	<
	Rawlsian (Single Woman Only), p10	<	<	<	<	<	<
	Rawlsian (Single Woman Only), p5	<	<	<	<	<	<
	Rawlsian (Couples Only), p10	<	<	<	<	<	<
	Rawlsian (Couples Only), p5	<	<	<	<	<	<
	Affirmative Action Feminist	<	<	<	<	<	<
	Rawlsian Affirmative Action Feminist, p10	<	<	<	<	<	<
	Rawlsian Affirmative Action Feminist, p5	<	<	<	<	<	<
TRA69	Equal	>	>	>	>	>	>
	Singles Only	>	>	>	>	>	>
	Single Women Only	<	<	<	<	<	<
	Couples Only	>	>	>	>	>	>
	Decreasing, a=.8	<	<	<	<	<	<
	Decreasing, a=2	<	<	<	<	<	<
	Rawlsian, p10	<	<	<	<	<	<
	Rawlsian, p5	<	<	<	<	<	<
	Rawlsian (Single Only), p10	<	<	<	<	<	<
	Rawlsian (Single Only), p5	<	<	<	<	<	<
	Rawlsian (Single Woman Only), p10	<	<	<	<	<	<
	Rawlsian (Single Woman Only), p5	<	<	<	<	<	<
	Rawlsian (Couples Only), p10	<	<	<	<	<	<
	Rawlsian (Couples Only), p5	<	<	<	<	<	<
	Affirmative Action Feminist	<	<	>	<	<	>
	Rawlsian Affirmative Action Feminist, p10	<	<	<	<	<	<
	Rawlsian Affirmative Action Feminist, p5	<	<	<	<	<	<
RA78	Equal	>	>	>	>	>	>
	Singles Only	<	<	<	<	<	>
	Single Women Only	<	<	<	<	<	<
	Couples Only	>	>	>	>	>	>
	Decreasing, a=.8	<	<	<	<	<	<
	Decreasing, a=2	<	<	<	<	<	<
	Rawlsian, p10	<	<	<	<	<	<
	Rawlsian, p5	<	<	<	<	<	<
	Rawlsian (Single Only), p10	<	<	<	<	<	<
	Rawlsian (Single Only), p5	<	<	<	<	<	<
	Rawlsian (Single Woman Only), p10	<	<	<	<	<	<
	Rawlsian (Single Woman Only), p5	<	<	<	<	<	<
	Rawlsian (Couples Only), p10	<	<	<	<	<	<
	Rawlsian (Couples Only), p5	<	<	<	<	<	<
	Affirmative Action Feminist	<	<	<	<	<	<
	Rawlsian Affirmative Action Feminist, p10	<	<	<	<	<	<
	Rawlsian Affirmative Action Feminist, p5	<	<	<	<	<	<
ERTA81	Equal	>	>	>	>	>	>
	Singles Only	<	<	<	<	<	>
	Single Women Only	<	<	<	<	<	<
	Couples Only	>	>	>	>	>	>
	Decreasing, a=.8	<	<	<	<	<	<
	Decreasing, a=2	<	<	<	<	<	<
	Rawlsian, p10	<	<	<	<	<	<
	Rawlsian, p5	<	<	<	<	<	<
	Rawlsian (Single Only), p10	<	<	<	<	<	<
	Rawlsian (Single Only), p5	<	<	<	<	<	<
	Rawlsian (Single Woman Only), p10	<	<	<	<	<	<
	Rawlsian (Single Woman Only), p5	<	<	<	<	<	<
	Rawlsian (Couples Only), p10	<	<	<	<	<	<
	Rawlsian (Couples Only), p5	<	<	<	<	<	<
	Affirmative Action Feminist	<	<	>	<	>	>
	Rawlsian Affirmative Action Feminist, p10	<	<	<	<	<	<
	Rawlsian Affirmative Action Feminist, p5	<	<	<	<	<	<

Notes: This table shows the welfare implications under different welfare weights for past reforms of the US federal income tax under different assumptions regarding behavioral responses (extensive + intensive margin, intensive margin only), and different scenarios for the intensive margin elasticity (see Table 1). Lump sum adjustments have been implemented on a per-tax-unit basis. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Table C.10: Welfare implications of past reforms (part 2)

Reform	Welfare Weights	Int. Margin			Ext. + Int. Margin		
		Low	Baseline	High	Low	Baseline	High
TRA86	Equal	>	>	>	>	>	>
	Singles Only	<	<	<	<	<	<
	Single Women Only	<	<	<	<	<	<
	Couples Only	>	>	>	>	>	>
	Decreasing, a=.8	<	<	<	<	<	<
	Decreasing, a=2	<	<	<	<	<	<
	Rawlsian, p10	<	<	<	<	<	<
	Rawlsian, p5	<	<	<	<	<	<
	Rawlsian (Single Only), p10	<	<	<	<	<	<
	Rawlsian (Single Only), p5	<	<	<	<	<	<
	Rawlsian (Single Woman Only), p10	<	<	<	<	<	<
	Rawlsian (Single Woman Only), p5	<	<	<	<	<	<
	Rawlsian (Couples Only), p10	<	<	<	<	<	<
	Rawlsian (Couples Only), p5	<	<	<	<	<	<
	Affirmative Action Feminist	<	<	>	<	<	>
	Rawlsian Affirmative Action Feminist, p10	<	<	<	<	<	<
	Rawlsian Affirmative Action Feminist, p5	<	<	<	<	<	<
OBRA90	Equal	>	>	>	>	>	>
	Singles Only	<	<	<	<	<	<
	Single Women Only	>	>	>	>	>	>
	Couples Only	>	>	>	>	>	>
	Decreasing, a=.8	<	<	<	<	<	<
	Decreasing, a=2	<	<	<	<	<	<
	Rawlsian, p10	<	<	<	<	<	<
	Rawlsian, p5	<	<	<	<	<	<
	Rawlsian (Single Only), p10	<	<	<	<	<	<
	Rawlsian (Single Only), p5	<	<	<	<	<	<
	Rawlsian (Single Woman Only), p10	<	<	<	<	<	<
	Rawlsian (Single Woman Only), p5	<	<	<	<	<	<
	Rawlsian (Couples Only), p10	>	>	>	>	>	>
	Rawlsian (Couples Only), p5	<	<	<	<	<	<
	Affirmative Action Feminist	>	>	>	>	>	>
	Rawlsian Affirmative Action Feminist, p10	<	<	<	<	<	<
	Rawlsian Affirmative Action Feminist, p5	<	<	<	<	<	<
OBRA93	Equal	<	<	<	<	<	<
	Singles Only	>	>	<	>	>	<
	Single Women Only	>	>	<	>	>	<
	Couples Only	<	<	<	<	<	<
	Decreasing, a=.8	>	>	<	>	>	<
	Decreasing, a=2	>	>	<	>	>	<
	Rawlsian, p10	>	>	<	>	>	<
	Rawlsian, p5	>	>	<	>	>	<
	Rawlsian (Single Only), p10	>	>	<	>	>	<
	Rawlsian (Single Only), p5	>	>	<	>	>	<
	Rawlsian (Single Woman Only), p10	>	>	<	>	>	<
	Rawlsian (Single Woman Only), p5	>	>	<	>	>	<
	Rawlsian (Couples Only), p10	>	>	>	>	>	>
	Rawlsian (Couples Only), p5	>	>	<	>	>	<
	Affirmative Action Feminist	>	>	<	>	>	<
	Rawlsian Affirmative Action Feminist, p10	>	>	<	>	>	<
	Rawlsian Affirmative Action Feminist, p5	>	>	<	>	>	<
EGTRRA01	Equal	>	>	>	>	>	>
	Singles Only	<	<	<	<	<	<
	Single Women Only	<	<	<	<	<	<
	Couples Only	>	>	>	>	>	>
	Decreasing, a=.8	<	<	<	<	<	<
	Decreasing, a=2	<	<	<	<	<	<
	Rawlsian, p10	<	<	<	<	<	<
	Rawlsian, p5	<	<	<	<	<	<
	Rawlsian (Single Only), p10	<	<	<	<	<	<
	Rawlsian (Single Only), p5	<	<	<	<	<	<
	Rawlsian (Single Woman Only), p10	<	<	<	<	<	<
	Rawlsian (Single Woman Only), p5	<	<	<	<	<	<
	Rawlsian (Couples Only), p10	<	<	<	<	<	<
	Rawlsian (Couples Only), p5	<	<	<	<	<	<
	Affirmative Action Feminist	<	<	<	<	<	<
	Rawlsian Affirmative Action Feminist, p10	<	<	<	<	<	<
	Rawlsian Affirmative Action Feminist, p5	<	<	<	<	<	<

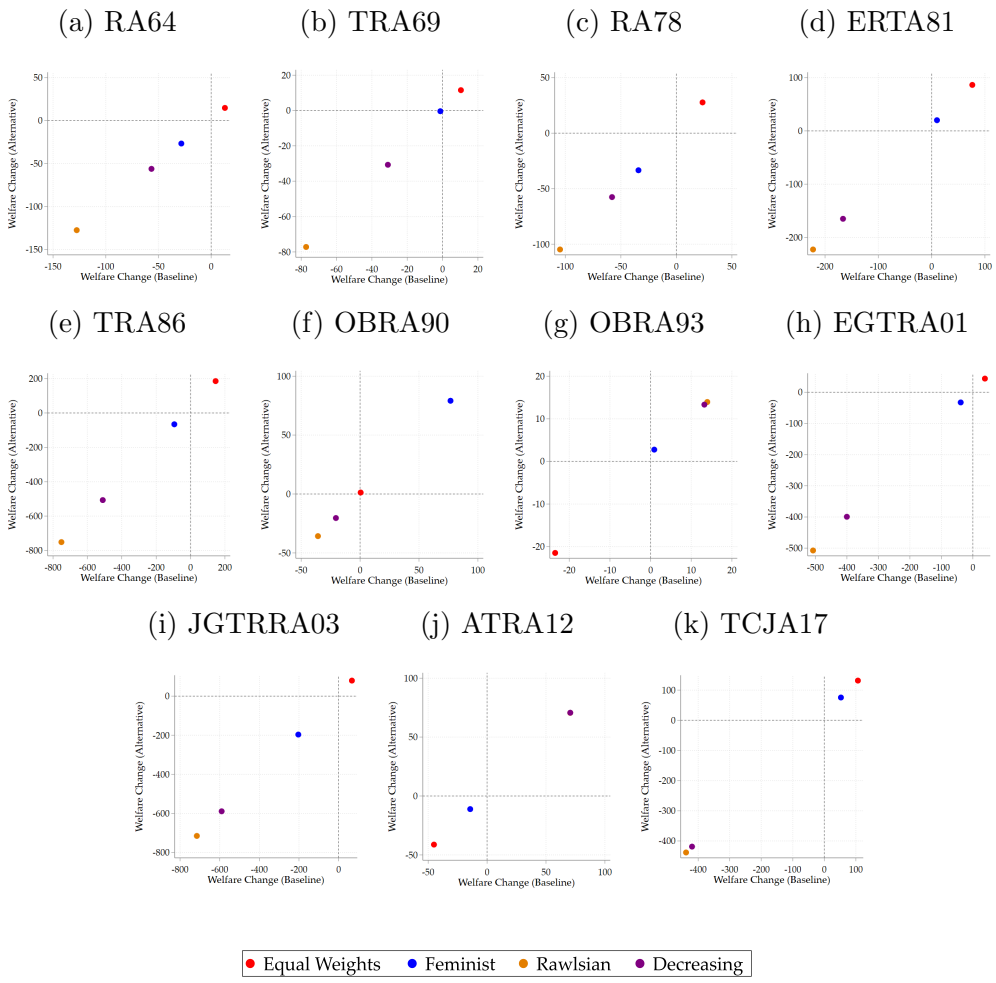
Notes: This table shows the welfare implications under different welfare weights for past reforms of the US federal income tax under different assumptions regarding behavioral responses (extensive + intensive margin, intensive margin only), and different scenarios for the intensive margin elasticity (see Table 1). Lump sum adjustments have been implemented on a per-tax-unit basis. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Table C.11: Welfare implications of past reforms (part 3)

Reform	Welfare Weights	Int. Margin			Ext. + Int. Margin		
		Low	Baseline	High	Low	Baseline	High
JGTRRA03	Equal	>	>	>	>	>	>
	Singles Only	<	<	<	<	<	<
	Single Women Only	<	<	<	<	<	<
	Couples Only	>	>	>	>	>	>
	Decreasing, a=.8	<	<	<	<	<	<
	Decreasing, a=2	<	<	<	<	<	<
	Rawlsian, p10	<	<	<	<	<	<
	Rawlsian, p5	<	<	<	<	<	<
	Rawlsian (Single Only), p10	<	<	<	<	<	<
	Rawlsian (Single Only), p5	<	<	<	<	<	<
	Rawlsian (Single Woman Only), p10	<	<	<	<	<	<
	Rawlsian (Single Woman Only), p5	<	<	<	<	<	<
	Rawlsian (Couples Only), p10	<	<	<	<	<	<
	Rawlsian (Couples Only), p5	<	<	<	<	<	<
	Affirmative Action Feminist	<	<	<	<	<	<
	Rawlsian Affirmative Action Feminist, p10	<	<	<	<	<	<
	Rawlsian Affirmative Action Feminist, p5	<	<	<	<	<	<
ATRA12	Equal	<	<	<	<	<	<
	Singles Only	>	>	>	>	>	<
	Single Women Only	>	>	>	>	>	>
	Couples Only	<	<	<	<	<	<
	Decreasing, a=.8	>	>	>	>	>	>
	Decreasing, a=2	>	>	>	>	>	>
	Rawlsian, p10	>	>	>	>	>	>
	Rawlsian, p5	>	>	>	>	>	>
	Rawlsian (Single Only), p10	>	>	>	>	>	>
	Rawlsian (Single Only), p5	>	>	>	>	>	>
	Rawlsian (Single Woman Only), p10	>	>	>	>	>	>
	Rawlsian (Single Woman Only), p5	>	>	>	>	>	>
	Rawlsian (Couples Only), p10	>	>	>	>	>	>
	Rawlsian (Couples Only), p5	>	>	>	>	>	>
	Affirmative Action Feminist	>	>	<	>	<	<
	Rawlsian Affirmative Action Feminist, p10	>	>	>	>	>	>
	Rawlsian Affirmative Action Feminist, p5	>	>	>	>	>	>
TCJA17	Equal	>	>	>	>	>	>
	Singles Only	<	<	<	<	<	<
	Single Women Only	<	<	<	<	<	<
	Couples Only	>	>	>	>	>	>
	Decreasing, a=.8	<	<	<	<	<	<
	Decreasing, a=2	<	<	<	<	<	<
	Rawlsian, p10	<	<	<	<	<	<
	Rawlsian, p5	<	<	<	<	<	<
	Rawlsian (Single Only), p10	<	<	<	<	<	<
	Rawlsian (Single Only), p5	<	<	<	<	<	<
	Rawlsian (Single Woman Only), p10	<	<	<	<	<	<
	Rawlsian (Single Woman Only), p5	<	<	<	<	<	<
	Rawlsian (Couples Only), p10	<	<	<	<	<	<
	Rawlsian (Couples Only), p5	<	<	<	<	<	<
	Affirmative Action Feminist	<	>	>	>	>	>
	Rawlsian Affirmative Action Feminist, p10	<	<	<	<	<	<
	Rawlsian Affirmative Action Feminist, p5	<	<	<	<	<	<

Notes: This table shows the welfare implications under different welfare weights for past reforms of the US federal income tax under different assumptions regarding behavioral responses (extensive + intensive margin, intensive margin only), and different scenarios for the intensive margin elasticity (see Table 1). Lump sum adjustments have been implemented on a per-tax-unit basis. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure C.30: Welfare, baseline and alternative measure



Notes: This figure shows for different welfare measures, how the baseline measure based on equation (B.28) compares to the alternative measure based on equation (B.29). Rawlsian weights are based on p5 while decreasing weights are based on $\alpha = 0.8$. The table shows welfare effects for the case with behavioral responses at the intensive margin (baseline elasticity scenario from Table 1) and extensive margin responses. Further, reforms are made revenue neutral by distributing any gains or losses lump-sum. Lump-sum adjustments are implemented at the tax unit level. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

D Supplementary material: Reforms *of* the system

In Section 5 of the main text, we analyze hypothetical reforms towards individual taxation from a political economy perspective and under social welfare considerations. This appendix provides supplementary information on these reforms (Appendix D.1) and on how we discipline hypothetical reforms with reference to past reforms towards individual taxation (Appendix D.2).

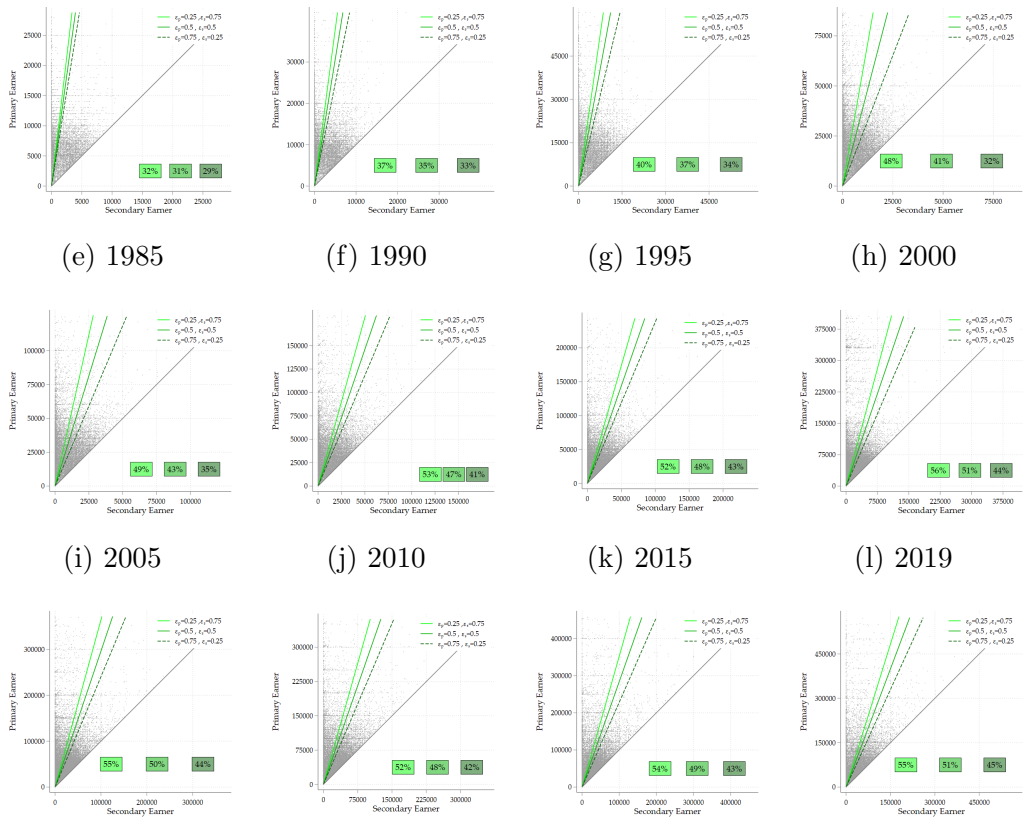
D.1 Stylized hypothetical reforms

In Section 5, we assess the political support of a reform towards individual taxation. Figure D.31 replicates the analysis for five-year intervals between 1965 and 2019. It serves as the ingredient to Figure 6 that visualizes the evolution of political support over time. We also discuss the welfare consequences of reforms towards individual taxation. The exact specifications of welfare weights is shown in Table D.12. Figure D.33 shows the corresponding welfare evaluations for selected years between 1965 and 2019.

In the main text, we also describe an alternative hypothetical reform towards individual taxation, where marginal tax rates are decreased for all secondary earners, but the increase of marginal tax rates for primary earners is restricted to the upper half of the couple income distribution. Figure D.34 visualizes the political feasibility and welfare consequences of this reform. In comparison to the baseline, this reform achieves broad political support and unites the welfare concerns for the poor and the working women.

Figure D.31: Reform towards individual taxation, political economy

(a) 1965 (b) 1970 (c) 1975 (d) 1980

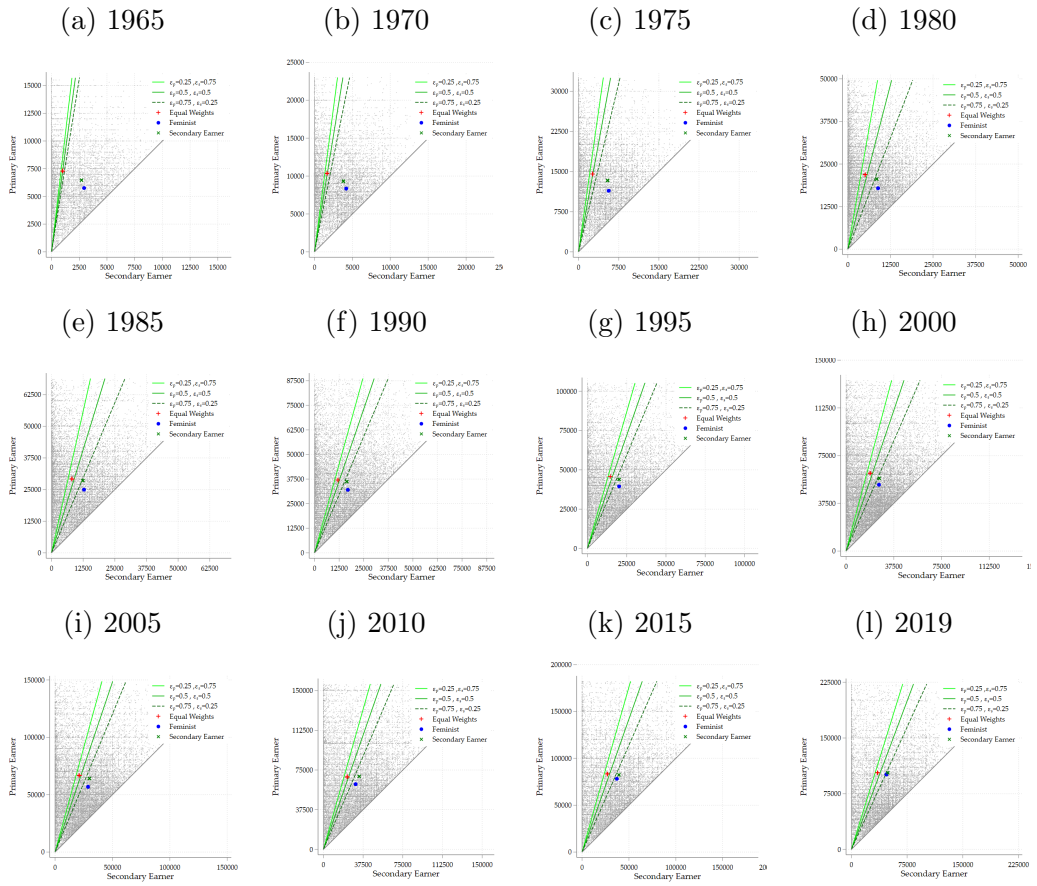


(e) 1985 (f) 1990 (g) 1995 (h) 2000

(i) 2005 (j) 2010 (k) 2015 (l) 2019

Notes: This figure replicates Figure 5 for more years. It shows how the political support for a revenue neutral reform towards individual taxation varies with behavioral responses to taxation. Each grey dot represents a couple in the data with specific income of the primary (secondary) earner displayed on the vertical (horizontal) axis. All results are displayed including extensive margin responses. The light green solid line illustrates the result under the baseline elasticity scenario of Table 1 in which the primary (resp. secondary) earner has an elasticity of 0.25 (resp. 0.75). For illustrative purposes, the dark green solid line refers to the case where primary and secondary earners' elasticities coincide (0.5) while the dashed green line shows the results under the assumption that the primary earner's elasticity (0.75) is higher than for the secondary earner (0.25). The figure also displays the respective share of couples than benefits from a reform towards individual taxation. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure D.32: Reform towards individual taxation, welfare (middle)



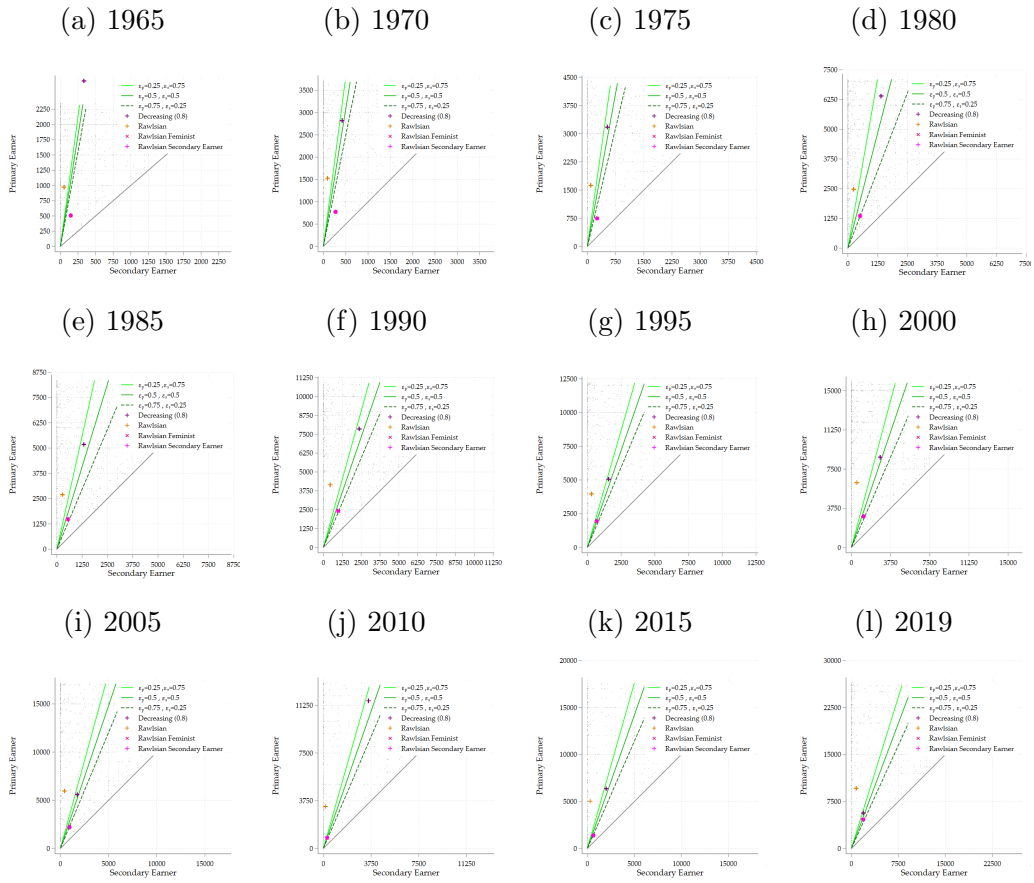
Notes: This figure replicates the left panel of Figure 8 for more years. It shows how a reform towards individual taxation is evaluated from a welfare perspective under different exogenous welfare weights. It displays welfare implications for welfare weights centered in the middle of the income distribution. Each gray dot represents a couple in the data with specific income of the primary (resp. secondary) earner displayed on the vertical (resp. horizontal) axis. Welfare evaluations with different welfare weights are plotted as a colored dot the location of which is defined via the average welfare-weighted primary earnings (vertical axis) and the average welfare-weighted secondary earnings (horizontal axis). All results are displayed including extensive margin responses. The light green solid line illustrates the result under the baseline elasticity scenario of Table 1 in which the primary (resp. secondary) earner has an elasticity of 0.25 (resp. 0.75). For illustrative purposes, the dark green solid line refers to the case where primary and secondary earners' elasticities coincide (0.5) while the dashed green line shows the results under the assumption that the primary earner's elasticity (0.75) is higher than for the secondary earner (0.25). For detailed information on welfare weight specification, see Table D.12. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Table D.12: Welfare weights for reforms *of* the system

Welfare weights	Details
Equal (Feminist)	$\forall y_m,\ g_m(y_m) = 1$
Decreasing	$\forall y_m,\ g_m(y_m) = (y_1 + y_2)^{-a}$
Rawlsian	$\forall y_m,\ g_m(y_m) = \begin{cases} 1, & \text{for } y_m \leq \text{P} \\ 0, & \text{for } y_m \geq \text{P} \end{cases}$
Affirmative Action Secondary Earner	$\forall y_m,\ g_m(y_m) = \frac{y_2}{y_m}$
Affirmative Action Feminist	$\forall y_m,\ g_m(y_m) = \frac{y_{woman}}{y_{man}+y_{woman}}$
Rawlsian Affirmative Action Feminist	$\forall y_m,\ g_m(y_m) = \begin{cases} \frac{y_{woman}}{y_{man}+y_{woman}}, & \text{for } y_m \leq \text{P} \\ 0, & \text{for } y_m \geq \text{P} \end{cases}$

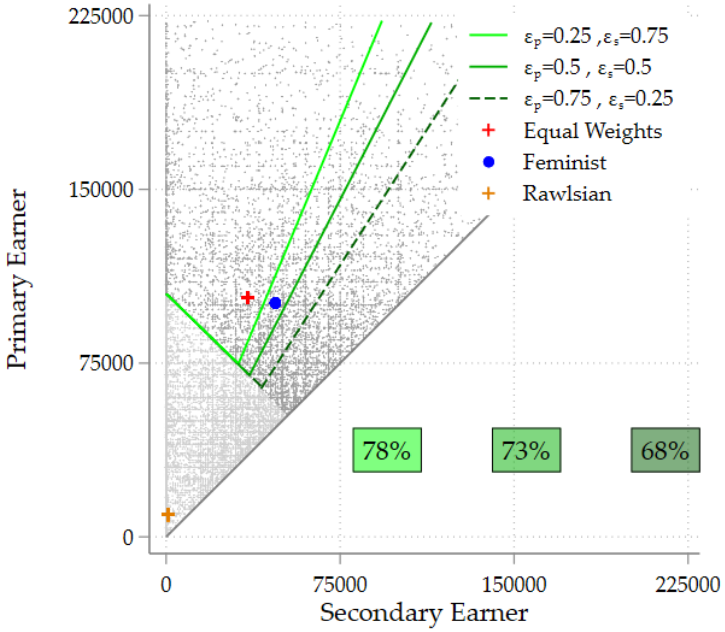
Notes: This table shows different specifications of welfare weights to evaluate reforms *of* the system. The sum of weights over the whole population of married couples is normalized to 1. P refers to specific percentiles of the couple income distribution and the parameter a is strictly positive. Note that our sample consists also of a small share of same-sex married couples (in 2019 around 0.8 percent of all married couples). While homosexual couples are included for the welfare analysis using Affirmative Action Secondary Earner welfare weights, they are not considered in the analysis using Affirmative Action Feminist welfare weights.

Figure D.33: Reform towards individual taxation, welfare (bottom)



Notes: This figure replicates the right panel of Figure 8 for more years. It shows how a reform towards individual taxation is evaluated from a welfare perspective under different exogenous welfare weights. It displays welfare implications for welfare weights centered at the bottom of the income distribution. Each gray dot represents a couple in the data with specific income of the primary (resp. secondary) earner displayed on the vertical (resp. horizontal) axis. Welfare evaluations with different welfare weights are plotted as a colored dot the location of which is defined via the average welfare-weighted primary earnings (vertical axis) and the average welfare-weighted secondary earnings (horizontal axis). All results are displayed including extensive margin responses. The light green solid line illustrates the result under the baseline elasticity scenario of Table 1 in which the primary (resp. secondary) earner has an elasticity of 0.25 (resp. 0.75). For illustrative purposes, the dark green solid line refers to the case where primary and secondary earners' elasticities coincide (0.5) while the dashed green line shows the results under the assumption that the primary earner's elasticity (0.75) is higher than for the secondary earner (0.25). For detailed information on welfare weight specification, see Table D.12. The specific percentile used for Rawlsian weights is P5 and $a = 0.8$ for decreasing welfare weights. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure D.34: Reconciling Rawlsian and Feminist welfare (2019)



Notes: This figure shows for the current tax system, how a partial reform towards individual taxation is evaluated from a welfare perspective under different exogenous welfare weights. A partial reform lowers marginal tax rates for all secondary earners, but raises marginal tax rates only for primary earners above the median of the couple income distribution. Each grey dot represents a couple in the data with specific income of the primary (resp. secondary) earner displayed on the vertical (resp. horizontal) axis. All results are displayed including extensive margin responses. The light green solid line illustrates the result under the baseline elasticity scenario of Table 1 in which the primary (resp. secondary) earner has an elasticity of 0.25 (resp. 0.75). For illustrative purposes, the dark green solid line refers to the case where primary and secondary earners' elasticities coincide (0.5) while the dashed green line shows the results under the assumption that the primary earner's elasticity (0.75) is higher than for the secondary earner (0.25). For detailed information on welfare weight specification, see Table D.12. The specific percentile used for Rawlsian weights is P5. All estimates are based on tax units with non-negative gross income in which both spouses are between 25 and 55 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

D.2 Disciplining hypothetical reforms

In Section 5 we describe the consequences of hypothetical reforms towards individual taxation, both from a stylized perspective and replicating observed reforms in Sweden and the United Kingdom. Here, we explain the details of the stylized reform and how we adapt our framework to replicate observed reforms towards individual taxation from other countries in the United States.

Under baseline assumptions about behavioral responses shown in Table 1, the hypothetical reform towards individual taxation would require a change in primary and secondary tax rates under the ratio $\frac{\tau_2}{\tau_1} = 3.22$ (see Figure 5). This implies that a revenue neutral reform that increases the marginal tax rate for primary earners by one percentage point can finance a 3.22 percentage point decrease in secondary earners marginal tax rates. The corresponding hypothetical change in tax liabilities is shown in Figure D.35a.

Figure D.35b depicts the case where we limit the increase in primary earners marginal tax rate to couples in the upper half of the income distribution (see Figure D.34). In this case, the corresponding ratio decreases to $\frac{\tau_2}{\tau_1} = 2.27$, because the reduction in τ_2 that can be financed through increases in τ_1 for rich couples only is now lower.

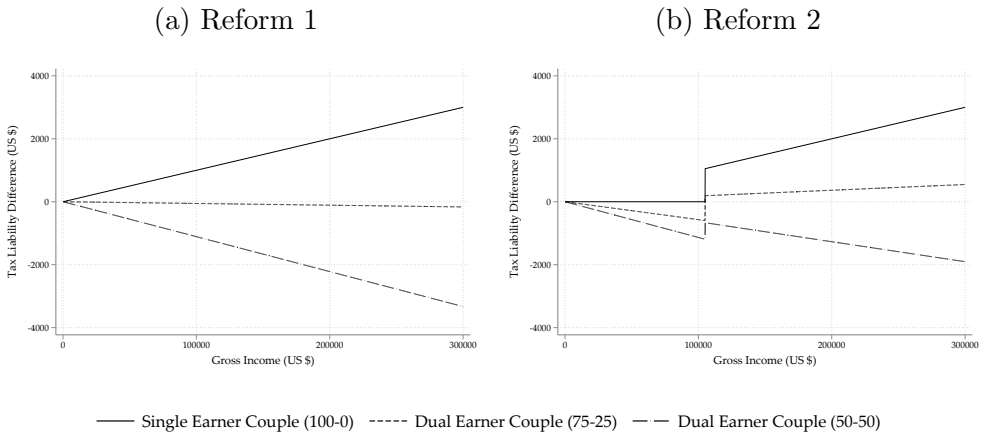
The two reforms that we discuss are just two exemplary reforms out of infinitely many hypothetical reforms that represent *reforms towards individual taxation*. We therefore now turn to countries that switched to individual taxation in the past.[39] We (i) analyze the shape of the respective reform, and (ii) test whether a reform towards individual taxation of this shape would achieve majority support in the US as of today. We focus on two countries that illustrate the contrast between different types of reforms towards individual taxation: Sweden and the United Kingdom.

D.2.1 Sweden

Sweden went from joint to individual taxation in 1971. Compared to the US, at the time of the reform, the prevalence of dual-earner couples was already very high. Among married couples with positive gross income, almost 50 percent were dual earner couples with a relatively equal within-couple income distribution while only around 10 percent were single earner couples (see Table

[39]For an overview of the tax treatment of couples around the world, see Table B.2. Tax reforms in OECD countries are shown in Table D.13.

Figure D.35: Hypothetical Reforms towards individual taxation, US



Notes: The figure shows the change in tax liabilities for the hypothetical reforms towards individual taxation across different levels of gross income and for different types of married couples. The reforms increase marginal tax rate on primary earnings by 1 percentage point. The corresponding reduction in secondary earners marginal tax rate is based on the ratio of revenue functions displayed in Equation (A.4). Revenue functions are calculated under both extensive and intensive margin behavioral responses and baseline assumptions about intensive margin elasticities shown in Table 1. Figure D.35a shows results for the general reform towards individual taxation while Figure D.35b shows results for the reform, in which marginal tax rate on primary earnings are only increased for couples above the median.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

D.14). This is significantly lower than the share of single earner couples in the US today which might explain the political feasibility of the reform.[40]

The reform introduced joint taxation, but at the same time modified existing marginal tax rates, tax brackets, and deduction possibilities. In particular, to limit the detrimental consequences for single earner couples, the reform introduced a spousal tax reduction that was phased out with secondary earnings.

Figure D.36 shows the aggregate impact of the Swedish reform incorporating various elements discussed in Selin (2014).[41] The Swedish reform resembles

[40]See Gustafsson (1992) for details and political context of the reform at the time. Gunnarsson and Eriksson (2017) discuss policy implications from this reform and conclude that "a majority of taxpayers needs to gain from a reform" as their most important policy lesson learned.

[41]We account for changes in the tax schedule, changes in local taxes, changes in the standard deduction, the deduction for work, and the introduction of the spousal and special tax reduction. We abstract, however, from changes in the treatment of owner occupied

Table D.13: Tax Reforms in OECD Countries

Country	**Year**	**Reform**
Denmark	1970	The unit of taxation changed from the family to individuals.
Sweden	1971	For married couples, earned income was taxed separately under a new unified tax schedule, regardless of marital status.
Austria	1973	Family taxation was replaced by individual taxation.
The Netherlands	1973	Joint taxation was replaced by individual taxation.
Finland	1976	Joint taxation was replaced by individual taxation.
Italy	1977	Joint taxation of husbands and wives was abolished, allowing spouses to be assessed separately.
Belgium	1988	The system changed from aggregated taxation for married couples to individual taxation, allowing the lower-earning spouse to transfer up to 30% of the couple's combined earned income.
Canada	1988	A spousal tax exemption was replaced by a non-refundable tax credit, reducing the system's reliance on joint taxation.
Spain	1988	The joint filing requirement was eliminated, giving married couples the option of filing jointly or separately.
United Kingdom	1990	Joint taxation was replaced by individual taxation.

Source: Authors compilation from OECD Tax Reform Database.

more the hypothetical reform in D.35b, since the negative consequences of increased marginal tax rates for primary earners only became relevant at the upper part of the income distribution.

To represent the complexities of the Swedish reform such that it can be applied to the United States, we provide a simplified, but accurate representation of the reform in Figure D.36b. It captures three key ingredients of the reform. First, for very poor couples with joint income below the first dashed line, there are no changes in marginal tax rates. Second, after the first dashed line, couples' tax liability decreases, both for single earner couples and for dual earner couples. Finally, the tax liability increases again, first for single earner couples and then for couples with a more equal income distribution. In particular, the reform can be described as follows

housing, interest rate expenses and the sickness insurance fee. We also abstract from changes in public transfers, most notably housing allowances and child allowances. Following Selin (2014), we compare joint filing under the tax system of 1969 to separate filing in 1975.

Table D.14: Sweden, Distribution of Married Couples, 1969

	100%	75%-100%	50%-75%
Share	9.58%	43.12%	47.3%
Median Income	28,651 SEK	35,639 SEK	43,534 SEK
Mean Income	34,789 SEK	40,793 SEK	46,535 SEK

Notes: This table displays the distribution of married couples in Sweden in 1969. We focus on all married couples where both spouses are between 25 and 55 years old. Income shares are calculated based on total gross earnings consisting of labor earnings and self-employment income. Empty income cells reflecting mismatching between the population data and income data are disregarded for the calculation. Among all adult individuals of age 25 to 55, 78% were married persons in 1969.
Source: Special analyses by Daniel Waldenström based on the Swedish population database for the income tax register and population register.

$$T^1 - T^0 = \begin{cases} 0 & \text{if } y_1 + y_2 \leq z_1, \\ -\tau_2 y_1 - \tau_2 y_2 & \text{if } y_1 + y_2 > z_1, y_1 \leq z_2, \\ \tau_1 y_1 - \tau_2 y_2 & \text{if } y_1 + y_2 > z_1, y_1 > z_2, \end{cases} \tag{D.38}$$

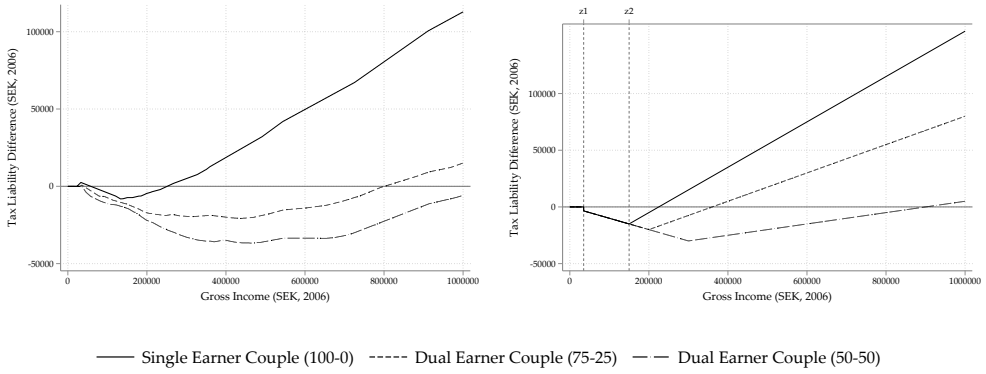
with $\tau_1 > 0$ and $\tau_2 > 0$ describing changes of marginal tax rates, z_1 and z_2 describing the income thresholds above which the changes apply.

Since the reform described by equation (D.38) would imply a discrete jump in the tax liability at the second threshold, the desired reform drawn in Figure D.36b is not revenue neutral. Instead, it needs to raise enough revenue to provide a conditional lump sum transfer l to all couples with primary earnings larger than z_2 to ensure a smooth function. Formally, the conditional lump sum transfer l is defined by

$$l = \begin{cases} -\tau_1 z_2 - \tau_2 z_2 & \text{if } y_1 + y_2 > z_1, y_1 > z_2, \\ 0 \quad \text{otherwise.} \end{cases} \tag{D.39}$$

Revenue Implications. The revenue implications of the reform can be expressed in terms of revenue functions:

Figure D.36: Sweden's tax reform of 1971



Notes: The figure shows the change in tax liabilities for the 1971 reform to individual taxation in Sweden across different levels of gross income and for different types of married couples. We follow the description of the reform by Selin (2014) and compare joint filing before the reform in 1969 to separate filing after the reform in 1975. Figure D.36a shows the impact of the reform calculated based on the detailed specifications in the tax law while Figure D.36b replicates the reform in a stylized manner according to equations (D.38) and (D.39) and for $\tau_1 = 0.2, \tau_2 = 0.1, z_1 = 35000, z_2 = 150000$.
Source: Authors' calculations based on Selin (2014).

$$\int_{\mathbb{K}} \mathcal{R}^2\left(y_2\right) dy_2 \tau_2 + \int_{\mathbb{K}}^{z_2} \mathcal{R}^1\left(y_1\right) dy_1 \tau_2$$

$$+ \int_{\mathbb{K},z_2} \mathcal{R}^1\left(y_1\right) dy_1 \tau_1 - z_2(\tau_1 + \tau_2) \int_{\mathbb{K},z_2} f(y_1) d(y_1). \tag{D.40}$$

All integrals are calculated only for couples in $\mathbb{K}$, where $\mathbb{K}$ is the set of couples with $y_1 + y_2 > z_1$. The first integral covers the revenue loss from decreasing secondary earners marginal tax rates by τ_2 for all couples. The second integral covers the revenue loss from decreasing primary earners marginal tax rate by τ_2 for couples with primary earnings up to z_2. The third integral covers the revenue gain from increasing primary earner marginal tax rates by τ_1 for couples with primary earnings larger than z_2. The final part of the equation captures the revenues necessary to finance the lump sum tax in Equation (D.39) for all couples with primary earnings larger than z_2.

Bringing the Swedish Reform to the US. The stylized Swedish tax reform has four parameters, τ_1, τ_2, z_1, z_2. To bring the Swedish reform to the US, we specify the thresholds z_1, z_2 exogenously by transforming the Swedish threshold values to their US dollar value as of 2019. The first Swedish threshold z_1 lies at around 35,000 SEK (2006 prices) which is equivalent to approximately 5000 USD in 2019 prices. The second Swedish threshold z_2 lies at around 150,000 SEK (2006 prices) which is equivalent to approximately 21,000 USD in 2019 prices. We then assume that the secondary earners marginal tax rate is decreased by 1 percentage point and that the primary earners marginal tax rate is increased by 1.25 percentage point. Any additional revenue loss or gain is redistributed lump-sum to all couples.[42]

Figure 9 in the main text shows the results. While the tax reduction at the bottom of the income distribution also applies to single earner couples, the following increase in tax liabilities occurs faster for single earner couples. As a consequence, equal earning dual earner couples still benefit from the reform at relatively high income levels. Figure 9b shows that about 63% of couples would benefit from such a reform indicating majority support. The winners are concentrated at the bottom of the income distribution and for couples with equal earnings between the two spouses.

D.2.2 United Kingdom

The United Kingdom went from joint to individual taxation in 1990.[43] While the reform left the tax schedule in place and did neither change tax brackets nor marginal tax rates on taxable income, the reform operated through changes in the tax exemptions for which married couples were eligible. Similar to Sweden, the reform cushioned the detrimental consequences of the reform for single earner couples through an additional allowance (tax exemption) for married couples. Figure D.37a displays the reform impact for different types of couples following the reform descriptions in Stephens and Ward-Batts (2004)

[42] Different values of the primary earners marginal tax rate change will influence the curvature of the tax liability difference and can yield different losses/gains in tax revenue.

[43] See Stephens and Ward-Batts (2004) for details of the reform and an analysis of it on the intra-household allocation of assets. To the best of our knowledge, there is no direct evaluation of this reform on labor supply. Blundell, Duncan and Meghir (1998) use individual taxation along with other income tax reforms in the UK to estimate labor supply of married women.

and comparing the pre reform tax year of 1989/1990 under joint filing to the post reform year 1990/1991 under separate filing.[44] The reform is different compared to both our stylized reforms towards individual taxation and the Swedish reform, since it left τ_1 untouched and only operated effectively through a reduction in τ_2.

Figure D.37b shows the stylized version of the reform that we can apply in our framework to the US. It captures three ingredients of the reform. First, for very poor couples with joint income below the first dashed line, there are no changes in the tax liability. Second, there is a small lump-sum reduction in taxes for all couples between the first and the second dashed line. Finally, after the second dashed line, couples with secondary earnings get a tax reduction. This tax cut occurs faster for couples with a more equal income distribution and at a slower pace for couples with a lower secondary earner share. Importantly, once secondary earnings have reached a specific threshold, there are no further changes in the tax liability. The stylized reform can be described as follows (τ_2 defined positively).

$$T^1 - T^0 = \begin{cases} 0 & \text{if } y_1 + y_2 \leq z_2, \\ -\tau_2 y_2 & \text{if } y_1 + y_2 > z_2, y_2 \leq z_3, \\ 0 & \text{if } y_2 > z_3. \end{cases} \tag{D.41}$$

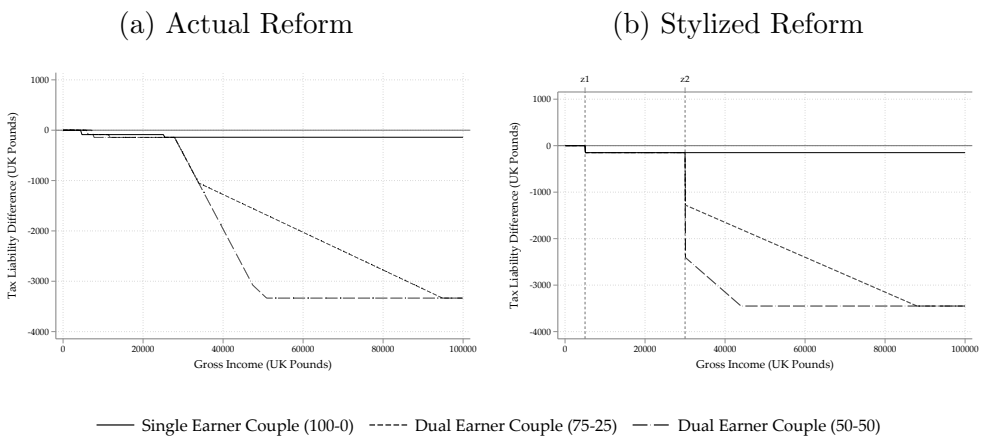
Since the reform described by equation (D.41) would imply discrete jumps in the tax liability, the reform requires some additional lump sum transfer.

$$l = \begin{cases} 0 & \text{if } y_1 + y_2 \leq z_1, \\ -l_1 & \text{if } y_1 + y_2 > z_1, y_2 \leq z_3, \\ -l_1 - \tau_2 z_3 & \text{if } y_1 + y_2 > z_1, y_2 > z_3. \end{cases} \tag{D.42}$$

Revenue Implications The revenue implications of the reform can be expressed in terms of revenue functions:

[44] Comparing these two years has the advantage to isolate the effect of the reform switch from joint to individual taxation from other changes in the tax and transfer system in the 1980s and 1990s. For an overview of changes in the tax and transfer system, see van de Ven and Hérault (2022).

Figure D.37: United Kingdom's tax reform of 1990



Notes: The figure shows the change in tax liabilities for the 1990 reform to individual taxation in UK across different levels of gross income and for different types of married couples. We follow the description of the reform by Stephens and Ward-Batts (2004) and compare joint filing before the reform in the tax year 1989/1990 to separate filing after the reform in the tax year 1990/1991. Figure D.37a shows the impact of the reform calculated based on the detailed specifications in the tax law while Figure D.37b replicates the reform in a stylized manner according to equations (D.41) and (D.42) and for $\tau_2 = 0.15, l_1 = 150, z_1 = 5000, z_2 = 30000, z_3 = 22000$.
Source: Authors' calculations based on Stephens and Ward-Batts (2004).

$$\int_{\mathbb{K}}^{z_3} \mathcal{R}^2\left(y_2\right) dy_2 \tau_2 + \int_{\mathbb{L}} -l_1 dy_1 + \tau_2 z_3 \int_{\mathbb{K},z_3} f(y_2) d(y_2). \tag{D.43}$$

The first integral captures the revenue loss from decreasing secondary earners marginal tax rates by τ_2. This applies to all couples in $\mathbb{K}$, where $\mathbb{K}$ is the set of couples with $y_1 + y_2 > z_2$ and only up to secondary earnings z_3. The second integral covers the revenue loss from the lump sum tax cut for all couples in the set $\mathbb{L}$, where $\mathbb{L}$ is the set of couples with $y_1 + y_2 > z_1$. The third integral covers the revenue loss from the transfer to all couples in $\mathbb{K}$ $(y_1 + y_2 > z_2)$ with secondary earnings larger than z_3.

Bringing the UK Reform to the US. The stylized UK tax reform has four parameters, z_1, z_2, z_3, l_1, and τ_2. To bring the Swedish reform to the US, we specify the thresholds exogenously by transforming the UK threshold values in 1989 to their US dollar value as of 2019 ($z_1 = 15,000$ USD, $z_2 = 92,000$

USD, $z_3 = 68,000$ USD, $l_1 = 500$ USD). We then assume that the secondary earners marginal tax rate is decreased by 5 percentage points. Any additional revenue/loss that the reform generates is redistributed lump sum to all couples.

Figure 10 in the main text shows the results. The reform works the opposite way compared to the Swedish reform. In particular, support comes from rich dual earner couples who benefit from the tax cut while poor and single earner couples are made worse off through the loss in tax revenue. Accounting for this loss, the UK type of reform towards individual taxation does not achieve majority support in the US as of today (only 43% in favor).

E Supplementary material: Alternative sample restriction

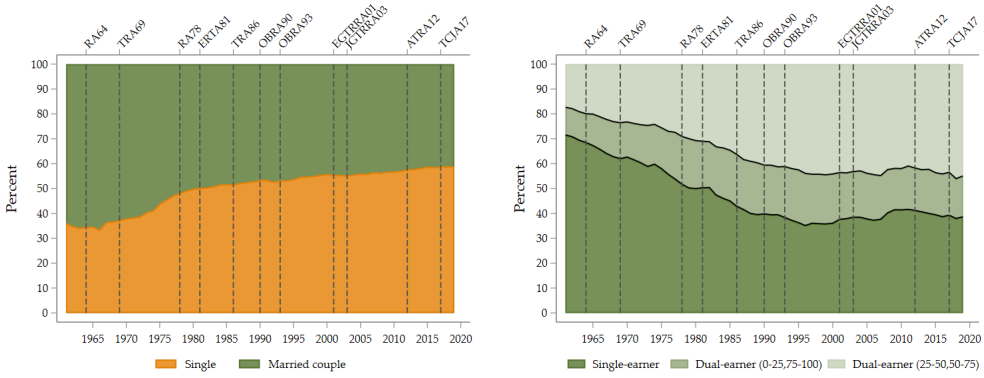
The main analysis focuses on the working age population, i.e. we restrict the sample to tax units with non-negative gross income in which both spouses are between 25 and 55 years old. This sample restriction follows from our model that does not include retirement and education decisions. In addition, since labor force attachment is much lower among old and young groups, our assumptions on behavioral responses to taxation do not apply straightforwardly to these groups.

In this section, as a robustness check, we replicate the figures and tables presented in the main text for an alternative sample restriction in which we consider all adults in tax units with non-negative gross income.[45] The main takeaway from this analysis is that the qualitative properties of our results remain valid. In general, the full population contains more tax units with zero gross income, more singles, and more single-earner couples. The main quantitative differences are based on the latter fact. Given that single-earner couples tend to loose from a reform towards individual taxation, this reform has less support than in our main analysis (47 percent instead of 55 percent for our baseline scenario).

[45] Under this sample restriction, all singles and both spouses in a couple are at least 18 years old.

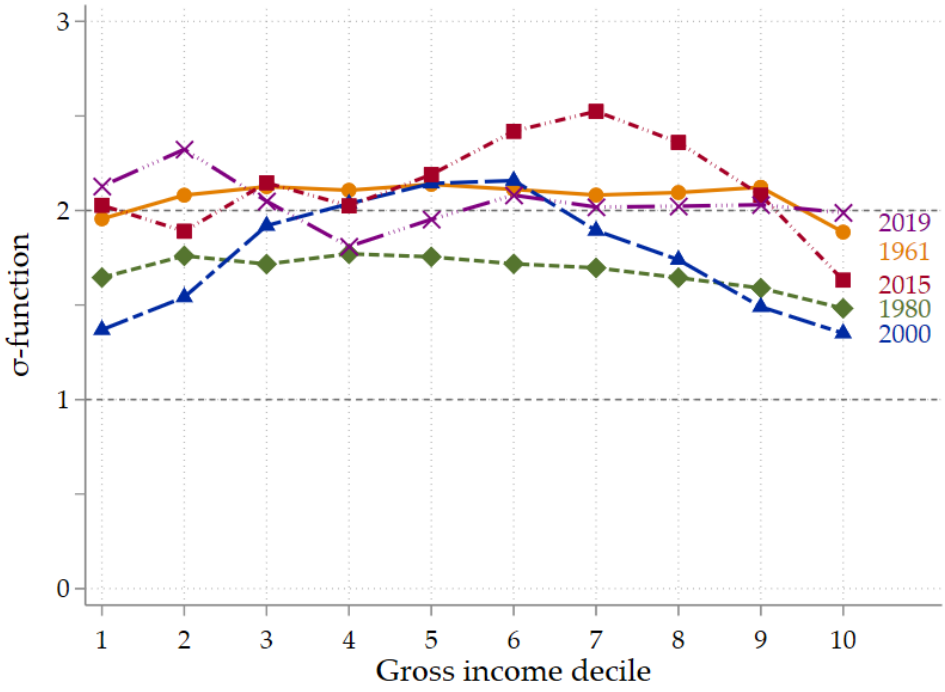
Figure E.38: Demographic change, alternative sample

(a) Tax unit types (b) Couple types



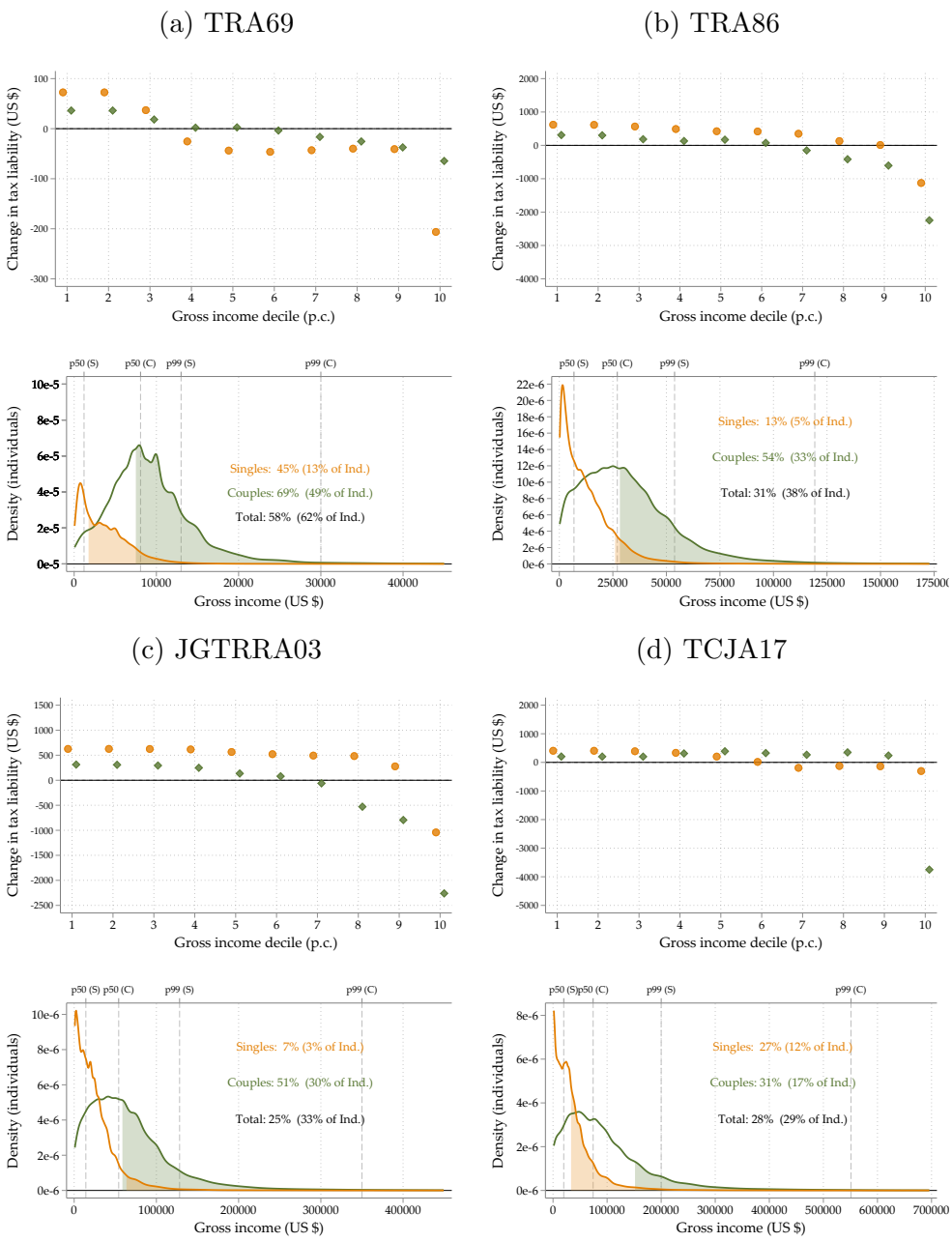
Notes: This figure replicates Figure 1 for the full adult population instead of the working age population. It shows the distribution of tax unit types over time. Figure E.38a displays the share of single tax units (orange area) and the share of couple tax units (green area). Figure E.38b displays the share of single-earner and dual-earner couples. A single-earner couple refers to a married couple, in which one spouse is not employed (dark green area). The figure further displays the share of dual-earner couples in which both spouses are employed and (i) one spouse earns between 0 and 25 percent (mid green area) and (ii) between 25 and 50 percent of total earnings (light green area). Earnings shares are computed on the basis of wage, business and farm income. Reforms of the federal income tax code as described in Table B.4 are displayed as vertical lines. All estimates are based on tax units with strictly positive gross income in which both spouses are at least 18 years old.
Source: Authors' calculations based on CPS-ASEC.

Figure E.39: The empirical splitting function σ, alternative sample



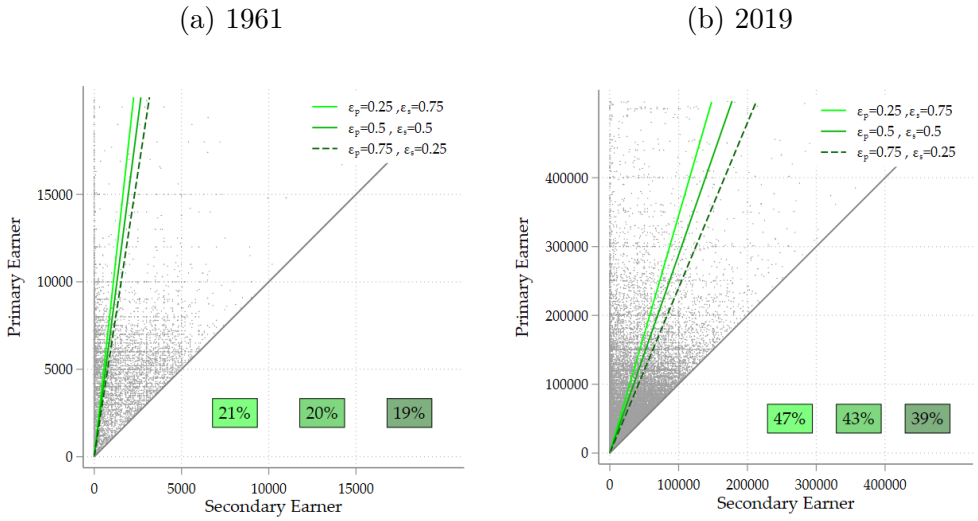
Notes: This figure replicates Figure 2 for the full adult population instead of the working age population. It shows estimates of the splitting function σ for selected years. The σ-function is calculated by estimating mean average tax rates of couples and singles. Mean average tax rates are used to solve numerically for σ (see Appendix B.3.2). Deciles refer to the gross income distribution of couples in the respective year. All estimates are based on tax units with strictly positive gross income in which both spouses are at least 18 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure E.40: Political feasibility, alternative sample



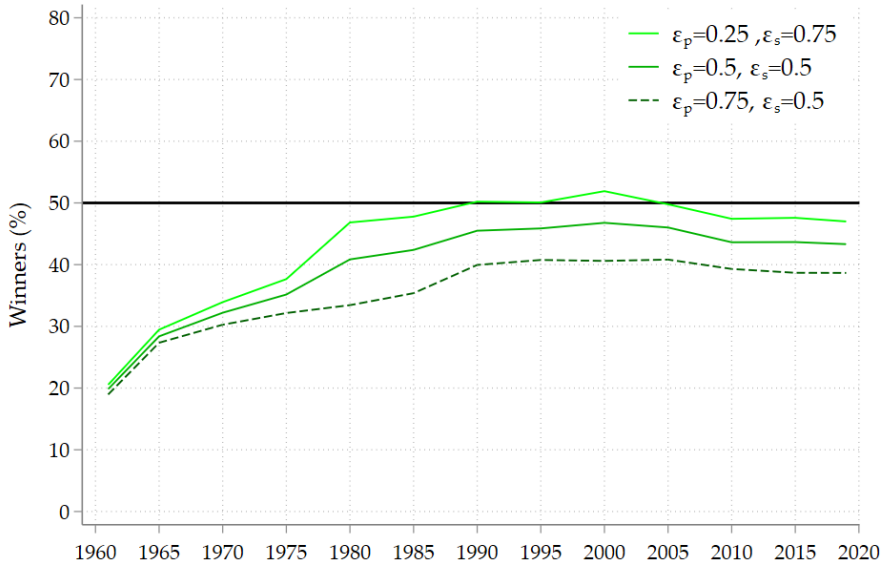
Notes: This figure replicates Figure 4 for the full adult population instead of the working age population. It shows the change in the tax liability (upper panel) and winners of the reform (lower panel) for singles and couples and for an alternative sample restriction, i.e. the full adult population. The change in tax liability represents the average change in tax liability per capita (PC) for each of the 10 per capita gross income deciles. The location of winners and losers across the gross income distribution are identified by evaluating the tax liability change for each of the 25 gross income quantiles. We account for behavioral responses at the intensive margin (baseline elasticity scenario from Table 1) and extensive margin responses. Further, reforms are made revenue neutral by distributing any gains or losses lump-sum. Lump-sum adjustments are implemented at the tax unit level. All estimates are based on tax units with non-negative gross income in which both spouses are at least 18 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure E.41: Reform towards individual taxation: Political economy, alternative sample



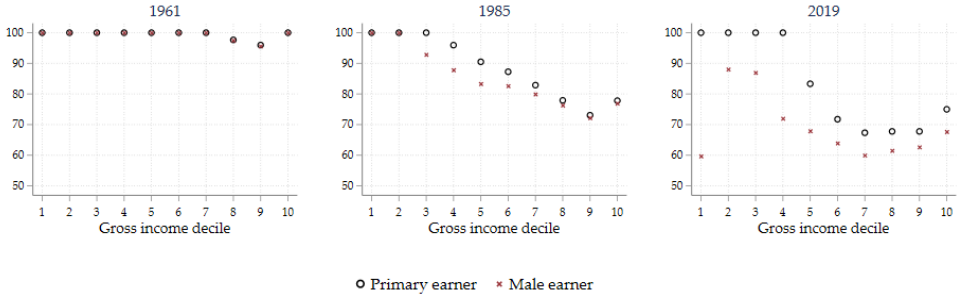
Notes: This figure replicates Figure 5 for the full adult population instead of the working age population. It shows for 1961 and 2019, how the political support for a revenue neutral reform towards individual taxation varies with behavioral responses to taxation. Each grey dot represents a couple in the data with specific income of the primary (secondary) earner displayed on the vertical (horizontal) axis. All results are displayed including extensive margin responses. The light green solid line illustrates the result under the baseline elasticity scenario of Table 1 in which the primary (resp. secondary) earner has an elasticity of 0.25 (resp. 0.75). For illustrative purposes, the dark green solid line refers to the case where primary and secondary earners' elasticities coincide (0.5) while the dashed green line shows the results under the assumption that the primary earner's elasticity (0.75) is higher than for the secondary earner (0.25). The figure also displays the respective share of couples than benefits from a reform towards individual taxation. All estimates are based on tax units with non-negative gross income in which both spouses are at least 18 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure E.42: Reform towards individual taxation: Share of winners over time, alternative sample



Notes: This figure replicates Figure 6 for the full adult population instead of the working age population. It shows how the political support for a revenue neutral reform towards individual taxation evolved over time. All results are displayed including extensive margin responses. The light green solid line illustrates the result under the baseline elasticity scenario of Table 1 in which the primary (resp. secondary) earner has an elasticity of 0.25 (resp. 0.75). For illustrative purposes, the dark green solid line refers to the case where primary and secondary earners' elasticities coincide (0.5) while the dashed green line shows the results under the assumption that the primary earner's elasticity (0.75) is higher than for the secondary earner (0.25). All estimates are based on tax units with non-negative gross income in which both spouses are at least 18 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure E.43: Median share of primary and male earner, alternative sample

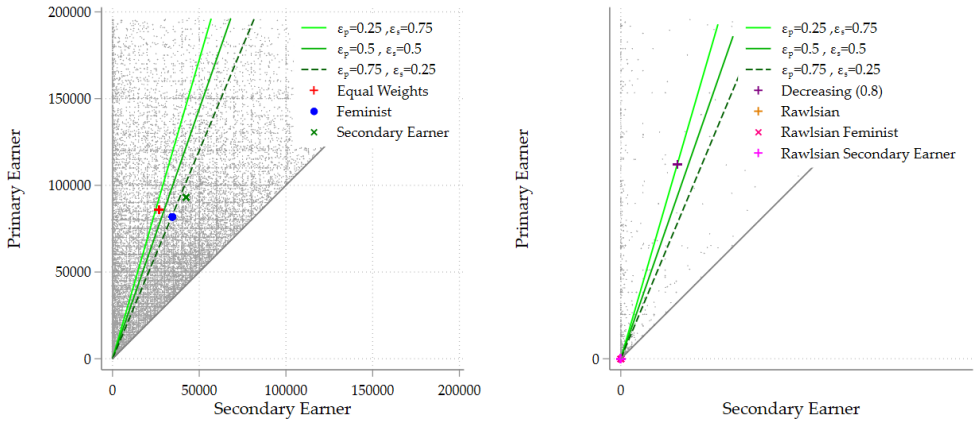


Notes: This figure replicates Figure 7 for the full adult population instead of the working age population. It shows the median income share of the primary earner in the couple by income decile. Earnings shares are computed on the basis of non-negative wage, business and farm income. All estimates are based on tax units with non-negative gross income in which both spouses are at least 18 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

Figure E.44: Reform towards individual taxation: Welfare (2019), alternative sample

(a) Welfare I

(b) Welfare II



Notes: This figure replicates Figure 8 for the full adult population instead of the working age population. It shows for the current tax system, how a reform towards individual taxation is evaluated from a welfare perspective under different exogenous welfare weights. Figure E.44a (E.44b) displays welfare implications for welfare weights centered in the middle (bottom) of the income distribution. Each gray dot represents a couple in the data with specific income of the primary (resp. secondary) earner displayed on the vertical (resp. horizontal) axis. Welfare evaluations with different welfare weights are plotted as a colored dot the location of which is defined via the average welfare-weighted primary earnings (vertical axis) and the average welfare-weighted secondary earnings (horizontal axis). All results are displayed including extensive margin responses. The light green solid line illustrates the result under the baseline elasticity scenario of Table 1 in which the primary (resp. secondary) earner has an elasticity of 0.25 (resp. 0.75). For illustrative purposes, the dark green solid line refers to the case where primary and secondary earners' elasticities coincide (0.5) while the dashed green line shows the results under the assumption that the primary earner's elasticity (0.75) is higher than for the secondary earner (0.25). For detailed information on welfare weight specification, see Table D.12. The specific percentile used for Rawlsian weights is P5 and $a = 0.8$ for decreasing welfare weights. All estimates are based on tax units with non-negative gross income in which both spouses are at least 18 years old.
Source: Authors' calculations based on NBER TAXSIM and CPS-ASEC.

F Supplementary material: Narratives about tax reforms

The particularities of the tax treatment of couples and singles in tax reforms cannot only be observed through an analysis of the implemented tax changes, but also by how narratives among tax reforms in different times were shaped by, e.g., the concern of marriage penalties or treatment of secondary earners. We use wordclouds to get a sense of the underlying discussion around three US tax reforms (TRA69, ERTA81 and TCJA17) that lead to significant changes in penalties and bonuses. The goal of this analysis is to reconstruct the narrative surrounding these reforms and to uncover to what extent the public discussion at the time is reflected in the effects of the final tax bill on the tax treatment of couples.

We source data from various sources displayed in Table F.15. Among the most prevalent source types are congressional records, newspaper articles, and policy documents prepared by think tanks. The raw data is preprocessed in the following way: first, we reduce the text data to include only letters and hyphens and transform it to lowercase. We then split strings to receive a list of words and remove all stopwords.[46] The remaining words are then reduced to their roots via lemmatization.[47] Finally, we correct for obvious spelling mistakes and compile one data set for each time around a reform.[48]

We construct three different types of wordclouds for each of the three reforms. *Type 1* includes raw unigrams (i.e. single words) and bigrams (i.e. collocations of two words). Word clouds of *Type 2* only includes raw bigrams. *Type 3* also focuses on bigrams, but involves further adjustments of the data. In particular, inversed bigrams (e.g. "rate tax" and "tax rate"), synonyms (e.g. "single person", "single individual") are grouped together. In a last step, bigrams referring to institutions or persons as well as doubled terms ("tax tax") are removed.

Across all three reforms, the treatment singles and couples was a prominent topic in public debate about tax reforms. Around TRA69, the arguments mainly circled around the unequal tax treatment of single persons and married couples (see Figure F.45). The displayed "income splitting" procedure in place

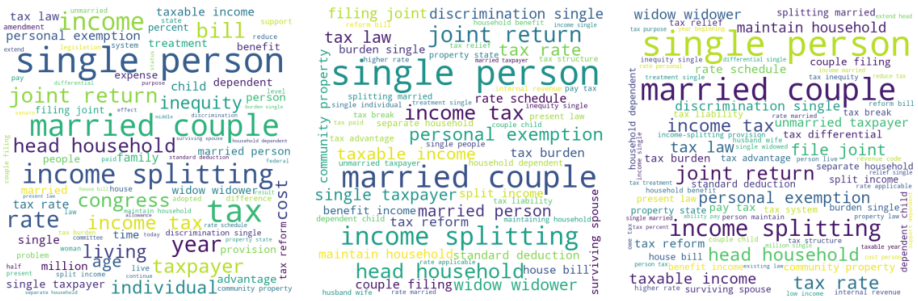
[46]The stopwords document is taken from Lisa Chalaguine's GitHub representation.

[47]In this case, we use the function WordNetLemmatizer.

[48]Tables F.16, F.17, and F.18 display the data sources compiled for each reform.

Figure F.45: Narratives for TRA69

(a) Type 1 (b) Type 2 (c) Type 3

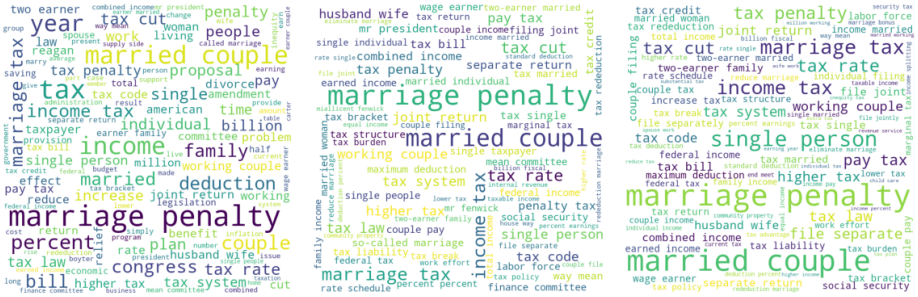


Notes: This figure shows narratives around the TRA69. Word clouds have been generated by pre-processing and compiling the textual sources displayed in Table F.16 to one large document and analyzing unigrams and bigrams within this data. Type 1 shows all unigrams and bigrams while Type 2 and Type 3 focuses on bigrams only. The wordcloud of Type 3 involves a further processing of the data by eliminating synonyms and inverse bigrams.
Source: Authors' calculations based on sources in Table F.16.

prior to the reform was perceived to unfairly discriminate against single people (see for example "discrimination single", "burden single", "inequity single"). In later years, the focus shifted towards the concern about unfair treatment of couples as terms like "marriage penalty" (or "marriage tax penalty") become prominent in the debate (see Figures F.46 and F.47). A lingering concern to "discourage marriage" is also discernible. The term "marriage neutrality" evolves as an objective. In addition, the incentive structure for the second earner, often a married woman, was also an important part of the discussion.

Figure F.46: Narratives for ERTA81

(a) Type 1 (b) Type 2 (c) Type 3



Notes: This figure shows narratives around ERTA81. Word clouds have been generated by preprocessing and compiling the textual sources displayed in Table F.16 to one large document and analyzing unigrams and bigrams within this data. Type 1 shows all unigrams and bigrams while Type 2 and Type 3 focuses on bigrams only. The wordcloud of Type 3 involves a further processing of the data by eliminating synonyms and inverse bigrams.
Source: Authors' calculations based on sources in Table F.17.

Figure F.47: Narratives for TCJA17

(a) Type 1 (b) Type 2 (c) Type 3

Notes: This figure shows narratives around TCJA17. Word clouds have been generated by preprocessing and compiling the textual sources displayed in Table F.18 to one large document and analyzing unigrams and bigrams within this data. Type 1 shows all unigrams and bigrams while Type 2 and Type 3 focuses on bigrams only. The wordcloud of Type 3 involves a further processing of the data by eliminating synonyms and inverse bigrams.
Source: Authors' calculations based on sources in Table F.16.

Table F.15: Text data source types

Type of source	TRA69	ERTA81	TCJA17
Congressional record	15	17	6
Official	4	8	2
Newspapers	4	87	10
President statement	3	9	2
Journal	3	0	3
Think tank	0	1	40
Blog	0	0	1
Total	29	122	64

Table F.16: Underlying text data for TRA69 (1967–1975)

Type of source	**Source name**	**URL**
congressional record	May 8, 1967, 90th Congress, 1st Session, Vol.113, Part 9	Link
congressional record	June 6, 1967, 90th Congress, 1st Session, Vol.113, Part 11	Link
official	Annual Report of the Secretary of the Treasury on the State of the Finances (Fiscal Year Ended June 30, 1968).	Link
newspaper	San Bernardino Sun	Link
President statement	Richard Nixon, Letter to Senate Leaders Mike Mansfield and Hugh Scott on the Tax Reform Bill.	Link
newspaper	San Bernardino Sun	Link
newspaper	San Bernardino Sun	Link
official	Tax Reform Act of 1969, Report of the Committee on Finance	Link
congressional record	August 7, 1969, 91st Congress, 1st Session, Vol. 115, Part 17	Link
congressional record	December 10, 1969, 91st Congress, 1st Session, Vol.115, Part 28	Link
congressional record	October 30, 1969, 91st Congress, 1st Session, Vol.115, Part 24	Link
congressional record	August 6, 1969, 91st Congress, 1st Session, Vol. 115, Part 17	Link
congressional record	February 19, 1969, 91st Congress, 1st Session, Vol.115, Part 3	Link
congressional record	September 11, 1969, 91st Congress, 1st Session, Vol.115, Part 19	Link
congressional record	October 2, 1969, 91st Congress, 1st Session, Vol.115, Part 21	Link
congressional record	February 5, 91st Congress, 1st Session, Vol.115, Part 3	Link
congressional record	February 17, 1969, 91st Congress, 1st Session, Vol.115, Part 3	Link
congressional record	December 3, 1969, 91st Congress, 1st Session, Vol.115, Part 27	Link
congressional record	June 5, 1969, 91st Congress, 1st Session, Vol.115, Part 11	Link
congressional record	August 13, 1969, 91st Congress, 1st Session, Vol.115, Part 18	Link
congressional record	April 15, 1969, 91st Congress, 1st Session, Vol.115, Part 7	Link
official	Annual Report of the Secretary of the Treasury on the State of the Finances (Fiscal Year Ended June 30, 1970).	Link
official	General Explanation of the Tax Reform Act of 1969, Joint Committee on Internal Revenue Taxation	Link
newspaper	San Bernardino Sun	Link
journal	Richards, 1970	Link
journal	Richards, 1971	Link

journal	Betz, 1974	Link

Table F.17: Underlying text data for ERTA81 (1978–1985)

Type of source	**Source name**	**URL**
newspaper	U.S. News and World Report	Link
newspaper	U.S. News and World Report	Link
newspaper	The Associated Press	Link
official	Annual Report of the Secretary of the Treasury on the State of the Finances (Fiscal Year Ended September 30, 1980).	Link
official	Exhibit 51.—Statement of Deputy Assistant Secretary Sunley, August 5, 1980, before the Subcommittee on Taxation and Debt Management of the Senate Finance Committee, on the tax treatment of married and single taxpayers	
President statement	Jimmy Carter tax proposals	Link
newspaper	Columbia Missourian	Link
newspaper	Catholic News Service	Link
newspaper	Desert Sun	Link
newspaper	Catholic News Service	Link
newspaper	The Broomfield Enterprise	Link
newspaper	San Bernardino Sun	Link
newspaper	Bronxville Review Press and Reporter	Link
newspaper	San Bernardino Sun	Link
newspaper	The Stanford Daily	Link
newspaper	San Bernardino Sun	Link
newspaper	Desert Sun	Link
newspaper	Desert Sun	Link
newspaper	Desert Sun	Link
newspaper	San Bernardino Sun	Link
newspaper	San Bernardino Sun	Link
newspaper	Lancaster Farming	Link
newspaper	Santa Cruz Sentinel	Link
newspaper	The Steamboat Pilot	Link
newspaper	Santa Cruz Sentinel	Link
newspaper	Santa Cruz Sentinel	Link
official	Administration'es (Carter) tax proposal	Link
newspaper	U.S. News and World Report	Link
newspaper	The Christian Science Monitor	Link
newspaper	The New York Times	Link
newspaper	The Associated Press	Link
newspaper	U.S. News and World Report	Link
newspaper	The Associated Press	Link
newspaper	The New York Times	Link
newspaper	The Christian Science Monitor	Link
newspaper	The Associated Press	Link
official	Economic Report of the President, 1981	Link
official	General Explanation of the Economic Recovery Tax Act of 1981, Joint Committee on Taxation	Link
President statement	Jimmy Carter, Budget Message Message to the Congress Transmitting the Fiscal Year 1982 Budget.	Link
President statement	Jimmy Carter, Annual Message to the Congress: The Economic Report of the President	Link

President statement	Ronald Reagan, Address Before a Joint Session of the Congress on the Program for Economic Recovery	Link
President statement	Ronald Reagan, Remarks on Federal Tax Reductions Following Meetings With Members of Congress	Link
President statement	Ronald Reagan, The President's News Conference	Link
President statement	Ronald Reagan, Remarks About Federal Tax Reduction Legislation at a Meeting With State Legislators and Local Government Officials	Link
President statement	Ronald Reagan, Address to the Nation on Federal Tax Reduction Legislation	Link
newspaper	Lancaster Farming	Link
newspaper	The Daily Collegian	Link
newspaper	The Daily Collegian	Link
newspaper	Desert Sun	Link
newspaper	Catholic News Service	Link
newspaper	Catholic News Service	Link
newspaper	Desert Sun	Link
newspaper	Catholic News Service	Link
newspaper	Desert Sun	Link
newspaper	Douglas County News-Press	Link
newspaper	Calexico Chronicle	Link
newspaper	San Bernardino Sun	Link
newspaper	San Bernardino Sun	Link
newspaper	San Bernardino Sun	Link
newspaper	Healdsburg Tribune, Enterprise and Scimitar	Link
newspaper	San Bernardino Sun	Link
newspaper	San Bernardino Sun	Link
newspaper	Recorder	Link
newspaper	Desert Sun	Link
newspaper	San Bernardino Sun	Link
newspaper	San Bernardino Sun	Link
newspaper	San Bernardino Sun	Link
newspaper	San Bernardino Sun	Link
newspaper	San Bernardino Sun	Link
newspaper	San Bernardino Sun	Link
newspaper	San Bernardino Sun	Link
newspaper	San Bernardino Sun	Link
newspaper	Desert Sun	Link
newspaper	Santa Cruz Sentinel	Link
newspaper	Desert Sun	Link
newspaper	Santa Cruz Sentinel	Link
newspaper	Desert Sun	Link
newspaper	Santa Cruz Sentinel	Link
newspaper	Santa Cruz Sentinel	Link
newspaper	Santa Cruz Sentinel	Link
newspaper	Santa Cruz Sentinel	Link
official	Economic Recovery Tax Act of 1981, Report of the Committee on Finance	Link
newspaper	Cherokeean	Link
congressional record	July 18, 1981, 97th Congress, 1st Session, Vol.127, Part 12	Link
congressional record	July 29, 1981, 97th Congress, 1st Session, Vol. 127, Part 14	Link
congressional record	March 11, 1981, 97th Congress, 1st Session, Vol.127, Part 3	Link
congressional record	February 5, 97th Congress, 1st Session, Vol.127, Part 2	Link
congressional record	April 10, 1981, 97th Congress, 1st Session, Vol.127, Part 6	Link
congressional record	July 27, 1981, 97th Congress, 1st Session, Vol.127, Part 13	Link
congressional record	March 24, 1981, 97th Congress, 1st Session, Vol.127, Part 4	Link

congressional record	February 26, 1981, 97th Congress, 1st Session, Vol.127, Part 3	Link
congressional record	July 15, 1981, 97th Congress, 1st Session, Vol.127, Part 12	Link
congressional record	January 6, 1981, 97th Congress, 1st Session, Vol. 127, Part 1	Link
congressional record	January 20, 1981, 97th Congress, 1st Session, Vol. 127, Part 1	Link
congressional record	August 3, 1981, 97th Congress, 1st Session, Vol.127, Part 15	Link
congressional record	June 10, 1981, 97th Congress, 1st Session, Vol.127, Part 9	Link
congressional record	January 5, 1981, 97th Congress, 1st Session, Vol. 127, Part 1	Link
congressional record	April 30, 1981, 97th Congress, 1st Session, Vol.127, Part 6	Link
congressional record	July 22, 1981, 97th Congress, 1st Session, Vol.127, Part 13	Link
congressional record	November 12, 1981, 97th Congress, 1st Session, Vol.127, Part 21	Link
newspaper	The Christian Science Monitor	Link
newspaper	The Associated Press	Link
newspaper	The Associated Press	Link
newspaper	The New York Times	Link
newspaper	The New York Times	Link
newspaper	The Associated Press	Link
official	Economic Report of the President, 1982	Link
President statement	Ronald Reagan, The President's News Conference	Link
newspaper	The Daily Collegian	Link
newspaper	The Daily Collegian	Link
newspaper	Desert Sun	Link
newspaper	Desert Sun	Link
newspaper	The Louisville Times	Link
newspaper	Rappahannock Record	Link
newspaper	San Bernardino Sun	Link
newspaper	Indianapolis Recorder	Link
newspaper	Desert Sun	Link
newspaper	Rappahannock Record	Link
newspaper	Smithfield Times	Link
newspaper	San Bernardino Sun	Link
official	The Treasury Department Report to the President, Volume 2: General Explanation of the Treasury Department Proposals	Link
thinktank	American Enterprise Institute, Feenberg	Link
newspaper	Santa Cruz Sentinel	Link

Table F.18: Underlying text data for TCJA17 (2016–2019)

Type of source	**Source name**	**URL**
thinktank	Center on Budget and Policy Priorities	Link
thinktank	Cato Institute	Link
thinktank	Tax Foundation	Link
thinktank	Indpendent Institute	Link
thinktank	Manhattan Institute	Link
thinktank	Urban Institute	Link
thinktank	American Enterprise Institute	Link
thinktank	American Enterprise Institute	Link
thinktank	R Street Institute	Link
thinktank	Urban Institute	Link
thinktank	Demos	Link
thinktank	American Enterprise Institute	Link

thinktank	American Enterprise Institute	Link
thinktank	Brookings Institution	Link
thinktank	Brookings Institution	Link
thinktank	Cato Institute	Link
thinktank	Center on Budget and Policy Priorities	Link
thinktank	The Century Foundation	Link
thinktank	Manhattan Institute	Link
thinktank	R Street Institute	Link
thinktank	Tax Foundation	Link
thinktank	Urban Institute	Link
thinktank	American Enterprise Institute	Link
newspaper	USNEWS.com	Link
thinktank	Institute for Family Studies	Link
thinktank	American Enterprise Institute	Link
thinktank	American Enterprise Institute	Link
thinktank	American Enterprise Institute	Link
thinktank	The Heartland Institute	Link
thinktank	Hudson Institute	Link
thinktank	Hudson Institute	Link
thinktank	Hudson Institute	Link
thinktank	Urban Institute	Link
newspaper	Deseret Morning News	Link
newspaper	States News Services	Link
journal	National Law Review	Link
journal	The ANNALS of the American Academy of Political and Social Science	Link
official	Joint Economic Committee	Link
thinktank	Brookings Institution	Link
thinktank	The Heritage Foundation	Link
thinktank	Manhattan Institute	Link
thinktank	Niskanen Center	Link
thinktank	American Enterprise Institute	Link
congressional record	October 17, 2017, 115th Congress, 1st Session, Vol.163, No.167	Link
congressional record	November 29, 2017, 115th Congress, 1st Session, Vol.163, No.194	Link
congressional record	October 11, 2017, 115th Congress, 1st Session, Vol.163, No.163	Link
congressional record	November 15, 2017, 115th Congress, 1st Session, Vol.163, No.187	Link
congressional record	December 1, 115th Congress, 1st Session, Vol.163, No.196	Link
congressional record	November 16, 2017, 115th Congress, 1st Session, Vol.163, No.188	Link
newspaper	Tribune Review	Link
newspaper	Tampa Bay Times	Link
newspaper	States News Services	Link
newspaper	Western Free Press	Link
newspaper	Western Free Press	Link
President statement	Donald J. Trump, The President's Weekly Address	Link
President statement	Donald J. Trump, Remarks at the Family Research Council's Values Voter Summit	Link
official	Economic Report of the President, 2018	Link
official	General Explanation of Public Law 115-97, Joint Committee on Taxation	Link
thinktank	Tax Foundation	Link
newspaper	The Oregon Catalyst	Link
thinktank	Georgia Center for Opportunity	Link
newspaper	The American Prospect	Link
blog	Newstex Blogs	Link
thinktank	Baker Institute	Link