Politically Feasible or Benefiting the Few? German Political Parties' Tax Reform Proposals since 1987

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Abstract

Do German political parties propose politically feasible tax reforms? I study this question based on an empirical implementation of a recent political economy model that defines political feasibility as majority support by the population. Using a microsimulation approach to obtain counterfactual post-reform allocations, I can confirm the validity of a median voter result for monotonic tax reforms, as predicted by the model. Upper Pareto bounds show that, for realistic assumptions about the elasticity of taxable income, the proposed marginal tax rates for top earners evolved from levels close to revenue maximization to considerably lower rates. Descriptive evidence based on text data from German parliamentary speeches suggests that the prevalence of efficiency arguments was crucial for the actual implementation of major reforms of the German income tax system over the last decades.

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1 Introduction

When faced with a reform idea, people tend to invoke their own current situation for comparison with a potential reformed state. Underlying this reflex is a human tendency for loss aversion (Kahneman and Tversky 1984), which can even lead to an irrational inclination to favor the status quo over other options, the so-called status quo bias (Samuelson and Zeckhauser 1988).

In the realm of income tax reforms, the status quo is prevalent as a baseline in ex ante evaluations of reform proposals. Prior to elections, voters can even examine a tax reform proposal's effect on their personal income situation by means of an online calculator.[1]

While the theory of optimal taxation largely abstracts from the status quo, Bierbrauer et al. (2021) use the status quo as point of departure to examine whether a tax reform is politically feasible. In the context of this paper, political feasibility is defined as support by a majority of the population. Focusing on monotonic tax reforms, Bierbrauer et al. (2021) show that the median voter is pivotal for majority support.[2]

Building upon the framework of Bierbrauer et al. (2021), this paper investigates whether tax reform proposals by German parties from 1987 to 2021 *a)* were monotonic, *b)* aligned support by citizens close to the median voter and the majority of the population, *c)* would have increased the progressivity of the tax schedule around a range of middle incomes, and *d)* would have been Pareto-improving. Looking at each party's voters separately, I further examine to what extent parties propose reforms that are to the particular advantage of their own voters as opposed to the population at large.

As only a fraction of the 49 examined tax reform proposals from 1987 to 2021 was actually implemented, I use the ifo Microsimulation Model to obtain individuals' tax liabilities and tax rates under a counterfactual post-reform tax schedule. The simulations are based on microdata from the German socio-economic panel (SOEP), an annual respresentative household survey. Many proposals include vague statements that require interpretation. German research institutes have routinely delivered such interpretations since the 2013 election, which I can take as the basis for my simulations (Blömer et al. 2021c; Peichl et al. 2014). These evaluations, however, are not available for earlier elections, which is why I invoke my own interpretations, closely oriented at the principles deducible from the more recent evaluation papers.

To pin down individuals' support for a reform proposal, the change in personal tax liability is weighed against the reform's effect on tax revenue per capita. The magnitude of

[1] See e.g. Schieritz et al. (2021) for the 2021 German federal election.

[2] Tax reforms are monotonic if the difference in tax liability vis-à-vis the status quo either increases or decreases monotonically along the income distribution.

this tax revenue effect is substantially influenced by the intensity of behavioral responses to a marginal tax rate change. Therefore, the results are presented for different values of the elasticity of taxable income (ETI) that are benchmarks in the empirical literature.

My findings provide strong evidence that median voter support and support by a majority of the population align for monotonic tax reforms. The 26 fully monotonic reform proposals in this paper exhibit this median voter property for each of the perceived ETI values. As results show, the median voter result can in practice even be largely extended to reforms which are either monotonic above or below the median. By contrast, the second theorem of Bierbrauer et al. (2021), predicting an increased progressivity of the tax schedule around a range of middle incomes that results from two types of politically feasible reforms, cannot be confirmed empirically in the German context. Upper Pareto bounds reveal two potential (depending on the ETI) Pareto improvements in the German income tax system due to proposed reforms in 1987 and 1998. Moreover, the evolution of parties' proposed marginal tax rates for top earners point to higher welfare weights for these individuals or a higher suspected ETI in recent years. Zooming in on a party perspective, I can additionally show that some German parties design their proposals to appeal only to a specific subset of the population, while others are more interested in receiving broad support for their reform ideas, independent of who their typical voters are.

Underlying the political economy model of Bierbrauer et al. (2021) are rational voters who can directly decide whether they are in favor or against a reform proposal. However, there are both examples for enacted reforms that are not politically feasible according to the model's logic and reform proposals that appear promising in light of their political feasibility but are very unlikely to survive the political process. In an attempt to shed light on this tension, I analyze German parliamentary speeches from 1985 to 2022 to reconstruct the politicians' narratives and priorities in tax policy. Wordclouds are employed to illustrate phrase counts and thus capture the importance of specific tax policy motives for the considered elections. Categorizing equity and efficiency motives unveils that efficiency arguments were overall more prevalent in the parliamentary tax discussion and seem crucial for the enactment of major tax reforms in Germany over the last decades.

This paper relates and contributes to several strands of the literature. First, and most importantly, the results confirm the empirical relevance of monotonic tax reforms and their median voter properties for the German context. Second, this analysis extends the literature on the ex ante evaluation of tax reform proposals of German parties. Systematic analyses are available for the elections from 2013 to 2021 (see e.g. Peichl et al. (2014) or Blömer et al. (2021c)). To my knowledge, this is the first time that earlier tax reform proposals from 1987 to 2009 are evaluated jointly through microsimulation. Similarly, Peichl et al. (2021) evaluate reform directions for the German tax and transfer system and

construct an upper Pareto bound for 2021. I provide another nine estimates for the upper Pareto bound in the German tax system that span a total of 30 years and thus enable a longer-term view on the taxation of high incomes in Germany. Third, the textual analysis in this paper contributes to the recently more popular subfield of narrative economics (Shiller 2017), specifically in the context of political speeches and taxation. Gentzkow et al. (2019b) use data on parliamentary speeches from the Congressional Record to examine political polarization in the United States. Scheve and Stasavage (2016), similar to what I do in this paper, look at text data to explain changes in the tax system. They relate the compensatory rhetoric common after WWII to the high marginal tax rates applied until the late 20^{th} century. By contrast, I consider tax arguments in German parliamentary speeches through the familiar equity/efficiency dichotomy and find an important role for efficiency narratives for recent tax reforms in Germany.

The remainder of the paper is structured as follows. The next section summarizes the main concepts of the theory of politically feasible reforms (Bierbrauer et al. 2021). Section 3 first presents the underlying microsimulation method and then delivers an empirical analysis that is structured along the theory's main components: monotonicity, median voter result, progressivity prediction and welfare perspective via Pareto bounds. Changing the perspective on political feasibility, Section 4 looks at it through the lens of a text data analysis. Section 5 concludes.

2 Politically Feasible Reforms of Nonlinear Tax Systems

The analysis in Section 3 stands on the shoulders of the political economy model developed in Bierbrauer et al. (2021). This section thus serves to introduce the key ideas and results constituting this theory of politically feasible reforms of nonlinear tax systems.

Unlike the earlier literature, this model captures voting over tax reforms instead of voting over entire nonlinear tax schedules. This new perspective enables the theory to make predictions that apply to every nonlinear tax system without further restrictions.

Crucially, tax reforms need to be monotonic for the model's propositions to hold. A monotonic tax reform incurs gains/losses that are monotonically increasing or decreasing along the income distribution. One prominent example of monotonic tax reforms are tax cuts targeted at all taxpayers which reduce the tax liability most at the top of the income distribution. These monotonic tax reforms give rise to a median voter result: a monotonic reform is supported by a majority of the population if and only if the median voter benefits from this reform. In other words, a tax reform is politically feasible if the median voter is a reform winner.

The authors also reveal two types of non-monotonic reforms for which the median voter theorem can hold. On the one hand, a tax cut for high-income individuals is politically feasible if the reduction in tax burden increases monotonically for individuals with incomes above the median and if the median voter is a beneficiary. This type of reform only requires monotonicity to hold for the upper half of the income distribution. On the other hand, a tax cut for low-income individuals is politically feasible if the reduction in tax burden increases monotonically for individuals up to and including the median voter and if the poorest voter is a beneficiary. Thus, monotonicity below the median is sufficient for the validity of the median voter theorem.

Who is classified as a beneficiary or a supporter?[3] Apart from the individual difference in tax payments, it is the reform's effect on overall tax revenue that is decisive to pin down reform beneficiaries. In the context of this theory, changes in tax revenue are redeemed lump-sum to the taxpayers.[4] Accordingly, a person gains from a tax reform if the sum of this person's difference in tax liability and the change in tax revenue per capita are

[3] In the view of this model, voters are only deciding upon their (monetary) interests. This leaves no role for alternative ways of influencing the voting decision such as the sort of ideational politics described in Ash et al. (2021b). Thus, a person having a pecuniary advantage from the reform is automatically perceived a supporter of that reform.

[4] It is a crucial assumption of this theory that the effects of additional tax revenue or reduced tax revenue are distributed equally among voters. Bierbrauer et al. (2021) also explore richer settings in their online Appendix. The authors can confirm the validity of the median voter result for these alternative settings.

positive. For instance, a person can still benefit from a tax increase if the positive effect on tax revenue exceeds the increase in tax payment. The shift in tax revenue is the same for every individual whereas the difference in tax liability varies for every individual. When the difference in tax liability either increases or decreases monotonically along the income distribution, i.e. tax reforms are monotonic, we can thus pin down a single income level dividing the population into winners and losers of the reform.

A tax reform's revenue effects crucially depend on the behavioral responses to a shift in the marginal tax rate. Different assumptions about the magnitude of the ETI can lead to large variation in the shares of winners and losers of a given reform. This variation, however, is only relevant for the classification of a reform as politically feasible, but does not impede the validity of the median voter theorem.

It is also the behavioral responses to taxation which complicate the determination of a reform's effect on individual tax liability.[5] Let $T_0(\cdot)$ denote a function calculating the tax payment due under the status quo tax schedule and let y_0 denote pretax income in a pre-reform state. Thus, $T_0(y_0)$ is the tax payment due for a person with pretax income y_0 in the status quo. Accordingly, $T_1(y_0)$ gives the post-reform tax liability given the pretax income in a pre-reform state. Simply computing the difference in individual tax liability based on the observed pre-reform gross income, $T_1(y_0) - T_0(y_0)$, is not sufficient as the individuals adjust their behavior in the aftermath of the reform and thus earn a pretax income y_1 in the post-reform state.[6] That said, $T_1(y_1) - T_0(y_1)$ does also not accurately capture the tax reform's effect on individual tax liability as the pre-reform income y_0 remains unaccounted for. As a consequence, Bierbrauer et al. (2021) present a sufficient condition to determine a tax reform winner:

$$R(\tau, h) - \max\{T_1(y_1) - T_0(y_1), T_1(y_0) - T_0(y_0)\} \geq 0, \tag{1}$$

with $R(\tau, h)$ denoting the revenue effect per capita.[7] Suppose a reform entails a marginal tax rate increase. Given a positive ETI, $T_1(y_1) - T_0(y_1)$ is lower than $T_1(y_0) - T_0(y_0)$. The opposite holds true in the event of a marginal tax rate decrease. Equation (1) assures that, independent of the type of reform, a reform winner benefits under both options of pretax incomes.

The remainder of the theoretical analysis in Bierbrauer et al. (2021) focuses on simple tax reforms. Simple reforms entail a change of marginal tax rates within a given income bracket, while tax payments below the lower threshold remain stable and tax payments above the treshold increase by the product of the tax rate increase and the span of the

[5] This is particularly relevant for the empirical implementation of the theory.

[6] The only exception is an ETI of 0 with no behavioral response, which would lead to $y_0 = y_1$.

[7] τ is a measure for the size of the reform and h is a function such that $T_1(y) - T_0(y) = \tau h(y)$.

bracket. Such simple reforms are monotonic. The authors first identify politically feasible reform directions in Pareto-efficient tax systems and then add a welfare perspective to characterize politically feasible and welfare-improving tax reforms. A Pareto-efficient tax system leaves no room for Pareto-improving reforms. Such a tax system paves the way for two types of politically feasible reforms: a tax cut for below-median incomes and a tax increase for above-median incomes. As these types of reforms are generally politically feasible, it could be that such reforms are commonly proposed by policymakers. If this were the case, the tax system would become increasingly progressive in a range of middle incomes over time as marginal tax rates for below-median incomes decline and marginal tax rates for above-median incomes increase.[8] Importantly, the marginal tax rates for above-median incomes can only be raised until they reach the upper Pareto bound.[9] This upper bound reflects the revenue-maximizing marginal tax rate for a given income level. The upper Pareto bound is formally defined by

$$\mathcal{D}^{up}(y) := \frac{1 - F(\omega_0(y))}{f(\omega_0(y))\omega_0(y)}(1 + \frac{1}{\varepsilon}), \tag{2}$$

where $\omega_0(y)$ is the type of an individual earning income y and ε denotes the ETI. F stands for the cumulative distribution function (c.d.f.) of types and f is the corresponding density function.[10] If the marginal tax rate lies in the range from 0 to the upper Pareto bound, there is no scope for a Pareto-improving tax reform and the current tax system is Pareto-efficient.[11] Conversely, if the marginal tax rate exceeds the upper Pareto bound at some point, a tax reform lowering the tax rate to the upper bound's level is Pareto-improving.[12]

Scaling $\mathcal{D}^{up}$ with welfare weights results in a welfare bound:

$$\mathcal{D}^{W}(y) := \frac{1 - F(\omega_0(y))}{f(\omega_0(y))\omega}(1 + \frac{1}{\varepsilon})(1 - \mathcal{G}(\omega_0(y))), \tag{3}$$

with $\mathcal{G}(\omega_0(y))$ being the average welfare weight assigned to individuals with types above ω_0. In the case of a Rawlsian social planner, where no weight is assigned to high-income types, $\mathcal{D}^{up}(y)$ and $\mathcal{D}^{W}(y)$ thus coincide. The above expressions for $\mathcal{D}^{up}(y)$ and

[8] Section 3.4 examines whether progressivity in a range of middle incomes actually increased in the German tax system from 1987 to 2021.

[9] For earlier work on Pareto-efficient taxation and Pareto bounds, refer to Stiglitz (1982), Werning (2007) or Lorenz and Sachs (2016).

[10] This formula can be transformed so to incorporate the distribution of incomes F_y and the corresponding income density f_y. This transformation is important for the empirical implementation of the upper Pareto bound as detailed in Section 3.

[11] Pareto-efficient tax systems are bounded from below by the lower Pareto bound. However, the lower Pareto bound only features negative tax rates. A tax rate greater than or equal to 0 is always larger than the lower Pareto bound and thus a sufficient condition.

[12] The mechanical loss in tax revenue is overcompensated by the individual's behavioral responses.

$\mathcal{D}^W(y)$ are linked with $T_0'(y)/(1-T_0'(y))$, an increasing function of the marginal tax rate $T_0'(y)$. Accordingly, a welfare-maximizing tax system in the spirit of Diamond (1998) is characterized by

$$\frac{T'(y^W(\omega))}{1-T'(y^W(\omega))} = \frac{1-F(\omega^W(y))}{f(\omega^W(y))\omega^W(y)}(1+\frac{1}{\varepsilon})(1-\mathcal{G}(\omega^W(y))), \tag{4}$$

where $y^W(\omega)$ corresponds to the income earned by type ω facing the welfare-maximizing tax system. Bierbrauer et al. (2021) connect these expressions with the two types of politically feasible reforms described above to characterize two types of politically feasible welfare improvements. First, there is scope for a simple reform decreasing the marginal tax rate at an income level below the median if $T_0'(y)/(1-T_0'(y))$ exceeds the welfare bound $\mathcal{D}^W$. Second, the marginal tax rate can be increased at an income level above the median if $T_0'(y)/(1-T_0'(y))$ lies below the welfare bound and the upper Pareto bound.[13]

Welfare concerns can thus dampen the movement towards higher marginal tax rates above the median and towards lower marginal tax rates below the median, that is bolstered by political feasibility. Bierbrauer et al. (2021) call this a tension between the maximization of political support and the maximization of welfare.

Finally, the authors test their theoretical predictions empirically for the US. Examining eleven major reforms of the federal income tax system since WWII and tax reforms proposed as part of political campaigns, it turns out that these reforms can be broadly classified as monotonic. Four out of eleven implemented reforms contain non-monotonicities. As the analysis of the median voter theorem reveals, even these four reforms are 'monotonic enough' for the theorem to hold: majority support and median voter support align for each of the eleven reforms, independent of the conceived ETI value. As predicted theoretically, the tax system evolved to be more progressive around a range of middle incomes. Lowered marginal tax rates for low income ranges due to the EITC introduction led to higher marginal tax rates in the phase out region of this work subsidy. Looking at upper Pareto bounds for ETI values greater than 0.4, especially the earlier tax reforms under scrutiny incurred Pareto improvements.

The following section similarly puts the political economy model in Bierbrauer et al. (2021) to test for the German context.

[13] Bierbrauer et al. (2021) summarize the interplay between Pareto-improving, welfare-improving and politically feasible tax reforms in their Table 1.

3 Political Feasibility of German Political Parties' Reform Proposals

This section examines German political parties' tax reform proposals along the lines of the model assumptions and predictions presented in Section 2. Following a glimpse into the microsimulation methods employed for the counterfactual evaluation of reform proposals are subsections devoted to each of the main questions of interest regarding the applicability and validity of this model of politically feasible tax reforms. First, are these reform proposals monotonic and does the model thus qualify to make predictions about their political feasibility? Second, does the median voter result hold for these proposals, i.e. is support by the median voter enough to infer majority support? Approaching the median voter result from a party-centered perspective, the alignment of median voter support and support by a majority of the respective party's voters is also explored. Digging further into how parties design their proposals, this subsection then studies to what extent parties propose reforms that are particularly advantageous for their own voters. Third, is there a trend towards higher progressivity for a range of middle incomes resulting from two types of politically feasible reforms? Fourth, what can be concluded about the development of the German income tax system and the parties' reform proposals from a welfare perspective?

3.1 Microsimulation for Reform Proposal Evaluation

The large majority of investigated tax reform proposals was never implemented, let alone evaluated. Microsimulation provides an opportunity to generate the counterfactual post-reform state. To carry out this task in the German context, I use the ifo Microsimulation Model and evaluate the German political parties' reform proposals from 1987 to 2021.[14] This model is based on microdata from the German Socio-economic Panel (SOEP), a representative household survey for Germany.[15] The SOEP offers a wide range of variables capturing personal and economic characteristics of individuals in these households. This detailed information paired with the ifo Microsimulation Model's comprehensive representation of the German tax and transfer system deliver accurate measures for each individual's taxes and transfers. To obtain aggregate variables reflecting the full German population, the SOEP's sample weights are applied throughout the analysis.

I have to make several assumptions to simulate the parties' reform proposals. These proposals often remain vague and only sketch general objectives as opposed to concrete

[14] Blömer and Peichl (2020) provide an overview of the ifo Microsimulation Model.

[15] The data is described in detail in Goebel et al. (2019). For the reform proposal simulations in this paper, I do not leverage the ifo Microsimulation Model's discrete choice structure and only work with the original SOEP data.

tax rate or tax bracket adjustments. These vague statements need to be transformed into simulatable reforms. For the years 2013 to 2021, I rely on interpretations by German economic research institutes evaluating the tax reform proposals (Blömer et al. 2021c; Peichl et al. 2014). These types of microsimulation papers are not available for earlier elections. Guided by the research institute's later interpretations, I translate sketchy statements into concrete reforms for the election years from 1987 to 2009. All information about the tax reform proposals is drawn from the parties' election programs.[16] Importantly, this paper only simulates the parties' proposals relating to the income tax schedule and the solidarity surcharge.[17] The analysis can be further extended to include parties' proposals related to capital income taxation, the taxation of couples, social security contributions or child allowance.[18] The tax functions for the simulated reform proposals in comparison with the status quo at the time are illustrated in Figures 43 to 52 in Appendix Section A.5.

Further modeling assumptions are made so as to be in line with the empirical analysis in Bierbrauer et al. (2021).[19] While the ifo Microsimulation Model works on the level of tax units, all computations in this section are scaled to the individual level.[20] Consequently, the income of couples has to be allocated among spouses: an equal split between spouses is assumed here.[21] Crucial for checking the monotonicity assumption and locating the median income, the individual's rank in the income distribution is determined based on pretax income ignoring capital income.[22] Capital income, however, is included in the taxable income and thus contributes to the computed tax payments.

As Bierbrauer et al. (2021), I also take into account that the parties' proposals can only take effect at a later point in time. Since the parties do not specify an implementation date for their proposals, I assume that tax policy has priority and reforms would be enacted in the year after the federal election took place. Individuals' incomes in the election year differ from incomes in the year after the election. Accounting for this, I inflate individuals' observed incomes from year 0, y_0^i, to year 1 via the German consumer price index (CPI).

[16] The election programs can be downloaded on the website of the respective party foundation. Detailed links are provided in the references.

[17] The solidarity surcharge was first introduced in 1991 to cover the costs of the German reunification and is since then (with short interruptions) levied as a percentage of the income tax payment.

[18] This extension is staged for a future version of this paper.

[19] Regarding their assumptions, Bierbrauer et al. (2021) are themselves inspired by earlier work of Eissa et al. (2008) and Piketty and Saez (2007).

[20] One tax unit always relates to one tax account. Accordingly, a couple filing jointly is treated as one tax unit and a single person is also treated as one tax unit.

[21] In practice, this first entails the calculation of taxes and transfers via the ifo Microsimulation Model for the couple's joint income. Subsequently, the joint pretax income and the calculated joint tax payment is split equally among spouses for the further analysis.

[22] Robustness checks using alternative income measures (i.e. pretax income including capital income and taxable income) are available upon request.

This inflated income is denoted as $\hat{y}_0^i$.

3.2 Monotonicity

The theory of politically feasible reforms is at its core a theory of monotonic tax reforms. Ascertaining the monotonicity property thus assures the applicability of the model. As stated in Section 2, monotonic tax reforms entail changes in the tax liability, which are either nondecreasing or nonincreasing along the income distribution. These tax liability shifts are captured by $T_1(\hat{y}_0^i) - T_0(y_0^i)$ with $T_1(\hat{y}_0^i)$ being the tax payment due under the reformed tax schedule based on the inflated pretax income. Figure 1 illustrates the average value of $T_1(\hat{y}_0^i) - T_0(y_0^i)$ per income decile for reforms proposed prior to the federal elections in 1998 and 2009. The horizontal dashed line indicates the revenue gains or revenue losses per capita incurred by the respective reform if we abstract from behavioral responses. The solid vertical line represents the voter with median income, which is determined based on pretax income without capital income. The monotonicity graphs for the other election years and a graph with the condensed monotonicity information for all reform proposals and election years can be found in Appendix Section A.1.

The German parties' proposed reforms can be categorized into three types: *1)* tax cuts for the full population, where the largest benefits accrue to top earners (e.g. all parties in 1998 in Figure 1), *2)* tax hikes for the full population, where higher incomes have to bear a larger increase in tax liability (e.g. The Left in 2002 in Figure 13 in the Appendix)[23], and *3)* V-shaped reforms leading to increasingly higher reductions of the tax liability up to a certain decile, where the trend is reversed such that subsequent deciles profit less or even pay more taxes than in the status quo (see e.g. The Left and SPD in 2009 in Figure 1).[24] While the latter reform type is non-monotonic, it fulfills monotonicity above or below the median in most cases.

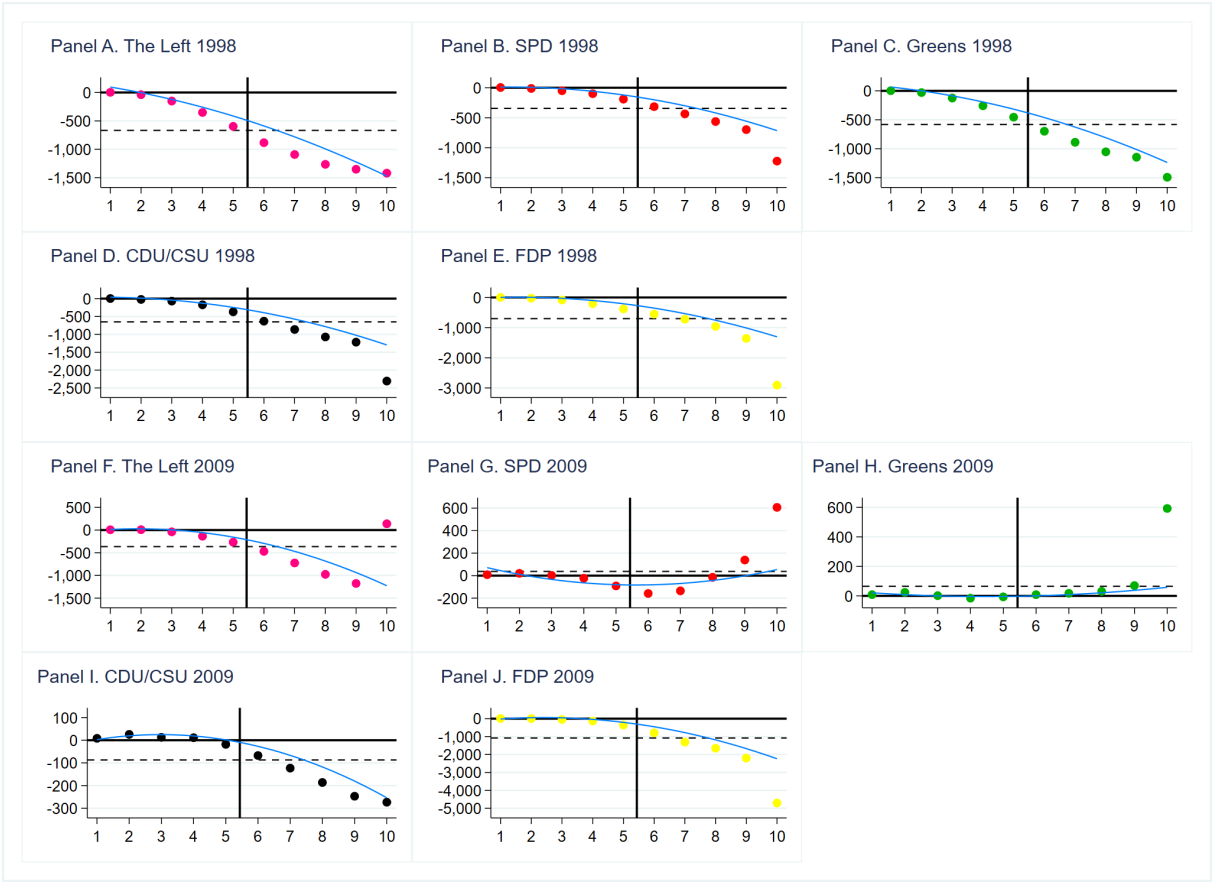
As described in Section 2, this one-sided monotonicity is sufficient for non-monotonic reforms to qualify for the application of the median voter result in two cases. Either, $T_1(\hat{y}_0^i) - T_0(y_0^i)$ is a nondecreasing function of reform gains above the median and the median voter benefits or $T_1(\hat{y}_0^i) - T_0(y_0^i)$ is a nondecreasing function of reform gains below (and including) the median and the poorest voter benefits.

Such non-monotonic reforms ensuring the validity of the median voter result can also

[23]The Left was only founded in 2007 as a union of the PDS and the WASG, a group of disappointed SPD politicians. For years prior to 2007, I use the election program provided by the PDS, which is seen as predecessor of today's Left. To avoid confusion, I use 'The Left' for all referrals to that party, independent of the respective year.

[24]In 1990, the FDP proposed a fourth reform type exhibiting an inverse V shape, i.e. a growing increase in tax liability that is reversed for the top decile.

Figure 1: Monotonicity of tax reform proposals 1998 and 2009



Notes: This figure illustrates the average value of the counterfactual change in tax liability $T_1(\hat{y}_0^i) - T_0(y_0^i)$ per income decile for reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 1998 and 2009. The blue line is a quadratic fit based on the underlying microdata. The horizontal dashed line indicates the reform's mean revenue effect (the revenue-neutral benchmark), i.e. the average of $T_1(\hat{y}_0^i) - T_0(y_0^i)$ over all individuals. The dots illustrating the decile averages are painted in the associated color of the respective party. To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. Deciles are computed based on pretax income without capital income. The taxable income includes capital income. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income.
Source: Author's calculations based on ifo Microsimulation Model.

be encountered among the 49 examined proposals: three proposals for the 1994 election (Greens, CDU/CSU, FDP) involve tax cuts where the poorest voter benefits from a positive revenue effect and the reduction in tax liability increases (approximately) up to and including the median voter. All of these reforms are V-shaped reforms, which underlines the relevance of this reform type for the empirical validity of the median voter result. These four proposals are an example of non-monotonic reforms that theoretically satisfy the median voter theorem. Empirically, there is mixed evidence for an alignment of

Table 1: Monotonicity property of tax reform proposals

year	*party* The Left	SPD	Greens	CDU/CSU	FDP
1987	o	+	++	++	-
1990	++	++	+	++	+
1994	++	+	+	+	+
1998	++	++	++	++	++
2002	++	++	++	++	++
2005	+	++	++	+	++
2009	+	-	+	+	++
2013	+	++	++	++	+
2017	+	++	+	+	-
2021	+	+	+	++	++

Notes: This table summarizes whether a proposed reform was monotonic. The '++' sign is used for fully monotonic reform proposals, the '+' sign is used for proposals which are monotonic above or below the median, the '-' sign is used for non-monotonic reform proposals, the 'o' sign describes the lack of a proposal. A reform proposal is categorized as monotonic if the average value of the counterfactual change in tax liability $(T_1(\hat{y}_0^i) - T_0(y_0^i))$ per decile is either continuously increasing or continuously decreasing along the deciles.

median voter and majority support with these proposals as laid out in Section 3.3.[25]

Table 1 summarizes which of the reform proposals can be broadly perceived as monotonic. All in all, 26 out of 49 studied proposals are fully monotonic. Another 20 proposals are either monotonic above the median or monotonic below the median, which is the minimum prerequisite to be classified as monotonic in Table 1. This categorization explicitly encompasses the V-shaped reforms commonly proposed by politically left-oriented parties (see for example the propositions of The Left or the SPD for the year 2009 in Figure 1).[26] The monotonicity findings in Table 1 are largely sustained when the number of bins along the income distribution is increased from 10 to 50 (see Appendix Section A.1).

3.3 Median Voter Property

The most central aspect for the validity of the theory of politically feasible tax reforms is whether the median voter result holds empirically. To check this property for the German parties' reform proposals, beneficiaries/supporters of a reform need to be determined. Recall from Section 2 that person i is a reform winner if

$$R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1^i), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0 \tag{5}$$

[25] Assuming an ETI of 0.5, the median voter result does not hold for any of these reforms. By contrast, the median voter result is valid for other ETI values.

[26] Bierbrauer et al. (2021) also show reforms that are enacted (TRA69) or proposed (see Figure G.3 in their Appendix) by the Democrats in the US and exhibit this V shape.

holds.[27] The mean revenue effect $R(\tau, h)$ is the average of the individual revenue effects R_i, which can be pinned down empirically as

$$R_i = (t_1^i - t_0^i - t_1^i \frac{\tau_1^i - \tau_0^i}{1 - \tau_0^i} \varepsilon^i) y_0^i, \tag{6}$$

where t_0^i and t_1^i reflect the average tax rates in the status quo and after the implementation of the reform, and τ_0^i and τ_1^i denote the respective effective marginal tax rates (EMTRs). The resulting mean revenue effect is inserted into the empirically computable beneficiary formula

$$R(\tau, h) - \max\{(t_1^i - t_0^i)(1 - \frac{\tau_1^i - \tau_0^i}{1 - \tau_0^i} \varepsilon^i) y_0^i, (t_1^i - t_0^i) y_0^i\} \geq 0. \tag{7}$$

Both (6) and (7) rely on the calculation of the behaviorally adjusted post-reform pretax income y_1^i as

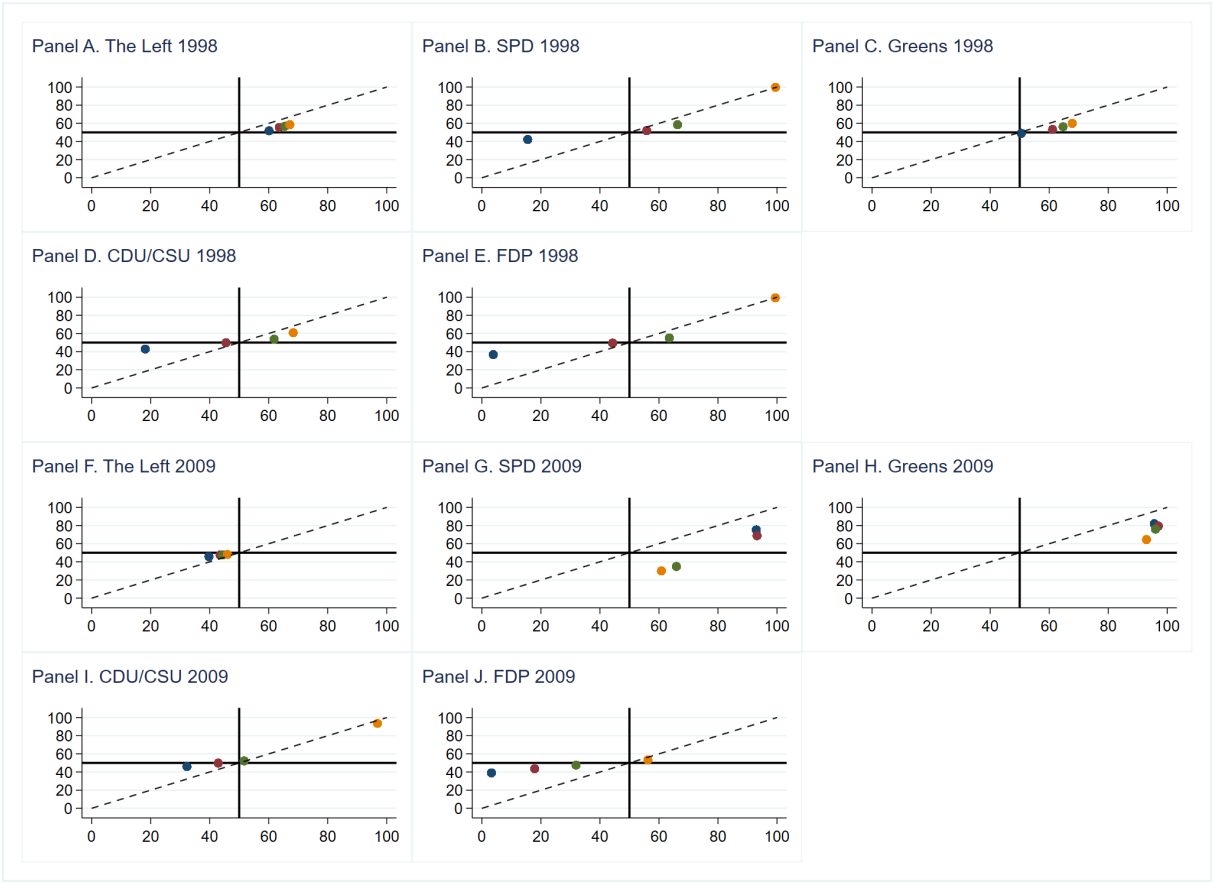
$$(1 - \frac{\tau_1^i - \tau_0^i}{1 - \tau_0^i} \varepsilon^i) y_0^i. \tag{8}$$

Importantly, the SOEP data has to be curtailed to secure a proper empirical implementation of (7). In the German tax system, individuals can face EMTRs of more than 100% due to transfer withdrawal. These individuals are omitted for the calculation of revenue effects. When the assumed ETI is 0, however, the full SOEP sample is used, since the EMTR plays no role. Moreover, individuals whose EMTR in the status quo is close to 100% and whose reformed EMTR is below 50% have an enormous impact on the calculated aggregate revenue effects of a reform due to the structure of (8) having $1 - \tau_0^i$ in the denominator. As the resulting behavioral responses are often unrealistically strong for these individuals, I set upper bounds for the status quo EMTR: 0.65 if the reform EMTR lies between 0.55 and 0.65 and 0.6 if the reform EMTR is below 0.55. These upper bounds circumvent a strong bias towards higher support shares in favor of reform proposals, that would result from upward-biased revenue effects.

The product of the above-described procedure is illustrated in Figure 2 for the election years 1998 and 2009. The fraction of reform beneficiaries among the full population (vertical axis) is plotted against the fraction of reform beneficiaries among a group of voters located close to the median income (p45–p55, horizontal axis) for four different

[27] The following formulas for the empirical implementation of (5) are taken from Appendix Section C of Bierbrauer et al. (2021). For comparability, I sustain the notation chosen by Bierbrauer et al. (2021). Refer to this source for the derivation details.

Figure 2: Alignment of median voter support and majority support, 1998 and 2009



Notes: This figure depicts the fraction of winners resulting from reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 1998 and 2009 for the full population (vertical axis) and for voters close to the median voter, i.e. p45–p55 (horizontal axis). A person i is a reform winner if $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1^i), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0$. The fraction of winners is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income. The dashed 45 degree line indicates an exact alignment of support among the full population and support by voters close to the median.
Source: Author's calculations based on ifo Microsimulation Model.

benchmark ETI values (0, 0.25, 0.5 and 1).[28] The dashed 45 degree line indicates an exact alignment of support among the full population and support by voters close to the median. Points lying in the first quadrant imply an alignment of majority support among the full population and among voters close to the median and, thus, political feasibility of the reform proposal. While points in the third quadrant of a panel also confirm the validity of

[28] While an ETI of 0 is useful to describe a world with no behavioral adjustments, all other values featured prominently in the ETI literature. Saez et al. (2012) suggest a baseline ETI of 0.25 in their survey, Doerrenberg et al. (2017) find an ETI of 0.5 in the German context and the earlier seminal work of Feldstein (1995, 1999) hinted at ETIs of 1 or higher. The recent metastudy by Neisser (2021) points out important contextual factors, which impact the estimated ETI.

the median voter result, they convey a lack of majority support for the respective reform proposal. Both the full population and the group of median voters reject the proposal. Evidence against the validity of the median voter result is provided if points are located in the second or fourth quadrant, meaning that one voter group wants the reform to be enacted whereas the other group wants to sustain the status quo. Similar figures for the other examined election years can be found in Appendix Section A.2.

For several reforms, the support shares for every ETI value under consideration lie very close to each other (see e.g. Panel F in Figure 2). Here, the revenue effect and the shift in individual tax payment largely neutralize each other, i.e. they evolve proportionally as the assumed ETI value is changed.

Table 2 sums up the validity of the median voter result for the perceived reform proposals. 37 out of 49 reforms align support by the full population and support by a group of median voters for each of the four ETI values considered. Six reforms feature alignment for three ETI values, while another six confirm the median voter result for less than three assumed ETI values.

For every fully monotonic reform proposal from 1987 to 2021, the theorem holds for each assumed ETI value.[29] If a reform is neither monotonic above nor below the median, majority support and median voter support do also not go hand in hand (see e.g. Panel G in Figure 2). All other reforms failing to fulfill the median voter result for at least three ETI values are V-shaped reforms. The three examples of non-monotonic reforms which should in theory fulfill the median voter result, demonstrate an alignment of median voter and full population support for three ETI values (see Panels C, D and E in Appendix Figure 22). As these latter reforms are also V-shaped, this subsection provides mixed evidence for the validity of the median voter result in the case of V-shaped reforms. Hence, only a fraction of V-shaped reforms proposed by German parties is monotonic enough for the median voter theorem to apply.

Overall, the alignment findings do not depend on the assumed ETI value. This outcome is in line with the conclusion in Bierbrauer et al. (2021).

When parties design their reform proposals, is median voter support also in the interest of their own voters? This would facilitate the presentation of a politically feasible reform for the respective party. To explore this question, Figure 3 compares the share of winners from CDU/CSU reform proposals between 1987 and 2021 among voters close to the median income in the full population (horizontal axis) with the share of winners among the CDU/CSU voters (vertical axis). Once again, beneficiaries are determined for four different ETI values. The corresponding figures for the other four parties can be looked

[29] One exception is the FDP 2021 proposal, where support does not perfectly align for an ETI of 1.

Table 2: Alignment of median voter support and majority support

year	*party* The Left	SPD	Greens	CDU/CSU	FDP
1987	o	++	++	++	-
1990	++	++	++	++	+
1994	++	-	+	+	+
1998	++	++	++	++	++
2002	++	++	++	++	++
2005	-	++	++	++	++
2009	++	-	++	++	++
2013	++	++	++	++	++
2017	-	++	++	+	-
2021	++	++	++	++	+

Notes: This table summarizes whether support by the majority of the population and support by people close to the median voter (p45–p55) align for reforms proposed by the five main German parties prior to federal elections from 1987 to 2021. The '++' sign indicates an alignment of support for each ETI value, the '+' sign indicates an alignment of support for three ETI values, the '-' sign indicates alignment for less than three ETI values, the 'o' sign describes the lack of a reform proposal. The support for a reform proposal is categorized as aligned if majority support or minority support correspond to each other for at least three out of four selected ETI values (0, 0.25, 0.5, 1).

up in Appendix Section A.2.

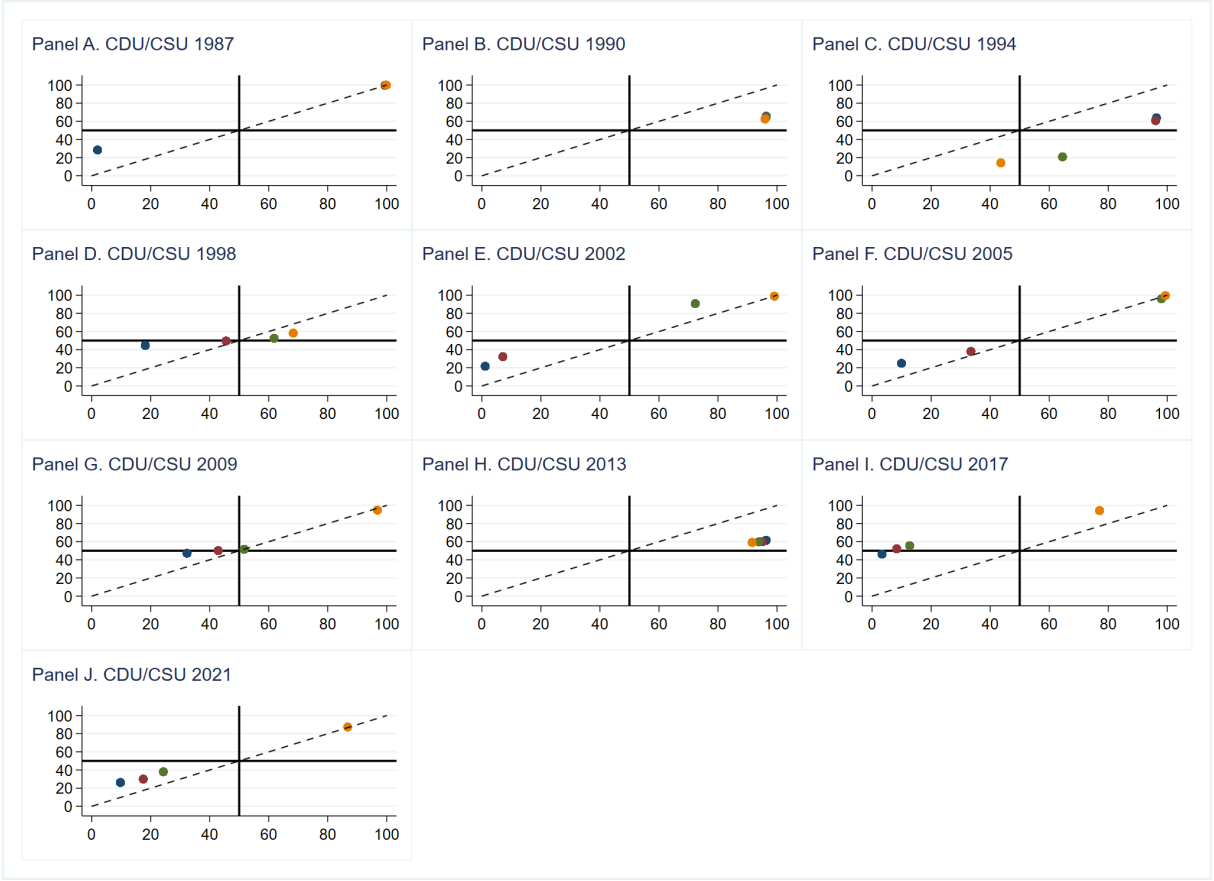
For CDU/CSU and SPD, support shares of the median voter and the own electorate are largely aligned. This might not be too surprising due to two reasons. First, these parties aim to represent the whole population and do not target a specific subset of voters with their policies. Second, at least one of CDU/CSU and SPD is always part of the government in Germany. The two parties thus have an incentive to propose tax reforms which are both politically feasible later on in the political process and in the interest of a large share of voters so to maximize their vote share.

Interestingly, the Left's reform proposals since 1998 always benefit roughly half of their own voters and half of the voters surrounding the median voter for each of the assumed ETI values. This seems to be rather erratic and does not point to certain political motives.

Conversely, the pattern for the FDP suggests political motives in the design of its reform proposals. While the FDP, being a smaller party that only irregularly enters government, does not seek the political feasibility of its proposals, the party seems eager to prove to its voters that it represents their particular interests. With exceptions in the election years 1987 and 1994, the FDP's proposals do not receive the median voter's support for lower values of the ETI. Only for an ETI of 1 would median voter support be assured for most reforms. Their own voters, however, broadly approve of the proposals, independent of the assumed ETI.

The picture is very different for the Greens, which is traditionally also a rather small

Figure 3: Alignment of median voter support (full population) and CDU/CSU voter support)

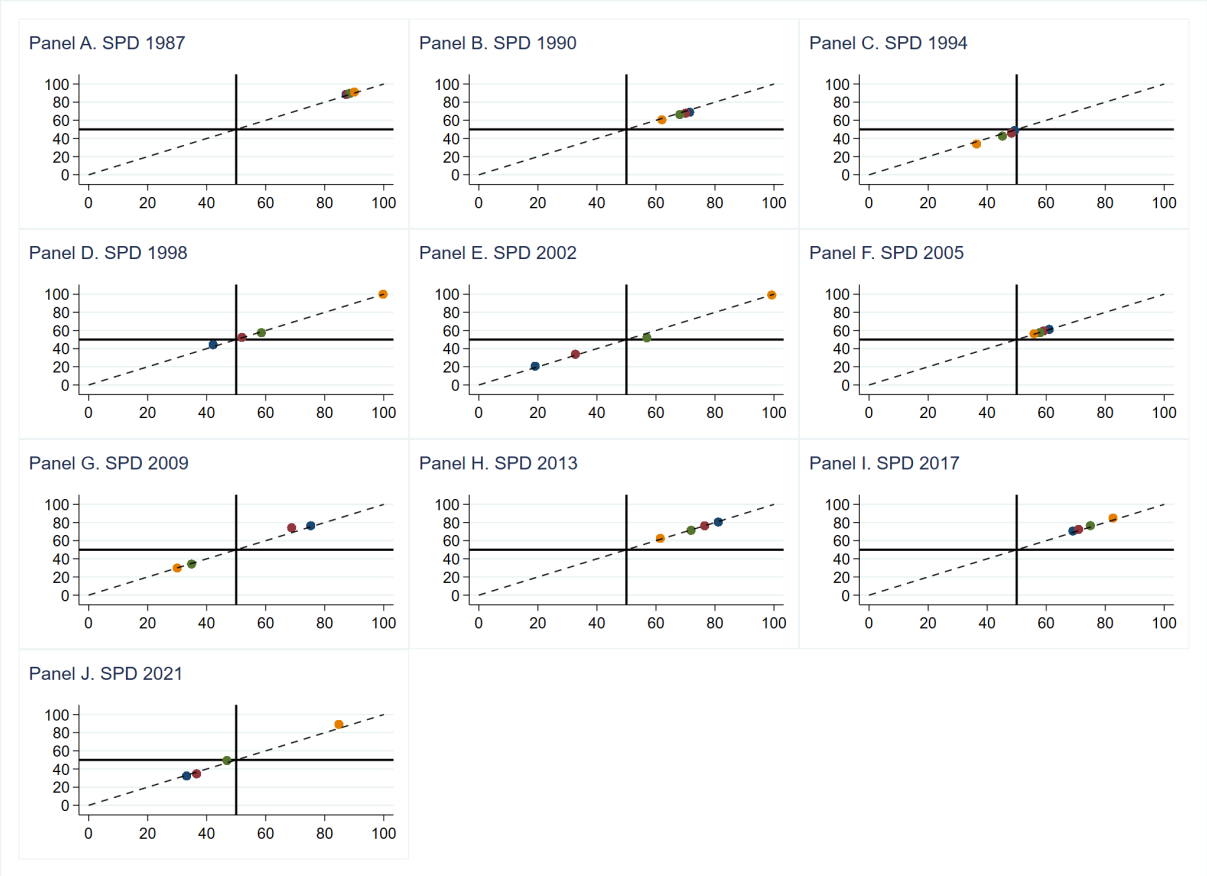


Notes: This figure depicts the fraction of winners from reforms of the German income tax system proposed by the CDU/CSU prior to federal elections for CDU/CSU voters (vertical axis) and for voters close to the median voter, i.e. p45–p55 (horizontal axis). A person i is a reform winner if $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1^i), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0$. The fraction of winners is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income. The dashed 45 degree line indicates an exact alignment of support among CDU/CSU voters and support by voters close to the median.
Source: Author's calculations based on ifo Microsimulation Model.

party. Except for 1998 and 2002, the support share among voters close to the median is higher than the support share among the Greens' own voters. Consequently, the Greens provide realistic reform options via targeting of median voter support. Their own voters' monetary interest only plays a minor role for the reform design.

Figure 4 for the SPD and Figures 29 to 32 for the other parties in Appendix Section A.2 can further substantiate these interpretations. Support among the own voters (vertical axis) is plotted against support in the whole population for the respective parties, again for four different ETI values.

Figure 4: Alignment of full population support and SPD voter support



Notes: This figure depicts the fraction of winners from reforms of the German income tax system proposed by the SPD prior to federal elections for SPD voters (vertical axis) and for the full population (horizontal axis). A person i is a reform winner if $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1^i), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0$. The fraction of winners is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income. The dashed 45 degree line indicates an exact alignment of support among SPD voters and support among the full population.
Source: Author's calculations based on ifo Microsimulation Model.

The share of reform winners for the full population and the own voters is almost perfectly aligned for the two largest German parties SPD and CDU/CSU. As outlined before, this makes sense since these parties want to appeal to voters from every income decile and claim to represent the whole population.

The Greens seem to have changed their tax policy objectives over time: while their proposed reforms were particularly advantageous for their own voters in 1998 and 2002, this pattern reversed subsequently. From 2005 to 2021 (not as much in 2017), the Greens' reform proposals were less popular among their own voters than among the full population. This finding is in line with Peichl et al. (2014) who explored the proposed reforms for 2013

in a similar fashion.[30] Voters of the Greens earn higher incomes than the average, but their preferred party has recently sought more progressive taxation. Likely, the Greens voters' support is not predominantly based on the party's tax policy but rather rooted in other policy positions.

By contrast, the FDP, also popular among top income earners, proposes income tax schedules which are more attractive for its own voters. Tax policy and own financial interests seem to be a more prevalent voting motive for these voters.

3.4 Progressivity

As the previous subsections showed, the first major claim of the theory of politically feasible reforms holds for German parties' tax reform proposals. The political economy model of Bierbrauer et al. (2021) further predicted that simple tax reforms involving tax cuts for below-median incomes or tax hikes for above-median incomes are generally politically feasible, which can initiate a sequence of these types of reforms. This subsection thus explores whether the German income tax system became, as suspected by theory, more progressive in income regions close to the median or could have become more progressive as a result of proposed reforms.

A person's EMTR reveals what fraction of an additional unit of income would have to be paid in taxes. Often, these EMTRs differ substantially among individuals adjacent in the income distribution. To receive smooth results for the degree of progressivity, captured by the ratio $T'/(1-T')$, I run a kernel-weighted local polynomial regression for the EMTR using an Epanechnikov kernel and a bandwidth of 4500. This smoothed version of the EMTR underlies the ratios $T'/(1-T')$ illustrated in Figures 5 and 6 (see Section 3.5).

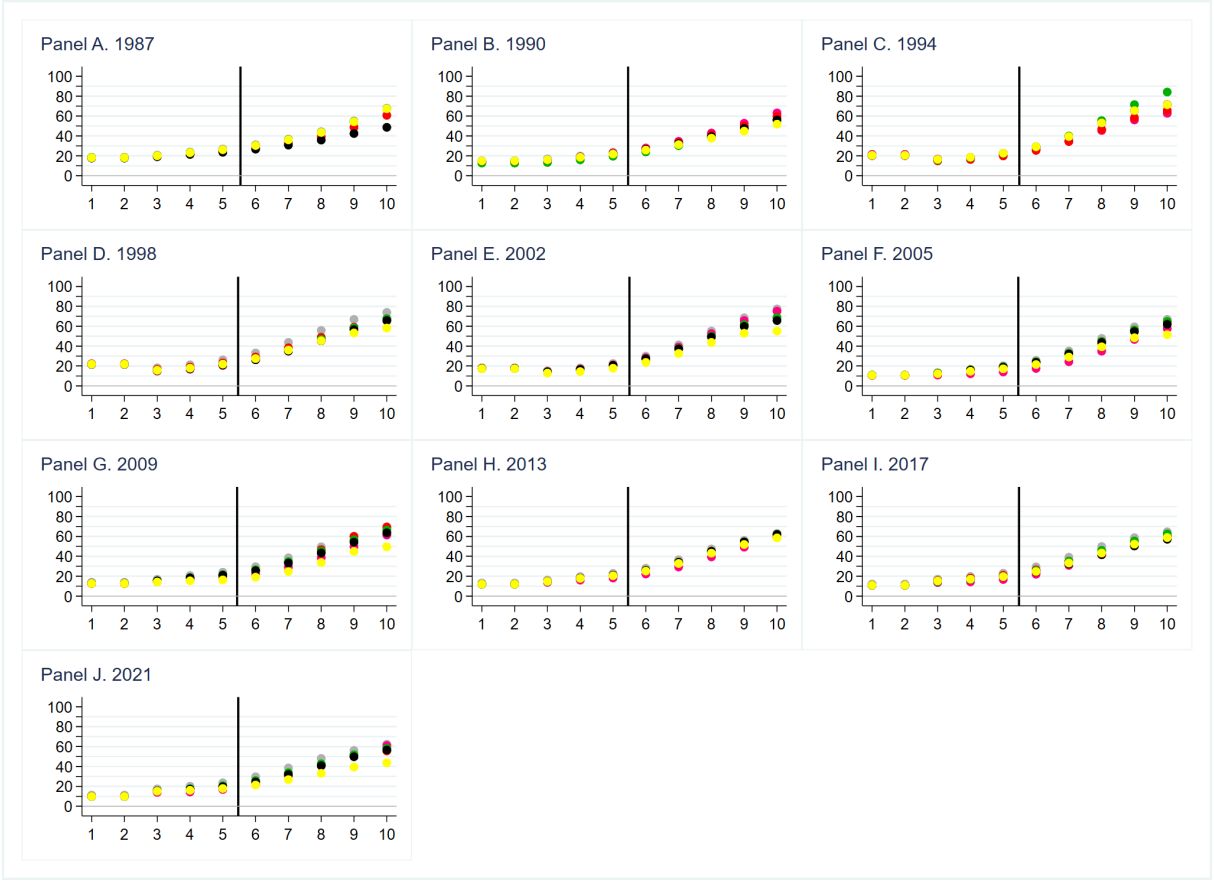
Do we see a trend towards higher progressivity around the median income in the German income tax system between 1987 and 2021?

Figure 5 depicts decile averages of the ratio $T'/(1-T')$ for the status quo (grey) and for reformed tax systems as proposed by the main German parties in their associated party color (The Left = pink, SPD = red, Greens = green, CDU/CSU = black, FDP = yellow). It does not reveal a trend towards higher progressivity for middle incomes. The tax schedule largely retained its degree of progressivity for incomes around and below the median. By contrast, income taxation became less progressive for the top deciles after 1998. This observation can likely be attributed to the stepwise reduction of the top marginal tax rate from 53% to 42% between 1998 and 2005.[31] Interestingly, the five main parties agreed

[30] Note that Peichl et al. (2014) simulate tax and transfer proposals while I only simulate proposals related to statutory tax rates, tax bracket thresholds and the solidarity surcharge.

[31] For a more detailed treatment of the evolution of the German income tax system between 1986 and 2021, see Blömer et al. (2021b).

Figure 5: $T'/(1-T')$ by Decile for the German income tax system, 1987–2021



Notes: This figure depicts the average value of $T'/(1-T')$ per decile, based on effective marginal tax rates T', as a measure for the progressivity of the German income tax system for election years from 1987 to 2021. Each panel shows the status quo (grey) and each party's reform proposal in the associated party colors (The Left = pink, SPD = red, Greens = green, CDU/CSU = black, FDP = yellow) for the respective years. To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. Deciles are computed based on pretax income without capital income. The taxable income includes capital income. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income.
Source: Author's calculations based on ifo Microsimulation Model.

on the general need for a less progressive tax schedule above the median at that time, but only differed with respect to the extent of the marginal tax rate decrease (see Panel D and E in Figure 5). Over all examined election years, the party proposals display only small progressivity differences for incomes below the median. Above the median up to the top decile, the dispersion of proposals increases. After 1994, the FDP proposals would have resulted in the least progressive tax schedule for top incomes. By and large, the progressivity patterns above the median income after 1994 match the general conceptions of more left-oriented parties favoring more redistribution and economically more liberal parties favoring lower tax burdens.

3.5 Welfare Perspective and Pareto Bounds

The reform agenda for the German income tax system from 1987 to 2021 was not directed towards achieving higher progressivity for middle incomes. Next, upper Pareto bounds for the election years are presented to evaluate whether the parties' proposals would have led to Pareto improvements.[32]

The following representation of the upper Pareto bound shifts the focus from exogenous types of individuals ω as in (2) to empirically estimable statistics of the income distribution:[33]

$$\mathcal{D}^{up}(y) := \frac{1 - F_y(y_0(\omega))}{f_y(y_0(\omega))y_0(\omega)} \frac{1}{\varepsilon}, \tag{9}$$

The empirical implementation of $\mathcal{D}^{up}$ thus requires the estimation of the German income distrubtion delivering values for the c.d.f. F_y and the density function f_y. Peichl et al. (2021) evaluate reform directions for the German tax and transfer system and base their analysis for high incomes on an upper Pareto bound. I closely follow their estimation procedure for the German gross income distribution. Using the aforementioned SOEP data, the income distribution is estimated via an adaptive kernel density estimator for each year under scrutiny.[34] In order to reflect only those individuals who are fully available to the labor market, the sample is restricted to persons between the age of 25 and 64. Thus, retirees and young adults do not enter the estimated income distribution. Since the SOEP lacks a representative number of observations at the upper tail of the income distribution, a Pareto distribution is added to refine the empirically estimated distribution for the top 5% of incomes.[35] The Pareto parameter to calibrate this Pareto distribution is taken from Drechsel-Grau et al. (2022), whose estimates are based on administrative data for Germany.[36]

Figure 6 illustrates the marginal tax ratio $T'/(1 - T')$ (vertical axis) for the status quo

[32]The lower Pareto bound is omitted in this subsection as the German income tax system does not contain negative tax rates comparable to the ones resulting from the EITC in the US. Moreover, I avoid assigning welfare weights to individuals and thus do not implement the welfare bound as shown in (3). Accordingly, this analysis is limited to welfare improvements resulting from the removal of inefficiencies.

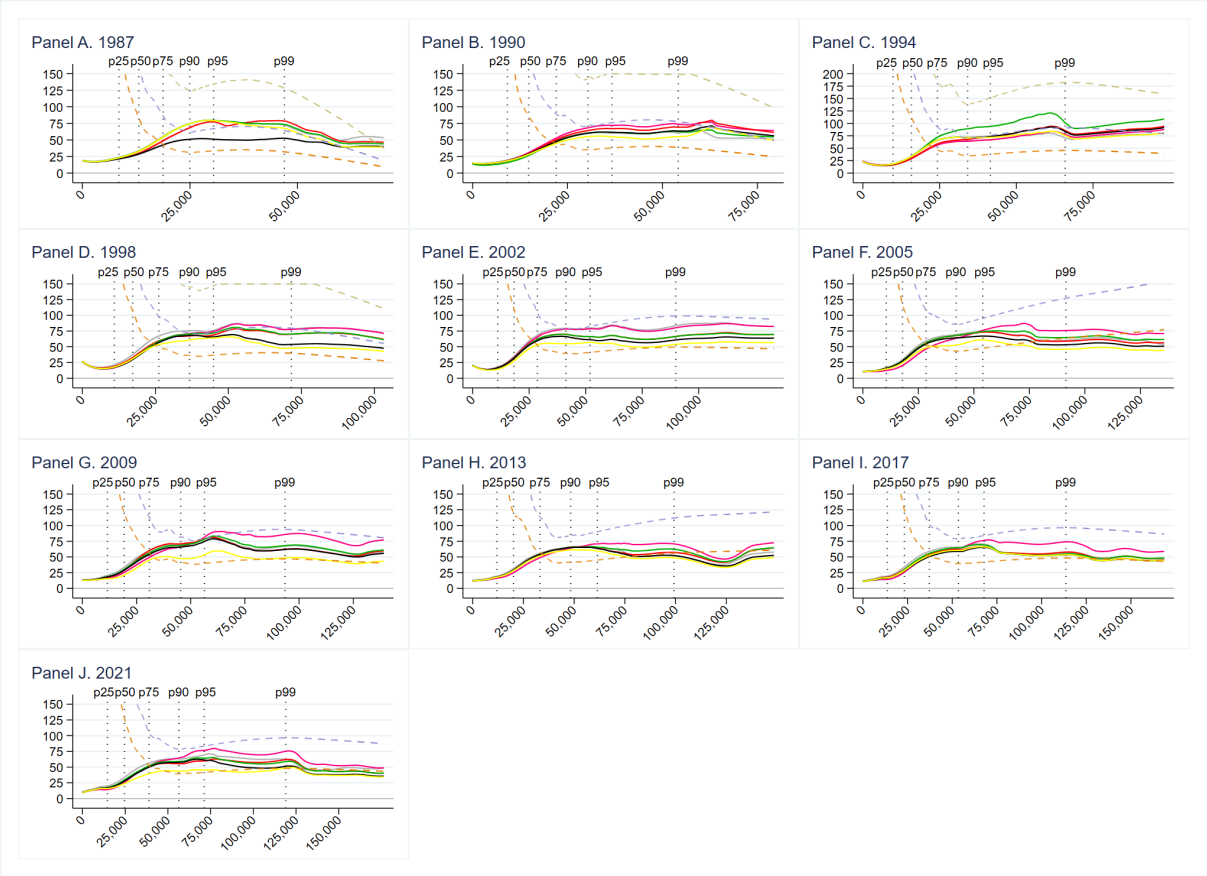
[33]See Bierbrauer et al. (2021) for a derivation of how to get from (2) to (9).

[34]The most recent data used is for 2018. This data underlies the estimated income distribution for the 2021 reform proposals.

[35]An extensive discussion about why I do not add hypothetical households for higher income ranges, as Peichl et al. (2021), is available in Appendix Section A.3.

[36]Drechsel-Grau et al. (2022) only provide Pareto parameters for the years 2005 and 2015. The 2005 estimate is used for the years 1987, 1990, 1994, 1998, 2002, and 2005. The 2015 estimate underlies the income distributions for 2009, 2013, 2017 and 2021. Alternatively, Bartels (2019) provides estimates for the computation of Pareto parameters from 1986 to 2014. As the resulting Pareto parameters significantly differ in magnitude from the estimates in Drechsel-Grau et al. (2022), I opted for the estimates based on administrative data.

Figure 6: Upper Pareto bounds for the German income tax system, 1987–2021



Notes: This figure illustrates the ratio $T'/(1-T')$, based on effective marginal tax rates T', for election years from 1987 to 2021 (vertical axis) plotted against pretax income (horizontal axis). Each panel shows the status quo (grey) and each party's reform proposal in the associated party colors (The Left = pink, SPD = red, Greens = green, CDU/CSU = black, FDP = yellow) for the respective years. The dashed lines reflect the upper Pareto bound for different ETI values (0.25 = khaki, 0.5 = lavender, 1 = orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. The vertical short-dashed lines point to different percentiles of the income distribution. All computations are scaled to the individual level. The income of married couples is split equally among spouses.
Source: Author's calculations based on ifo Microsimulation Model.

(grey) and each of the main German parties' proposals in their associated colors along different pretax income levels (horizontal axis) for election years from 1987 to 2021. Dashed lines reflect the upper Pareto bound at the respective income level for three selected ETI values: 0.25 (khaki), 0.5 (lavender) and 1 (orange).

Until 1998, the tax schedule closely follows the upper Pareto bound for an ETI of 0.5. From 2002 onwards, the proposed ratio $T'/(1-T')$ rather approaches the upper Pareto bound for an assumed ETI of 1. Since then, the actual and proposed marginal tax burden comes closest to the upper Pareto bound for an ETI of 0.5 between the 90^{th} and 95^{th} percentile. From a political feasibility perspective, all reform proposals since 2002

could have further increased marginal tax rates above the median if the assumed ETI for Germany is at or below 0.5. Assuming an ETI of 0.25, none of the proposals made after 1987 came close to the corresponding upper Pareto bound.

Certain patterns are discernible when looking at individual parties' trends. The Left has constantly proposed the most progressive schedule since 1998. However, looking at the top 5% of incomes, even proposals by The Left remain significantly below the upper Pareto bound for an ETI of 0.5 from 2013 to 2021. On the other end of the spectrum, the FDP proposals after 1998 are close to aligning with the upper Pareto bound for an ETI of 1 for the top 5% of incomes.

Important from a welfare perspective, the reforms of the German income tax system proposed by the CDU/CSU in 1987 and by all parties (except for The Left) in 1998 can be seen as Pareto-improving if we assume an ETI of 0.5 or higher for Germany.

In sum, the tax schedule and the tax reform proposals by Germany's main parties evolved such that the (proposed) marginal tax burden for the highest 10% of incomes moved from a level at or slightly above the upper Pareto bound for an ETI of 0.5 to a level considerably below that Pareto bound.

4 Analysis of Parliamentary Speeches

Section 3.5 showed that, in terms of the upper Pareto bound, top earners in Germany are nowadays taxed less stringently than a few decades ago. However, a simple reform increasing marginal tax rates above the median would be politically feasible. Bierbrauer et al. (2021) argue that these kinds of reforms might not be enacted as frequently due to other politically feasible reform options such as tax cuts which are larger for taxpayers with higher incomes.[37]

While a large selection of reforms can be politically feasible in the sense of benefiting a majority of the population, only a fraction of proposals has an actual chance of surviving the political process. We can try to better understand the political process by means of text data on speeches in the German parliament. These speeches are likely to reflect the

[37]But even if these latter reforms are not politically feasible in the light of this theory, they may still prove feasible in reality. Three out of four examined US tax reforms after 2000 in Bierbrauer et al. (2021) involved large tax cuts primarily benefiting top earners. Using the model´s perspective, these reforms would have only been possible with an expected ETI of 1 or higher. Even assuming an ETI higher than 1, the 2003 reform is not politically feasible in the light of the theory. Yet, this reform was enacted. Bartels (2005) argues that people did not oppose this reform due to a lack of understanding for the association between taxation and inequality. It thus seems as if the enacted policies and the accompanying argumentation are not always rooted in evidence-based arguments, but could also reflect ideological arguments that do not hold empirically. Closely connected, Ash et al. (2021b) illustrate for the US that a form of ideational politics can change the population's perceptions about cause and effect of policies.

representatives' actual priorities.

After introducing the main steps taken in the analysis of German parliamentary speeches, this section presents wordclouds for each election year to grasp the main points in the discussion about tax policy in the German parliament.[38] Alongside the wordclouds, the prevalence of invoked equity and efficiency motives in parliamentary speeches is examined by election year.

The dataset for this section is based on German parliamentary speeches from 1985 to 2022. Specifically, I use the prepared dataset provided by Limebit (2022).[39] This dataset combines the raw text data with information about the speaker (e.g. name, job, party affiliation) and the timing of the speech.[40]

For each federal election from 1987 to 2021, I construct a bag-of-words model consisting of distinct two-word phrases or bigrams and the number of times these phrases were spoken in parliament. Unigrams are not sufficient to capture combined words such as 'tax reduction', which is why research based on text data regularly relies on two-word phrases (see e.g. Gentzkow et al. (2019b) or Gentzkow and Shapiro (2010)).[41] The data for each election year encompasses speeches from the two years preceding the election year, the year of the election and the year after the election. For instance, the corpus for the year 1998 includes parliamentary speeches from 1996 to 1999. The two election years linked with shortened legislative periods (1990 and 2005) only include speeches from 1989 to 1991 and 2004 to 2006, respectively.

The phrase counts result from a series of preprocessing steps. First, each word in the raw text is lemmatized via the HanTa lemmatizer (Wartena 2019), which is specifically developed to deal with the idiosyncracies of the German language.[42] Second, all punctuation and numbers are removed from the text such that only letters remain. Third, all words are

[38] Wordclouds are based on a bag-of-words model, which counts the number of occurrences for each word in a corpus. Digging deeper into narrative structures in text, Ash et al. (2021a) provide an alternative tool specifically designed to disentangle narratives and arguments from text data. See also Gentzkow et al. (2019a) for a recent survey on text data methods in economics.

[39] The corresponding raw data is provided by the German Bundestag: https://www.bundestag.de/services/opendata.

[40] Further details about the methodology behind the creation of the dataset can be found here: https://github.com/open-discourse/open-discourse.

[41] Using phrases with more than two words is computationally expensive and leads to high-dimensional data. Gentzkow et al. (2019a) offer ways for how to deal with the dimensionality problem.

[42] An alternative to lemmatization would be stemming. Stemming groups together different word types with the same stem and creates inflected word forms, which are not equivalent to actual words. For instance, 'driver', 'driven' and 'driving' would become 'driv'. By contrast, lemmatization transforms words back to their base form. In the example, 'driver' would remain 'driver', while 'driven' and 'driving' become 'drive'. As I present wordclouds that serve to give a descriptive insight into the type of arguments around tax policy, I prefer lemmatization for interpretability reasons.

set to lower case. Fourth, a list of very common and uninformative words is removed.[43] The resulting dataset contains every lemmatized and preprocessed speech performed in the German parliament from 1985 to 2021. To subset the full set of speeches to those speeches that are related to income taxation, I use a dictionary-based approach.[44] Every speech including at least one of the tax-related words listed in Table 3 in Appendix Section A.4 is selected for the analysis.

This subset of speeches referring to tax policy still includes redundant information. I seek to remove these redundancies via three measures. First, I create a list of words that shall not be part of any bigram, i.e. a bigram including one of these words is omitted from the analysis. This word list consists of *1)* procedural language in the German parliament,[45] *2)* all of the speakers' last names, and *3)* a manually collected parliamentary stopword list (see Appendix Table 4).[46] Second, phrases repeating the same word twice are dropped. Third, manually inspecting the 200 most common bigrams in the subset of speeches, I produce a list of bigrams to be removed from the corpus (see Appendix Table 5).[47] Finally, only phrases occurring at least ten times in an election period remain in the respective period's corpus.

Figures 7 to 9 show wordclouds for each election in Germany between 1987 and 2021. The size of a phrase in a wordcloud reflects how often this phrase was used in the subset of parliamentary speeches. Figure 10 condenses the phrases into equity and efficiency motives and shows the frequency of these motives relative to the number of all bigrams in the corpus for the respective legislative period over time. This equity-efficiency distinction is deduced from a collection of terms that are typically either related to equity or efficiency concerns (see Appendix Table 6 for a list).

Combining the specific phrases featuring in the wordclouds with the overall frequency of equity or efficiency motives invoked by parliamentarians enables a researcher to reconstruct enacted tax policy and evaluate whether an election offers a window of opportunity for major tax reforms.

[43] I use the stop word list provided in this GitHub repository: https://github.com/stopwords-iso/stopwords-de, visited on 08/05/2022. Usually, lemmatization or stemming is conducted after steps two to four. However, the HanTa lemmatizer improves its precision by harnessing sentence structure and part-of-speech tags. Therefore, I apply the lemmatizer to the raw text data.

[44] Alternatively, agenda topics could be used to determine when representatives speak about income taxation. Selection via topic shares generated from unsupervised topic modeling methods is also viable (see e.g. Lippmann (2022) for an application of unsupervised topic modeling in an economics context).

[45] I seek to capture procedural language via all nouns contained in the German parliamentary law (German Bundestag 2022). This approach is inspired by Gentzkow et al. (2019b).

[46] This list contains German states' names, surnames of politicians who were not member of the parliament, politicans' positions, party names, currency abbreviations and several parliamentary-specific stopwords featuring among the 100 most common words in the corpus after the preprocessing procedure.

[47] This list is mainly made up of phrasal verbs or sayings.

Figure 7: Most common phrases in German parliamentary speeches relating to income taxation, 1987–1998

Panel A. 1987

Panel B. 1990

Panel C. 1994

Panel D. 1998

Notes: This figure shows wordclouds featuring the most common bigrams in preprocessed German parliamentary speeches held two years prior until one year after the election years 1987 to 1998, respectively (1990 is an exception with speeches from 1989 to 1991). The relevant subset of speeches is selected via occurrence of at least one of the terms specified in Appendix table 3.

For the 1987 election, the CDU/CSU proposed a reform that can be seen as Pareto-improving under the assumption of an ETI exceeding 0.5 (see Section 3.5). This large reform, taking effect in 1990 and turning the German tax schedule into a linear-progressive tax schedule, was intensely discussed prior to and shortly after the 1987 election. Unsurprisingly for a tax cut, the discussion included a high fraction of efficiency-related

Figure 8: Most common phrases in German parliamentary speeches relating to income taxation, 2002–2013

Panel A. 2002

Panel B. 2005

Panel C. 2009

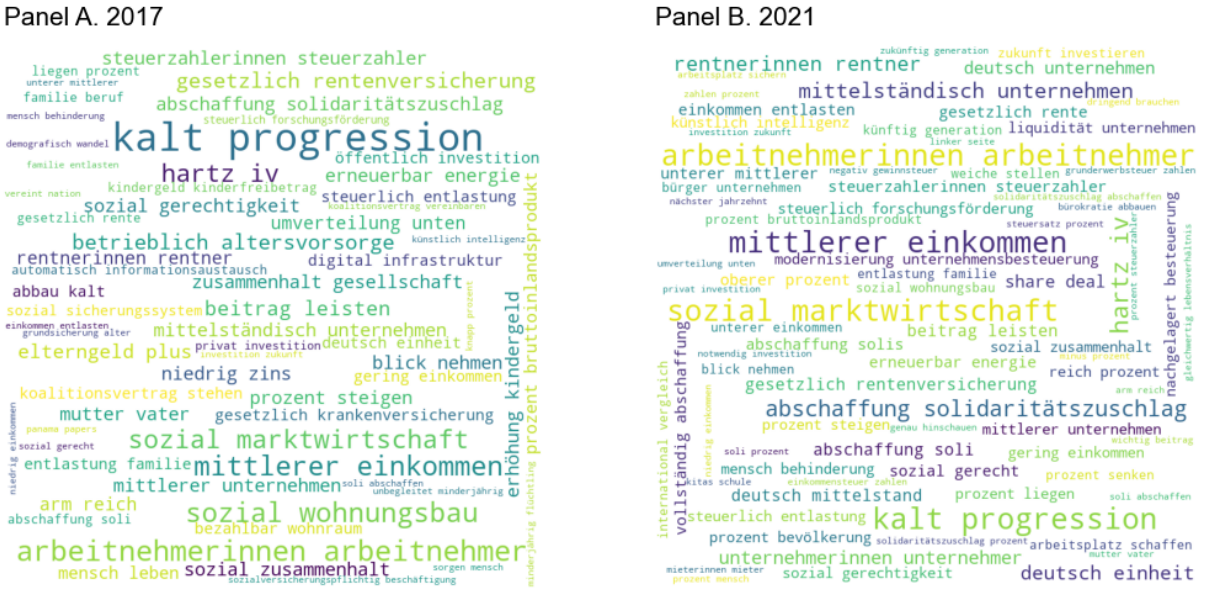
Panel D. 2013

Notes: This figure shows wordclouds featuring the most common bigrams in preprocessed German parliamentary speeches held two years prior until one year after the election years 2002 to 2013, respectively (2005 is an exception with speeches from 2004 to 2006). The relevant subset of speeches is selected via occurrence of at least one of the terms specified in Appendix table 3.

phrases.

The German reunification and its fiscal consequences were at the center of attention during the 1990 and 1994 elections. This was also the time when the solidarity surcharge was introduced into the German tax system. Astonishingly, Panel B and C in Figure 7 lack a direct reference to the solidarity surcharge.

Figure 9: Most common phrases in German parliamentary speeches relating to income taxation, 2017–2021



Notes: This figure shows wordclouds featuring the most common bigrams in preprocessed German parliamentary speeches held two years prior until one year after the election years 2017 and 2021, respectively. The relevant subset of speeches is selected via occurrence of at least one of the terms specified in Appendix table 3.

Employment-related phrases consistently feature prominently in parliamentary speeches addressing tax topics. Combating unemployment or the creation of jobs are closely linked with income taxation by parliamentarians.[48] Especially in 1998, when all parties proposed substantial tax cuts resulting in largest tax reductions for the top earners, employment was a first-order concern.[49] This strong focus on employment topics leads to a peak in efficiency motives and coincides with the years when equity phrases were least popular among representatives. As the significance of employment phrases in the wordclouds subsides after 2005, the overall share of efficiency arguments in tax policy speeches also drops considerably.

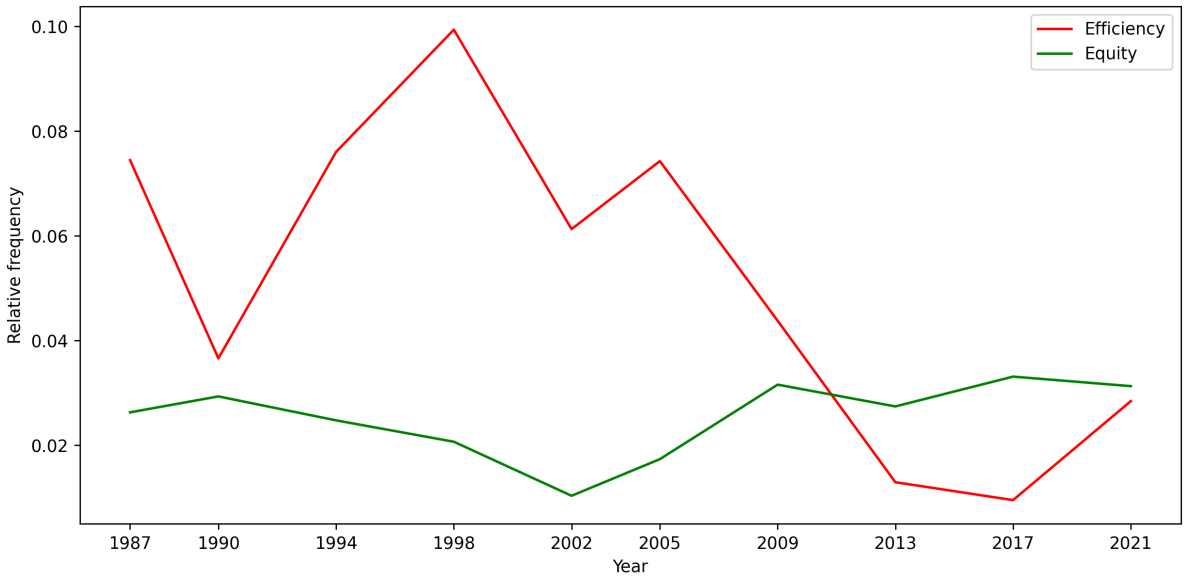
Interestingly, 'middle incomes' is one of the most frequent terms over the whole time period and appears in eight out of ten wordclouds. This emphasizes again some parties' median voter focus, which became apparent in Section 3.3. Addressing middle incomes in speeches can be even more effective for vote maximization as people have a tendency to misperceive their actual position in the income distribution with a bias towards the middle of the distribution (Hvidberg et al. 2020).

Bracket creep appears first in the wordcloud for the 2009 election and has gained

[48] Recent evidence by Hope and Limberg (2022) speaks against the trickle-down argument that tax cuts for top earners can reduce unemployment.

[49] Germany was described as 'the sick man of Europe' at that time (Dustmann et al. 2014).

Figure 10: Equity and efficiency bigrams in German parliamentary speeches, 1987–2021



Notes: This figure shows the proportion of bigrams relating to equity and efficiency motives in preprocessed German parliamentary speeches from 1987 to 2021. The relevant subset of speeches is selected via occurrence of at least one of the terms specified in Appendix table 3. Appendix table 6 shows the keywords used for the equity/efficiency categorization.

importance since then. Intriguingly, the government, since 2012, is mandated by law to evaluate the magnitude of bracket creep biannually.[50] The parliament shall then decide whether to adjust tax brackets so to avoid bracket creep. Recently, bracket creep was even overcompensated by the parliament (Blömer et al. 2021a) and should thus not be a first-order concern any more. As the wordclouds illustrate, bracket creep was still regularly mentioned by German representatives prior to and after the 2017 and 2021 elections.

Similarly important for these two elections, the abolition of the solidarity surcharge was frequently discussed. The so-called 'soli' was partly abolished in 2021, but still remains intact for top earners. This fallback solution can be better rationalized considering the trend towards more discussion about equity topics in recent years.

The lingering interest in rather unimportant topics reflects the current state of the tax discussion in Germany. Germany has not experienced any large tax reforms since the 2005 election. This absence of major reforms coincides with a strong decline in efficiency bigrams. It appears that text data from parliamentary speeches can capture the perceived urgency for income tax reforms among politicians.[51] Over the last decades, this urgency

[50] See Federal Ministry of Finance (2020) for the latest evaluation.

[51] Of course, these wordclouds do not control for party affiliation. Hence, positions of larger parties with more representatives are likely to be discussed more frequently and are thus also the ones having a higher number of counts. As these parties are usually also part of the government, it is further more likely that their proposals are implemented.

was primarily transmitted via efficiency arguments. Thus, even if parties propose major reforms qualifying for majority support according to the theory by Bierbrauer et al. (2021), these large reforms need a political window of opportunity to be enacted.

By and large, this text data approach helps to reconstruct the tax policy narrative and arguments relevant for the respective election and thus to better understand why the parties proposed the reforms as they did.

5 Conclusion

This paper examined German political parties' tax reform proposals from 1987 to 2021 along multiple dimensions. All monotonic and most partly monotonic reform proposals fulfill a median voter result claiming that median voter support is a necessary and sufficient condition for majority support in the full population. Contradicting theoretical results, politically feasible reform opportunities did not spark a trend towards steeper tax schedule progression in the middle of the income distribution. Upper Pareto bounds show that German parties substantially reduced the squeeze on top earners over the last decades. Part of this reduction can be viewed as a Pareto improvement for an assumed ETI of 0.5. Parties differ in the types of reforms they propose and who they address as beneficiaries: while the liberal FDP mainly benefits its own voters, the Greens propose reforms that are better for the median voter than for their own voters. A textual analysis of German parliamentary speeches uncovered major arguments of the German tax discussion and pointed to efficiency narratives as the catalyst for large reforms.

Several limitations of this paper should be emphasized. First, parties' tax reform proposals often contain vague statements that require the researcher's own interpretation and thus leave room for discussion. Second, the SOEP data underlying this analysis undersamples high incomes, which necessitates imperfect fallback solutions to construct upper Pareto bounds. Third, the distinction between equity and efficiency arguments relies crucially on the researcher's categorization of signal words. The textual analysis does further not enable any causal claims and should be seen as purely descriptive evidence.

Party officials should conclude from this paper that it is not sufficient to solely propose reforms that are to the advantage of a majority of the population, but also to steer the tax policy discussion in a direction that incorporates these propositions.

There is still much to be learned on the political economy of tax reforms in future research. The model of Bierbrauer et al. (2021) provides a benchmark for the rational voter. Incorporating elements from behavioral economics to take account of voters' imperfections as the ones documented by Bartels (2005) can be a worthwhile exercise. In

addition, this paper's textual analysis hinted at an important role of narratives for the actual implementation of tax reforms. Applying recent causal methods to examine this relationship seems promising.

References

Ash, Elliott, Germain Gauthier, and Philine Widmer (2021a). "Text semantics capture political and economic narratives". In: *arXiv preprint arXiv:2108.01720*.

Ash, Elliott, Sharun Mukand, and Dani Rodrik (2021b). *Economic Interests, Worldviews, and Identities: Theory and Evidence on Ideational Politics*. Working Paper 29474. National Bureau of Economic Research.

Bartels, Charlotte (2019). "Top incomes in Germany, 1871–2014". In: *The Journal of Economic History* 79.3, pp. 669–707.

Bartels, Larry M (2005). "Homer gets a tax cut: Inequality and public policy in the American mind". In: *Perspectives on Politics* 3.1, pp. 15–31.

Bierbrauer, Felix J, Pierre C Boyer, and Andreas Peichl (2021). "Politically feasible reforms of nonlinear tax systems". In: *American Economic Review* 111.1, pp. 153–91.

Blömer, Maximilian, Przemyslaw Brandt, Anina Harter, Martin Mosler, and Andreas Peichl (2021a). *Verteilungswirkungen ausgewählter steuerpolitischer Reformen der 19. Legislaturperiode*. ifo Forschungsberichte 122. ifo Institut. URL: https://www.ifo.de/publikationen/2021/monographie-autorenschaft/verteilungswirkungen-ausgewaehlter-steuerpolitischer.

Blömer, Maximilian, Lilly Fischer, Manuel Pannier, and Andreas Peichl (2021b). *Die effektive Belastung von Erwerbseinkommen unterschiedlicher Haushaltstypen seit 1986*. ifo Forschungsberichte 127. URL: https://www.ifo.de/publikationen/2021/monographie-autorenschaft/die-effektive-belastung-von-erwerbseinkommen.

– (2021c). "Die Reformvorschläge bei der Einkommensbesteuerung der Parteien zur Bundestagswahl 2021". In: *ifo Schnelldienst* 74.10. URL: https://www.ifo.de/publikationen/2021/aufsatz-zeitschrift/die-reformvorschlaege-bei-der-einkommensbesteuerung-der-parteien.

Blömer, Maximilian and Andreas Peichl (2020). *The ifo Tax and Transfer Behavioral Microsimulation Model*. ifo Working Paper 335. ifo Institute. URL: https://www.ifo.de/publikationen/2020/working-paper/ifo-tax-and-transfer-behavioral-microsimulation-model.

Bündnis 90/Die Grünen (1987). *Bundestagswahlprogramm 1987*. URL: https://www.boell.de/assets/boell.de/images/download_de/publikationen/1987_Wahlprogramm_Bundestagswahl.pdf (visited on 05/09/2022).

– (1990). *Das Programm zur 1. gesamtdeutschen Wahl 1990*. URL: https://www.boell.de/assets/boell.de/images/download_de/publikationen/1990_Wahlprogramm_Bundestagswahl.pdf (visited on 05/09/2022).

Bündnis 90/Die Grünen (1994). *Programm zur Bundestagswahl 1994*. URL: https://www.boell.de/assets/boell.de/images/download_de/stiftung/1994_Wahlprogramm.pdf (visited on 05/09/2022).
– (1998). *Programm zur Bundestagswahl 98. Grün ist der Wechsel.* URL: https://www.boell.de/assets/boell.de/images/download_de/publikationen/1998_Wahlprogramm_Bundestagswahl.pdf (visited on 05/09/2022).
– (2002). *Grün wirkt! Unser Wahlprogramm 2002–2006*. URL: https://www.boell.de/assets/boell.de/images/download_de/publikationen/2002_Wahlprogramm_Bundestagswahl.pdf (visited on 05/09/2022).
– (2005). *Eines für alle: Das Grüne Wahlprogramm 2005*. URL: https://www.boell.de/assets/boell.de/images/download_de/publikationen/2005_Wahlprogramm_Bundestagswahl.pdf (visited on 05/09/2022).
– (2009). *Der Grüne neue Gesellschaftsvertrag. Klima. Arbeit. Gerechtigkeit. Freiheit.* URL: https://www.boell.de/assets/boell.de/images/download_de/publikationen/2009_Wahlprogramm_Bundestagswahl.pdf (visited on 05/09/2022).
– (2013). *Zeit für den Grünen Wandel. Teilhaben. Einmischen. Zukunft schaffen.* URL: https://cms.gruene.de/uploads/documents/BUENDNIS-90-DIE-GRUENEN-Bundestagswahlprogramm-2013.pdf (visited on 06/06/2022).
– (2017). *Zukunft wird aus Mut gemacht. Bundestagswahlprogramm 2017.* URL: https://cms.gruene.de/uploads/documents/BUENDNIS_90_DIE_GRUENEN_Bundestagswahlprogramm_2017.pdf (visited on 06/06/2022).
– (2021). *Programmentwurf zur Bundestagswahl 2021*. URL: https://cms.gruene.de/uploads/documents/2021_Wahlprogrammentwurf.pdf (visited on 06/10/2022).
CDU/CSU (1987). *Weiter so, Deutschland. Für eine gute Zukunft.* URL: https://www.kas.de/c/document_library/get_file?uuid=e68c4584-f8fa-0ab6-e805-008bffa77c6b&groupId=252038 (visited on 05/09/2022).
– (1990). *Ja zu Deutschland - Ja zur Zukunft.* URL: https://www.kas.de/c/document_library/get_file?uuid=8fadd4c2-d340-08df-f9e5-1bf586baa2f1&groupId=252038 (visited on 05/09/2022).
– (1994). *Wir sichern Deutschlands Zukunft.* URL: https://www.kas.de/c/document_library/get_file?uuid=98cdb41b-6612-123f-43f8-d8308788511f&groupId=252038 (visited on 05/09/2022).
– (1998). *Wahlplattform.* URL: https://www.kas.de/c/document_library/get_file?uuid=7f7482d3-0e0c-818a-3701-b78da7086c4d&groupId=252038 (visited on 05/09/2022).

CDU/CSU (2002). *Leistung und Sicherheit. Zeit für Taten.* URL: https://www.kas.de/c/document_library/get_file?uuid=35a04938-f9b6-dd01-83a1-48a036b3f840&groupId=252038 (visited on 05/09/2022).
– (2005). *Deutschlands Chancen nutzen. Wachstum. Arbeit. Sicherheit.* URL: https://www.kas.de/c/document_library/get_file?uuid=6c914ac8-7c46-b010-b1a1-24aa4261d24b&groupId=252038 (visited on 05/09/2022).
– (2009). *Wir haben die Kraft - Gemeinsam für unser Land.* URL: https://www.kas.de/c/document_library/get_file?uuid=7d6e0b45-01b2-1cc7-793a-84d61e9c5086&groupId=252038 (visited on 05/09/2022).
– (2013). *Gemeinsam erfolgreich für Deutschland. Regierungsprogramm 2013–2017.* URL: https://www.kas.de/c/document_library/get_file?uuid=9d6f34de-bd31-556e-ba5b-a5792f330aa4&groupId=252038 (visited on 06/06/2022).
– (2017). *Für ein Deutschland, in dem wir gut und gerne leben. Regierungsprogramm 2017–2021.* URL: https://www.cdu.de/system/tdf/media/dokumente/170703regierungsprogramm2017.pdf?file=1 (visited on 06/06/2022).
– (2021). *Das Programm für Stabilität und Erneuerung. Gemeinsam für ein modernes Deutschland.* URL: https://www.csu.de/common/download/Regierungsprogramm.pdf (visited on 06/10/2022).
Diamond, Peter A (1998). "Optimal income taxation: an example with a U-shaped pattern of optimal marginal tax rates". In: *American Economic Review*, pp. 83–95.
Die Linke (2005). *Für eine neue soziale Idee. Wahlprogramm zu den Bundestagswahlen 2005.* URL: https://www.die-linke.de/fileadmin/download/wahlen2021/BTWP21_Entwurf_Vorsitzende.pdf (visited on 05/09/2022).
– (2009). *Bundestagswahlprogramm der Partei DIE LINKE.* URL: https://www.die-linke.de/fileadmin/download/wahlen2021/BTWP21_Entwurf_Vorsitzende.pdf (visited on 05/09/2022).
– (2013). *100% sozial. Wahlprogramm zur Bundestagswahl 2013.* URL: https://www.die-linke.de/fileadmin/download/wahlen2021/BTWP21_Entwurf_Vorsitzende.pdf (visited on 06/06/2022).
– (2017). *Sozial. Gerecht. Frieden. Für alle. Die Zukunft, für die wir kämpfen! Langfassung des Wahlprogramms zur Bundestagswahl 2017.* URL: https://www.die-linke.de/fileadmin/download/wahlen2021/BTWP21_Entwurf_Vorsitzende.pdf (visited on 06/06/2022).
– (2021). *Zeit zu handeln. Für soziale Sicherheit, Frieden und Klimagerechtigkeit! Wahlprogramm der Partei DIE LINKE zur Bundestagswahl 2021.* URL: https://www.die-linke.de/fileadmin/download/wahlen2021/BTWP21_Entwurf_Vorsitzende.pdf (visited on 06/10/2022).

Doerrenberg, Philipp, Andreas Peichl, and Sebastian Siegloch (2017). "The elasticity of taxable income in the presence of deduction possibilities". In: *Journal of Public Economics* 151, pp. 41–55.

Drechsel-Grau, Moritz, Andreas Peichl, Johannes F Schmieder, Kai D Schmid, Hannes Walz, and Stefanie Wolter (2022). *Inequality and income dynamics in Germany*. Working Paper 29818. National Bureau of Economic Research.

Dustmann, Christian, Bernd Fitzenberger, Uta Schönberg, and Alexandra Spitz-Oener (2014). "From sick man of Europe to economic superstar: Germany's resurgent economy". In: *Journal of Economic Perspectives* 28.1, pp. 167–88.

Eissa, Nada, Henrik Jacobsen Kleven, and Claus Thustrup Kreiner (2008). "Evaluation of four tax reforms in the United States: Labor supply and welfare effects for single mothers". In: *Journal of Public Economics* 92.3-4, pp. 795–816.

FDP (1987). *Zukunft durch Leistung. Die Wahlplattform der FDP zur Bundestagswahl 1987*. URL: https://www.fdp.de/sites/default/files/2021-06/FDP_Programm_Bundestagswahl2021_1.pdf (visited on 05/09/2022).

– (1990). *Das liberale Deutschland. Programm der FDP zu den Bundestagswahlen am 2. Dezember 1990*. URL: https://www.fdp.de/sites/default/files/2021-06/FDP_Programm_Bundestagswahl2021_1.pdf (visited on 05/09/2022).

– (1994). *Liberal denken. Leistung wählen. Das Programm der FDP zur Bundestagswahl 1994*. URL: https://www.fdp.de/sites/default/files/2021-06/FDP_Programm_Bundestagswahl2021_1.pdf (visited on 05/09/2022).

– (1998). *Es ist Ihre Wahl. Das Wahlprogramm der Liberalen zur Bundestagswahl 1998*. URL: https://www.fdp.de/sites/default/files/2021-06/FDP_Programm_Bundestagswahl2021_1.pdf (visited on 05/09/2022).

– (2002). *Bürgerprogramm 2002. Programm der FDP zur Bundestagswahl 2002*. URL: https://www.fdp.de/sites/default/files/2021-06/FDP_Programm_Bundestagswahl2021_1.pdf (visited on 05/09/2022).

– (2005). *Arbeit hat Vorfahrt. Deutschlandprogramm 2005*. URL: https://www.fdp.de/sites/default/files/2021-06/FDP_Programm_Bundestagswahl2021_1.pdf (visited on 05/09/2022).

– (2009). *Die Mitte stärken. Deutschlandprogramm der Freien Demokratischen Partei*. URL: https://www.fdp.de/sites/default/files/2021-06/FDP_Programm_Bundestagswahl2021_1.pdf (visited on 05/09/2022).

– (2013). *Bürgerprogramm 2013. Damit Deutschland stark bleibt*. URL: https://www.fdp.de/sites/default/files/2021-06/FDP_Programm_Bundestagswahl2021_1.pdf (visited on 06/06/2022).

FDP (2017). *Schauen wir nicht länger zu. Programm der Freien Demokraten zur Bundestagswahl 2017*. URL: https://www.fdp.de/sites/default/files/2021-06/FDP_Programm_Bundestagswahl2021_1.pdf (visited on 06/06/2022).

– (2021). *Wahlprogramm der Freien Demokraten*. URL: https://www.fdp.de/sites/default/files/2021-06/FDP_Programm_Bundestagswahl2021_1.pdf (visited on 06/10/2022).

Federal Ministry of Finance (2020). *Der Effekt der kalten Progression bei der Einkommensteuer*. URL: https://www.bundesfinanzministerium.de/Monatsberichte/2020/12/Inhalte/Kapitel-3-Analysen/3-5-effekt-der-kalten-progression.html?nn=e537fc8c-9e05-4840-90c8-53f93fac9cf8 (visited on 08/05/2022).

Feldstein, Martin (1995). "The effect of marginal tax rates on taxable income: a panel study of the 1986 Tax Reform Act". In: *Journal of Political Economy* 103.3, pp. 551–572.

– (1999). "Tax avoidance and the deadweight loss of the income tax". In: *Review of Economics and Statistics* 81.4, pp. 674–680.

Gentzkow, Matthew, Bryan Kelly, and Matt Taddy (2019a). "Text as data". In: *Journal of Economic Literature* 57.3, pp. 535–74.

Gentzkow, Matthew and Jesse M Shapiro (2010). "What drives media slant? Evidence from US daily newspapers". In: *Econometrica* 78.1, pp. 35–71.

Gentzkow, Matthew, Jesse M Shapiro, and Matt Taddy (2019b). "Measuring group differences in high-dimensional choices: method and application to congressional speech". In: *Econometrica* 87.4, pp. 1307–1340.

German Bundestag (2022). *Geschäftsordnung des Deutschen Bundestages und Geschäftsordnung des Vermittlungsausschusses*. URL: https://www.btg-bestellservice.de/pdf/10080000.pdf (visited on 07/04/2022).

Goebel, Jan, Markus M Grabka, Stefan Liebig, Martin Kroh, David Richter, Carsten Schröder, and Jürgen Schupp (2019). "The German socio-economic panel (SOEP)". In: *Jahrbücher für Nationalökonomie und Statistik* 239.2, pp. 345–360.

Hope, David and Julian Limberg (2022). "The economic consequences of major tax cuts for the rich". In: *Socio-Economic Review* 20.2, pp. 539–559.

Hvidberg, Kristoffer B, Claus Kreiner, and Stefanie Stantcheva (2020). *Social Positions and Fairness Views on Inequality*. Working Paper 28099. National Bureau of Economic Research.

Kahneman, Daniel and Amos Tversky (1984). "Choices, values, and frames". In: *American Psychologist* 39.4, pp. 341–350.

Limebit (2022). *Open Discourse*. URL: https://opendiscourse.de (visited on 08/05/2022).

Lippmann, Quentin (2022). "Gender and lawmaking in times of quotas". In: *Journal of Public Economics* 207.104610.

Lorenz, Normann and Dominik Sachs (2016). "Identifying laffer bounds: a sufficient-statistics approach with an application to Germany". In: *The Scandinavian Journal of Economics* 118.4, pp. 646–665.

Neisser, Carina (2021). "The elasticity of taxable income: A meta-regression analysis". In: *The Economic Journal* 131.640, pp. 3365–3391.

PDS (1990). *Wahlprogramm der Linken Liste/PDS zur Bundestagswahl 1990.* URL: https://www.die-linke.de/fileadmin/download/wahlen2021/BTWP21_Entwurf_Vorsitzende.pdf (visited on 05/09/2022).

– (1994). *Opposition gegen Sozialabbau und Rechtsruck. Wahlprogramm der PDS 1994.* URL: https://www.die-linke.de/fileadmin/download/wahlen2021/BTWP21_Entwurf_Vorsitzende.pdf (visited on 05/09/2022).

– (1998). *Programm der PDS zur Bundestagswahl 1998.* URL: https://www.die-linke.de/fileadmin/download/wahlen2021/BTWP21_Entwurf_Vorsitzende.pdf (visited on 05/09/2022).

– (2002). *Es geht auch anders: Nur Gerechtigkeit sichert Zukunft! Programm der PDS zur Bundestagswahl 2002.* URL: https://www.die-linke.de/fileadmin/download/wahlen2021/BTWP21_Entwurf_Vorsitzende.pdf (visited on 05/09/2022).

Peichl, Andreas, Felix Bierbrauer, Dominik Sachs, and Daniel Weishaar (2021). "Mehrheitsfähige und wohlfahrtssteigernde Reformen des deutschen Steuer-und Transfersystems: Von Entzugsraten, Mittelstands-und Wohlstandsbäuchen". In: *Perspektiven der Wirtschaftspolitik* 22.3, pp. 191–202.

Peichl, Andreas, Nico Pestel, Sebastian Siegloch, and Eric Sommer (2014). "Bundestagswahlkampf 2013: Klientelpolitik durch Steuerreform?" In: *Perspektiven der Wirtschaftspolitik* 15.2, pp. 182–194.

Piketty, Thomas and Emmanuel Saez (2007). "How progressive is the US federal tax system? A historical and international perspective". In: *Journal of Economic Perspectives* 21.1, pp. 3–24.

Saez, Emmanuel, Joel Slemrod, and Seth H Giertz (2012). "The elasticity of taxable income with respect to marginal tax rates: A critical review". In: *Journal of Economic Literature* 50.1, pp. 3–50.

Samuelson, William and Richard Zeckhauser (1988). "Status quo bias in decision making". In: *Journal of Risk and Uncertainty* 1.1, pp. 7–59.

Scheve, Kenneth and David Stasavage (2016). *Taxing the rich: A History of Fiscal Fairness in the United States and Europe*. Princeton University Press.

Schieritz, Mark, Jakob Bauer, Christian Endt, Christopher Pietsch, and Julius Tröger (2021). *Damit können Sie rechnen.* URL: https://www.zeit.de/2021/37/interaktiver-steuerrechner-einkommen-ifo-bundestagswahl-parteien (visited on 07/24/2022).

Shiller, Robert J (2017). "Narrative economics". In: *American Economic Review* 107.4, pp. 967–1004.

SPD (1987). *Aus Respekt vor Deiner Zukunft. Das Zukunftsprogramm der SPD.* URL: http://library.fes.de/pdf-files/bibliothek/retro-scans/a87-04013.pdf (visited on 05/09/2022).

– (1990). *Aus Respekt vor Deiner Zukunft. Das Zukunftsprogramm der SPD.* URL: http://library.fes.de/pdf-files/bibliothek/retro-scans/fa90-05465.pdf (visited on 05/09/2022).

– (1994). *Aus Respekt vor Deiner Zukunft. Das Zukunftsprogramm der SPD.* URL: http://library.fes.de/pdf-files/bibliothek/retro-scans/fa94-02358.pdf (visited on 05/09/2022).

– (1998). *Aus Respekt vor Deiner Zukunft. Das Zukunftsprogramm der SPD.* URL: http://library.fes.de/pdf-files/bibliothek/retro-scans/a98-04467.pdf (visited on 05/09/2022).

– (2002). *Erneuerung und Zusammenhalt. Regierungsprogramm 2002–2006.* URL: http://library.fes.de/pdf-files/bibliothek/retro-scans/a02-03539.pdf (visited on 05/09/2022).

– (2005). *Vertrauen in Deutschland. Das Wahlmanifest der SPD.* URL: http://library.fes.de/pdf-files/bibliothek/downl/040705_wahlmanifest.pdf (visited on 05/09/2022).

– (2009). *Sozial und Demokratisch. Anpacken. Für Deutschland. Das Regierungsprogramm der SPD.* URL: http://library.fes.de/prodok/ip-02016/regierungsprogramm2009_lf_navi.pdf (visited on 05/09/2022).

– (2013). *Das Wir entscheidet. Das Regierungsprogramm 2013–2017.* URL: http://library.fes.de/pdf-files/bibliothek/downl/7758779/20130415_regierungsprogramm_2013_2017.pdf (visited on 06/06/2022).

SPD-Parteivorstand (2017). *Zeit für mehr Gerechtigkeit. Unser Regierungsprogramm für Deutschland.* URL: http://library.fes.de/pdf-files/bibliothek/downl/zeit_fuer_mehr_gerechtigkeit-unser_regierungsprogramm.pdf (visited on 06/06/2022).

– (2021). *Aus Respekt vor Deiner Zukunft. Das Zukunftsprogramm der SPD.* URL: https://www.spd.de/fileadmin/Dokumente/Beschluesse/Programm/SPD-Zukunftsprogramm.pdf (visited on 06/10/2022).

Stiglitz, Joseph E (1982). "Self-selection and Pareto efficient taxation". In: *Journal of Public Economics* 17.2, pp. 213–240.

Wartena, Christian (2019). "A probabilistic morphology model for German lemmatization". In: *Proceedings of the 15th Conference on Natural Language Processing (KONVENS 2019)*, pp. 40–49.

Werning, Iván (2007). *Pareto efficient income taxation*. Unpublished. mimeo, MIT.

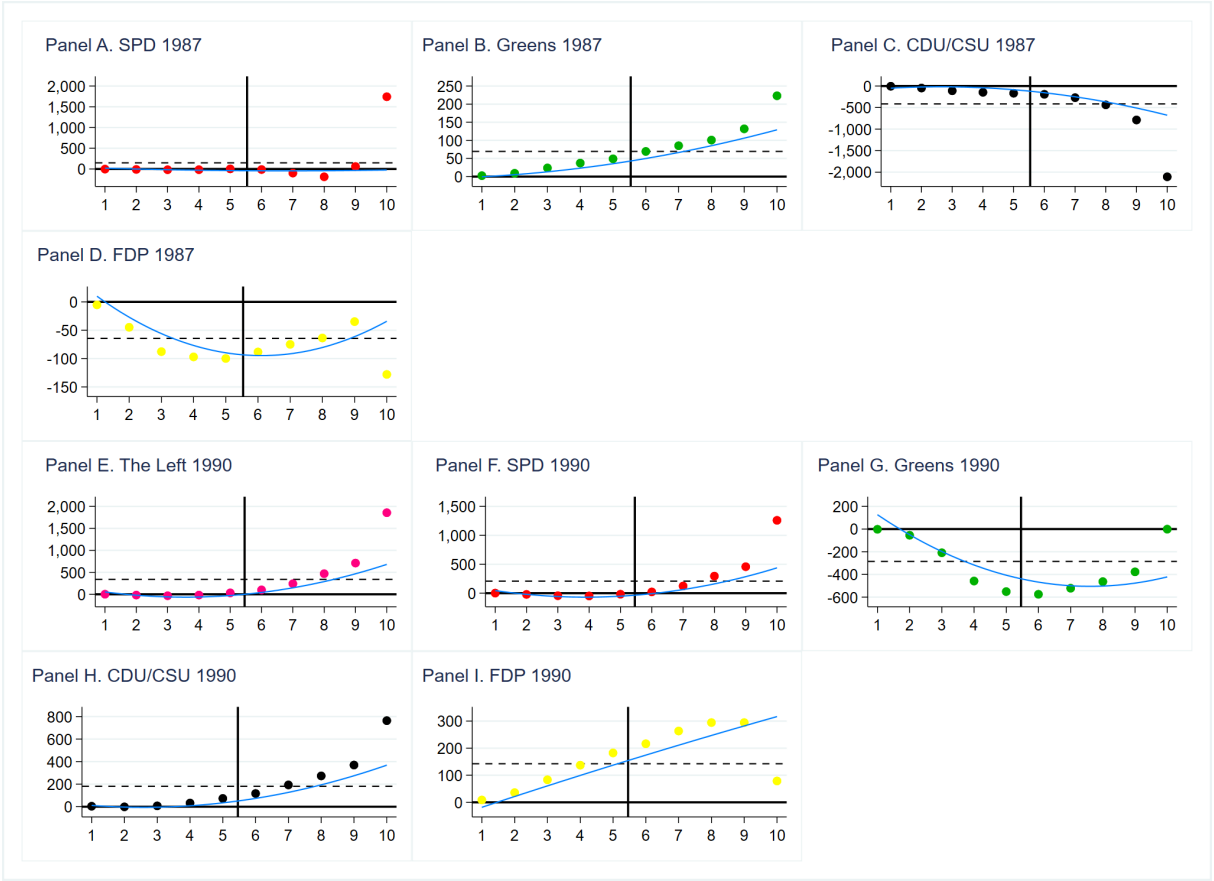
A Appendix

A.1 Monotonicity

Figure 11: Monotonicity of tax reform proposals, 1987–2021

Notes: This figure illustrates the average value of the counterfactual change in tax liability $T_1(\hat{y}_0^i) - T_0(y_0^i)$ per income decile for reforms of the German income tax system proposed by the five main German parties prior to the federal elections from 1987 to 2021. The horizontal dashed lines indicate the respective reform's mean revenue effect (the revenue-neutral benchmark), i.e. the average of $T_1(\hat{y}_0^i) - T_0(y_0^i)$ over all individuals, in the associated color of the respective party (The Left = pink, SPD = red, Greens = green, CDU/CSU = black, FDP = yellow). The dots illustrating the decile averages are likewise painted in the associated color of the respective party. To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. Deciles are computed based on pretax income without capital income. The taxable income includes capital income. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 12: Monotonicity of tax reform proposals 1987 and 1990



Notes: This figure illustrates the average value of the counterfactual change in tax liability $T_1(\hat{y}_0^i) - T_0(y_0^i)$ per income decile for reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 1987 and 1990. The blue line is a quadratic fit based on the underlying microdata. The horizontal dashed line indicates the reform's mean revenue effect (the revenue-neutral benchmark), i.e. the average of $T_1(\hat{y}_0^i) - T_0(y_0^i)$ over all individuals. The dots illustrating the decile averages are painted in the associated color of the respective party. To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. Deciles are computed based on pretax income without capital income. The taxable income includes capital income. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 13: Monotonicity of tax reform proposals 1994 and 2002

Notes: This figure illustrates the average value of the counterfactual change in tax liability $T_1(\hat{y}_0^i) - T_0(y_0^i)$ per income decile for reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 1994 and 2002. The blue line is a quadratic fit based on the underlying microdata. The horizontal dashed line indicates the reform's mean revenue effect (the revenue-neutral benchmark), i.e. the average of $T_1(\hat{y}_0^i) - T_0(y_0^i)$ over all individuals. The dots illustrating the decile averages are painted in the associated color of the respective party. To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. Deciles are computed based on pretax income without capital income. The taxable income includes capital income. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income.
Source: Author's calculations based on ifo Microsimulation Model.

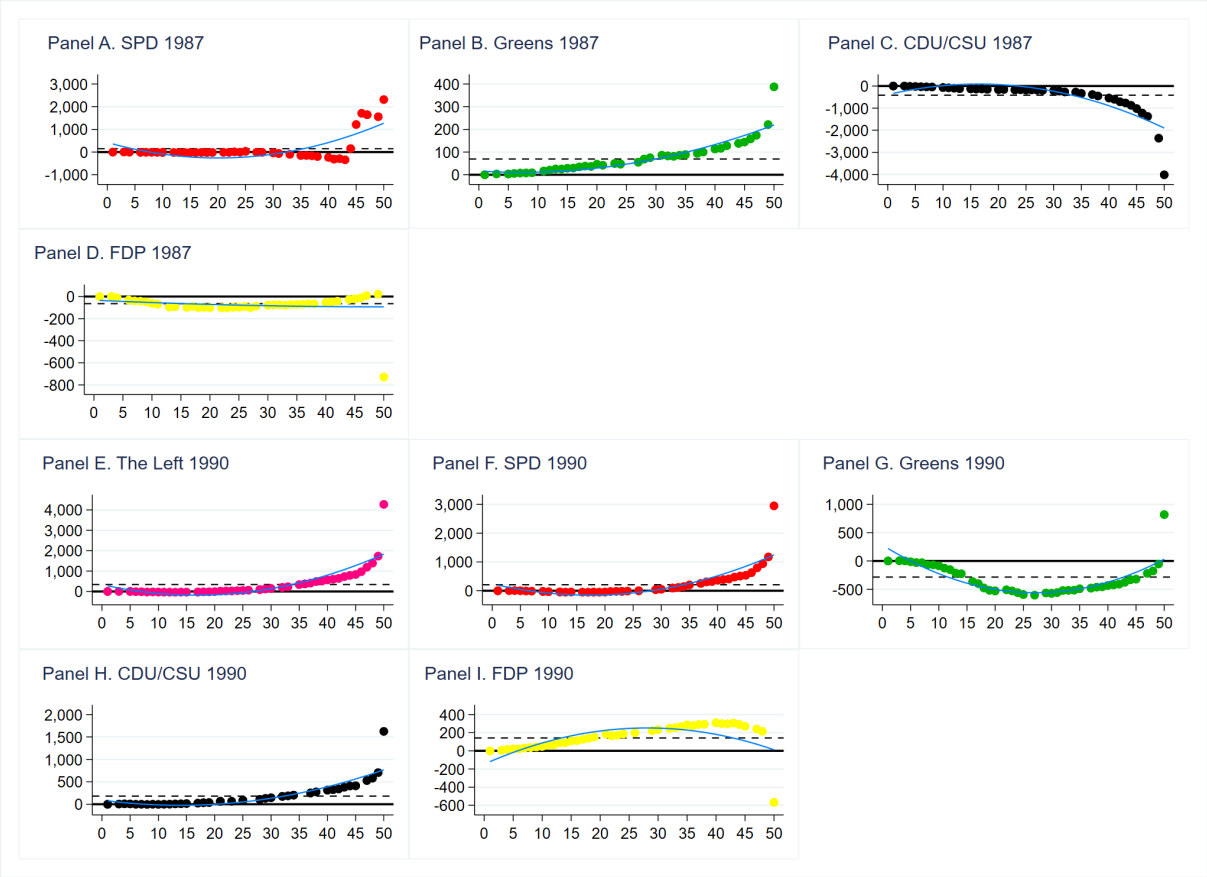
Figure 14: Monotonicity of tax reform proposals 2005 and 2013

Notes: This figure illustrates the average value of the counterfactual change in tax liability $T_1(\hat{y}_0^i) - T_0(y_0^i)$ per income decile for reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 2005 and 2013. The blue line is a quadratic fit based on the underlying microdata. The horizontal dashed line indicates the reform's mean revenue effect (the revenue-neutral benchmark), i.e. the average of $T_1(\hat{y}_0^i) - T_0(y_0^i)$ over all individuals. The dots illustrating the decile averages are painted in the associated color of the respective party. To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. Deciles are computed based on pretax income without capital income. The taxable income includes capital income. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 15: Monotonicity of tax reform proposals 2017 and 2021

Notes: This figure illustrates the average value of the counterfactual change in tax liability $T_1(\hat{y}_0^i) - T_0(y_0^i)$ per income decile for reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 2017 and 2021. The blue line is a quadratic fit based on the underlying microdata. The horizontal dashed line indicates the reform's mean revenue effect (the revenue-neutral benchmark), i.e. the average of $T_1(\hat{y}_0^i) - T_0(y_0^i)$ over all individuals. The dots illustrating the decile averages are painted in the associated color of the respective party. To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. Deciles are computed based on pretax income without capital income. The taxable income includes capital income. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 16: Monotonicity of tax reform proposals 1987 and 1990



Notes: This figure illustrates the average value of the counterfactual change in tax liability $T_1(\hat{y}_0^i) - T_0(y_0^i)$ for 50 bins of the income distribution for reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 1987 and 1990. The blue line is a quadratic fit based on the underlying microdata. The horizontal dashed line indicates the reform's mean revenue effect (the revenue-neutral benchmark), i.e. the average of $T_1(\hat{y}_0^i) - T_0(y_0^i)$ over all individuals. The dots illustrating the bin averages are painted in the associated color of the respective party. To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. Bins are computed based on pretax income without capital income. The taxable income includes capital income. All computations are scaled to the individual level. The income of married couples is split equally among spouses.
Source: Author's calculations based on ifo Microsimulation Model.

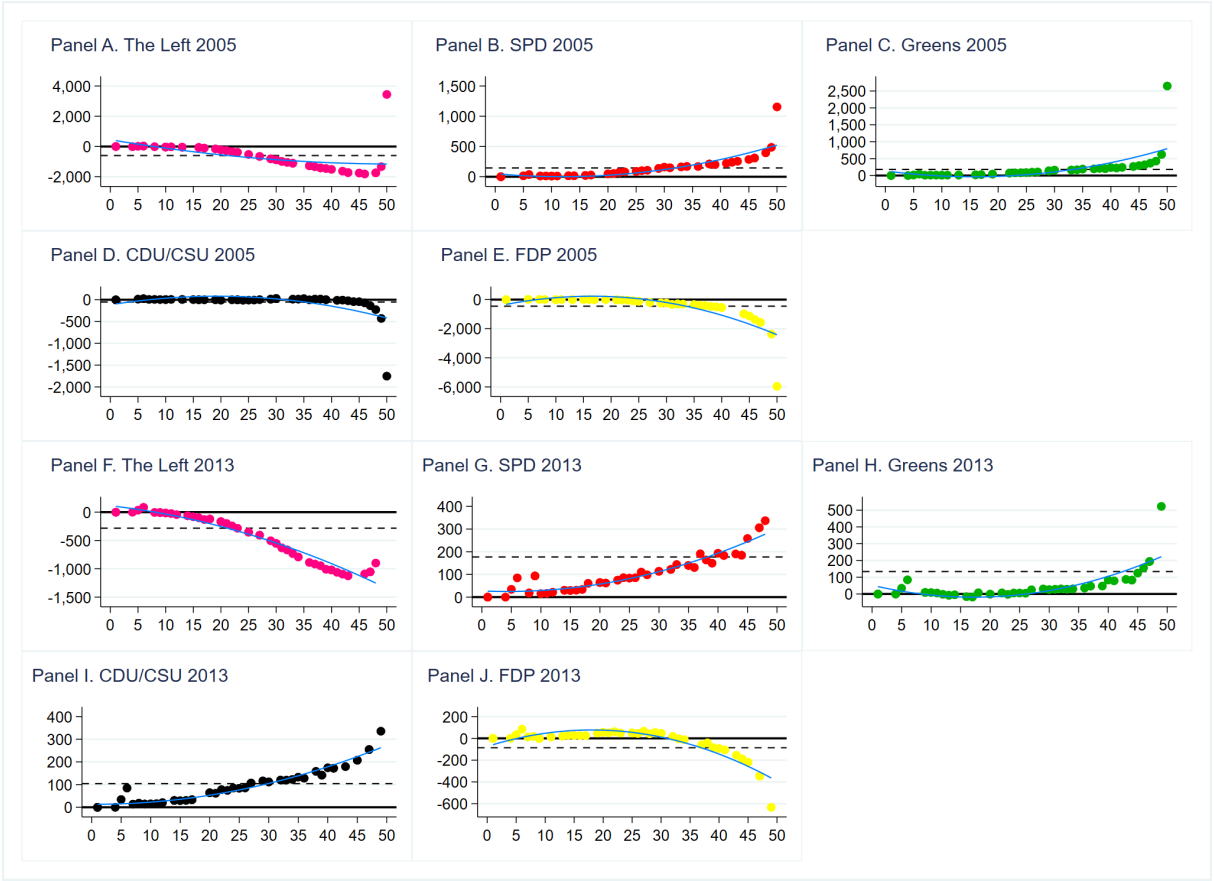
Figure 17: Monotonicity of tax reform proposals 1994 and 2002

Notes: This figure illustrates the average value of the counterfactual change in tax liability $T_1(\hat{y}_0^i) - T_0(y_0^i)$ for 50 bins of the income distribution for reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 1994 and 2002. The blue line is a quadratic fit based on the underlying microdata. The horizontal dashed line indicates the reform's mean revenue effect (the revenue-neutral benchmark), i.e. the average of $T_1(\hat{y}_0^i) - T_0(y_0^i)$ over all individuals. The dots illustrating the bin averages are painted in the associated color of the respective party. To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. Bins are computed based on pretax income without capital income. The taxable income includes capital income. All computations are scaled to the individual level. The income of married couples is split equally among spouses.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 18: Monotonicity of tax reform proposals 1998 and 2009

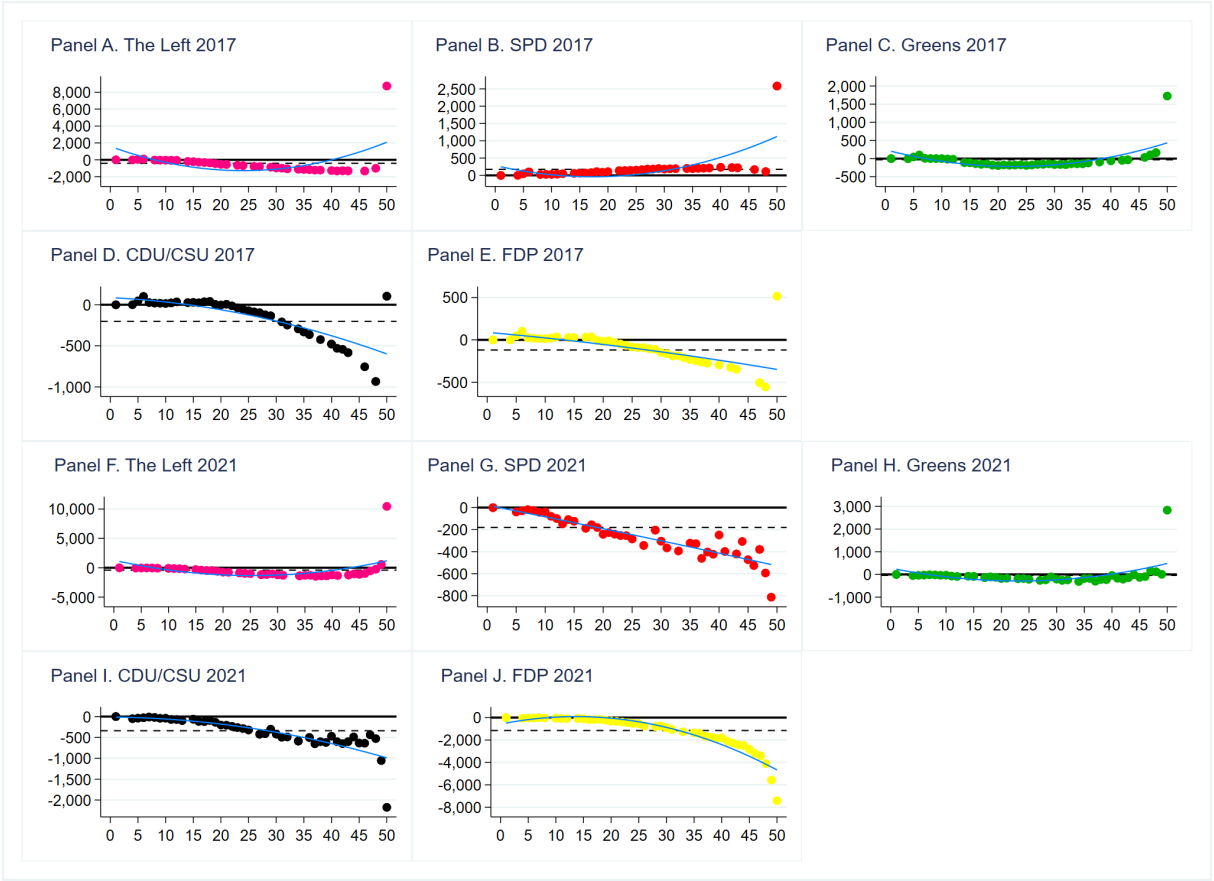
Notes: This figure illustrates the average value of the counterfactual change in tax liability $T_1(\hat{y}_0^i) - T_0(y_0^i)$ for 50 bins of the income distribution for reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 1998 and 2009. The blue line is a quadratic fit based on the underlying microdata. The horizontal dashed line indicates the reform's mean revenue effect (the revenue-neutral benchmark), i.e. the average of $T_1(\hat{y}_0^i) - T_0(y_0^i)$ over all individuals. The dots illustrating the bin averages are painted in the associated color of the respective party. To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. Bins are computed based on pretax income without capital income. The taxable income includes capital income. All computations are scaled to the individual level. The income of married couples is split equally among spouses.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 19: Monotonicity of tax reform proposals 2005 and 2013



Notes: This figure illustrates the average value of the counterfactual change in tax liability $T_1(\hat{y}_0^i) - T_0(y_0^i)$ for 50 bins of the income distribution for reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 2005 and 2013. The blue line is a quadratic fit based on the underlying microdata. The horizontal dashed line indicates the reform's mean revenue effect (the revenue-neutral benchmark), i.e. the average of $T_1(\hat{y}_0^i) - T_0(y_0^i)$ over all individuals. The dots illustrating the bin averages are painted in the associated color of the respective party. To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. Bins are computed based on pretax income without capital income. The taxable income includes capital income. All computations are scaled to the individual level. The income of married couples is split equally among spouses.
Source: Author's calculations based on ifo Microsimulation Model.

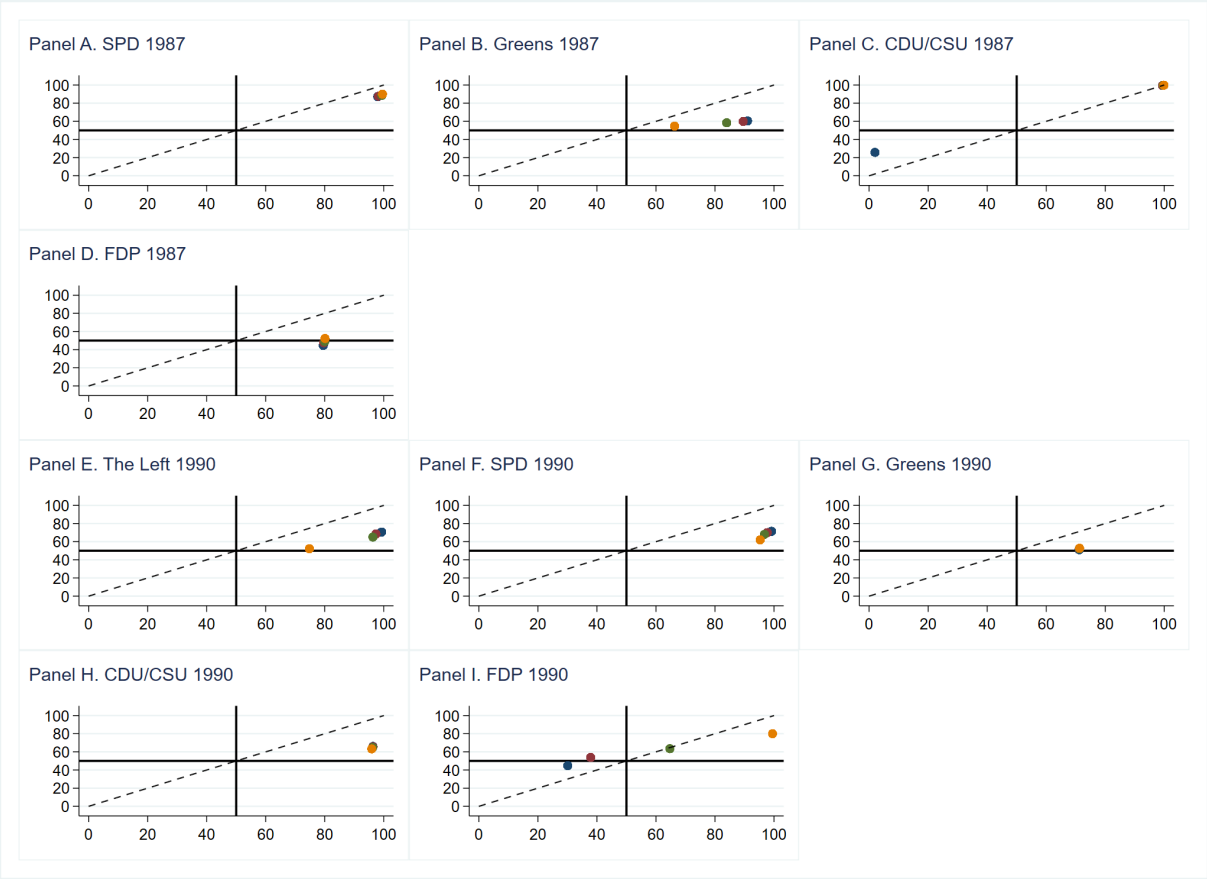
Figure 20: Monotonicity of tax reform proposals 2017 and 2021



Notes: This figure illustrates the average value of the counterfactual change in tax liability $T_1(\hat{y}_0^i) - T_0(y_0^i)$ for 50 bins of the income distribution for reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 2017 and 2021. The blue line is a quadratic fit based on the underlying microdata. The horizontal dashed line indicates the reform's mean revenue effect (the revenue-neutral benchmark), i.e. the average of $T_1(\hat{y}_0^i) - T_0(y_0^i)$ over all individuals. The dots illustrating the bin averages are painted in the associated color of the respective party. To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. Bins are computed based on pretax income without capital income. The taxable income includes capital income. All computations are scaled to the individual level. The income of married couples is split equally among spouses.
Source: Author's calculations based on ifo Microsimulation Model.

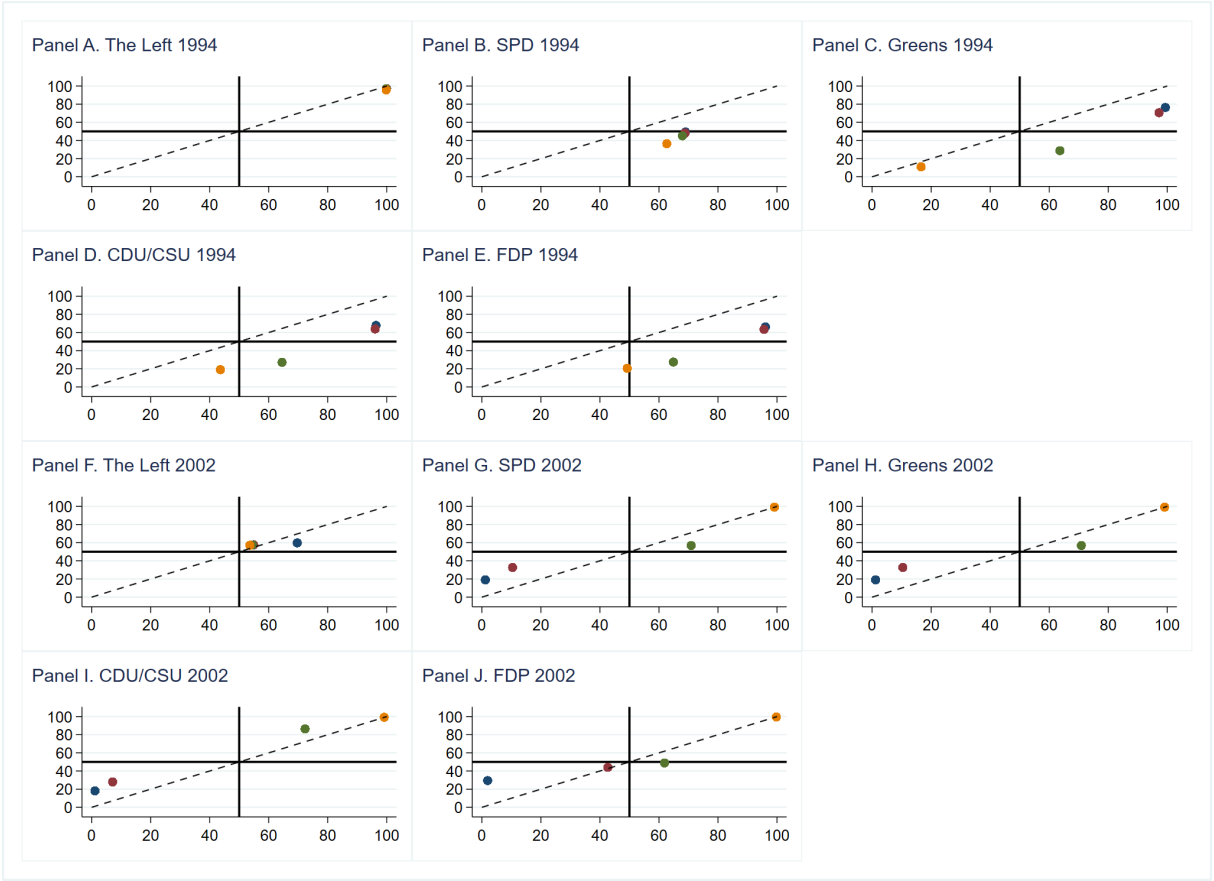
A.2 Median Voter Property

Figure 21: Alignment of median voter support and majority support, 1987 and 1990



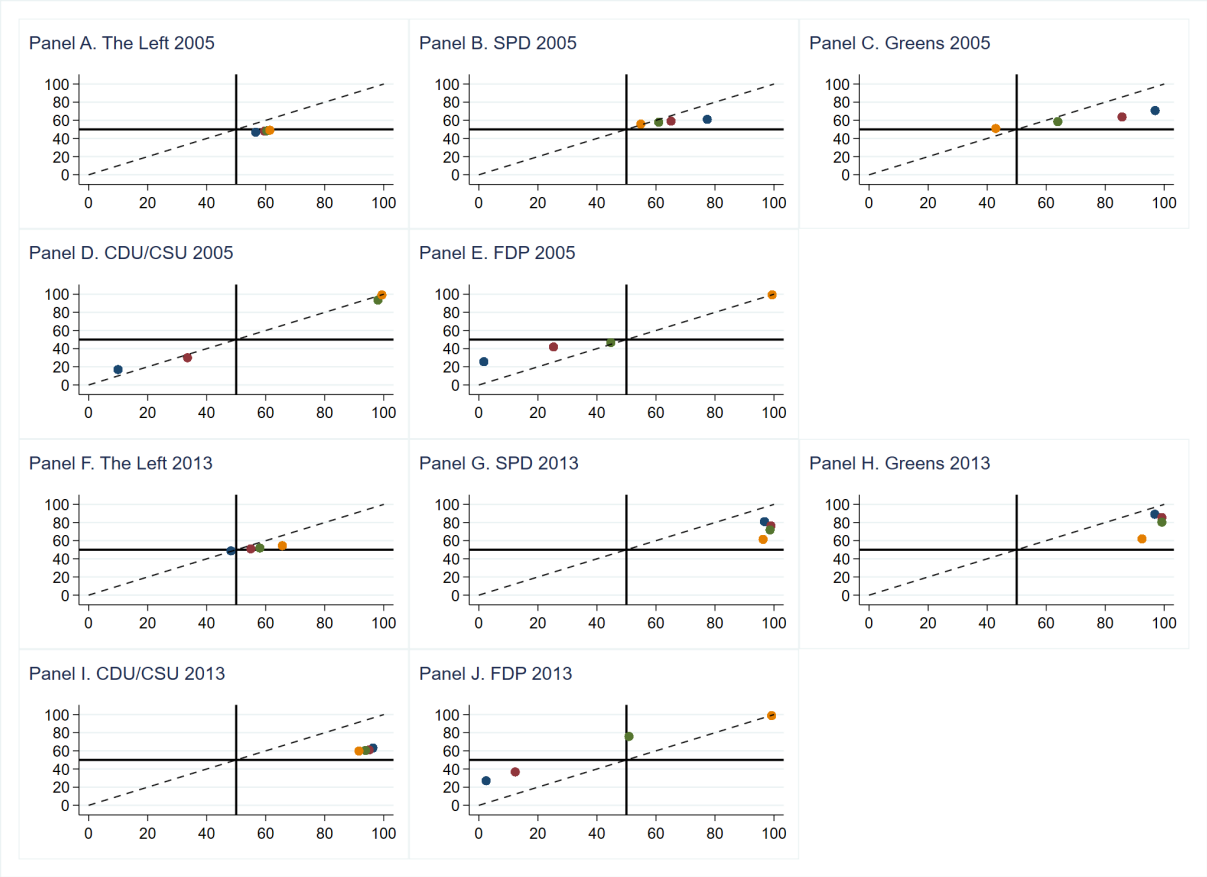
Notes: This figure depicts the fraction of winners resulting from reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 1987 and 1990 for the full population (vertical axis) and for voters close to the median voter, i.e. p45–p55 (horizontal axis). A person i is a reform winner if $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0$. The fraction of winners is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income. The dashed 45 degree line indicates an exact alignment of support among the full population and support by voters close to the median.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 22: Alignment of median voter support and majority support, 1994 and 2002



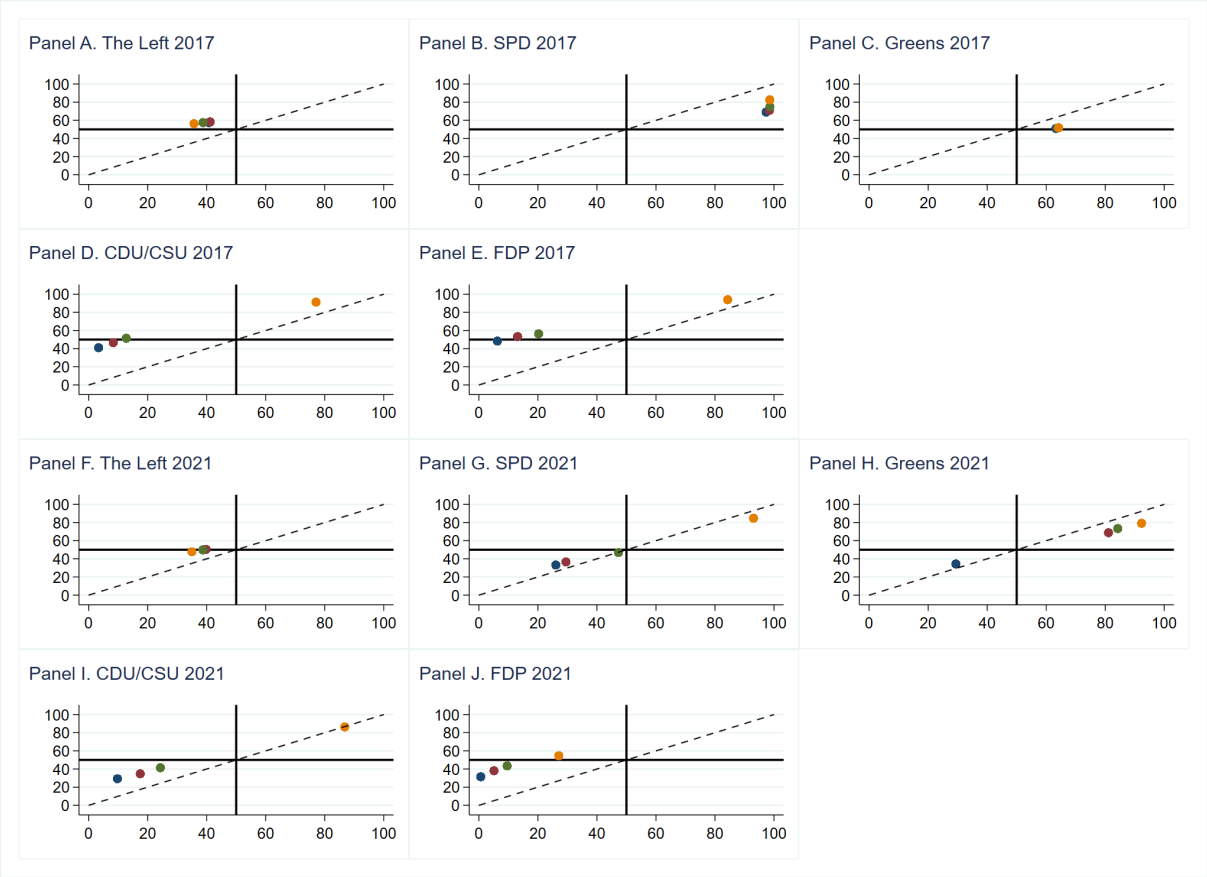
Notes: This figure depicts the fraction of winners resulting from reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 1994 and 2002 for the full population (vertical axis) and for voters close to the median voter, i.e. p45–p55 (horizontal axis). A person i is a reform winner if $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0$. The fraction of winners is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income. The dashed 45 degree line indicates an exact alignment of support among the full population and support by voters close to the median.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 23: Alignment of median voter support and majority support, 2005 and 2013



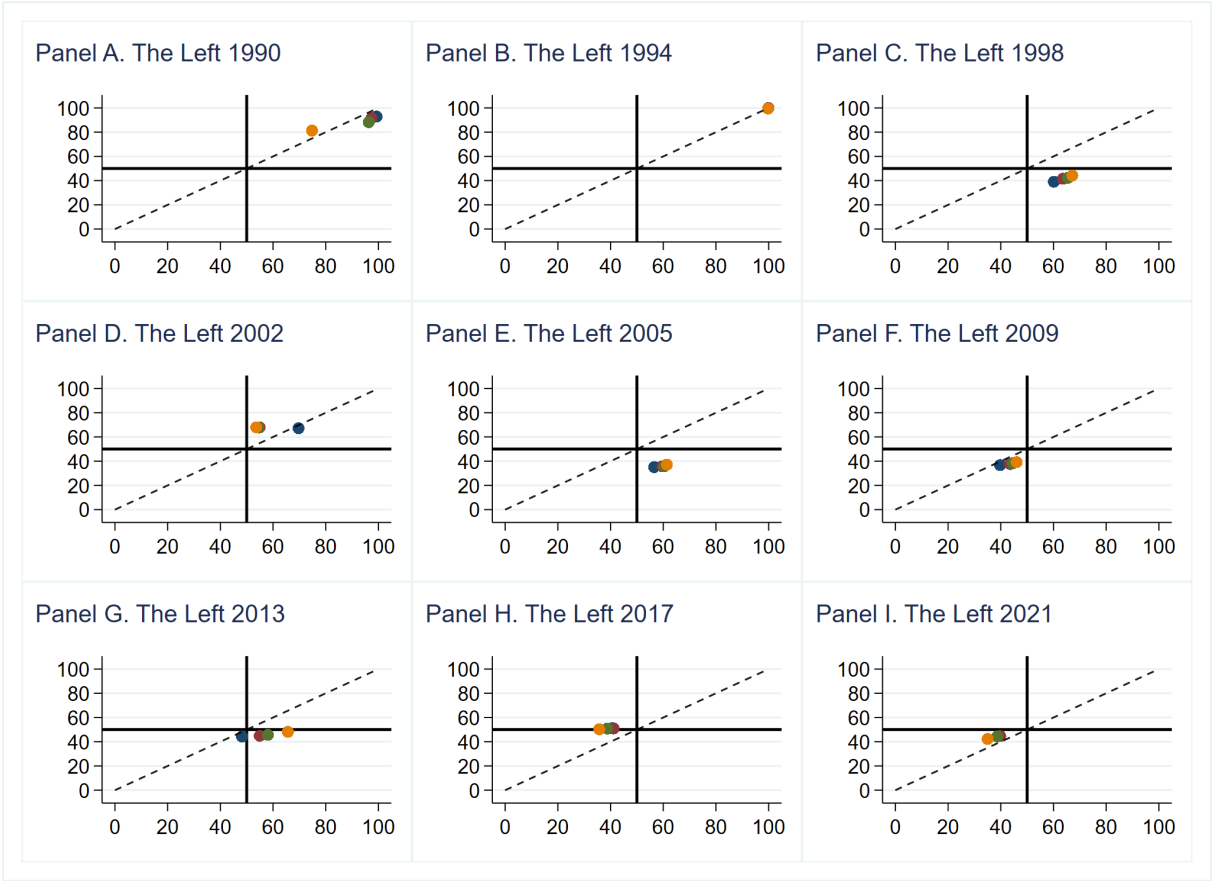
Notes: This figure depicts the fraction of winners resulting from reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 2005 and 2013 for the full population (vertical axis) and for voters close to the median voter, i.e. p45–p55 (horizontal axis). A person i is a reform winner if $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0$. The fraction of winners is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income. The dashed 45 degree line indicates an exact alignment of support among the full population and support by voters close to the median.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 24: Alignment of median voter support and majority support, 2017 and 2021



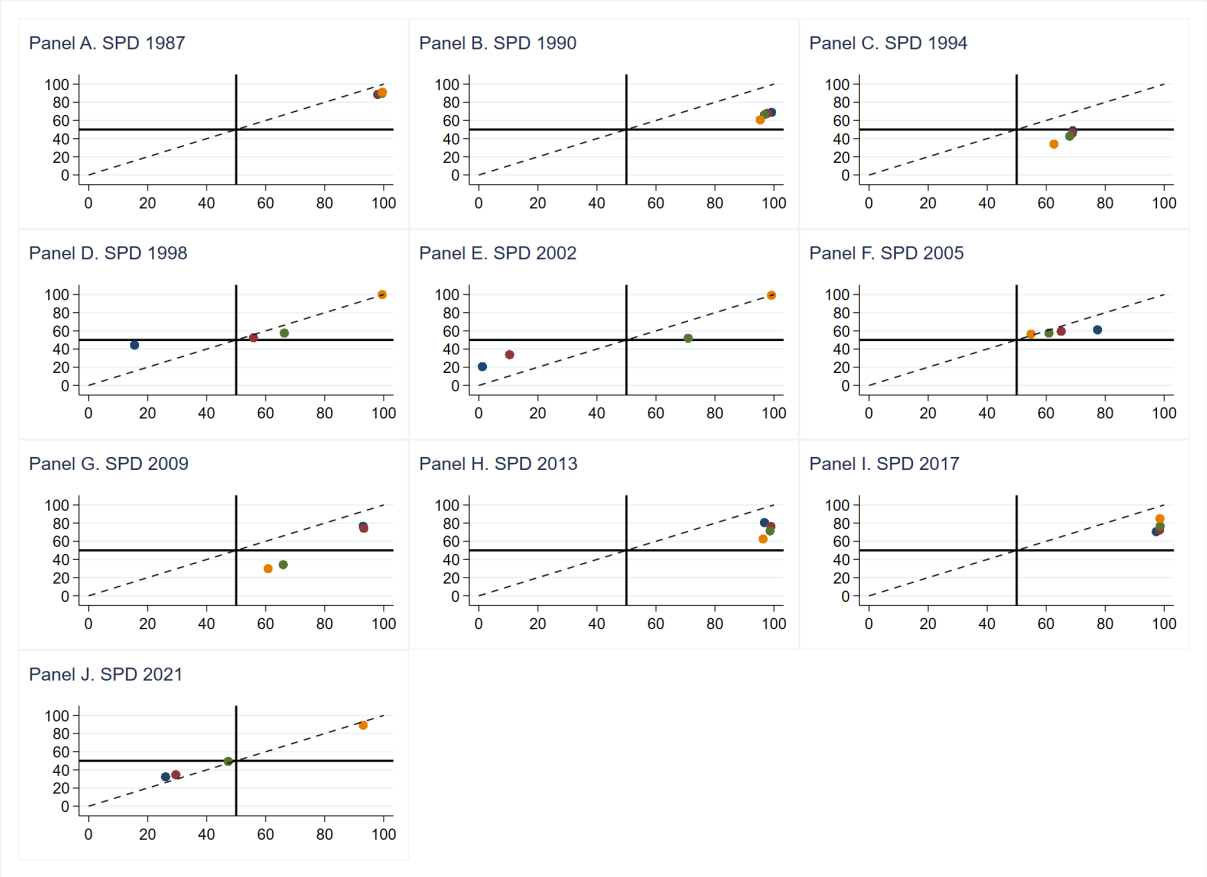
Notes: This figure depicts the fraction of winners resulting from reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 2017 and 2021 for the full population (vertical axis) and for voters close to the median voter, i.e. p45–p55 (horizontal axis). A person i is a reform winner if $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0$. The fraction of winners is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income. The dashed 45 degree line indicates an exact alignment of support among the full population and support by voters close to the median.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 25: Alignment of median voter support (full population) and majority support (The Left electorate)



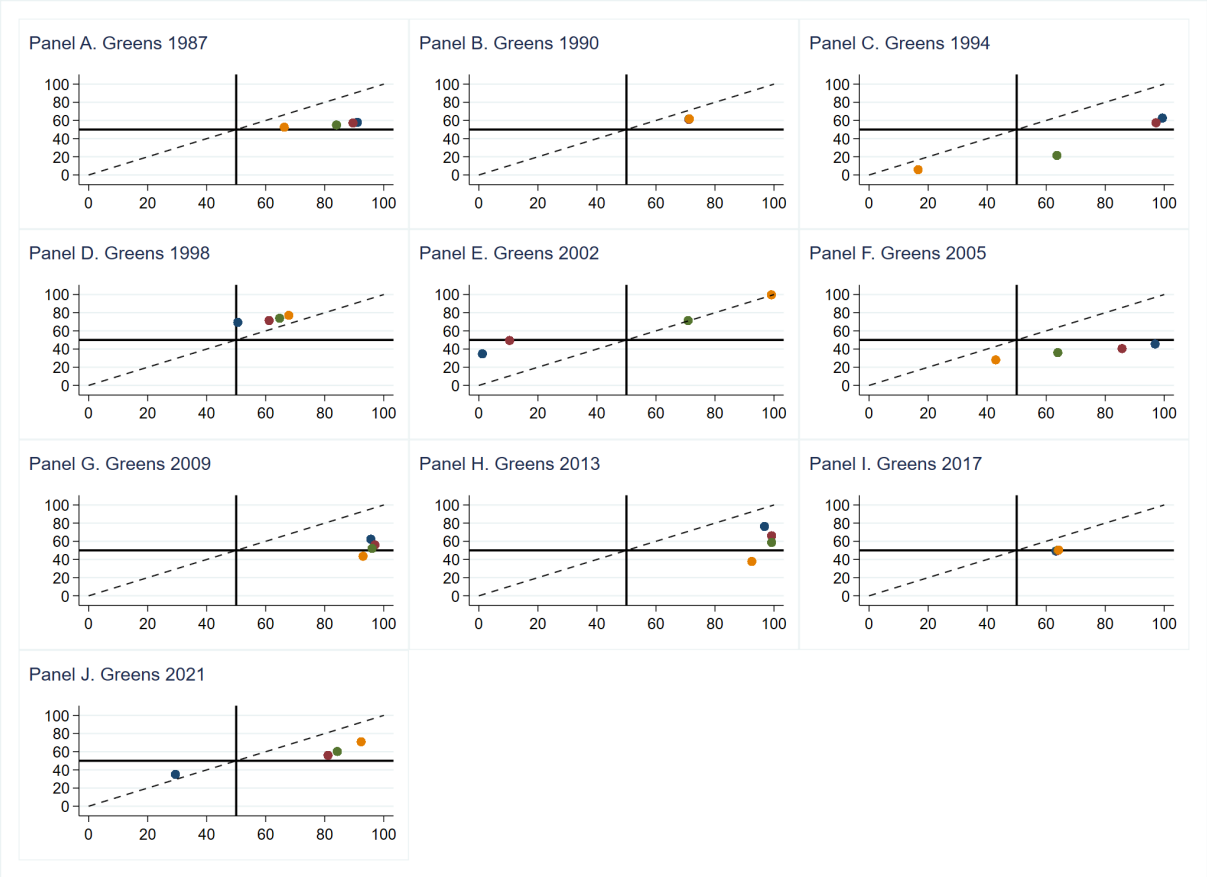
Notes: This figure depicts the fraction of winners from reforms of the German income tax system proposed by The Left prior to federal elections for voters of The Left (vertical axis) and for voters close to the median voter, i.e. p45–p55 (horizontal axis). A person i is a reform winner if $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1^i), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0$. The fraction of winners is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income. The dashed 45 degree line indicates an exact alignment of support among The Left voters and support by voters close to the median.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 26: Alignment of median voter support (full population) and majority support (SPD electorate)



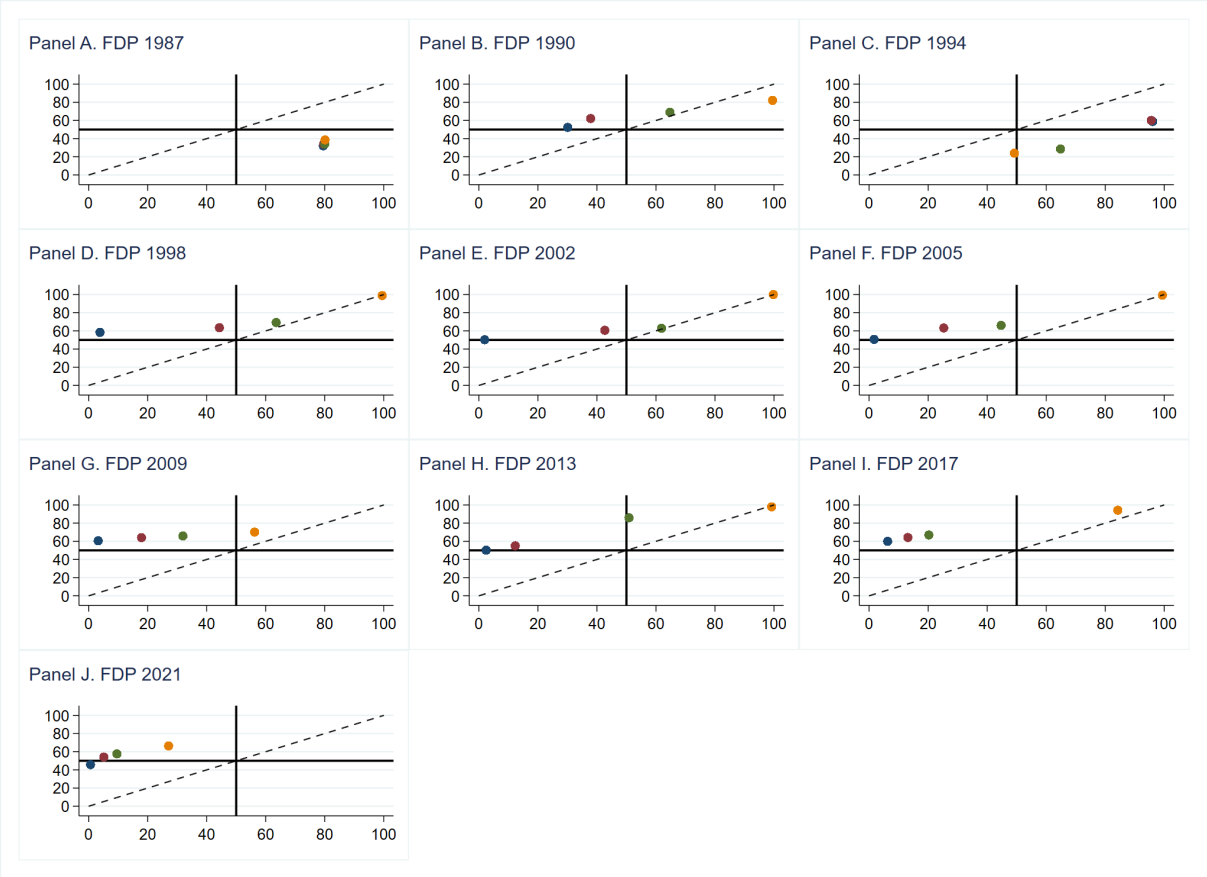
Notes: This figure depicts the fraction of winners from reforms of the German income tax system proposed by the SPD prior to federal elections for SPD voters (vertical axis) and for voters close to the median voter, i.e. p45–p55 (horizontal axis). A person i is a reform winner if $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1^i), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0$. The fraction of winners is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income. The dashed 45 degree line indicates an exact alignment of support among SPD voters and support by voters close to the median.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 27: Alignment of median voter support (full population) and majority support (Greens electorate)



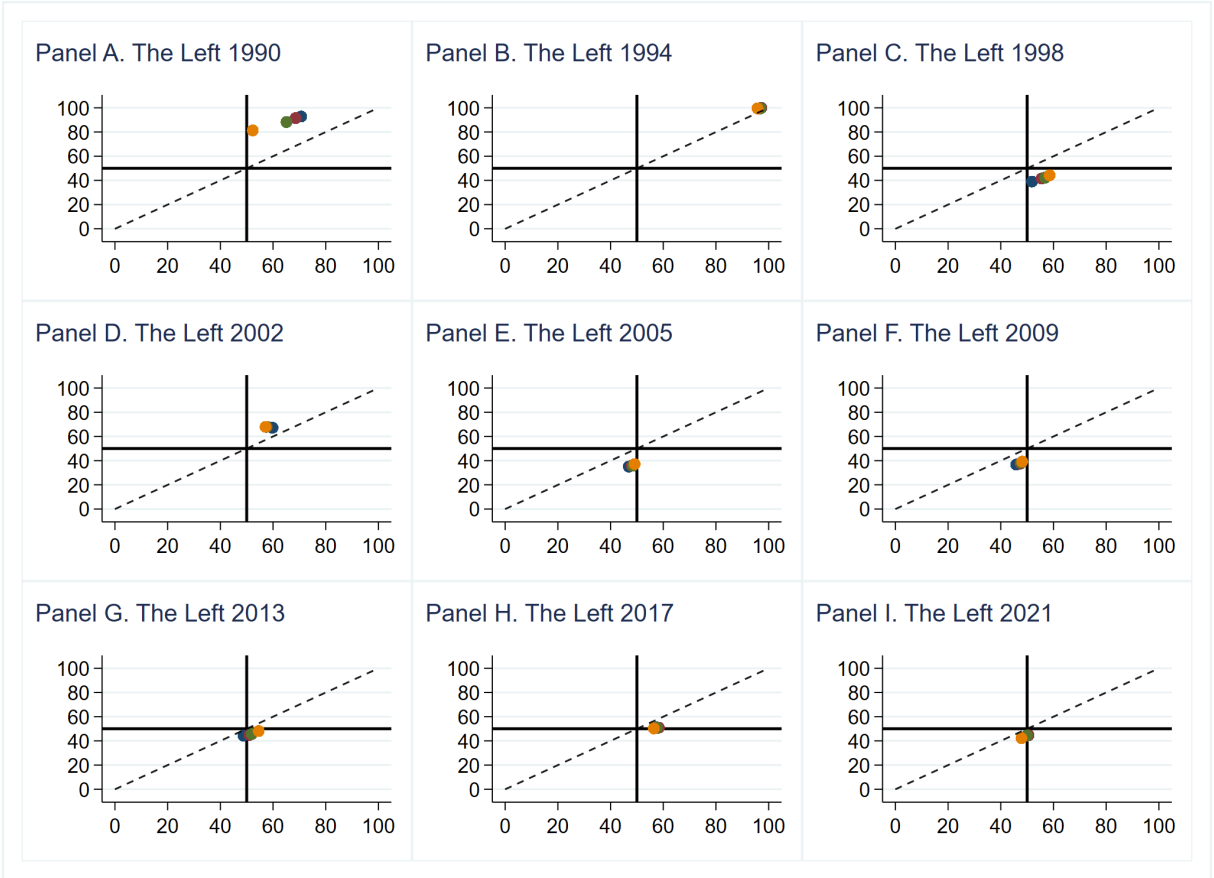
Notes: This figure depicts the fraction of winners from reforms of the German income tax system proposed by the Greens prior to federal elections for Greens voters (vertical axis) and for voters close to the median voter, i.e. p45–p55 (horizontal axis). A person i is a reform winner if $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1^i), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0$. The fraction of winners is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income. The dashed 45 degree line indicates an exact alignment of support among voters of the Greens and support by voters close to the median.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 28: Alignment of median voter support (full population) and majority support (FPD electorate)



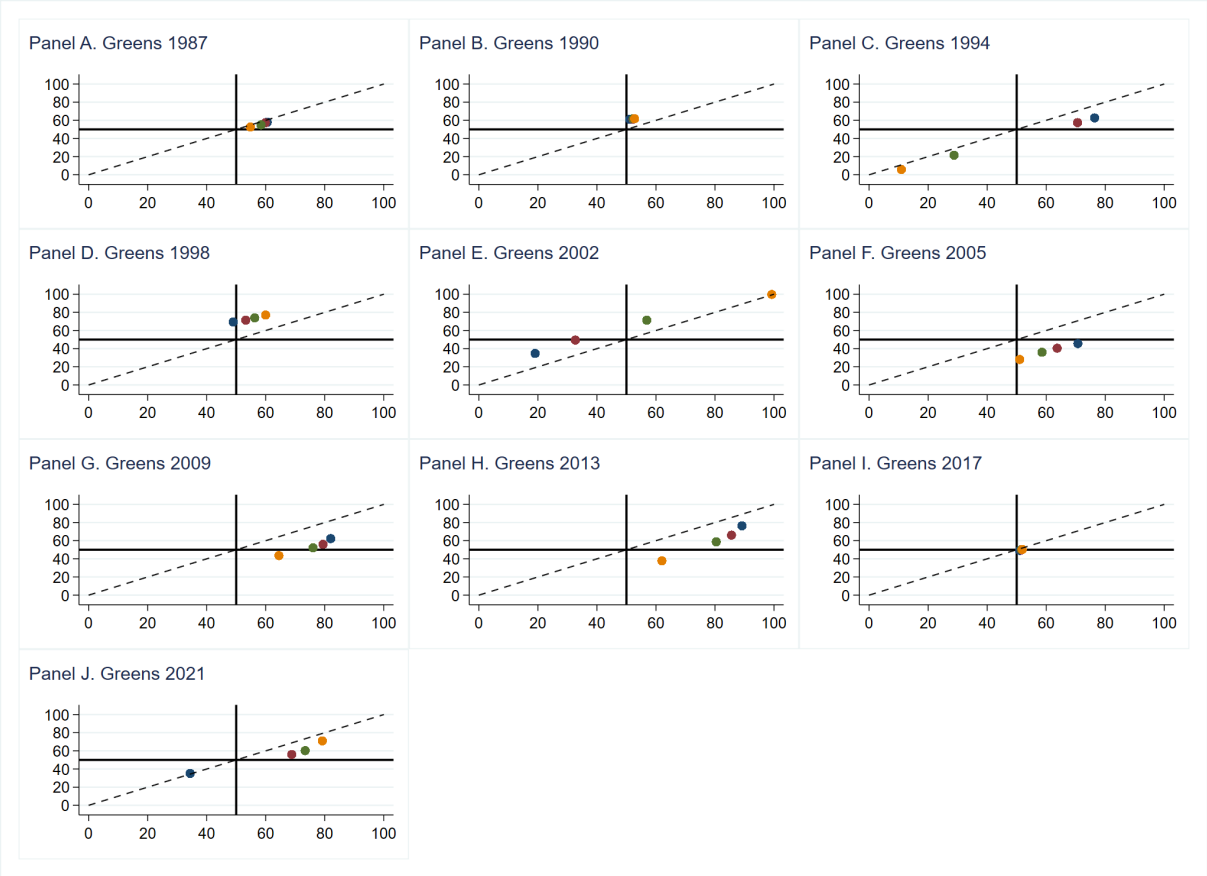
Notes: This figure depicts the fraction of winners from reforms of the German income tax system proposed by the FDP prior to federal elections for FDP voters (vertical axis) and for voters close to the median voter, i.e. p45–p55 (horizontal axis). A person i is a reform winner if $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1^i), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0$. The fraction of winners is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income. The dashed 45 degree line indicates an exact alignment of support among FDP voters and support by voters close to the median.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 29: Alignment of full population support and support by voters of The Left



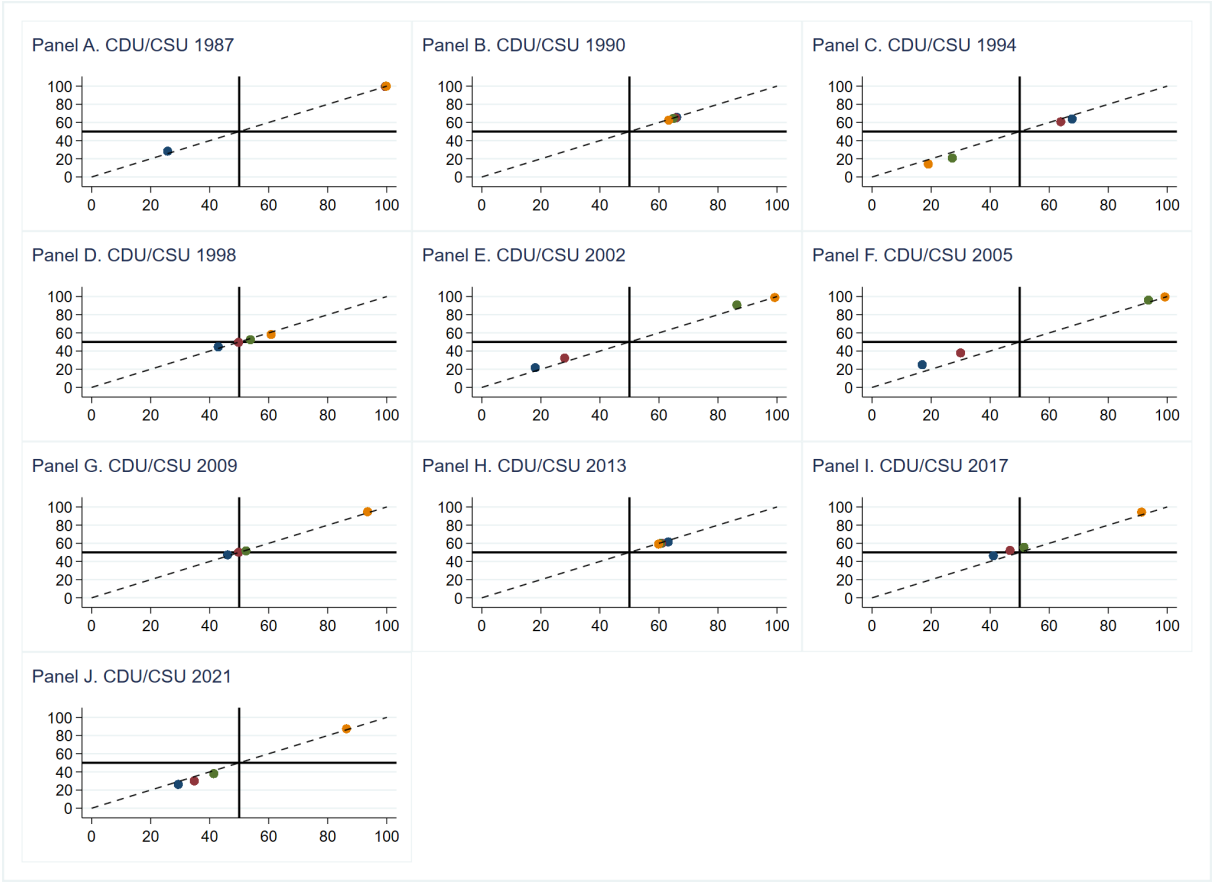
Notes: This figure depicts the fraction of winners from reforms of the German income tax system proposed by The Left prior to federal elections for voters of The Left (vertical axis) and for the full population (horizontal axis). A person i is a reform winner if $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1^i), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0$. The fraction of winners is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income. The dashed 45 degree line indicates an exact alignment of support among voters of The Left and support among the full population.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 30: Alignment of full population support and Greens voter support



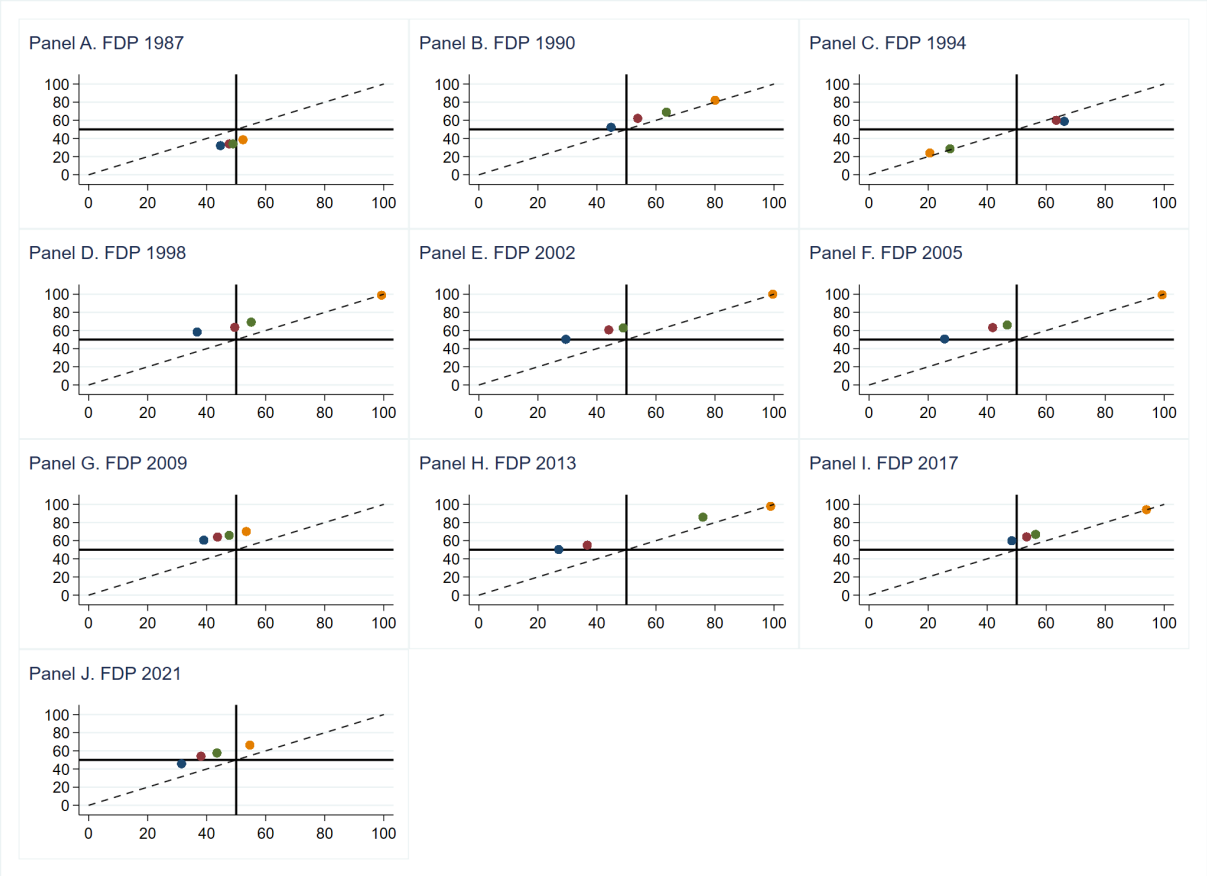
Notes: This figure depicts the fraction of winners from reforms of the German income tax system proposed by the Greens prior to federal elections for voters of the Greens (vertical axis) and for the full population (horizontal axis). A person i is a reform winner if $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1^i), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0$. The fraction of winners is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income. The dashed 45 degree line indicates an exact alignment of support among Greens voters and support among the full population.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 31: Alignment of full population support and CDU/CSU voter support



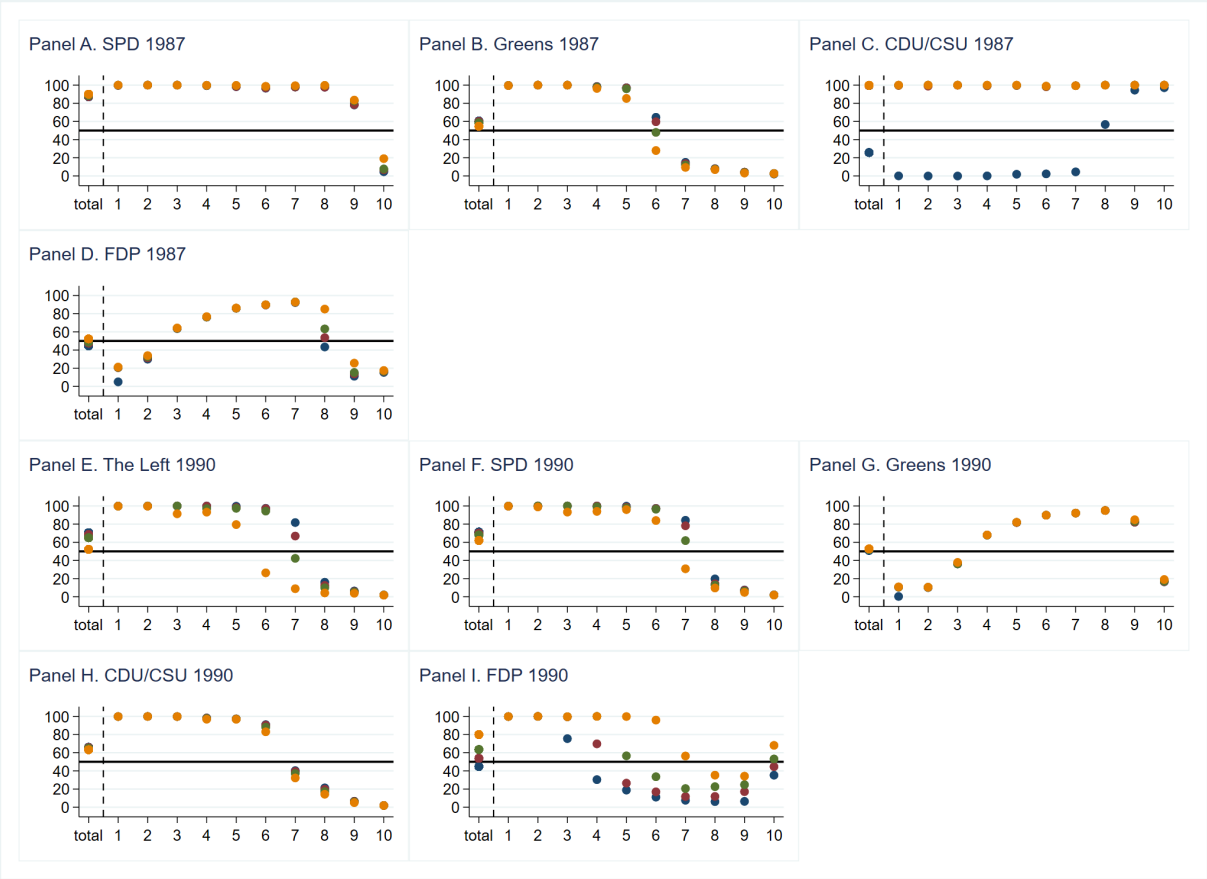
Notes: This figure depicts the fraction of winners from reforms of the German income tax system proposed by the CDU/CSU prior to federal elections for CDU/CSU voters (vertical axis) and for the full population (horizontal axis). A person i is a reform winner if $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1^i), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0$. The fraction of winners is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income. The dashed 45 degree line indicates an exact alignment of support among CDU/CSU voters and support among the full population.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 32: Alignment of full population support and FDP voter support



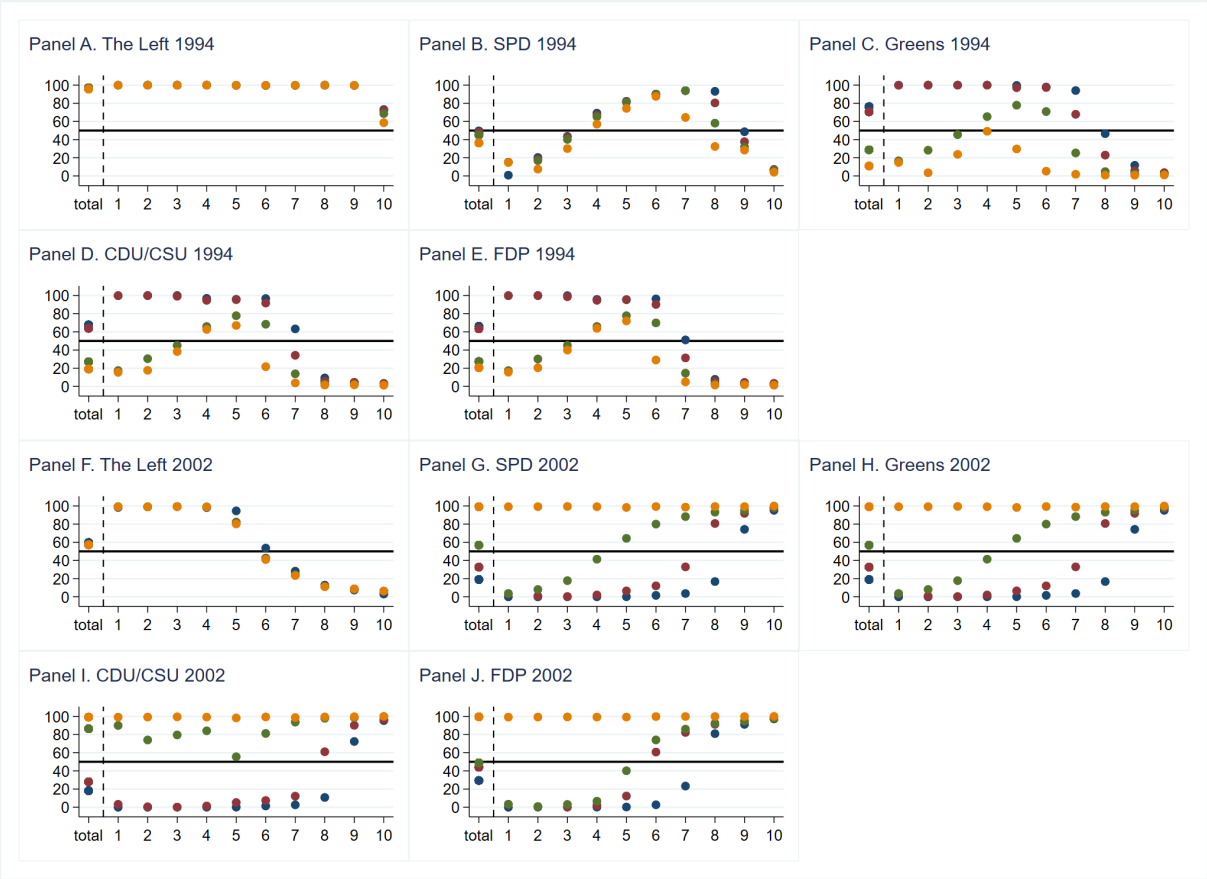
Notes: This figure depicts the fraction of winners from reforms of the German income tax system proposed by the FDP prior to federal elections for FDP voters (vertical axis) and for the full population (horizontal axis). A person i is a reform winner if $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1^i), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0$. The fraction of winners is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses. The solid vertical line represents the voter with median income. The dashed 45 degree line indicates an exact alignment of support among FDP voters and support among the full population.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 33: Share of reform winners/supporters, 1987 and 1990



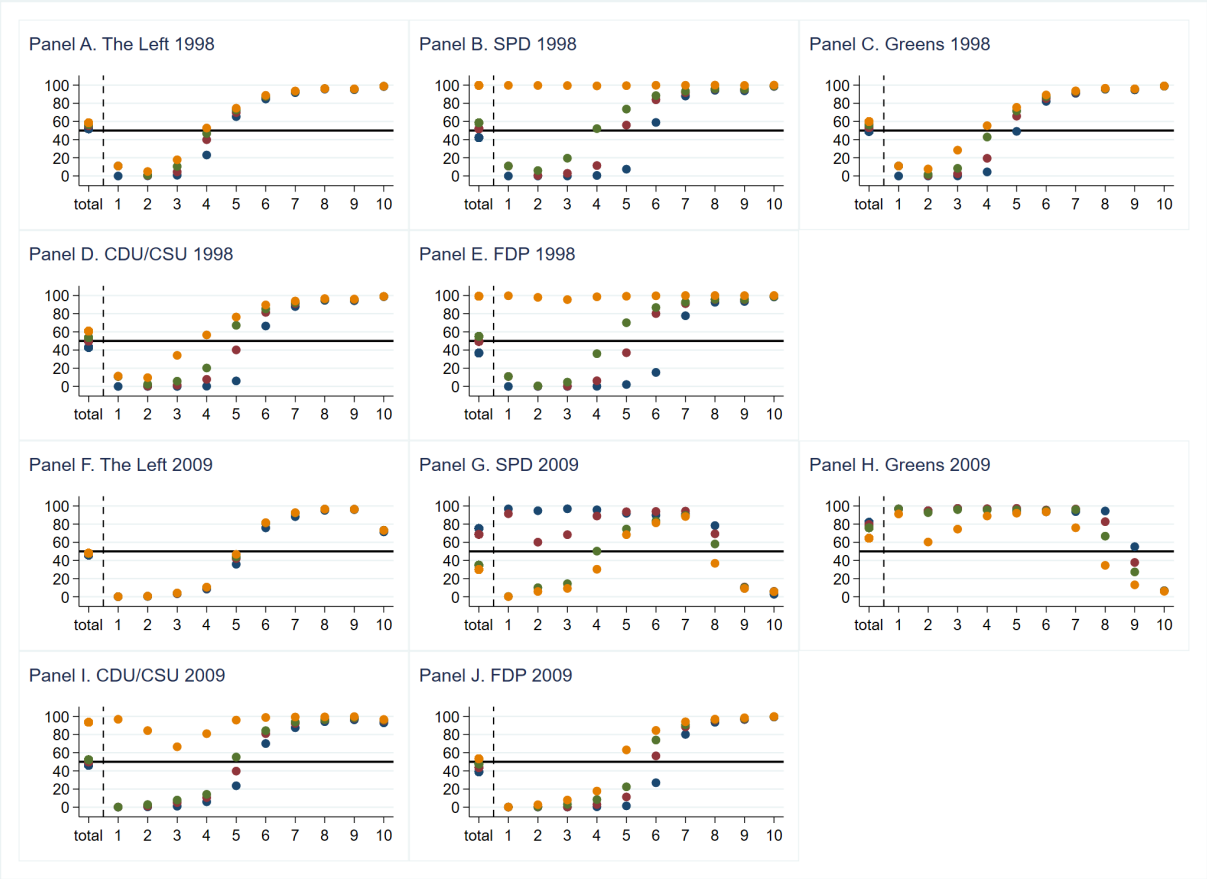
Notes: This figure depicts the fraction of winners resulting from reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 1987 and 1990 for the full population and per decile. A person i is a reform winner if $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0$. The fraction of winners is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 34: Share of reform winners/supporters, 1994 and 2002



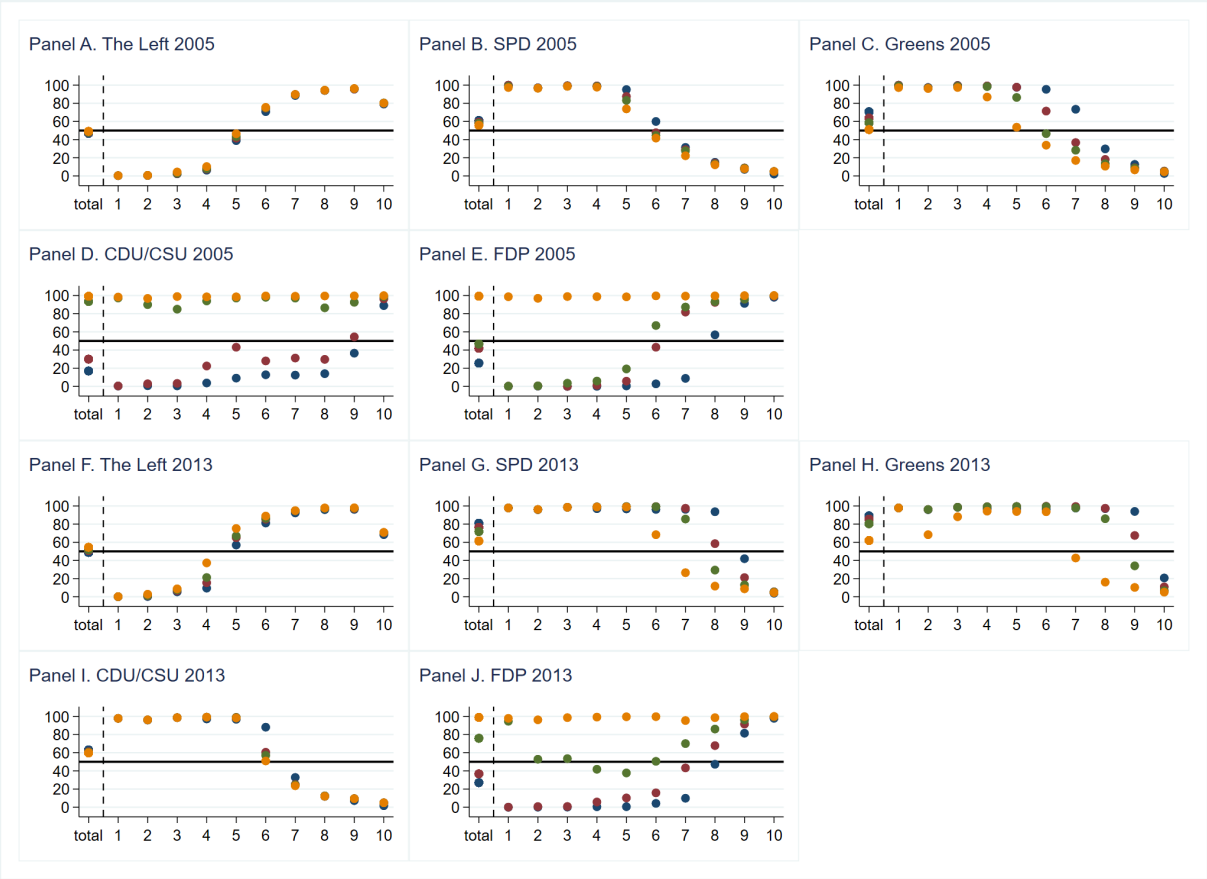
Notes: This figure depicts the fraction of winners resulting from reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 1994 and 2002 for the full population and per decile. A person i is a reform winner if $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0$. The fraction of winners is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 35: Share of reform winners/supporters, 1998 and 2009



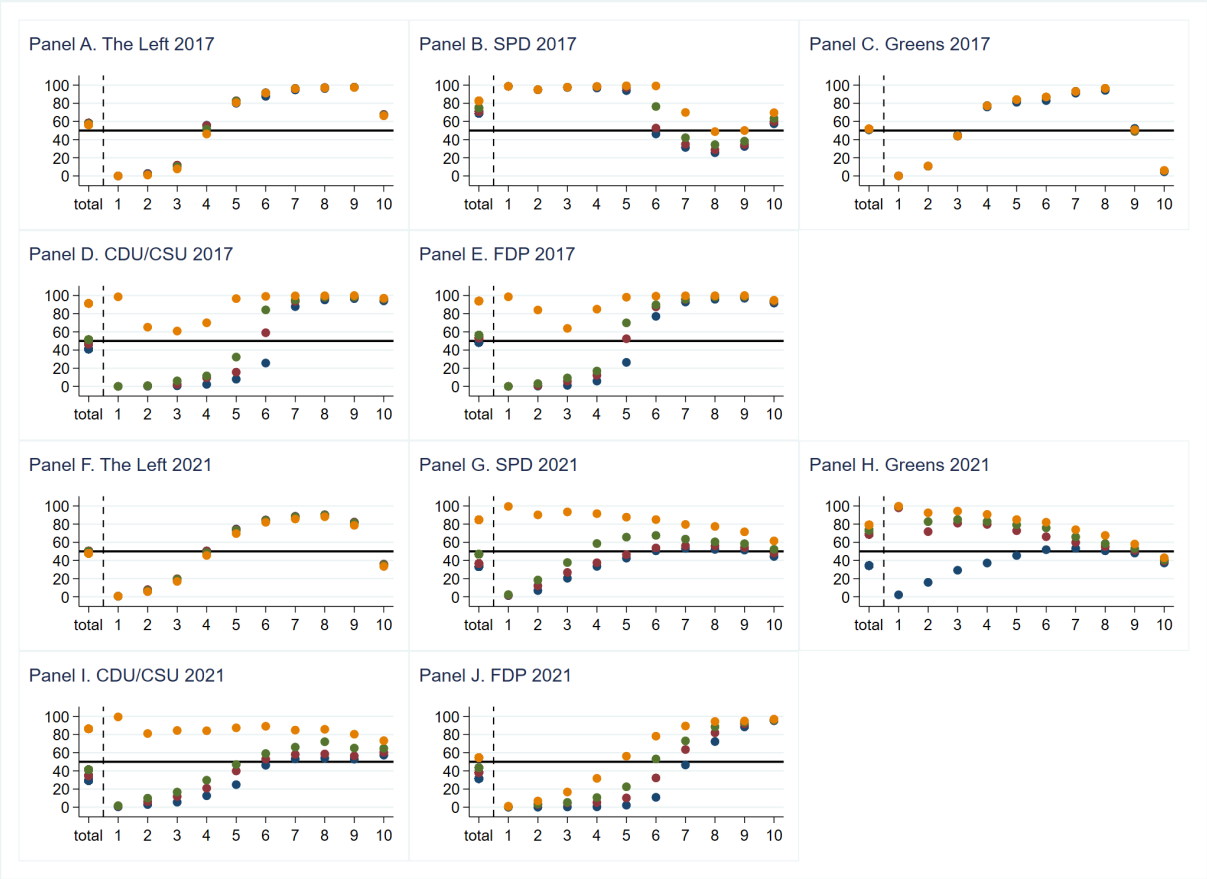
Notes: This figure depicts the fraction of winners resulting from reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 1998 and 2009 for the full population and per decile. A person i is a reform winner if $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0$. The fraction of winners is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 36: Share of reform winners/supporters, 2005 and 2013



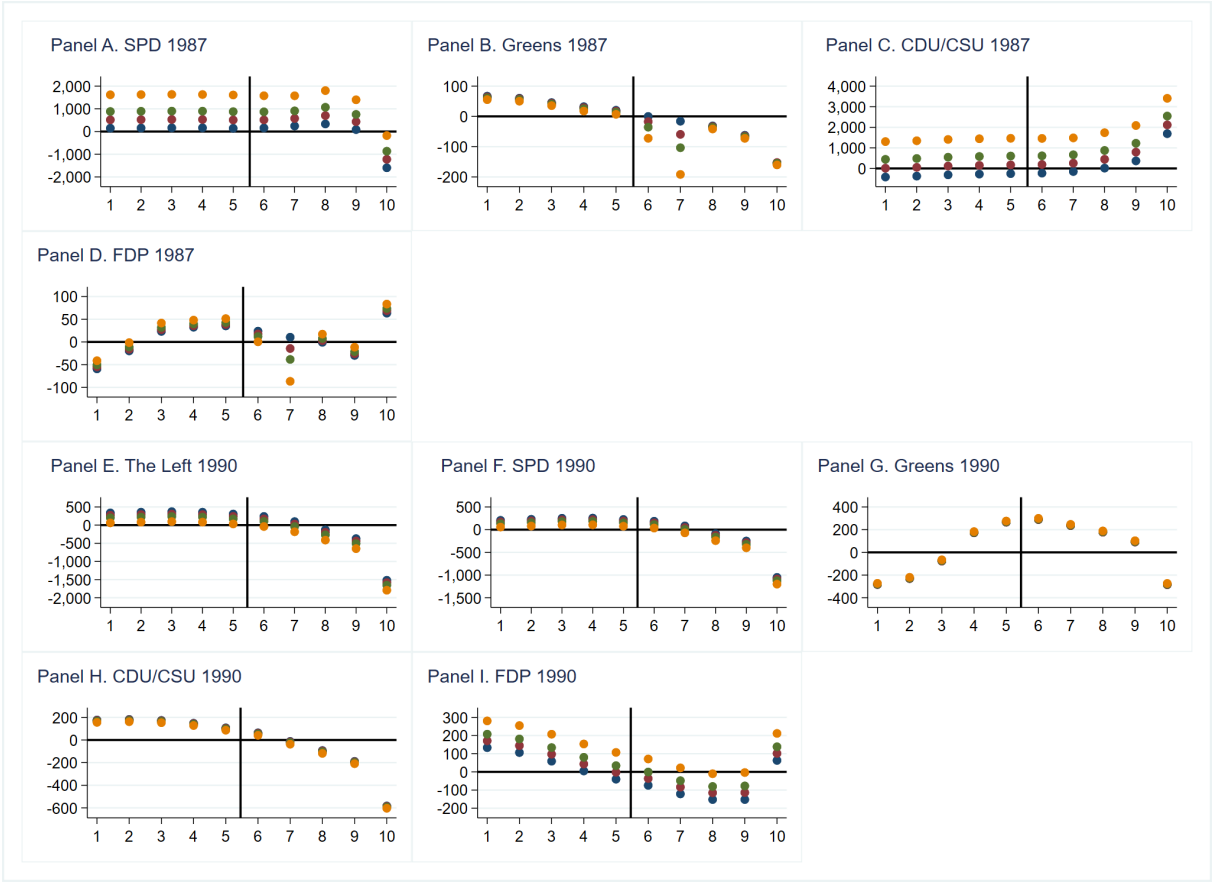
Notes: This figure depicts the fraction of winners resulting from reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 2005 and 2013 for the full population and per decile. A person i is a reform winner if $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0$. The fraction of winners is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 37: Share of reform winners/supporters, 2017 and 2021



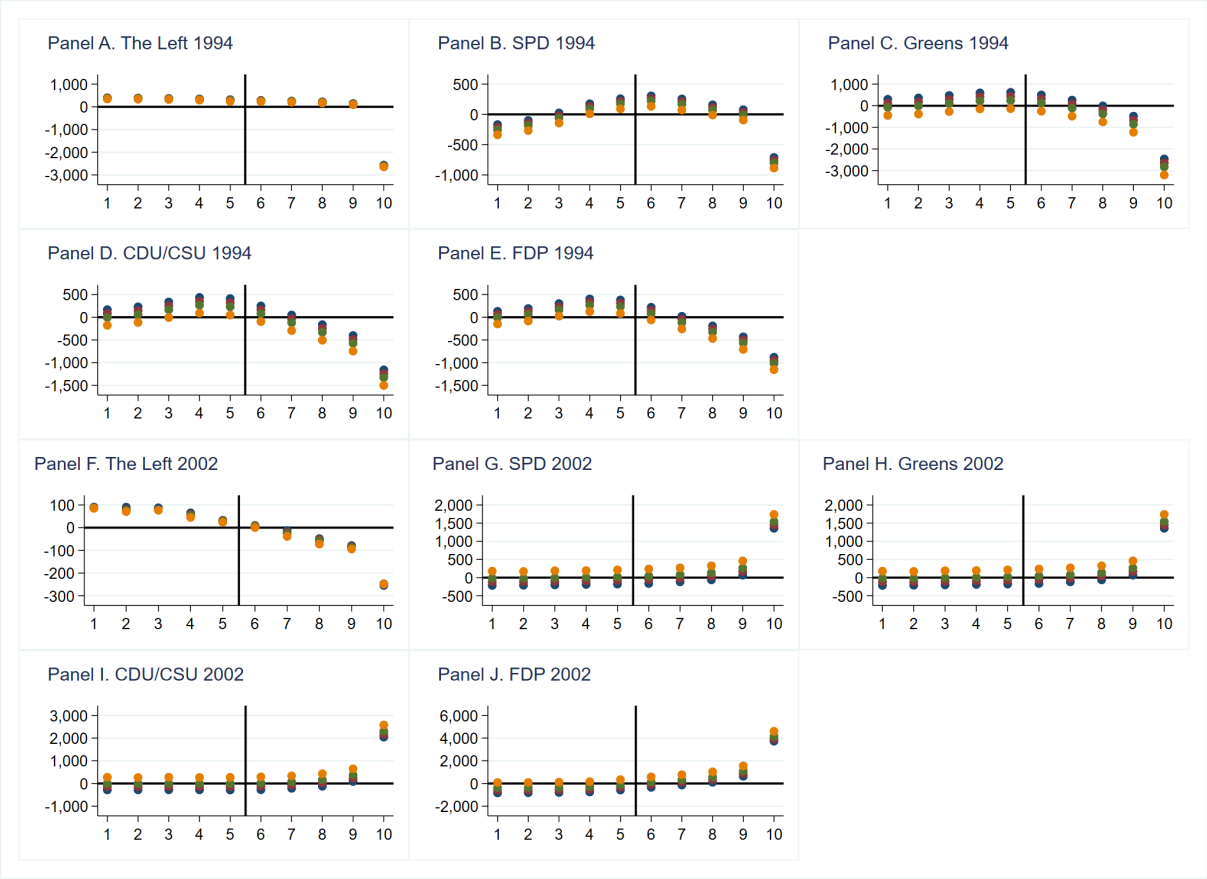
Notes: This figure depicts the fraction of winners resulting from reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 2017 and 2021 for the full population and per decile. A person i is a reform winner if $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1), T_1(\hat{y}_0^i) - T_0(y_0^i)\} \geq 0$. The fraction of winners is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 38: Winners and losers of tax reform proposals, 1987 and 1990



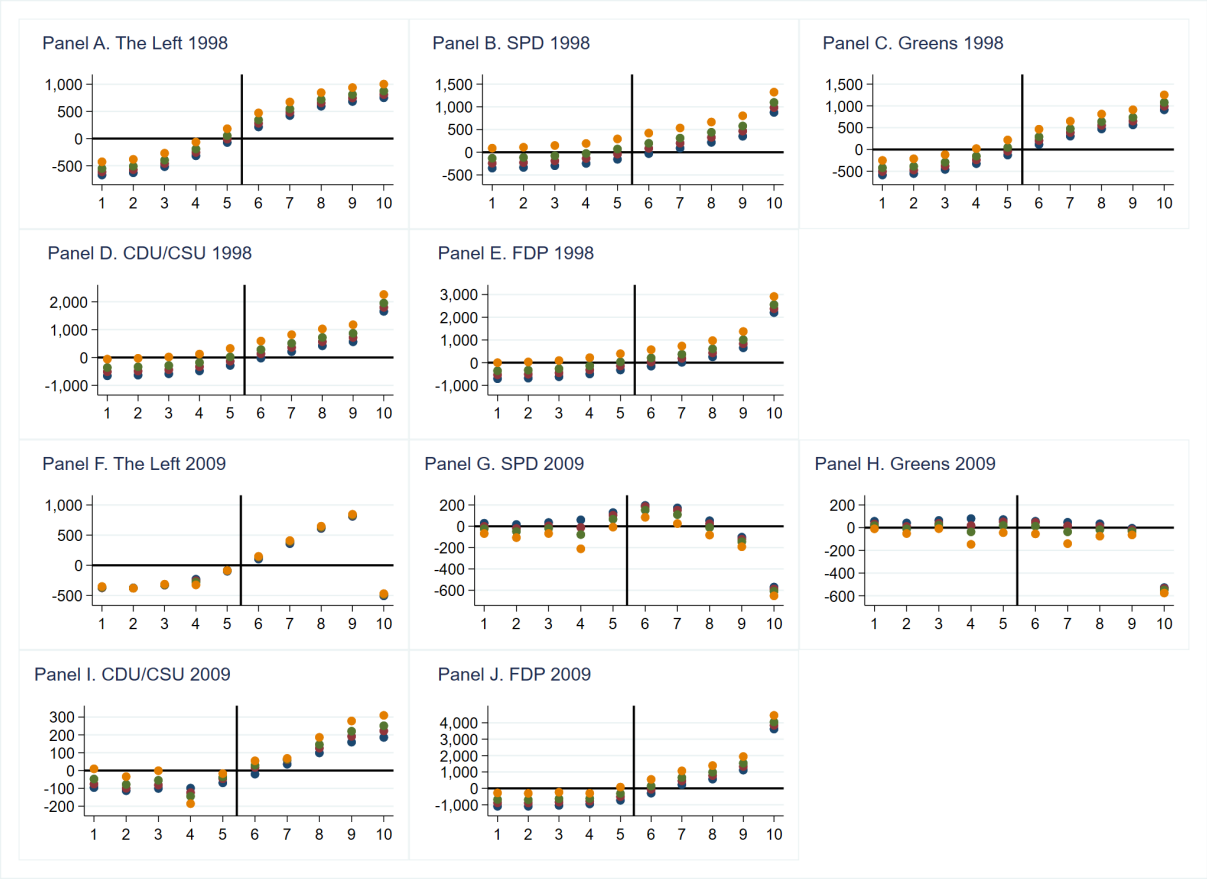
Notes: This figure depicts the average value of how much a person gains or loses from a reform, $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1), T_1(\hat{y}_0^i) - T_0(y_0^i)\}$, per decile for reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 1987 and 1990. The reform gain/loss is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 39: Winners and losers of tax reform proposals, 1994 and 2002



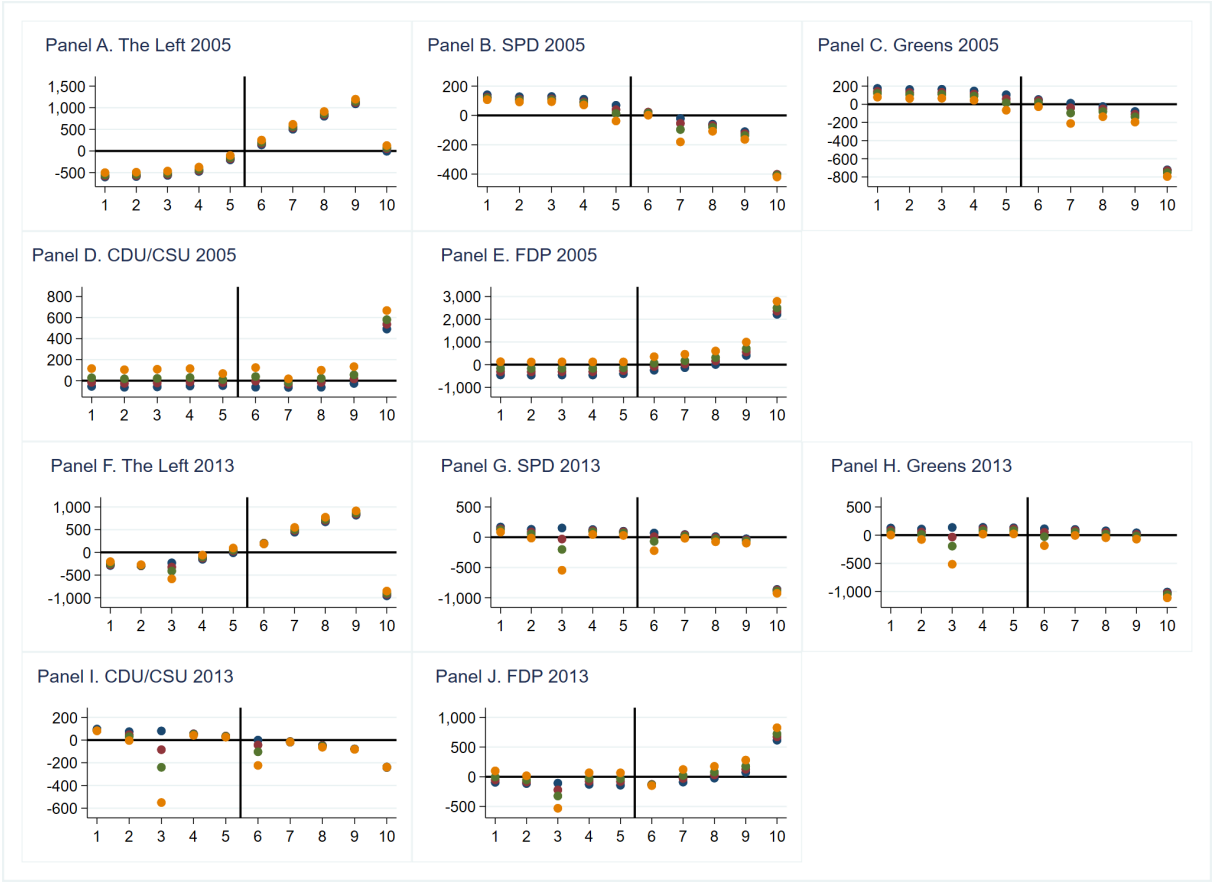
Notes: This figure depicts the average value of how much a person gains or loses from a reform, $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1), T_1(\hat{y}_0^i) - T_0(y_0^i)\}$, per decile for reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 1994 and 2002. The reform gain/loss is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 40: Winners and losers of tax reform proposals, 1998 and 2009



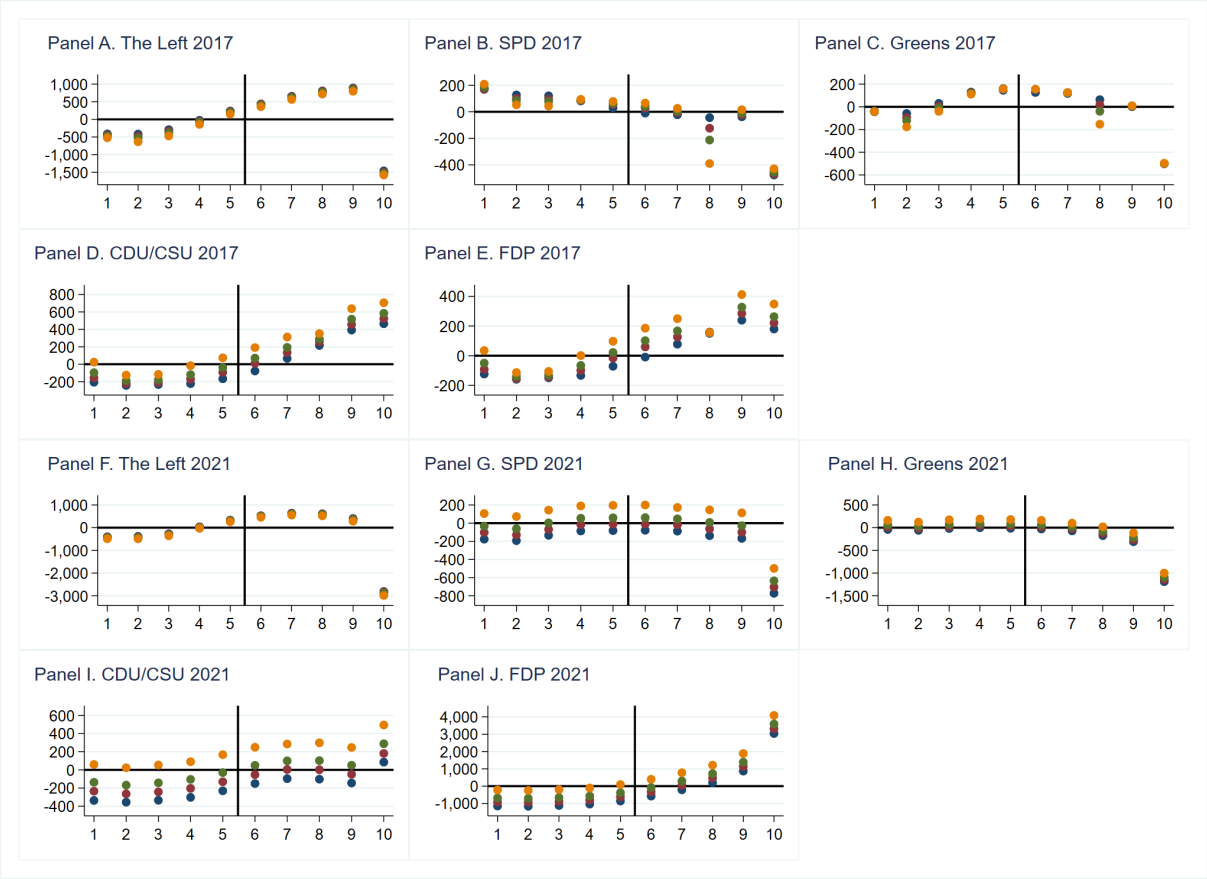
Notes: This figure depicts the average value of how much a person gains or loses from a reform, $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1), T_1(\hat{y}_0^i) - T_0(y_0^i)\}$, per decile for reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 1998 and 2009. The reform gain/loss is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 41: Winners and losers of tax reform proposals, 2005 and 2013



Notes: This figure depicts the average value of how much a person gains or loses from a reform, $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1), T_1(\hat{y}_0^i) - T_0(y_0^i)\}$, per decile for reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 2005 and 2013. The reform gain/loss is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses.
Source: Author's calculations based on ifo Microsimulation Model.

Figure 42: Winners and losers of tax reform proposals, 2017 and 2021



Notes: This figure depicts the average value of how much a person gains or loses from a reform, $R(\tau, h) - \max\{T_1(y_1^i) - T_0(y_1), T_1(\hat{y}_0^i) - T_0(y_0^i)\}$, per decile for reforms of the German income tax system proposed by the five main German parties prior to the federal elections of 2017 and 2021. The reform gain/loss is determined for four different ETI values: 0 (blue), 0.25 (red), 0.5 (green) and 1 (orange). To compute the counterfactual tax payment $T_1(\hat{y}_0^i)$, incomes from year 0 (y_0^i) are inflated to year 1 ($\hat{y}_0^i$) using the German CPI. All computations are scaled to the individual level. The income of married couples is split equally among spouses.
Source: Author's calculations based on ifo Microsimulation Model.

A.3 Estimation of the German income distribution

Unlike Peichl et al. (2021), I do not add hypothetical households for incomes above a certain threshold to generate a smooth EMTR function. Instead, I copy empirical observations above a given income threshold and, creating a symmetric window of incomes around their empirically observed income, assign each of the duplicated observations a stepwise increased/decreased gross income. For instance, a person earning a gross income of 100,000 € is copied 200 times and 100 of these newly generated observations are assigned a lower income, while the other 100 observations are assigned a higher income. The assigned income is varied in steps of 100 €, so that the lowest assigned income is 90,000 € and the highest assigned income is 110,000 €. The individuals' sample weight is adjusted accordingly to avoid biasing the results towards these copied observations. As nominal incomes grew substantially over time, thresholds and smoothing factors are also adjusted accordingly. This procedure sustains the original persons' characteristics while smoothing EMTR values for high-income individuals, which are rare in the SOEP. Using hypothetical households as in Peichl et al. (2021) carries the implicit assumption that top income earners only receive labor income. However, there is a large fraction of top income households whose primary source of income is capital income. This has a substantial impact on the EMTR estimated for these income ranges. An alternative procedure would involve assigning hypothetical households capital and labor income in shares which correspond to the empirically estimated shares for that income range. Drechsel-Grau et al. (2022) provides such estimates for the German income distribution.

A.4 Text Analysis

Table 3: Signal words for income tax speech selection

einkommensteuersteuerreform	solidaritätszuschlag	ehegattensplitting
lohnnebenkosten	umverteilung	kinderfreibetrag
abgeltungsteuer	abgeltungssteuer	sozialversicherungsbeitrag
sozialversicherungsbeiträge	minijob	midijob
minijobgrenze	solidaritätsbeitrag	spitzensteuersatz
steuersenkung	steuersatz	steuerwettbewerb
leistungsfeindlich	einkommensungleichheit	steuererhöhung
steuersystem	steuerpolitik	steuereinnahmen
eingangssteuersatz	steuergerechtigkeit	progression
grundfreibetrag	spitzensteuersatzes	progressionszone
steuerentlastung	steuerentlastungen	steuertarif
einkommensteuergesetz	soli	solis

Table 4: Manually compiled parliamentary stopwords

herr	jahr	dame
kollege	dm	milliarde
million	sagen	frage
reden	recht	eigentlich
euro	hören	präsidentin
cdu	csu	fdp
spd	dollar	präsidentschaft
koalition	adenauer	verehrt
kollegin	legislaturperiode	lieb
herzlich	dank	bürgerinnen
bayern	baden	württemberg
sachsen	thüringen	anhalt
brandenburg	berlin	mecklenburg
vorpommern	hamburg	schleswig
holstein	bremen	niedersachsen
nordrhein	westfalen	saarland
rheinland	pfalz	hessen
minister	ministerin	bundeskanzlerin
wählerin	geehrt	linke
debatte	mitbürgerinnen	gott
möchten	verehren	frau
abend	diskussion	stoiber
bundesfinanzminister	ministerpräsident	grüne
söder	de	

Table 5: Excluded bigrams

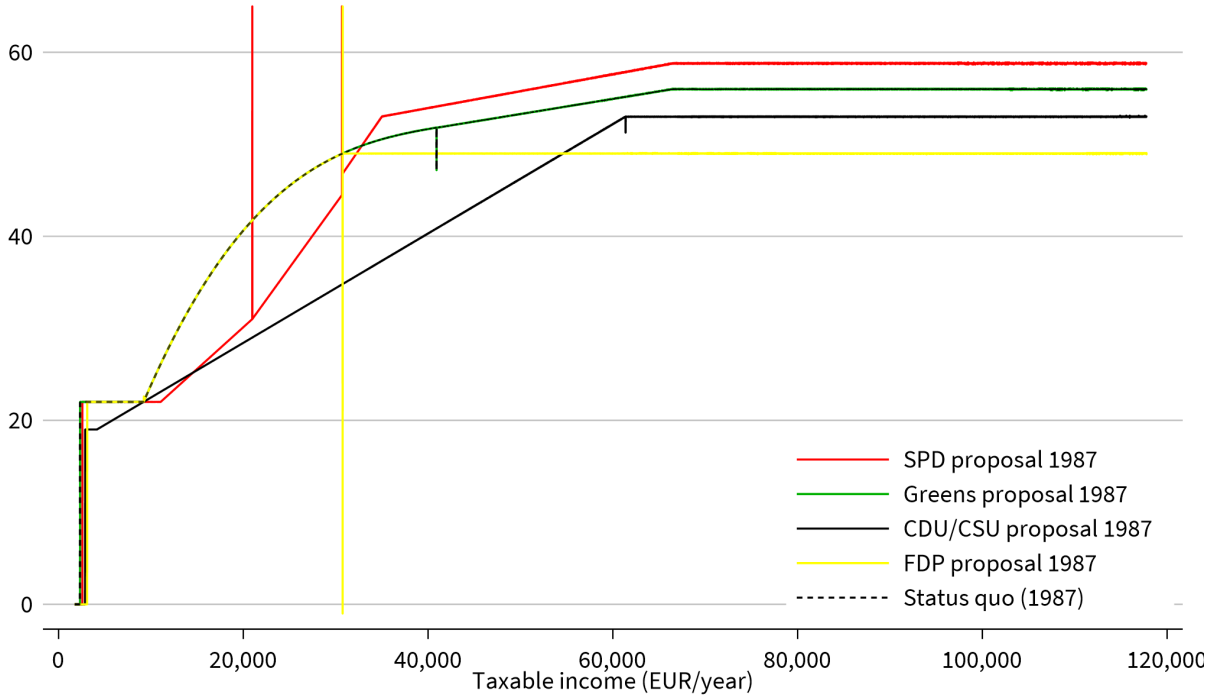
problem lösen	rolle spielen	fügen hinzu
genau gegenteil	lösung problem	ausdruck bringen
schritt richtung	wichtig schritt	eindruck erwecken
völlig falsch	völlig klar	tisch legen
erhalten bleiben	zustande bringen	lösung finden
auge führen	angriff nehmen	schwierig situation
sehen lassen	konsequenz ziehen	griff bekommen
infrage stellen	auseinander setzen	klipp klar
kauf nehmen	erinnerung rufen	gang setzen
konzept vorlegen	zeitung lesen	dringend notwendig
dringend erforderlich	nehmen beispiel	zugrunde legen
genau anschauen	gelten insbesondere	übrig bleiben
lassen gemeinsam	auge verlieren	franz josef

Table 6: List of efficiency and equity signal words

efficiency	*equity*
arbeitsplatz	umverteilung
arbeitslosigkeit	gerecht
lohnnebenkosten	ungerecht
aufschwung	ungerechtigkeit
wachstum	gerechtigkeit
mittelständisch	arm
mittelstand	reich

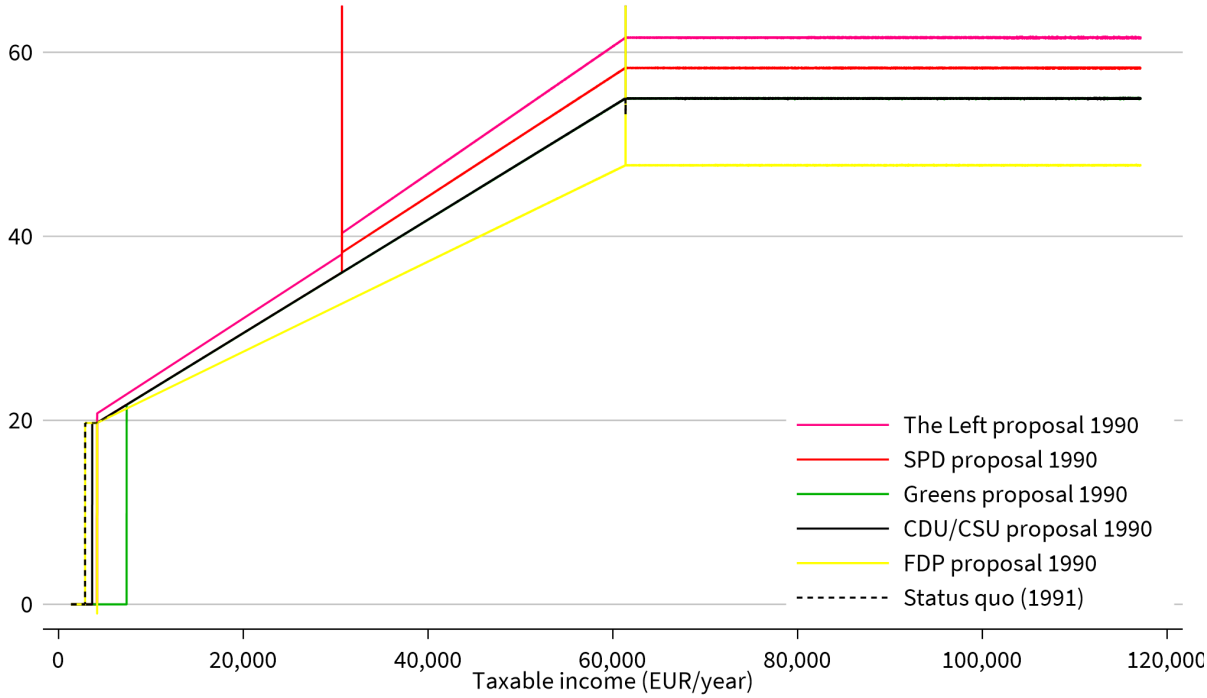
A.5 Tax reform proposals of German political parties, 1987–2021

Figure 43: Marginal Tax Rate (%) – Proposals 1987 – Single



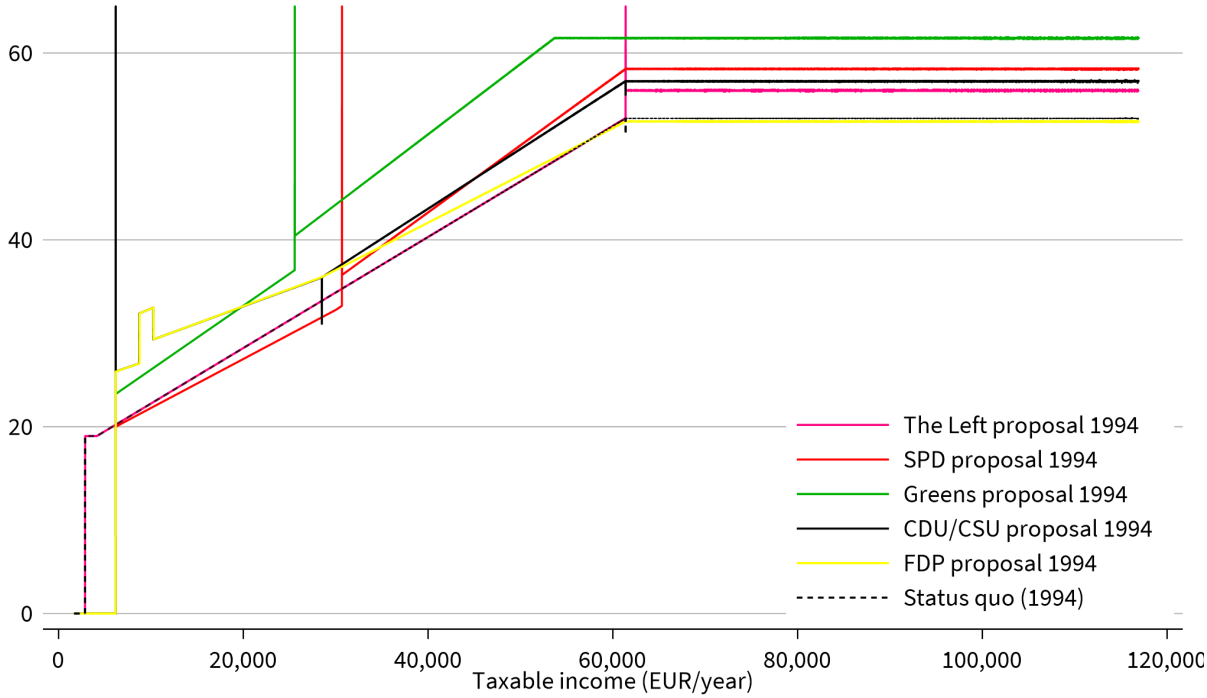
Note: The graph shows the total marginal burden from income tax and solidarity surcharge for a given taxable income of a household. Graphical truncation at -1 and 65 percent.

Figure 44: Marginal Tax Rate (%) – Proposals 1990 – Single



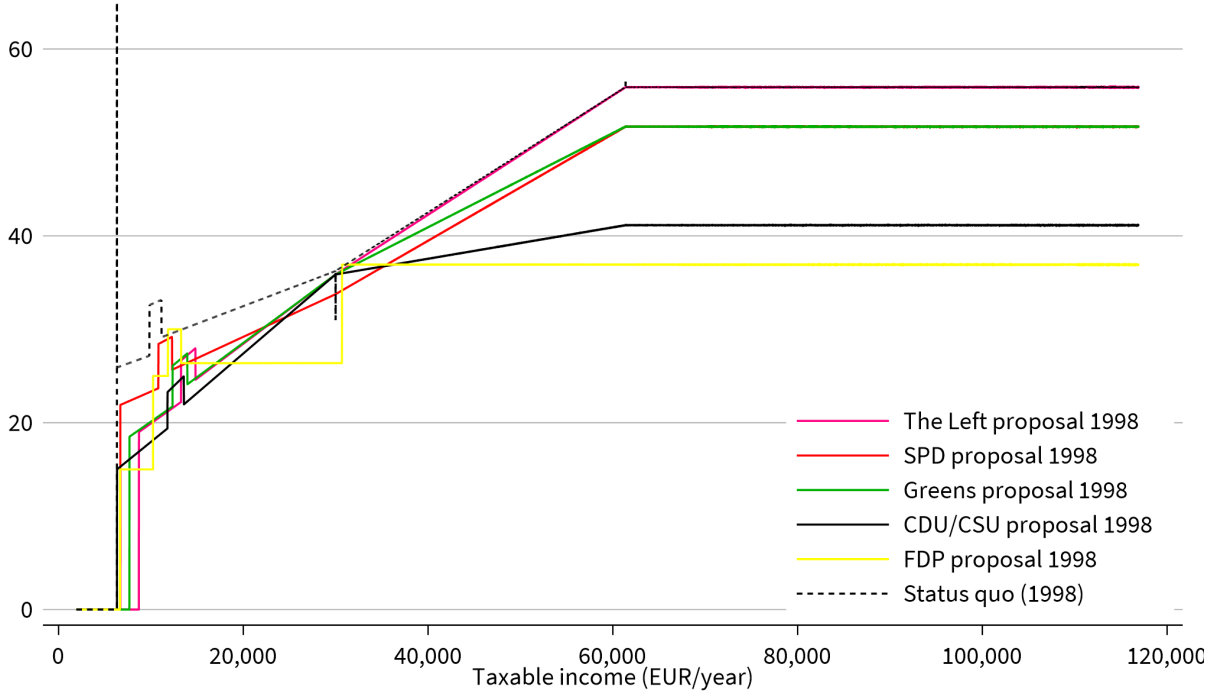
Note: The graph shows the total marginal burden from income tax and solidarity surcharge for a given taxable income of a household. Graphical truncation at -1 and 65 percent.

Figure 45: Marginal Tax Rate (%) – Proposals 1994 – Single



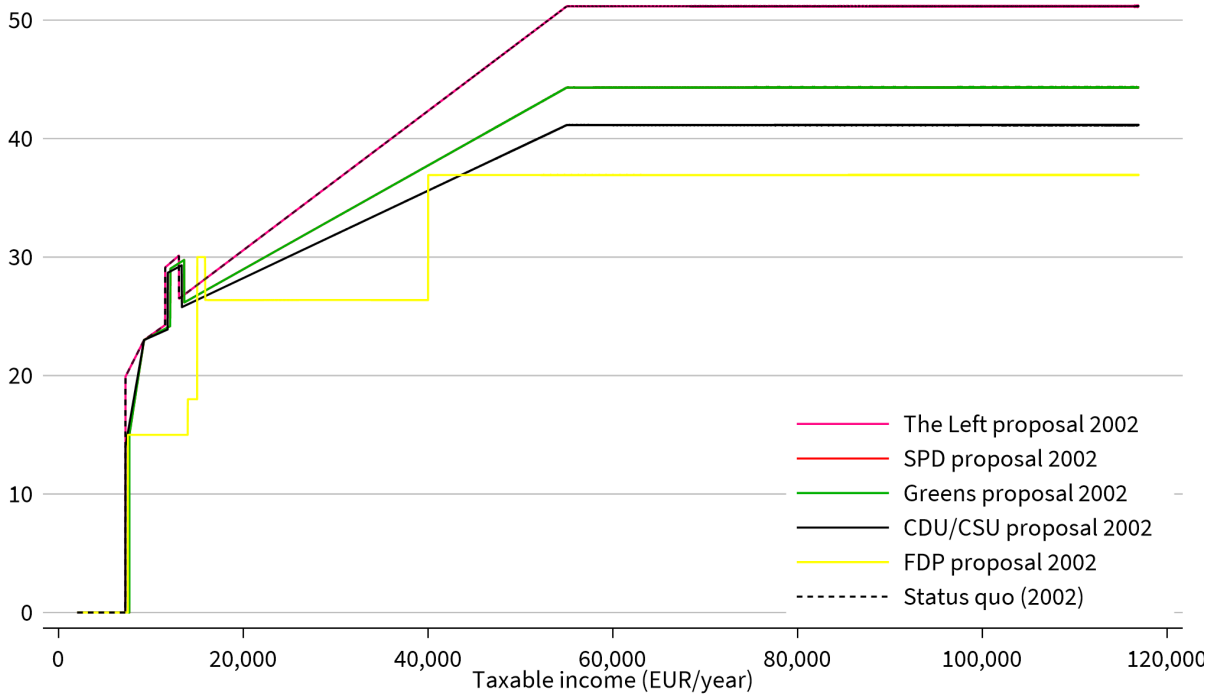
Note: The graph shows the total marginal burden from income tax and solidarity surcharge for a given taxable income of a household. Graphical truncation at 65 percent.

Figure 46: Marginal Tax Rate (%) – Proposals 1998 – Single



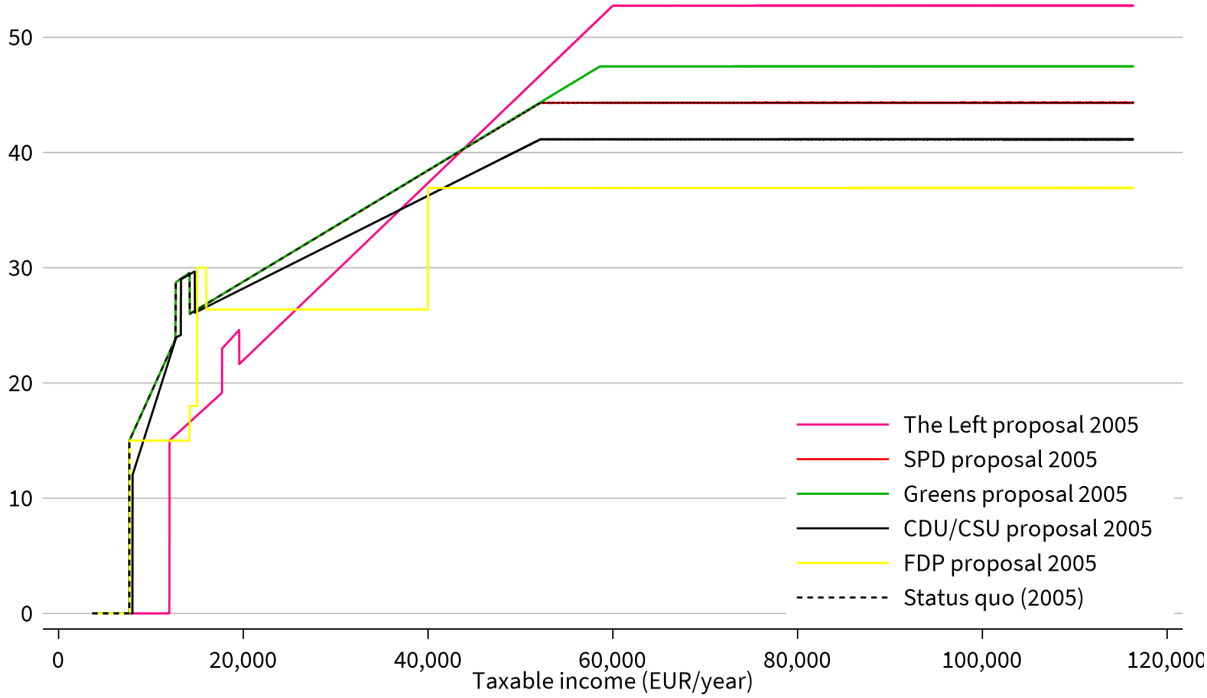
Note: The graph shows the total marginal burden from income tax and solidarity surcharge for a given taxable income of a household. Graphical truncation at 65 percent.

Figure 47: Marginal Tax Rate (%) – Proposals 2002 – Single



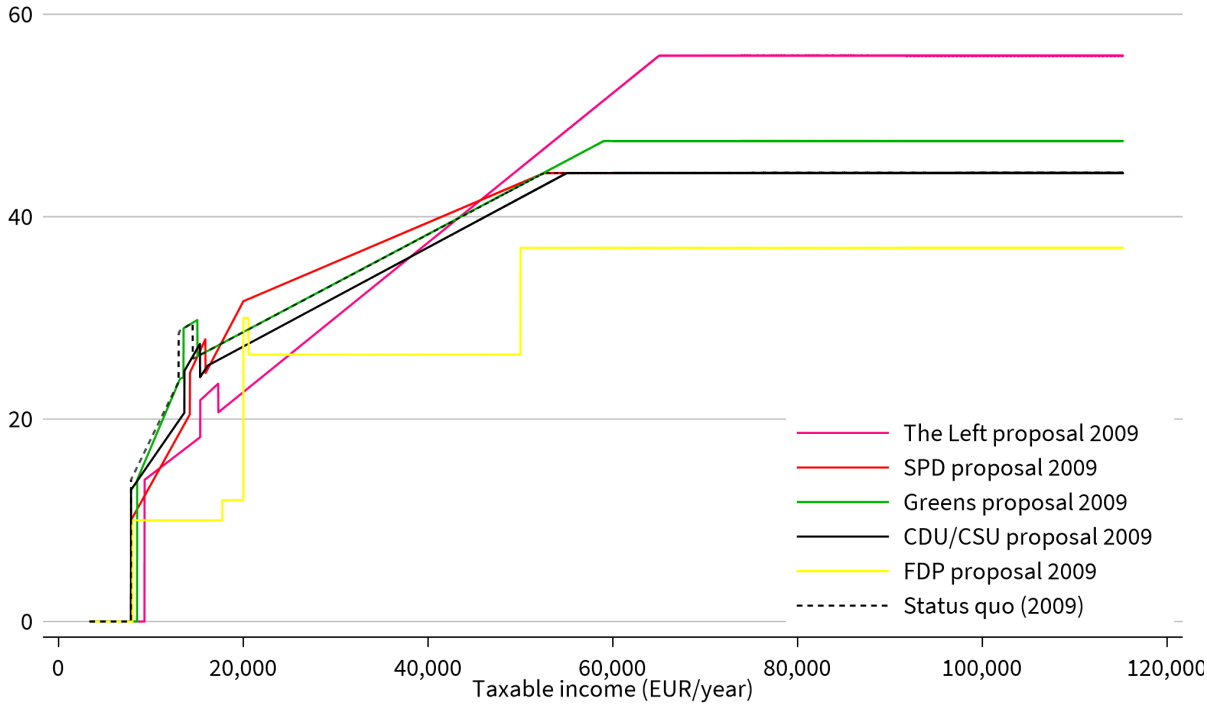
Note: The graph shows the total marginal burden from income tax and solidarity surcharge for a given taxable income of a household.

Figure 48: Marginal Tax Rate (%) – Proposals 2005 – Single



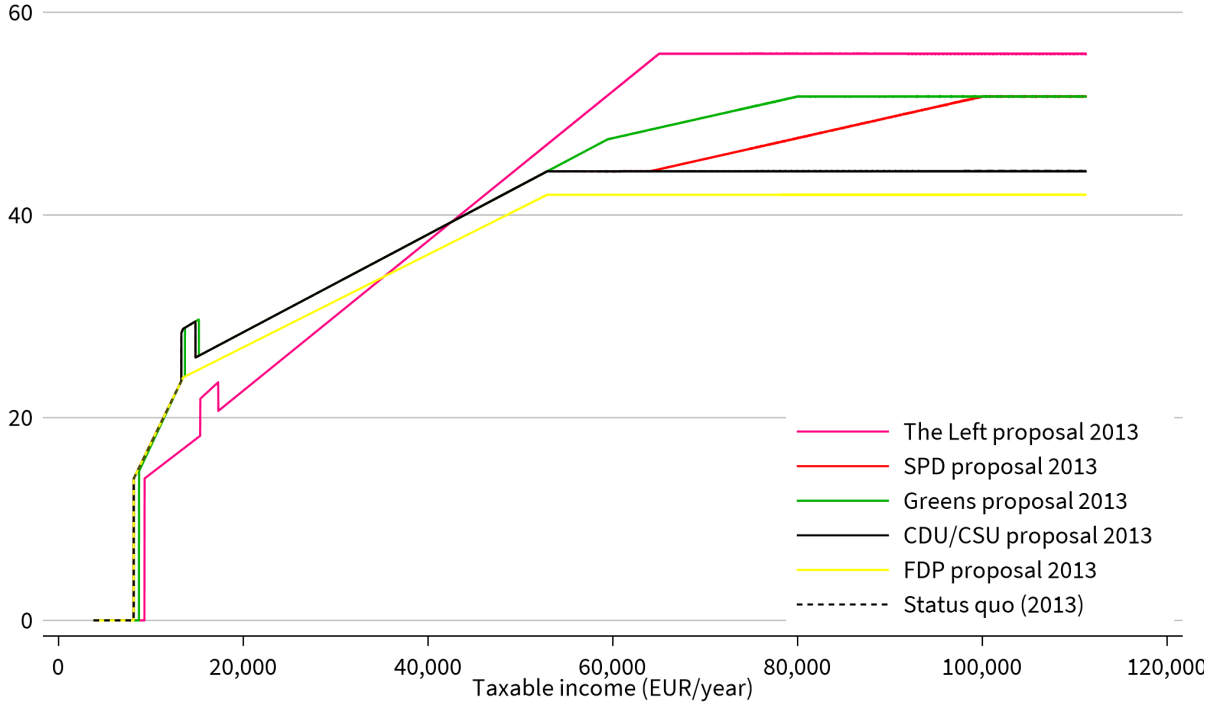
Note: The graph shows the total marginal burden from income tax and solidarity surcharge for a given taxable income of a household.

Figure 49: Marginal Tax Rate (%) – Proposals 2009 – Single



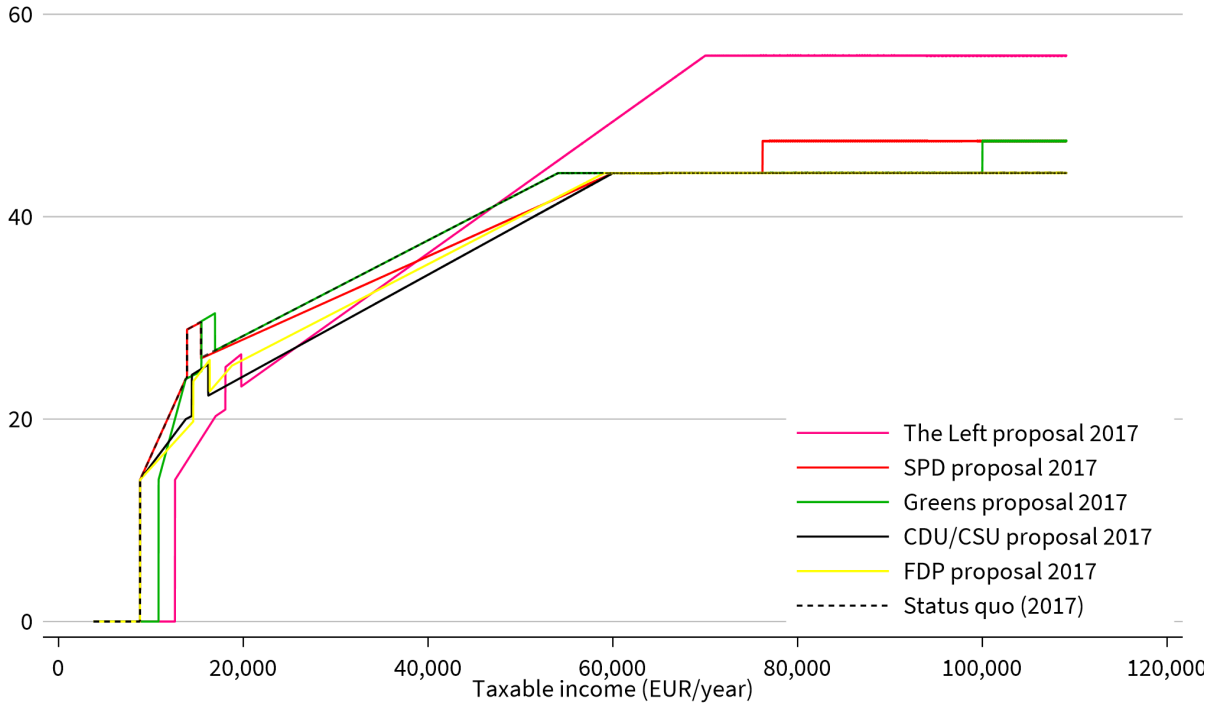
Note: The graph shows the total marginal burden from income tax and solidarity surcharge for a given taxable income of a household.

Figure 50: Marginal Tax Rate (%) – Proposals 2013 – Single



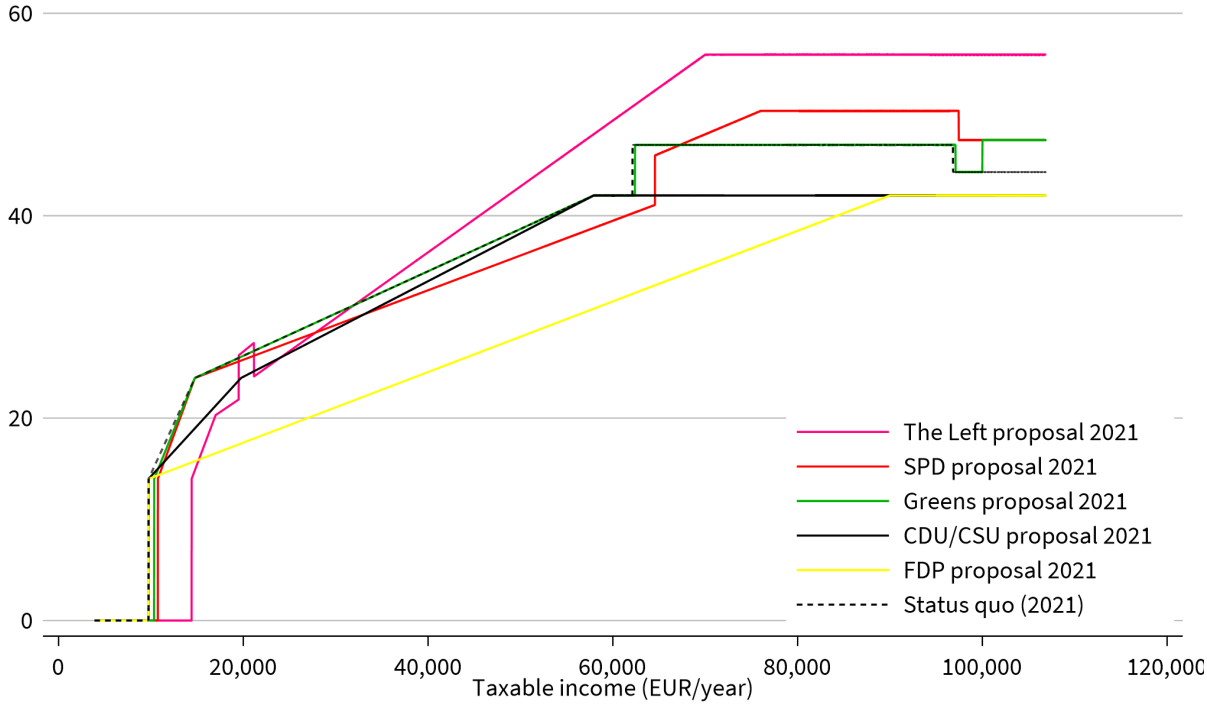
Note: The graph shows the total marginal burden from income tax and solidarity surcharge for a given taxable income of a household.

Figure 51: Marginal Tax Rate (%) – Proposals 2017 – Single



Note: The graph shows the total marginal burden from income tax and solidarity surcharge for a given taxable income of a household.

Figure 52: Marginal Tax Rate (%) – Proposals 2021 – Single



Note: The graph shows the total marginal burden from income tax and solidarity surcharge for a given taxable income of a household.