Public Preferences over Changes to the Composition of Government Tax Revenue *

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How governments raise tax revenue is at the core of domestic political conflict. Public opinion towards taxation is measured generally and qualitatively by many surveys, but previous research has not closely linked public preferences to the budget problem faced by governments of how best to raise or cut a marginal quantity of revenue. We present results from a novel tax preference experiment in which UK respondents are given choices over different tax 'levers' that are expected to raise or cut equal revenue. We find that while different tax levers vary substantially in their popularity, there is a 'hidden consensus' regarding different tax levers across income levels and partisanship of respondents.

Introduction

Collecting taxes is one of the most fundamental actions of government, and decisions about how to raise revenue have important consequences for distribution and growth. However, we know relatively little about how citizens would prefer government revenues to be raised: which taxes are popular (or less unpopular) and with whom. The burgeoning experimental literature on public tax policy preferences has largely neglected these questions of the tax mix, while scholarship on the tax mix has sometimes overlooked public opinion.

Inattention to public preferences over how tax revenue is raised is surprising in light of canonical political economy models highlighting the optimisation problem that balances political satisfaction and revenue goals (Hettich and Winer, 1984). From a policy perspective, political science has produced little direct evidence regarding the "dissatisfaction prices" of different revenue sources, a critical question in a time of high public deficits and rising future spending pressures.

We study preferences over revenue-equivalent tax changes in the UK. We propose marginal

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changes to actually-existing taxes to a nationally representative sample of voters. Our survey experiment presents a choice between randomly paired possible changes to two different taxes at a time, specifying the quantitative change needed for each tax to generate the same revenue change. We model respondents' choices following a Bradley-Terry framework (Bradley and Terry, 1952) to estimate the *relative* popularity of different revenue-equivalent changes to the tax structure.

This empirical exercise makes three important contributions. First, we provide a comprehensive description of preferences over the balance of all the major taxes in the UK system, providing rare empirical evidence on public opinion over the tax mix. The differences in popularity between the relatively preferred versus disliked taxes suggests that there is space in the UK tax system for majority-popular reforms. Second, we are able to separate preferences over the composition of taxation from preferences over its level. This reveals a hidden consensus among voters over where revenue should be raised. While partisanship and material interest may generate disagreement over the appropriate *level* of taxation, there is widespread agreement on its *composition*.

Finally, our approach contributes to the emerging experimental literature on preferences over taxation (Kneafsey and Regan, 2022; Ballard-Rosa, Martin and Scheve, 2017), expanding its scope to consider the composition of revenue collection across a wide range of taxes. Understanding public tax attitudes through this cross-tax lens is an important complement to these studies which often focus on explaining the unpopularity of certain taxes – especially those with redistributive benefits (Scheve and Stasavage, 2022; Elkjær et al., 2023) – but which do not allow for the even lower popularity of raising revenue through less progressive channels.

Tax Composition and Public Preferences

Our theoretical inspiration comes primarily from an old public choice approach which sets the political resistance generated by different taxes against the revenues generated from each tax base (Hettich and Winer, 1984). In the original model, the marginal pain of a pound paid in tax is assumed equal across taxes, but increasing non-linearly in the rate. Additional political costs arise from (different) administrative burdens across tax bases. Balancing revenue gains with

political costs implies a diversified tax base, due to the increasing marginal costs, with higher relative reliance on easily-adminstered taxes. However, to our knowledge, there have been no empirical calibrations of these popularity costs.[1]

Citizens may also dislike some taxes more than others for reasons beyond financial and administrative burden, as highlighted in existing research. Particular attention has been given to visibility (Wilensky, 2002), fairness (Scheve and Stasavage, 2022), and progressivity (Prasad, 2006). However, the generality of these categories, and the potential for slippage between tax design and voter perception, mean that they do not provide strong expectations about attitudes towards specific taxes.

On visibility, we follow Martin and Harper (2021) in the view that attributions of visibility are typically based on untested assumptions, and sometimes on circular reasoning, where opposition to a tax is cited as an indication of its visibility, and visibility given as the reason for opposition. Where more specific predictions are made, visibility arguments often derive from idiosyncratic features of the United States tax system, which has received the most scholarly attention (Campbell, 2018).

Equally, the perceived fairness of a tax seems intuitively likely to affect its popularity, but what fairness consists in is indeterminate. Some accounts point to "equal treatment" (Scheve and Stasavage, 2022), but countervailing evidence points to fairness as the "ability to pay" (Daunton, 2002), inherently requiring *unequal* treatment. Similarly, misperceptions of how taxes actually work can lead to slippage from what voters might think fair under full information (Kuziemko et al., 2015). This makes it difficult to hypothesize in advance which taxes should elicit greater support on fairness grounds.

The one exception here, perhaps, is to expect progressive taxes to be relatively popular. A large body of work finds widespread support for the principle of progressivity (Barnes, 2014; Limberg, 2020), and majority support for progressive changes from the status quo (Ballard-Rosa, Martin and Scheve, 2017).

But studies of support for progressivity have focused more on variation between people than

[1] If the political costs of taxation depend on the benefits it finances, isolating taxation is a consequential simplification. However, this mirrors the common simplification of considering expenditure alone. Assuming that the spending profile will not change with a tax change is empirically realistic and implicit in our approach.

comparisons to other taxes. Progressivity preferences have been shown to be highly structured by income (Beramendi and Rehm, 2016), but this has not been cleanly empirically separated from this tax-level effect, since progressivity is typically presented as higher taxes on the rich, but not also lower taxes on the poor.

Meanwhile, in the literature on the tax mix, considering public opinion over types of taxes directly is rare. The central explanations of variations across countries (and over time) are located in political institutions and the relative power they give to groups with different interests (Kemmerling and Truchlewski, 2021). These preferences are inferred from the material positions of these groups. Those with lower incomes "should favor a more progressive tax system, whereas richer voters should reject tax progressivity" (Haffert, 2021, p.99). Since they consume a larger share of their incomes, the less well-off should be less supportive of taxes on consumption. Symmetrically, (progressive) taxes on income and capital fall more heavily on the better-off (Timmons, 2005). These materialist building blocks underpin the taxes that different parties and organized interests endorse, but constituents' preferences are assumed rather than investigated.

The prediction of variation in tax mix preferences across income and partisan groups motivates our empirical verification.

Empirical Approach

We examine preferences over tax composition at the margin of current UK tax policy, and consider variation in preferences by income and party vote, in a novel survey. Our design directly tracks the quantities we want to estimate. Our interest in tax composition means we want to consider preferences over budget-equivalent propositions. Second, we want to make sure that the comparisons we analyse are quantitatively informed. Otherwise, people may overestimate the feasibility of raising revenues from certain taxes (Johnson, 2023). Third, we want to elicit preferences over a comprehensive set of tax levers, rather than (only) those most salient to researchers. Taken together, these three considerations point to asking respondents their opinions on revenue equivalent increases (or decreases) to as many existing taxes as possible.

We are able to do this in the UK thanks to the annual publication (by HMRC, the central tax authority) of the revenue effects of indicative changes to major national taxes: Income Tax,

Corporation Tax, Capital Gains Tax, Inheritance Tax and National Insurance contributions, as well as Stamp Duty Land Tax[2], duties on alcohol, tobacco and fuel, and VAT rates. Where possible, the revenue estimates incorporate estimates of taxpayers' behavioural responses (HMRC, 2021). The data cover major thresholds as well as rates. We used the figures from June 2021 to calculate the changes to 23 tax levers implied by the same (£1 billion) revenue change from the status quo.[3] This incremental approach is similar how tax policy tends to be made, through small adjustments to existing revenue levers (Rose and Karran, 1987).

We presented 9713 respondents with one pairwise choice between tax changes.[4] Our survey was fielded by YouGov to a nationally representative sample of UK adults between the 4^{th} and the 14^{th} of October 2021. Each response is a choice between two reforms relative to the pre-existing baseline, and each proposal includes the headline change, an account of how the relevant tax works, and the size of the change required to raise or cut the required revenue. Figure 1 shows an example choice, as delivered to respondents.

[2] Taxes on property transactions.

[3] A list of these, descriptions of the status quo, and of the proposed changes (as used in the experiment) can be found in the appendix.

[4] In comparisons of different types of survey-experimental approaches to behavioural benchmarks, paired choice designs like this one tend perform the best (Hainmueller, Hangartner and Yamamoto, 2015).

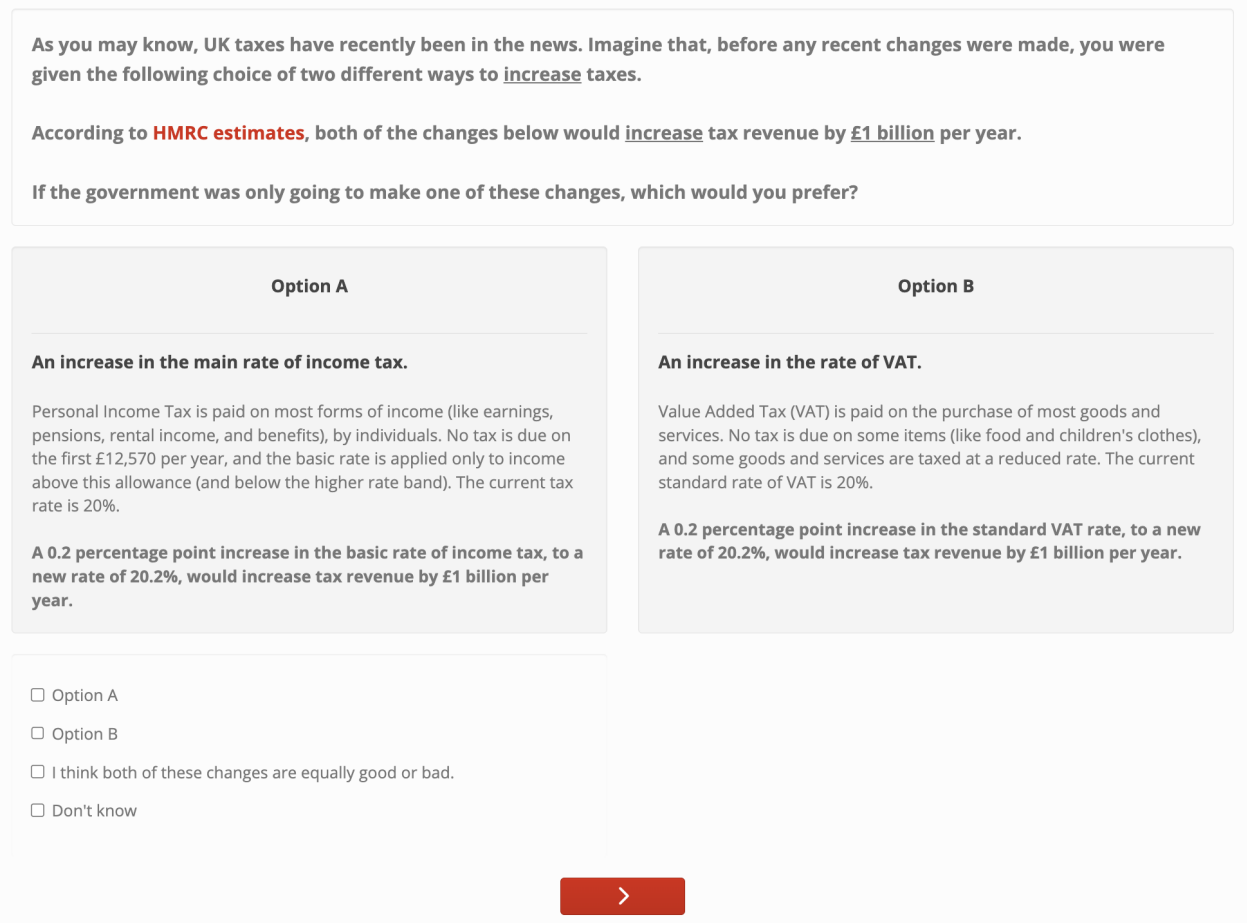

Figure 1: Survey Experiment Prompt Example

Our presentations are different to the way citizens typically encounter tax proposals. In public debate, there is usually no counterfactual budget-equivalent option to change another tax instead. Tax reform proposals also typically provide less practical explanation, and more overt normative framing. It is not our concern here to ascertain the effects of framing on tax popularity (it matters, McCaffery and Baron, 2004). Rather, we try to elicit any views the public may have on the underlying budget problem, where revenue equivalencies are critical. Budget-equivalent alternative proposals reflect an important feature of political reality, if one less commonly presented to the public.[5]

[5]To the chagrin of economists (Blastland and Dilnot, 2022).

Basic Response Statistics and Task Complexity

Of 9713 responses to our experiment, 2565 endorse proposal A and 2528 endorse proposal B. 4620 are neutral responses, of which 2911 express "I think both of these changes are equally good or bad" while 1709 "Don't know".[6] The latter may include respondents who failed to engage with the task, but in real politics, individuals equally fail to engage with the task. We retain both neutral responses, rather than dropping respondents, to maintain representativeness. Higher rates of neutral responses for particular taxes simply make these less likely to be estimated as especially popular or unpopular.

The extent of the neutral responses is understandable given that the random pairwise comparisons yield many comparisons that even well-informed individuals might not have strong views about.[7] We see some evidence of variation in neutral response rates by the complexity of the choice.[8] However, some real tax changes *would be* complex, and it is of substantive interest if that yields neutrality. What we ask of respondents is still less complicated than many applications in the literature (for an example on the spending side, see Bonica, 2015).

Models for Tax Preference Choices

We build a series of models to summarize the data. Using Y_i to denote respondent i's choice, we code responses as follows:

- $Y_i = 1$ if respondent prefers A
- $Y_i = 0.5$ if respondent gives a neutral response
- $Y_i = 0$ if respondent prefers B.

This allows us to interpret differences on the scale of proportions of respondents preferring one tax option to another, while retaining the neutral responses.

Following a generalized Bradley-Terry model framework, we model the expected value of Y_i as a function of the competing "popularities" π_j of different tax change proposals j. With proposals

[6] The overall shares choosing one of the two proposals, that the two are equal, and "don't know" are 51%, 30% and 19%, respectively.

[7] We provide further descriptive statistics on engagement in the appendix.

[8] There are more neutral and don't know responses in comparisons that include National Insurance tax levers, and relatively low for comparisons that include simpler (e.g. alcohol and tobacco tax) levers. Levers with a high share of don't know responses also have a higher share (on average) of "equally good or bad" responses.

$j \in A, B$, this can be written:

$$E[Y_i] = \alpha + \pi_{iA} - \pi_{iB}.$$

α is the expected value of Y_i when the two proposals are equally popular, i.e. if $\pi_{iA} = \pi_{iB}$.[9] Note that the popularities in this model are only identified relative to one another: pairwise comparison data only yields information about relative, not absolute, popularity of options. Full identification and estimation details for our baseline and variant models are in the appendix.

Results: Preferences Over Tax Levers

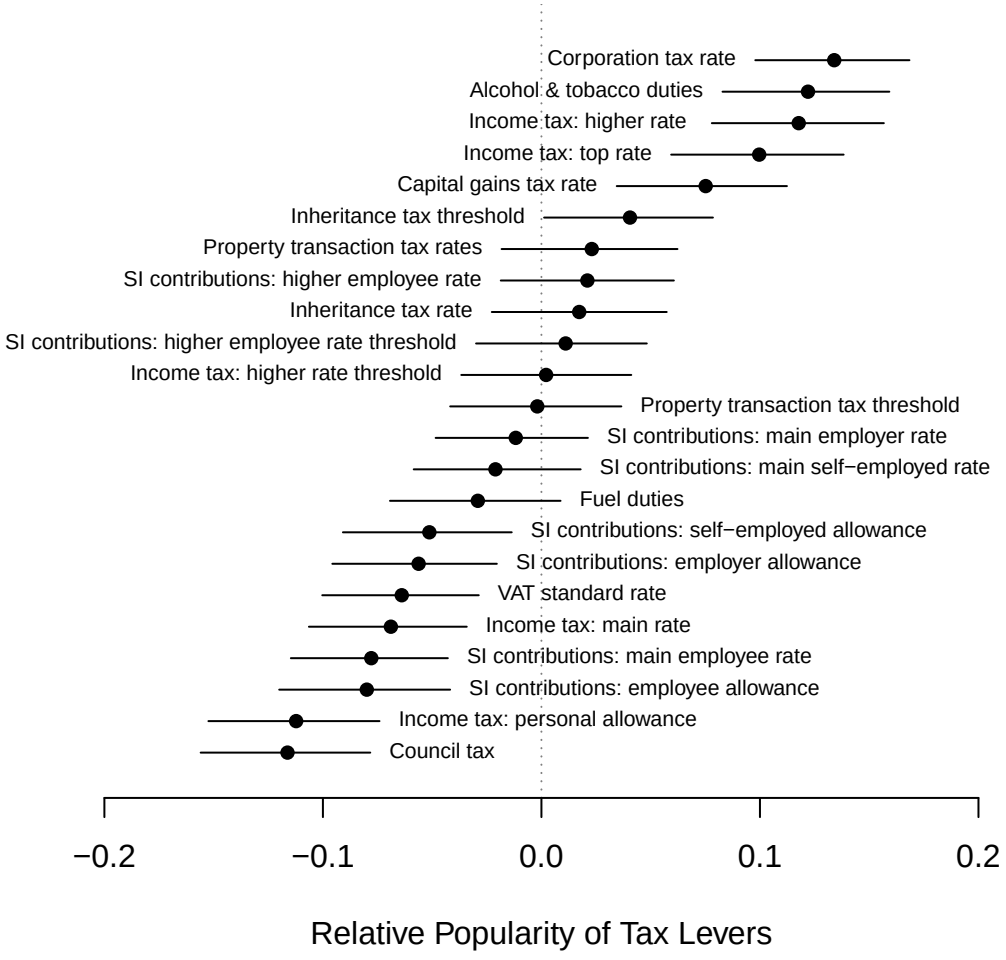

Figure 2: Relative public preference for tax levers, in units of probability of supporting taxation via a given lever versus others.

[9] α can be thought of as the advantage of a proposal being option A vs option B, irrespective of content. We do not find any evidence that α deviates from 0.5 (no advantage) in our data.

Figure 2 shows estimates of the relative preferences for each tax lever (averaging over all comparisons in the experiment).[10] The differences are substantial. Increasing (or not decreasing) the corporation tax rate is preferred to increasing (or not decreasing) Council Tax by 0.25. With a representative level of neutral responses, this corresponds to a population-level response distribution where 37.5% of respondents prefer the corporate tax rate increase, and only 12.5% prefer the council tax increase. The remaining 50% are indifferent or don't know. From the perspective of political efficiency, the differences across taxes imply that popular reforms to the composition of tax revenues are available.

Second, the taxes that are most popular are generally progressive: those on higher earners and on capital or corporate incomes. This is consistent with previous research asking about general preferences, but replicates with reference to concrete policy levers. Moreover, while support for these taxes may be economically naive, our design decreases naivety as much as possible. We provided estimates which try to include the behavioural responses to tax changes, and the scale of the required changes to rates reflects the narrow bases of these taxes.[11]

The Hidden Consensus on Taxation

We also examine differences in the popularity of tax levers between types of respondent, characterized by income and partisanship. We discover very little variation by income, and only slightly more by party, in the taxes that British citizens prefer. This consensus may be hidden by divergent views on the overall level of taxation which contaminate simpler designs' estimates of the popularity of particular taxes.

[10] We "reverse code" the tax decrease prompts in this analysis, such that higher estimates correspond to taxes j that are preferred as a source of revenue. See appendix for mathematical details.

[11] As another indicator of the lack of explanatory power of naivety for these results, we see no less support for these progressive taxes among the more highly educated.

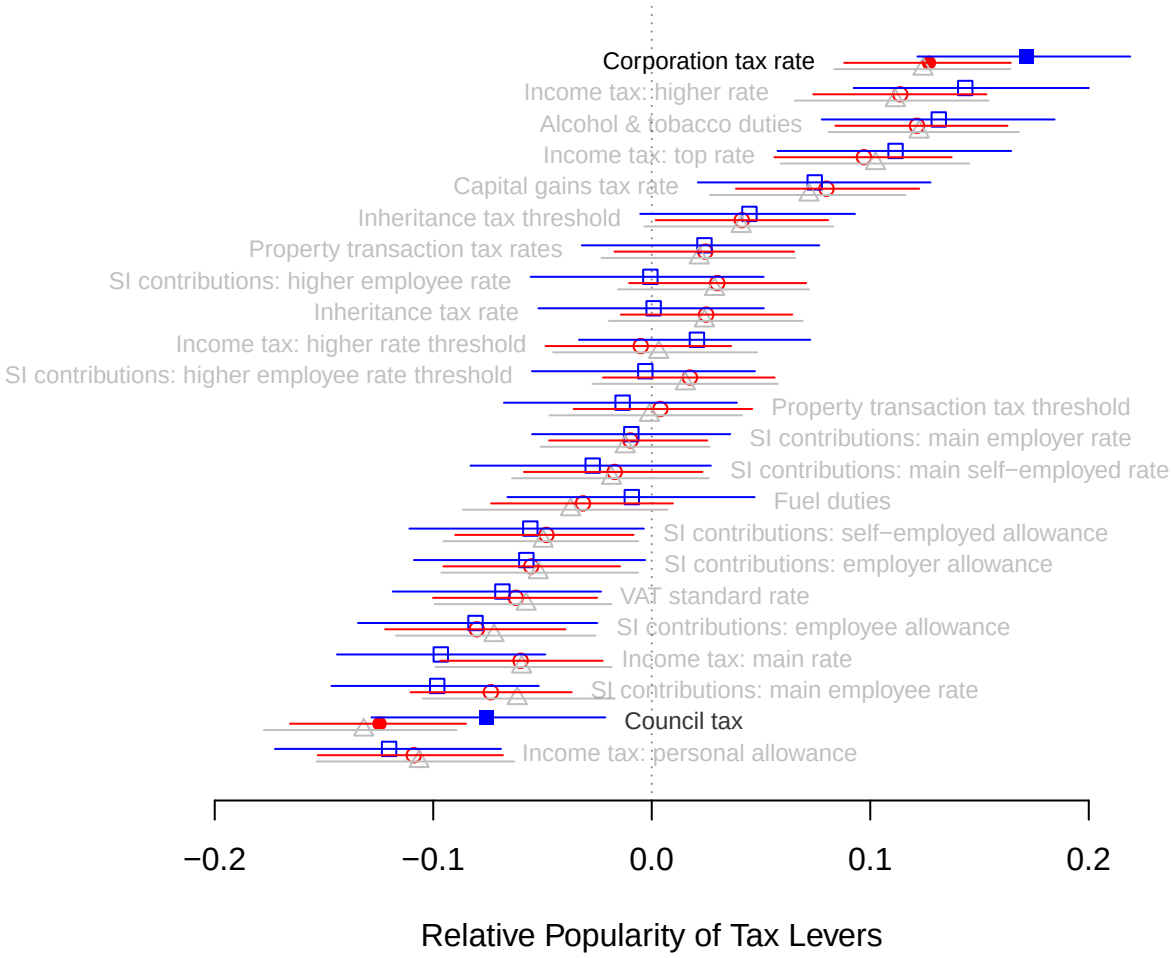

Figure 3: Relative public preference for tax levers for respondents with household incomes above 45k (blue squares), below 45k (red circles) and those who did not answer the income item (grey triangles), in units of probability of supporting taxation via a given lever versus others. Solid points indicate tax levers where the 95% interval for the difference between those below 45k and the respective other group excludes zero.

Figure 3 shows estimates for respondents with household incomes above and below £45,000,[12] and those who did not give an income response. Figure 4 shows estimates for Conservative and Labour voters. In both figures the overall orderings of the taxes are similar across groups, and there are few levers (indicated with solid points on the figures) where there are statistically significant differences in the popularities of individual taxes between groups.

Only the corporation tax rate and council tax have statistically differentiable levels of popularity by income. Those with incomes over £45,000 see both of these taxes more favourably than

[12] Of the income response thresholds in the survey data, this was the one closest to median household income in the UK at the time of the survey. We present an analysis split by approximate income tercile (at £25,000 and £60,000) in the appendix, and the results are very similar.

those with incomes below £45,000. For corporation tax, this reinforces support for a very popular tax, while the council tax is less unpopular with high-income respondents. There are no significant differences by income for the two higher rates of personal income taxation (the higher and the top rates), nor for the threshold at which the higher rate kicks in. Higher-income respondents also endorse raising revenue through other progressive taxes (capital gains tax rates, stamp duty, and inheritance taxation) just as strongly as lower-income respondents. Overall, the correlation between the preference estimates for those with incomes under versus over £45,000 is 0.96.

There are more taxes where partisan differences can be found, but again, the headline picture is of consensus. Labour voters are more supportive than Conservative of higher rates of personal income tax on the highest earners, and of raising revenue through inheritance and fuel taxation. Conservative voters are more supportive of three of the eight possible changes to social insurance contributions.

These social insurance differences deserve some comment. The Conservative UK government had just announced changes to this tax when the experiment was fielded.[13] These comprised slight cuts to revenue via adjustments to tax-free allowances. Meanwhile, substantial increases in *rates* for employees and the self-employed increased revenue. In our data, one of these three rates (the main rate for employees) and two of the thresholds are more popular among Conservatives. While Conservative voters do not quite endorse the precise enacted changes, it seems plausible that the partisan patterns could reflect short-term effects rather than durable preference cleavages.

[13] See https://theconversation.com/autumn-budget-2021-experts-react-170741.

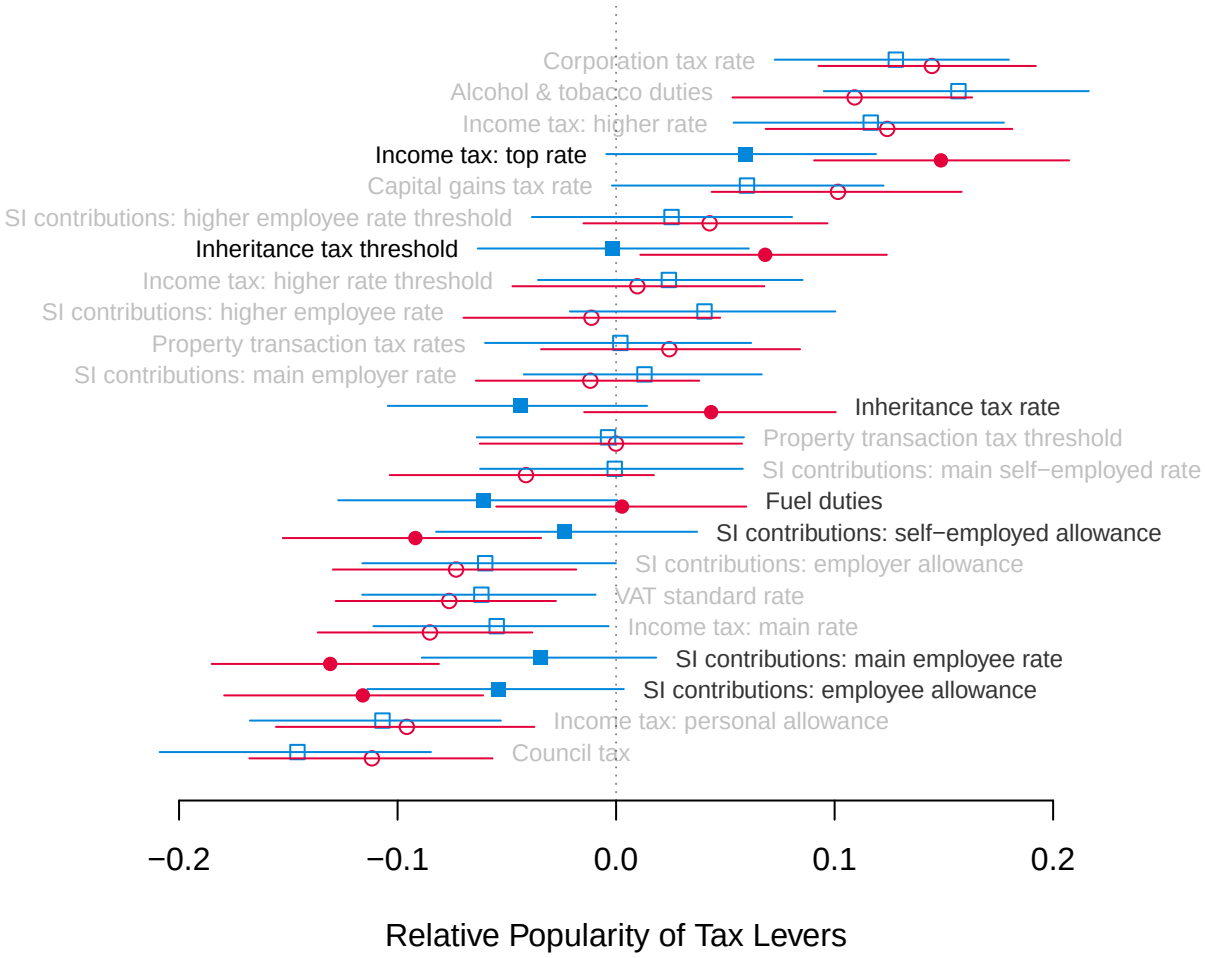

Figure 4: Relative public preference for tax levers for 2019 Conservative (blue squares) versus 2019 Labour (red circles) voters, in units of probability of supporting taxation via a given lever versus others. Solid points indicate tax levers where the 95% interval for the party difference excludes zero.

Even with this immediate pre-experiment shock to attitudes, partisan differences are not very large when considered across all levers. The correlation between the preference estimates for Labour vs Conservative voters is 0.82. This consensus is surprising in light of the comparative literature on the tax mix which grounds partisan differences in the divergent interests of different parties' constituents.[14]

[14]We explored further variation by EU Referendum vote, by 2019 turnout, by 2019 vote including all parties, by gender and by education in the appendix. None of the sets of estimates showed any particularly systematic differences in preferences either, providing further evidence for a 'hidden consensus'.

Robustness

Our results are robust to a number of other experimental variations (reported in the appendix). First, we model choices over increases separately from decreases to gauge the appropriateness of our underlying idea of a general popularity driving choices on both kinds of choice. Second, we consider much larger changes – £10 billion, instead of £1 billion – for the 'big five' taxes with which it is plausible to raise that much revenue. Finally, we consider choices made when we provide additional arguments for or against both options, as a check on the sensitivity of our results to differences in presentation. For all three of these variations, there is little evidence of any substantial difference from our main results.

Generalizability

How idiosyncratic is the result that there are popular, revenue-neutral tax reforms available, relative to the politically efficient tax mix? There may be some theoretical reasons to expect low responsiveness of policy to public opinion in Britain (Hobolt and Klemmensen, 2008), making the gap between preferences and the status quo tax system that we discover unusual. But more recent data show little variation across countries, with the UK even among the more responsive (Rasmussen, Mäder and Reher, 2018). Taking taxation more specifically, politicians setting tax policy in Britain have relatively high levels of insulation (Steinmo, 1993), but this cuts two ways: it limits direct public influence, but politicians (compared to tax experts or civil servants) are the policy actors most likely to be sensitive to public preferences.

On the popularity ranking of taxes, we cannot draw conclusions about whether the source of (relative) popularity lies in specific features of Britain's implementation of particular taxes, or in broader characteristics shared by these taxes across countries. However, with the possible exceptions of property taxes (Council and Stamp Duty Land Tax), most UK taxes are not particularly unusual in comparative perspective. Moreover, while our experiment makes this limitation very obvious, it is not unique to our design. In broader cross-national studies, or more general question wordings, we also do not know if respondents are reacting to their experience of country-specific particularities.

The obvious extension, to fill these gaps, is to field appropriately domesticated equivalent

surveys in other countries, yielding cross-national evidence on preferences over concrete policies. Researchers could then consider which underlying theoretical characteristics (progressivity, visibility) are associated with support for different tax mixes as a useful complement to asking respondents their views on these characteristics directly.

A more consequential limitation of the generality of our methodology is that the design is difficult to extend beyond actually-existing taxes. This precludes the examination of, for example, a well-designed wealth tax, or a flat tax on income. However, there are offsetting gains in terms of the practicability of the proposed reforms (and thus the policy utility of our results), as well as the relative familiarity and credibility of the proposals to respondents.

Conclusion

We use experimental control to identify preferences over specific tax parameters in isolation from accompanying revenue changes which otherwise make the measurement of preferences about tax composition very difficult. We rely on respondents' ability to make comparisons between concrete proposals – such that they need not articulate a full preference ordering, nor the details of what they like or dislike about specific taxes – which is a more feasible task in a highly technical area. The revenue-equivalent changes bring the policy choice much closer to politicians' (or Treasury civil servants') tax policy problem.

We thereby identify the levers that might be involved in politically viable tax reform in the UK, minimising public dissatisfaction with taxation for a given revenue level, and show that the existing composition of UK taxation is far from optimising the revenue-discontent tradeoff. Specifically, increasing taxes on corporations, higher income tax payers, capital gains, and alcohol and tobacco is likely to be less politically painful than other increases. To the extent that tax cuts can be found, they will be most popular if broadly distributed, and targeted to the lower end of the income tax. Equally, two of the UK taxes widely regarded as dysfunctional by policy experts and economists, Council Tax and National Insurance, are also disliked by the general population. Communicated with appropriate reference to the real revenue trade-offs, their reform should be politically feasible. Given the partisan (and socio-demographic) consensus over the tax mix, these aggregate patterns do not mask major electoral cleavages blocking this kind of reform.

Our approach in this paper uses the actually-existing tax system as its starting point, asking questions (only) about concrete potential modifications. A far more challenging problem would be to attempt to characterize public attitudes away from the current margin. The concrete details required also make any implementation of measuring such tax mix preferences parochial: our measurement tool could be 'domesticated' to other tax systems, but we would only be able to learn that VAT in Germany is more (or less) relatively popular compared to the actually-existing German income tax system, and not about whether Germans or Brits are more predisposed to favour sales taxes in the abstract. Nevertheless, replicating the comprehensive approach to attitudes to a broad universe of tax levers in different countries would vastly increase our understanding of attitudes towards taxation by taking preferences over tax composition seriously.

Appendix

Table of Tax Levers

Tax lever (short)	Tax lever (long)	Description of status quo	Statement of change to increase revenue	Statement of change to cut revenue
A&T duties	Alcohol & tobacco duties	Taxes are paid on the purchase of wine, spirits, beer, cider, cigarettes, and so on. The level of the tax depends on the amount of alcohol and the type of drink or tobacco product. The current tax rates are £2.23 per bottle of wine, £7.70 per bottle of spirits, 44p per pint of beer or cider, and £6.57 per pack of cigarettes.	An 8.7% increase in alcohol and tobacco duties, to new rates of £2.42, £8.47, £0.48 and £7.14, for wine, spirits, beer, and cigarettes, would increase tax revenue by £1 billion per year.	An 8.7% decrease in alcohol and tobacco duties, to new rates of £2.04, £7.11, £0.4 and £6, for wine, spirits, beer, and cigarettes, would cut tax revenue by £1 billion per year.
CGT rates	Capital gains tax rate	Capital gains taxes are paid on profits from the sale of assets (like stocks and investment properties), by individuals. No tax is due on the first £12,300 per year, and the tax is only applied to profits above this allowance. The current tax rate is 10% for basic rate income taxpayers and 20% for higher rate income tax payers.	A 17 percentage point increase in capital gains tax rates, to new rates of 27% and 37%, for basic and higher rate tax payers, would increase tax revenue by £1 billion per year.	A 17 percentage point decrease in capital gains tax rates, to new rates of 0% and 2%, for basic and higher rate tax payers, would cut tax revenue by £1 billion per year.
Council Tax	Council tax	Council taxes are paid on the value of residential property, by households. The exact amount depends on the assessed value of the property and the local council responsible for the area it is in. The current average tax rate for an average (Band D) property is £1,898 per year.	A 3.3% increase in council tax rates, to a new rate of £1,961 per year for an average Band D property, would increase tax revenue by £1 billion per year.	A 3.3% decrease in council tax rates, to a new rate of £1,835 per year for an average Band D property, would cut tax revenue by £1 billion per year.
CT rate	Corporation tax rate	Corporation taxes are paid on profits, by companies. There is no tax-free allowance, but all business expenses are excluded, and there are some other deductions (such as capital allowances and various forms of relief). The current tax rate is 19%.	A 0.3 percentage point increase in corporate income tax rates, to a new rate of 19.3%, would increase tax revenue by £1 billion per year.	A 0.3 percentage point decrease in corporate income tax rates, to a new rate of 18.7%, would cut tax revenue by £1 billion per year.
			A 3.4 percentage point increase in corporate income tax rates, to a new rate of 22.4%, would increase tax revenue by £10 billion per year.	A 3.4 percentage point decrease in corporate income tax rates, to a new rate of 15.6%, would cut tax revenue by £10 billion per year.
Fuel duties	Fuel duties	Fuel duty is paid on the purchase of petrol, diesel, and other fuels. The tax depends on the type of fuel, and is set as a fixed amount per litre. The current tax rate for petrol and diesel fuel is 57.95 pence per litre.	A 3.3 pence increase in fuel duty, to a new rate of 60p per litre, would increase tax revenue by £1 billion per year.	A 3.3 pence decrease in fuel duty, to a new rate of 55p per litre, would cut tax revenue by £1 billion per year.

(continued)

Tax lever (short)	Tax lever (long)	Description of status quo	Statement of change to increase revenue	Statement of change to cut revenue
IHT rate	Inheritance tax rate	Inheritance taxes are paid on the value of an estate (property, money and possessions) at death, if it is above a certain allowance limit and not left to a spouse or civil partner. No tax is due on estates worth less than £500,000 including residential property, and the tax is only applied to the value of the estate above this allowance. The current tax rate is 40%.	A 6.9 percentage point increase in inheritance tax rates, to a new rate of 47%, would increase tax revenue by £1 billion per year.	A 6.9 percentage point decrease in inheritance tax rates, to a new rate of 33%, would cut tax revenue by £1 billion per year.
IHT threshold	Inheritance tax threshold	Inheritance taxes are paid on the value of an estate (property, money and possessions) at death, if it is above a certain allowance and not left to a spouse or civil partner. The tax rate above the allowance is 40%. No tax is currently due on estates worth less than £500,000 including residential property, and the tax is only applied to the value of the estate above this limit.	A 16.5% decrease in the value of the inheritance tax allowance, so that only the first £422,000 of the value of the estate is untaxed, would increase tax revenue by £1 billion per year.	A 16.5% increase in the value of the inheritance tax allowance, so that the first £578,000 of the value of the estate is untaxed, would cut tax revenue by £1 billion per year.
NI rate - Employees > PT	Social insurance contributions: main employee rate	National Insurance contributions are paid based on earnings, by individuals and their employers. No tax is due from employees on earnings below £797 per month, and the tax is due only on earnings above this allowance. The main contribution rate for employees is currently 12%.	A 0.2 percentage point increase in employee National Insurance contributions, to a new rate of 12.2%, would increase tax revenue by £1 billion per year.	A 0.2 percentage point decrease in employee National Insurance contributions, to a new rate of 11.8%, would cut tax revenue by £1 billion per year.
			A 2.2 percentage point increase in employee National Insurance contributions, to a new rate of 14.2%, would increase tax revenue by £10 billion per year.	A 2.2 percentage point decrease in employee National Insurance contributions, to a new rate of 9.8%, would cut tax revenue by £10 billion per year.
NI rate - Employees > UEL	Social insurance contributions: higher employee rate	National Insurance contributions are paid based on earnings, by individuals and their employers. The main contribution rate for employees is 12%, but there is a lower rate applied to earnings above £4,189 per month. The contribution rate for employees' earnings above this upper limit is currently 2%.	A 0.9 percentage point increase in employee's National Insurance contributions above the upper earnings limit, to a new rate of 2.9%, would increase tax revenue by £1 billion per year.	A 0.9 percentage point decrease in employee's National Insurance contributions above the upper earnings limit, to a new rate of 1.1%, would cut tax revenue by £1 billion per year.
NI rate - Employers > ST	Social insurance contributions: main employer rate	National Insurance contributions are paid based on earnings, by individuals and their employers. No tax is due from employers on employees' earnings below £737 per month, and the tax is due only on earnings above this allowance. The contribution rate for employers is currently 13.8%.	A 0.15 percentage point increase in employers' National Insurance contributions, to a new rate of 14%, would increase tax revenue by £1 billion per year.	A 0.15 percentage point decrease in employers' National Insurance contributions, to a new rate of 13.6%, would cut tax revenue by £1 billion per year.

(continued)

Tax lever (short)	Tax lever (long)	Description of status quo	Statement of change to increase revenue	Statement of change to cut revenue
			A 1.5 percentage point increase in employers' National Insurance contributions, to a new rate of 15.3%, would increase tax revenue by £10 billion per year.	A 1.5 percentage point decrease in employers' National Insurance contributions, to a new rate of 12.3%, would cut tax revenue by £10 billion per year.
NI rate - Self-employed class 4	Social insurance contributions: main self-employed rate	National Insurance contributions are paid based on earnings, by individuals and their employers. For the self-employed, the main class of contributions ("Class 4") are due on profits above £9,568 per year, and this tax is applied only to profits above this allowance. The Class 4 contribution rate is currently 9%.	A 3.6 percentage point increase in Class 4 National Insurance contributions for the self-employed, to a new rate of 12.6%, would increase tax revenue by £1 billion per year.	A 3.6 percentage point decrease in Class 4 National Insurance contributions for the self-employed, to a new rate of 5.4%, would cut tax revenue by £1 billion per year.
NI threshold - Employees PT	Social insurance contributions: employee allowance	National Insurance contributions are paid based on earnings, by individuals and their employers. No tax is due on employees' earnings below a certain level. Employees pay at a rate of 12% on earnings above the allowance. The current tax allowance is £797 per month.	A 4.1% decrease in the tax allowance for employee contributions, so that only the first £760 of earnings per month is untaxed, would increase tax revenue by £1 billion per year.	A 4.1% increase in the tax allowance for employee contributions, so that the first £830 of earnings per month is untaxed, would cut tax revenue by £1 billion per year.
NI threshold - Employees UEL	Social insurance contributions: higher employee rate threshold	National Insurance contributions are paid based on earnings, by individuals and their employers. The main contribution rate for employees is 12%, but a lower rate of 2% applies above a certain earnings threshold. The current threshold for the lower rate is £4,189 per month.	A 5.4% increase in the earnings threshold for lower rate contributions, so that the 2% rate applies to earnings above £4,420 per month, would increase tax revenue by £1 billion per year.	A 5.4% decrease in the earnings threshold for lower rate contributions, so that the 2% rate applies to earnings above £3,960 per month, would cut tax revenue by £1 billion per year.
NI threshold - Employers ST	Social insurance contributions: employer allowance	National Insurance contributions are paid based on earnings, by individuals and their employers. No tax is due on employees' earnings below a certain level. Employers pay contributions at a rate of 13.8% on earnings above the allowance. The current tax allowance is £737 per month.	A 3.2% decrease in the tax allowance for employer contributions, so that only the first £710 of earnings per month is untaxed, would increase tax revenue by £1 billion per year.	A 3.2% increase in the tax allowance for employer contributions, so that the first £760 of earnings per month is untaxed, would cut tax revenue by £1 billion per year.
NI threshold - Self-employed LPL	Social insurance contributions: self-employed allowance	National Insurance contributions are paid based on earnings, by individuals and their employers. For the self-employed, the main class of contributions ("Class 4") are due on profits above a certain allowance, at the rate of 9%. The current tax allowance is £9,568 per year.	A 43.5% decrease in the tax allowance for self-employed profits, so that only the first £5,410 of profits per year is untaxed, would increase tax revenue by £1 billion per year.	A 43.5% increase in the tax allowance for self-employed profits, so that the first £13,730 of profits per year is untaxed, would cut tax revenue by £1 billion per year.

(continued)

Tax lever (short)	Tax lever (long)	Description of status quo	Statement of change to increase revenue	Statement of change to cut revenue
PIT rate - additional	Income tax: top rate	Personal Income Tax is paid on most forms of income (like earnings, pensions, rental income, and benefits), by individuals. The additional rate of income tax applies to income above £150,000 per year. The current tax rate is 45%.	A 6.1 percentage point increase in the additional rate of income tax, to a new rate of 51%, would increase tax revenue by £1 billion per year.	A 5 percentage point decrease in the additional rate of income tax, to a new rate of 40%, would cut tax revenue by £1 billion per year.
PIT rate - basic	Income tax: main rate	Personal Income Tax is paid on most forms of income (like earnings, pensions, rental income, and benefits), by individuals. No tax is due on the first £12,570 per year, and the basic rate is applied only to	A 0.2 percentage point increase in the basic rate of income tax, to a new rate of 20.2%, would increase tax revenue by £1 billion per year. A 1.7 percentage point increase in the basic rate of income tax, to a new rate of 21.7%, would increase tax revenue by £10 billion per year.	A 0.2 percentage point decrease in the basic rate of income tax, to a new rate of 19.8%, would cut tax revenue by £1 billion per year. A 1.7 percentage point decrease in the basic rate of income tax, to a new rate of 18.3%, would cut tax revenue by £10 billion per year.
PIT rate - higher	Income tax: higher rate	Personal Income Tax is paid on most forms of income (like earnings, pensions, rental income, and benefits), by individuals. The higher rate of income tax applies to income above a threshold of £50,270 per year (and below the additional rate band). The current tax rate is 40%.	A 0.7 percentage point increase in the higher rate of income tax, to a new rate of 40.7%, would increase tax revenue by £1 billion per year.	A 0.7 percentage point decrease in the higher rate of income tax, to a new rate of 39.3%, would cut tax revenue by £1 billion per year.
PIT threshold - basic rate limit	Income tax: higher rate threshold	Personal Income Tax is paid on most forms of income (like earnings, pensions, rental income, and benefits), by individuals. The main income tax rate is 20% above the tax-free personal allowance but below the higher rate threshold, and 40% above the threshold. The current higher rate threshold is £50,270 per year.	A 2.7% decrease in the income threshold for higher rate taxation, so that the 40% rate applies to income above £49,130 per year, would increase tax revenue by £1 billion per year.	A 2.7% increase in the income threshold for higher rate taxation, so that the 40% rate applies to income above £51,647 per year, would cut tax revenue by £1 billion per year.
PIT threshold - personal allowance	Income tax: personal allowance	Personal Income Tax is paid on most forms of income (like earnings, pensions, rental income, and benefits), by individuals. The main income tax rate is 20%, and applies to income above the tax-free personal allowance (and below the higher rate threshold). The current personal allowance is £12,570 per year.	A 1.1% decrease in the personal income tax allowance, so that only the first £12,430 per year is untaxed, would increase tax revenue by £1 billion per year.	A 1.1% increase in the personal income tax allowance, so that the first £12,707 per year is untaxed, would cut tax revenue by £1 billion per year.
SDLT rates	Property transaction tax rates	Residential Stamp Duty Land Tax ("Stamp Duty") is paid on the purchase of residential property. No tax is due on properties worth less than £125,000, and the tax is only applied to the value of the property above this allowance. The current rates range between 2% and 12%, with higher rates for more expensive properties.	A 0.9 percentage point increase in all the Stamp Duty rates, to new rates ranging from 2.9% to 12.9%, would increase tax revenue by £1 billion per year.	A 0.8 percentage point decrease in all the Stamp Duty rates, to new rates ranging from 1.2% to 11.2%, would cut tax revenue by £1 billion per year.

(continued)

Tax lever (short)	Tax lever (long)	Description of status quo	Statement of change to increase revenue	Statement of change to cut revenue
SDLT threshold	Property transaction tax threshold	Residential Stamp Duty Land Tax ("Stamp Duty") is paid on the purchase of residential property. Stamp Duty rates are on a sliding scale between 2% and 12%, with higher rates for more expensive properties. No tax is currently due on properties worth less than £125,000, and the tax is only applied to the value of the property above this limit.	A 9.1% decrease in the tax allowance for Stamp Duty, so that only the first £114,000 of the property purchase price is untaxed, would increase tax revenue by £1 billion per year.	A 9.5% increase in the tax allowance for Stamp Duty, so that the first £137,000 of the property purchase price is untaxed, would cut tax revenue by £1 billion per year.
VAT standard rate	VAT standard rate	Value Added Tax (VAT) is paid on the purchase of most goods and services. No tax is due on some items (like food and children's clothes), and some goods and services are taxed at a reduced rate.	A 0.2 percentage point increase in the standard VAT rate, to a new rate of 20.2%, would increase tax revenue by £1 billion per year. A 1.4 percentage point increase in the standard VAT rate, to a new rate of 21.4%, would increase tax revenue by £10 billion per year.	A 0.2 percentage point decrease in the standard VAT rate, to a new rate of 19.8%, would cut tax revenue by £1 billion per year. A 1.4 percentage point decrease in the standard VAT rate, to a new rate of 18.6%, would cut tax revenue by £10 billion per year.

Statistics on Respondent Attention

Response Time by Response Category

Answer	Median Response Time (in seconds)
Option A	54.67
Option B	55.84
Neutral	54.73
Don't know	29.33

Response Time and Share of Neutral Responses by Tax Lever

	Median response time (seconds)		Share of ...	
Tax Lever	All responses	Excluding DK's	Neutral	Don't know
A&T duties	48.60	51.23	0.26	0.13
CGT rates	49.50	53.41	0.27	0.20
Council Tax	50.92	54.22	0.27	0.15
CT rate	46.44	50.19	0.26	0.16
Fuel duties	45.57	47.48	0.30	0.16
IHT rate	49.36	55.76	0.29	0.16
IHT threshold	52.67	56.44	0.30	0.19
NI rate - Employees > PT	48.82	52.36	0.33	0.18
NI rate - Employees > UEL	51.89	56.43	0.33	0.22
NI rate - Employers > ST	51.99	54.29	0.34	0.17
NI rate - Self-employed class 4	50.03	54.11	0.34	0.20
NI threshold - Employees PT	56.98	62.80	0.30	0.20
NI threshold - Employees UEL	59.87	62.80	0.35	0.20
NI threshold - Employers ST	56.45	60.58	0.31	0.20
NI threshold - Self-employed LPL	55.42	61.92	0.32	0.22
PIT rate - additional	51.84	55.82	0.30	0.18
PIT rate - basic	52.31	56.64	0.28	0.17
PIT rate - higher	52.15	56.64	0.30	0.17
PIT threshold - basic rate limit	58.58	62.54	0.32	0.19
PIT threshold - personal allowance	53.17	58.81	0.28	0.19
SDLT rates	46.07	50.84	0.30	0.17
SDLT threshold	53.75	59.52	0.28	0.19
VAT standard rate	47.81	50.28	0.28	0.13

Relationship between Don't Knows and Neutral Responses by Tax Lever

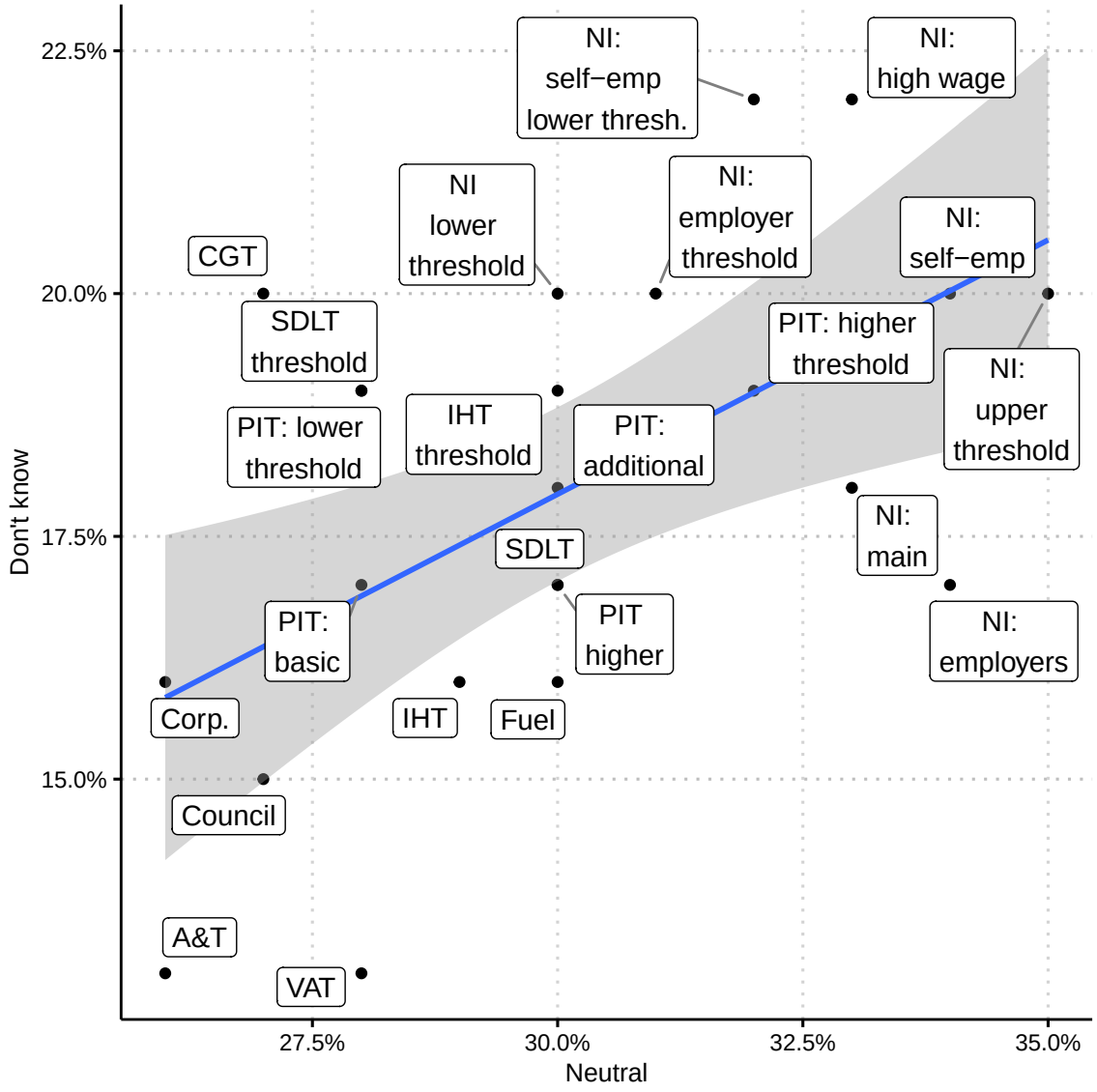

Figure 5: Share of neutral and don't know responses by tax lever.

Model Specification, Identification, and Estimation

Specification

Each respondent i makes a choice between two alternative two proposals $j \in A, B$, with an option to to give a neutral response if they are not sure or view both alternatives as equally attractive/unattractive.

- $Y_i = 1$ if Respondent prefers A
- $Y_i = 0.5$ if Respondent gives neutral response
- $Y_i = 0$ if Respondent prefers B

Following a generalized Bradley-Terry model framework, we model the expected value of Y_i as a function of the competing "popularities" π_j of different tax change proposals j. With proposals A and B, this can be written formally as:

$$E[Y_i] = \alpha + \pi_{iA} - \pi_{iB}$$

where α is the expected value of Y_i when the two proposals are equally popular, i.e. if $\pi_{iA} = \pi_{iB}$.[15]

Within this framework, we can specify the popularities π_{ij} as a function $f(X_i, Z_j)$ of the experimentally varied features of the proposals Z_j, and observational characteristics of the respondents X_i. This yields a probability-scale model where additive forms of $f(X_i, Z_j)$ can be interpreted as the additive effects on the net support for a proposal with a given feature versus an alternative feature, or for one group of respondents relative to another group, averaging over the opposing proposals. The difference between π_{iA} and π_{iB} is the predicted difference between the proportion of respondents preferring A over B and the share of those preferring B over A.[16]

Many of our models additionally involve a variable S_i which describes the sign of the proposed tax change:

- $S_i = 1$ if prompt describes a choice between tax increases

[15] α can be thought as the order effect 'advantage' of a proposal being presented as option A vs option B, irrespective of their content. If $\alpha = 0.5$, there is no advantage.

[16] Because the modelled probabilities are not close to 0 or 1 for any A or B, the results are not sensitive to this choice of a linear functional form. Similar results can be obtained using an ordered logistic/probit framework with equivalent specifications of the deterministic component.

- $S_i = -1$ if prompt describes a choice between tax cuts

Models that incorporate S_i in different ways enable us to either (a) combine responses from choices over increases and choices over cuts to estimate which tax levers the respondent would generally prefer to use to raise marginal revenue or (b) to disaggregate responses from choices over increases and choices over cuts to consider possible patterns of asymmetry in how respondents would prefer to raise marginal revenue.

Our initial analysis defines $\pi_{ij} = S_i \nu_j$ where $S_i = 1$ for tax increase prompts and -1 for decrease prompts, pooling our data such that greater values of ν_j correspond to taxes j that tend to be preferred as a source of revenue. The model presented in Figure 2 plots ν_j parameter for each tax lever j estimated using the model equation:

$$E[Y_i] = \alpha + S_i \nu_A - S_i \nu_B$$

under the identification assumption that $\nu_j \sim N(0, \sigma)$, where σ is the estimated standard deviation of the lever popularities around their mean.

The models presented in Figures 3 and 4, plot ν_j parameter for each tax lever j estimated using the model equation:

$$E[Y_i] = \alpha + S_i(\beta_A X_i) - S_i(\beta_B X_i)$$

where we estimate a vector of β_j per tax lever and define X_i matrices that have an intercept (column of ones) plus some number of features k of the respondent giving response i. We regularize the coefficients with a normal prior $\beta_{jk} \sim N(0, \sigma_k)$ that shrinks all tax-specific coefficients towards zero according to their common variance by feature k. This avoids spuriously large differences due to limited samples and the number of comparisons being considered.

We use this same model setup for the analyses presented in appendix figures. In the figure comparing preferences in tax increase versus tax decrease prompts, we use S_i as our X_i variable, which creates an interaction between levers and the tax change direction, yielding separate estimates for both tax change direction for each lever.

Identification

By assuming that $\nu_j \sim N(0, \sigma)$, we set the zero point for our interval-level quantity of interest as the average of the popularities for the tax levers we tested. As noted in the main text, this kind of experimental design cannot yield estimates of absolute popularity of tax levers. Our identification restriction here is analogous to the one used in "random effects" models, as opposed to the "fixed effects" restriction of setting a single level to zero and estimating all others relative to that one. Thus, the interval estimates in our figures should be understood as describing uncertainty about a given lever relative to the average level, which is presented as a dotted vertical line in each plot.

Estimation

We estimate our models using Stan (Carpenter et al., 2016), with full code available in our replication package.

Robustness Checks

Preferences over Tax Increases Versus Decreases

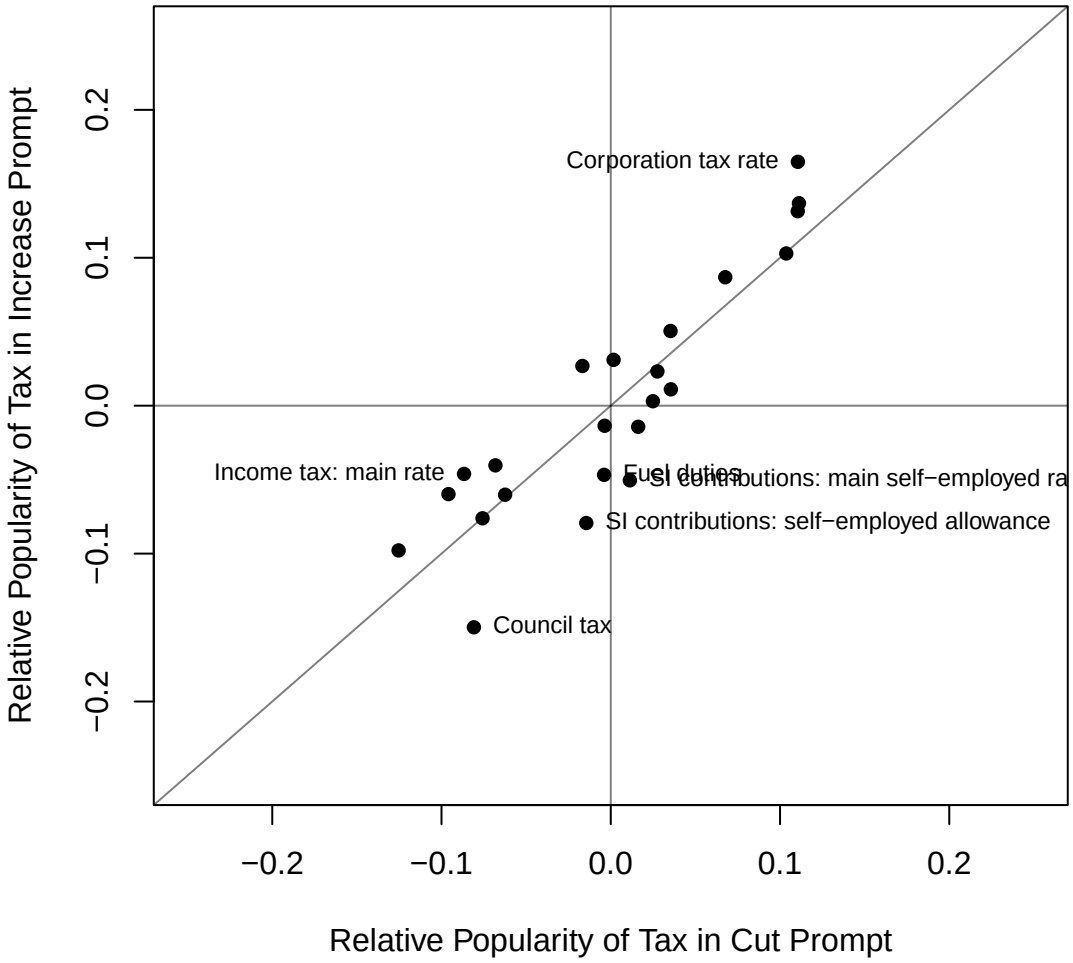

Figure 6: Relative popularity of a given tax in tax increase prompts as a function of the relative popularity of the same tax in tax cut prompts. Text labels provided for tax levers where 95% intervals for the differences exclude zero.

Preferences for Larger versus Smaller Tax Changes

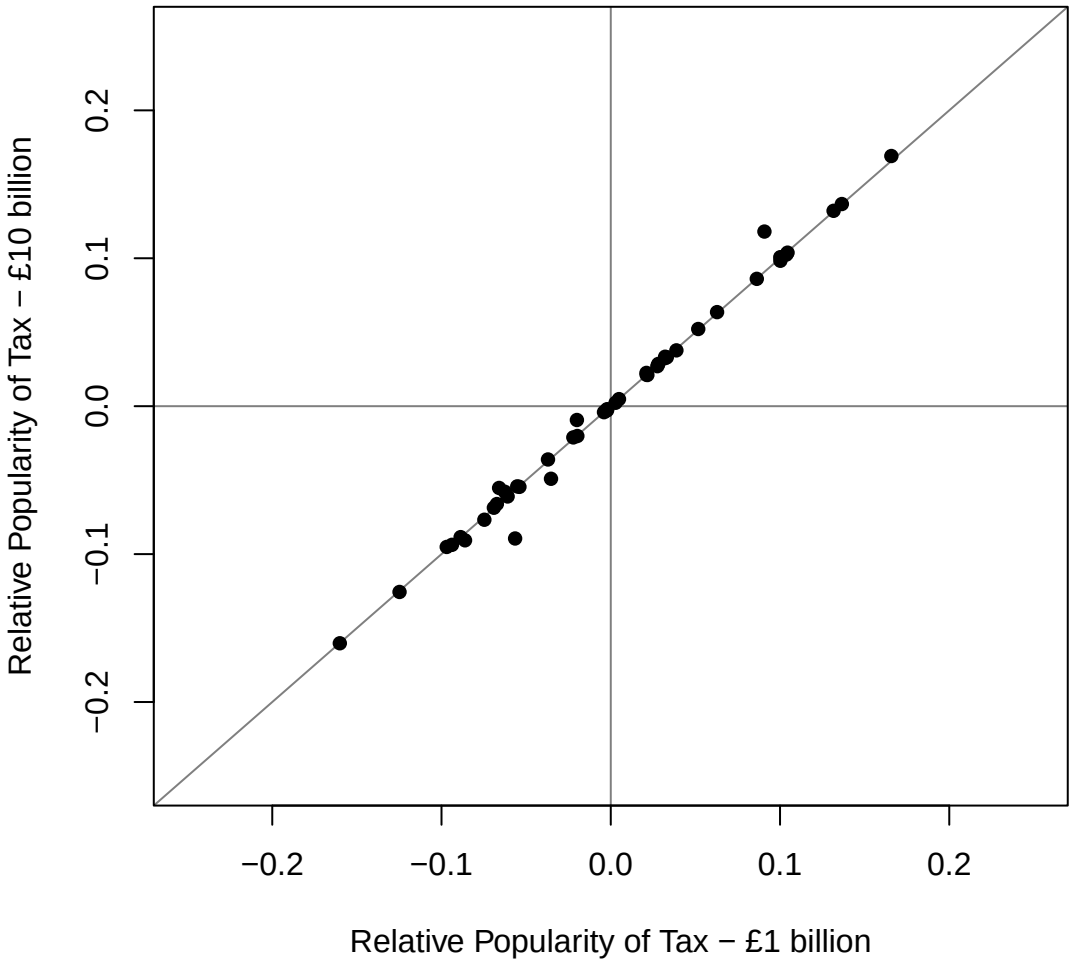

Figure 7: Relative popularity of changing a given tax lever in a given direction, to change revenue by £1 billion (x-axis) versus £10 billion (y-axis). There are no tax levers where 95% intervals for the differences exclude zero.

Sensitivity to Arguments

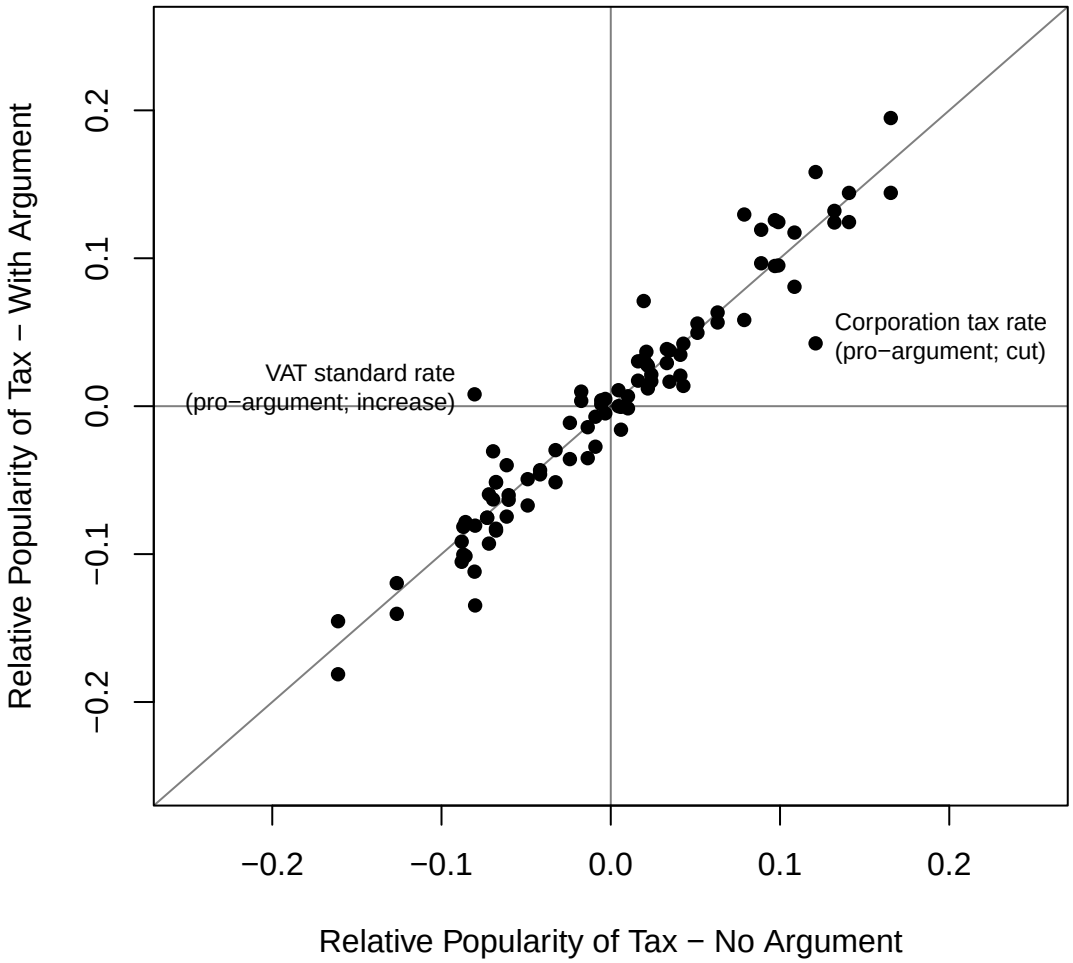

Figure 8: Relative popularity of changing a given tax lever in a given direction, in the baseline condition (x-axis) versus with pro or con argument texts provided (y-axis). Text labels provided for tax levers where 95% intervals for the differences exclude zero.

Estimated Preference by Covariates

In this appendix, we report estimates examining tax lever preferences by EU referendum vote, 2019 general election turnout, gender, income and degree status.

Preferences by EU Referendum Vote

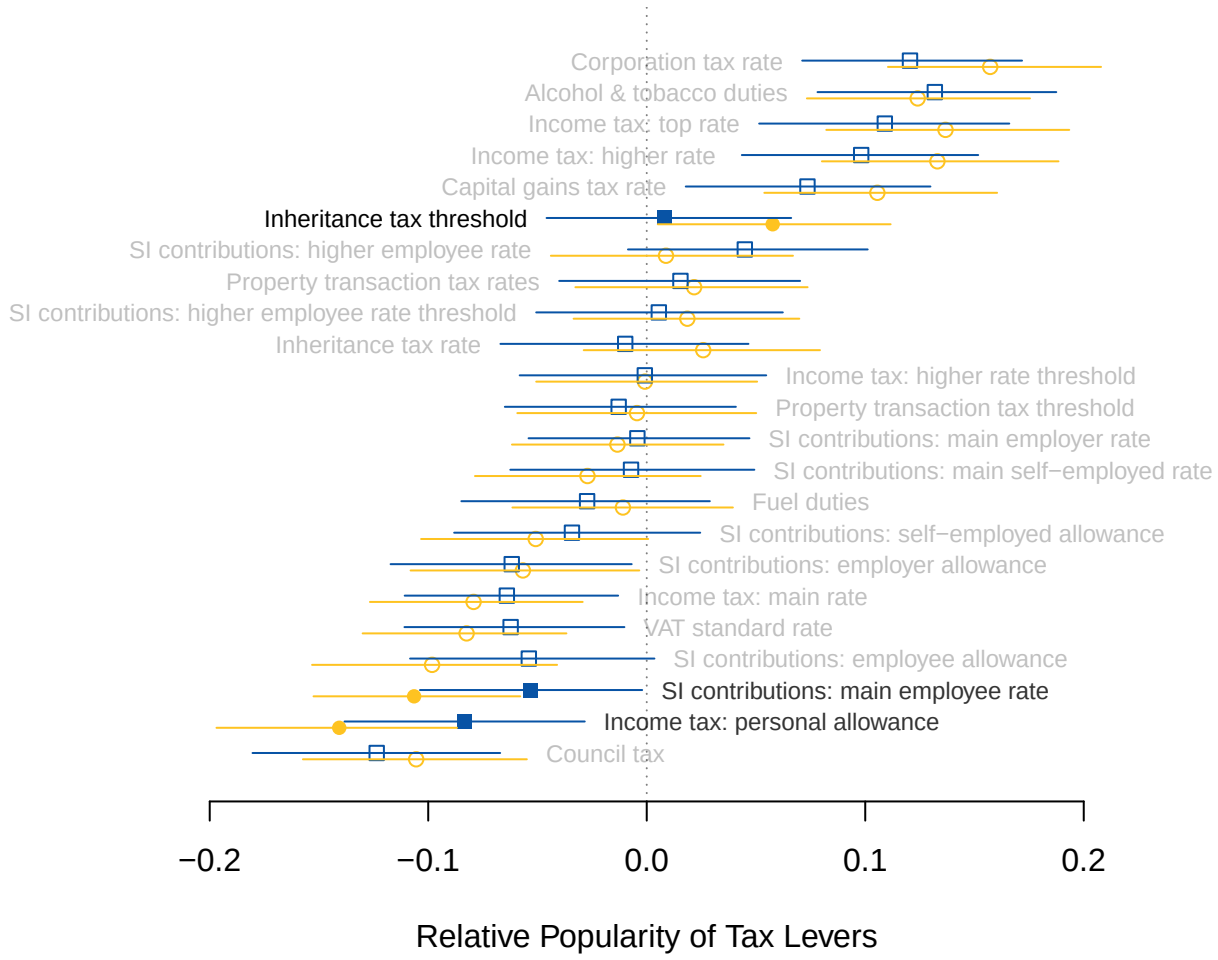

Figure 9: Relative public preference for tax levers for Leave (blue squares) versus Remain (yellow circles) voters in the 2015 EU Referendum, in units of probability of supporting taxation via a given lever versus others in pairwise comparisons of revenue-equivalent increases and decreases. Solid points and black label text indicate tax levers where the 95% interval for the difference excludes zero.

Preferences by 2019 Voter Turnout

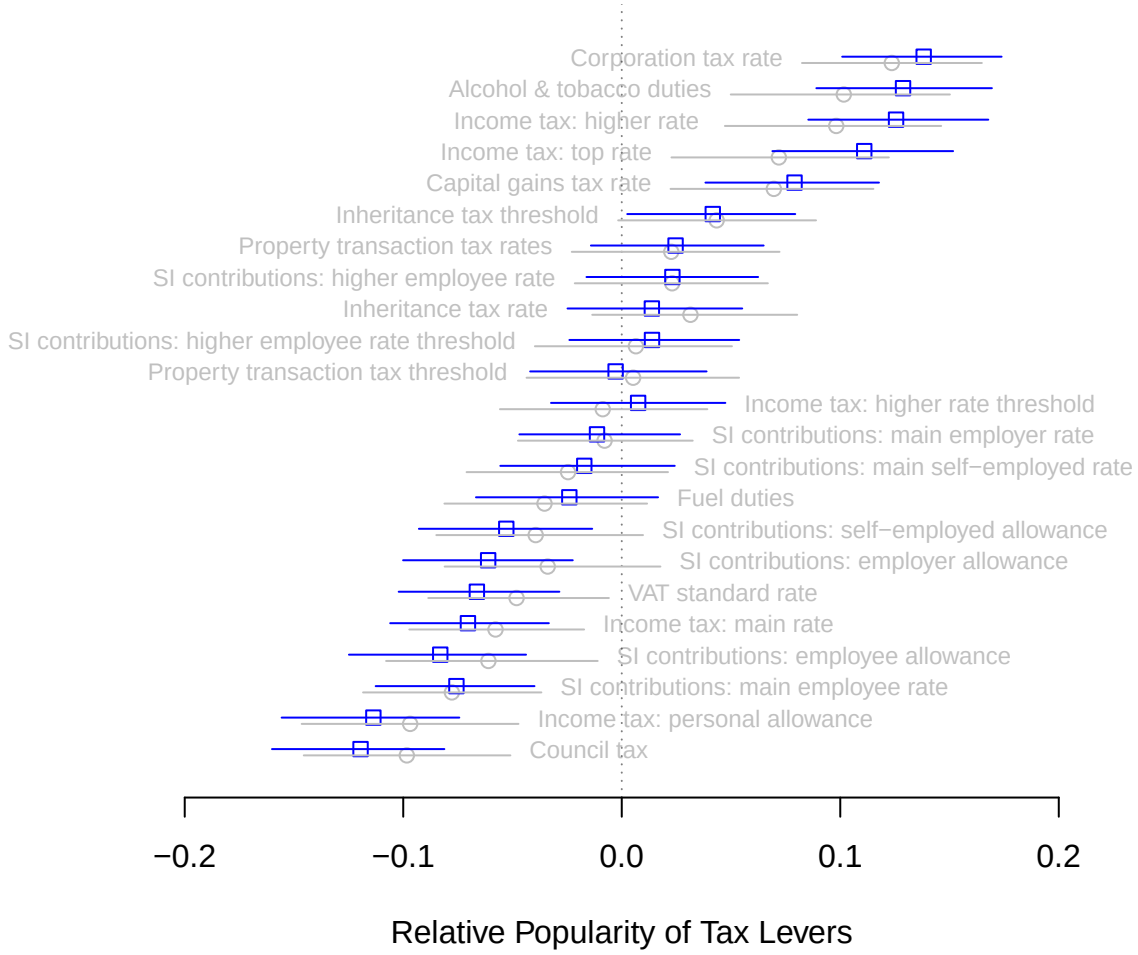

Figure 10: Relative public preference for tax levers for 2019 non-voters (grey circles) versus 2019 voters (blue squares) voters, in units of probability of supporting taxation via a given lever versus others in pairwise comparisons of revenue-equivalent increases and decreases. Solid points and black label text indicate tax levers where the 95% interval for the difference excludes zero.

Preferences by Party Choice (additional categories)

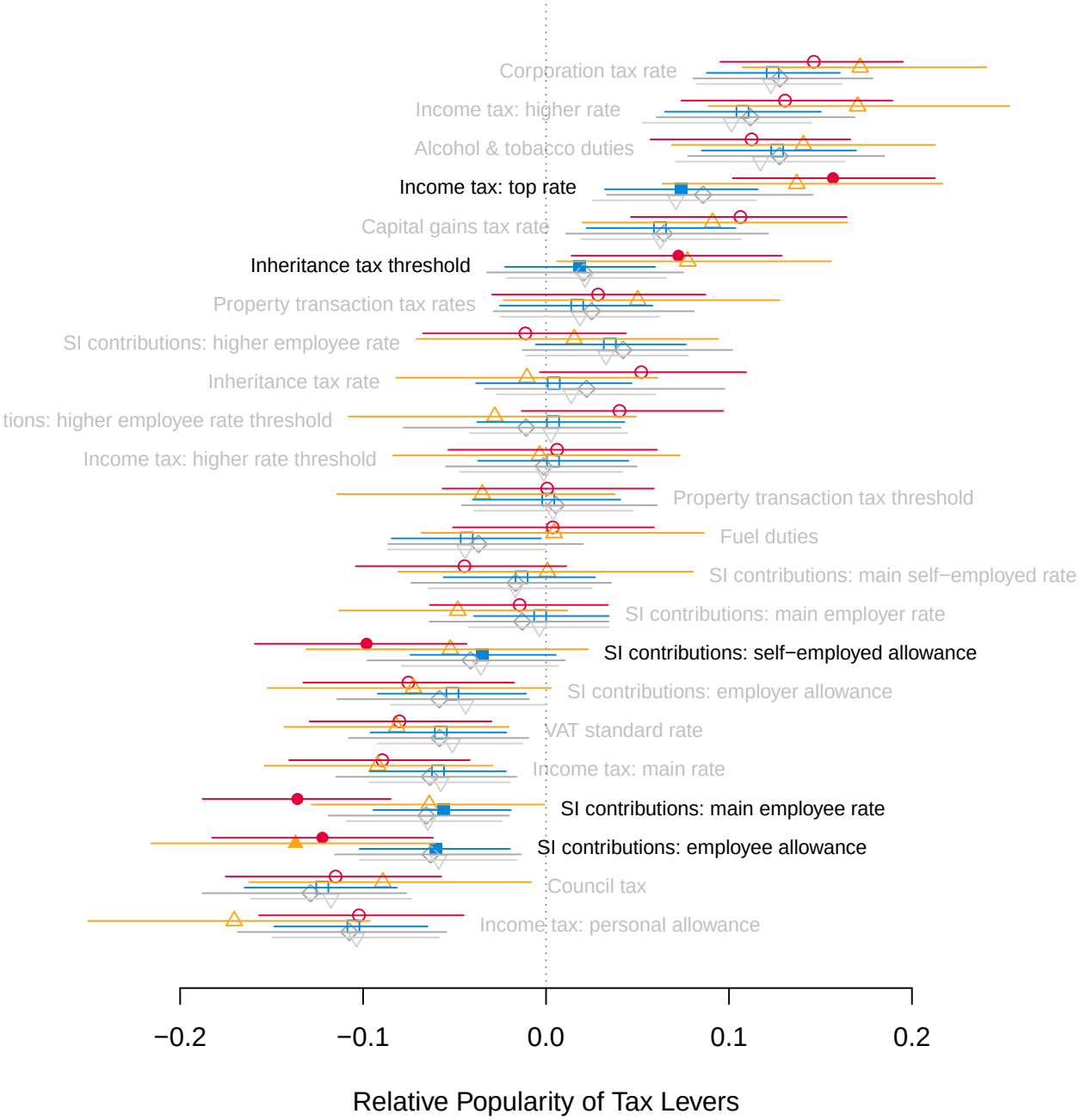

Figure 11: Relative public preference for tax levers for Conservative (blue squares), Labour (red circles), Liberal Democrat (yellow triangles) voters, voters of other parties (dark gray diamonds) and non-voters (light gray inversed triangles) in the 2019 General Election in units of probability of supporting taxation via a given lever versus others in pairwise comparisons of revenue-equivalent increases and decreases. Solid points and black label text indicate tax levers where the 95% interval for the party difference excludes zero.

Preferences by Income (additional categories)

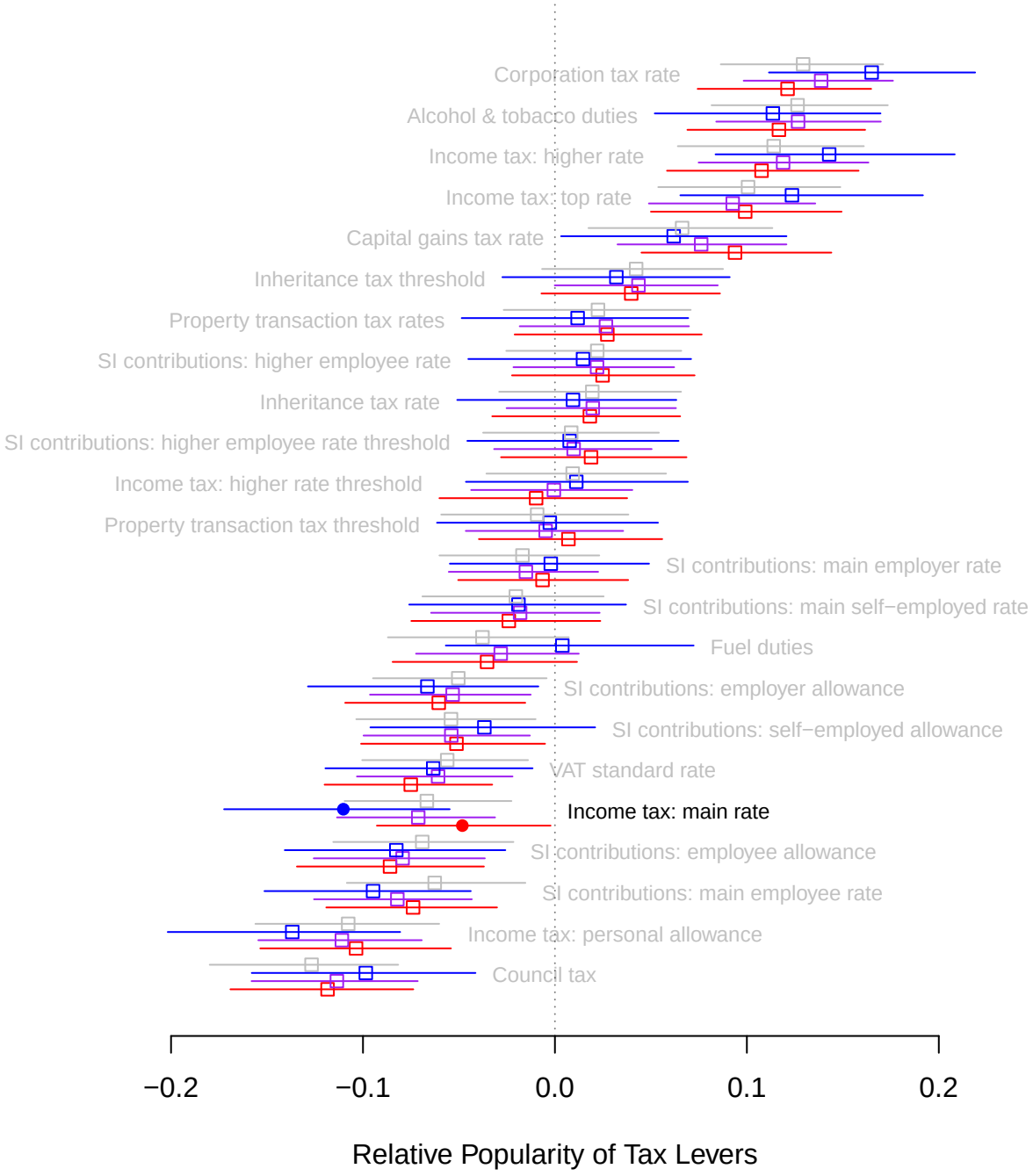

Figure 12: Relative public preference for tax levers for respondents with household incomes above 60k (blue circles), between 25k and 60k (purple circles), below 25k (red circles), and those who did not answer the income item (grey squares), in units of probability of supporting taxation via a given lever versus others. Solid points and black label text indicate tax levers where the 95% interval for an income category difference excludes zero.

Preferences by Gender

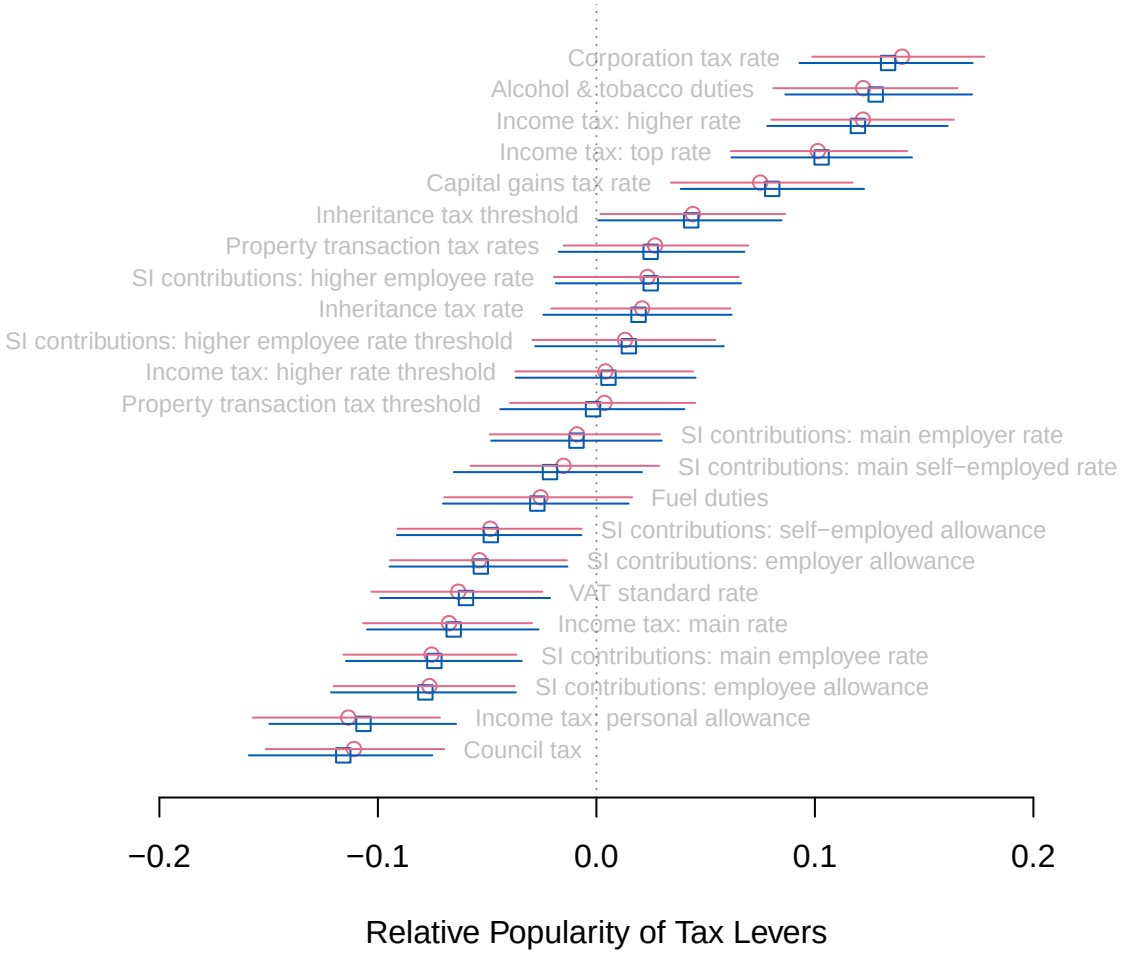

Figure 13: Relative public preference for tax levers for men (pink circles) versus women (blue squares), in units of probability of supporting taxation via a given lever versus others in pairwise comparisons of revenue-equivalent increases and decreases. Solid points and black label text indicate tax levers where the 95% interval for the gender difference excludes zero.

Preferences by Education Level

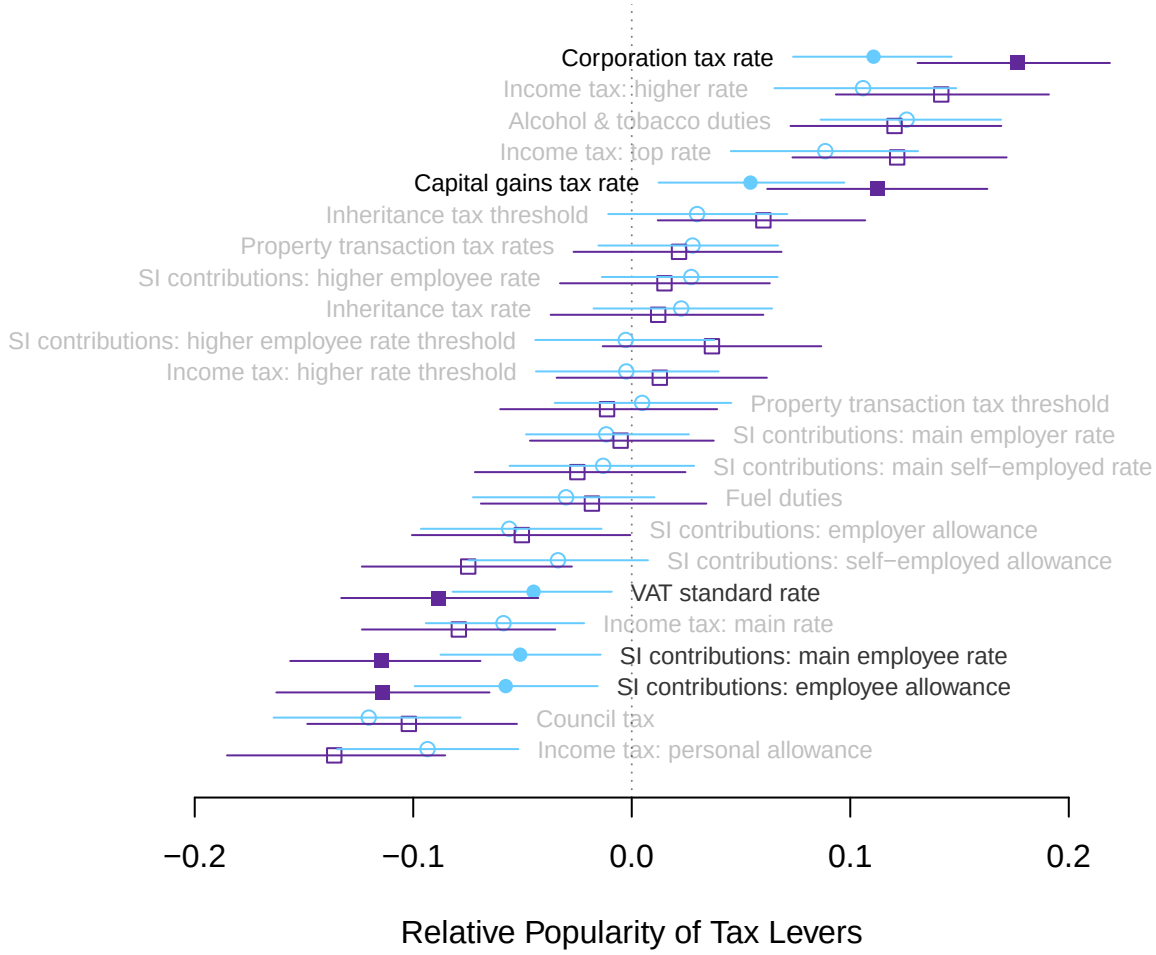

Figure 14: Relative public preference for tax levers for respondents without (blue circles) versus with university degree (purple squares), in units of probability of supporting taxation via a given lever versus others in pairwise comparisons of revenue-equivalent increases and decreases. Solid points and black label text indicate tax levers where the 95% interval for the difference excludes zero.

Preference Multivariate Analysis

tax	intercept	over45k	refused	degree	female	leave	lab	ld	other	none
A&T duties	0.120	0.009	0.001	-0.004	0.005	0.005	-0.010	0.012	0.002	-0.007
CGT rates	0.049	-0.009	-0.008	0.050	0.005	-0.002	0.031	0.017	0.002	0.000
Council Tax	-0.125	0.032	-0.009	0.010	-0.004	-0.004	0.001	0.022	-0.006	0.005
CT rate	0.111	0.022	-0.003	0.054	-0.005	-0.008	0.008	0.025	0.003	0.000
Fuel duties	-0.043	0.014	-0.007	0.002	-0.002	0.001	0.042	0.034	0.005	-0.001
IHT rate	0.022	-0.017	-0.001	-0.013	-0.002	-0.018	0.044	-0.011	0.017	0.008
IHT threshold	0.025	-0.004	0.000	0.019	-0.001	-0.021	0.045	0.039	0.002	0.001
NI rate - Employees > PT	-0.050	-0.009	0.013	-0.046	0.002	0.014	-0.062	0.006	-0.008	-0.008
NI rate - Employees > UEL	0.032	-0.019	0.000	-0.003	0.001	0.013	-0.038	-0.012	0.007	-0.001
NI rate - Employers > ST	-0.009	-0.001	-0.003	0.012	0.000	0.004	-0.009	-0.038	-0.009	0.001
NI rate - Self-employed class 4	-0.009	-0.007	-0.002	-0.008	-0.006	0.007	-0.024	0.013	-0.003	-0.003
NI threshold - Employees PT	-0.057	0.003	0.008	-0.043	-0.001	0.013	-0.046	-0.051	-0.002	0.002
NI threshold - Employees UEL	-0.005	-0.017	-0.002	0.038	0.002	-0.001	0.028	-0.030	-0.014	-0.001
NI threshold - Employers ST	-0.054	-0.002	0.003	0.010	0.001	-0.006	-0.023	-0.020	-0.006	0.007
NI threshold - Self-employed LPL	-0.030	-0.001	-0.001	-0.030	0.000	0.005	-0.051	-0.005	-0.004	0.000
PIT rate - additional	0.063	0.003	0.006	0.024	0.002	0.004	0.074	0.049	0.012	-0.002
PIT rate - basic	-0.051	-0.025	0.000	-0.012	0.002	0.000	-0.025	-0.024	-0.004	0.001
PIT rate - higher	0.102	0.018	-0.003	0.026	-0.002	-0.011	0.016	0.042	0.004	-0.005

(continued)

tax	intercept	over45k	refused	degree	female	leave	lab	ld	other	none
PIT threshold - basic rate limit	-0.008	0.017	0.010	0.012	0.001	-0.001	-0.002	-0.007	-0.004	-0.004
PIT threshold - personal allowance	-0.108	-0.002	0.002	-0.031	0.006	0.020	0.009	-0.040	-0.001	0.002
SDLT rates	0.024	0.000	-0.003	-0.007	-0.001	-0.005	0.012	0.024	0.007	0.001
SDLT threshold	0.013	-0.009	-0.005	-0.012	-0.005	-0.009	-0.003	-0.030	0.004	0.002
VAT standard rate	-0.047	0.002	0.005	-0.039	0.003	-0.002	-0.017	-0.015	-0.001	0.004
Correlation with bivariate estimates		0.964	0.995	0.989	0.993	0.865	0.993	0.987	0.997	0.988

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