Malte Chirvi, Cornelius Schneider

Stated Preferences for Capital Taxation – Tax Design, Misinformation and the Role of Partisanship

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Malte Chirvi* / Cornelius Schneider#

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Although theoretical research on optimal capital taxation suggest to incorporate public opinions, the empirical literature on preferences regarding capital taxation almost exclusively focusses on the emotionally loaded estate tax. This paper presents a more comprehensive investigation of preferences towards different, tangible instruments of capital taxation beyond the estate tax. In particular, we focus on the effects of tax-specific design features and personal as well as asset-related characteristics. For this, we conducted a factorial survey experiment with over 3,200 respondents on Amazon's Mechanical Turk (MTurk). By using different tax instruments as reference points for each other we strengthen the robustness of our findings. While our results confirm well-established findings of previous literature, we show that the specific design of tax instruments is indeed decisive for preferences over capital taxation. Whereas proposed effective tax rates of the estate tax and the one-time wealth tax show a significant progressivity, there is no clear pattern for both periodical taxes. Furthermore, preferences depend on the respondents' characteristics, especially their partisanship. Democrats clearly prefer concentrated over periodical capital taxes, Republicans' only articulated preference refers to the particular rejection of the estate tax. Remarkably, this opposition does not hold for a perfectly congruent one-time wealth tax. This result provides novel empirical evidence for drivers of the opposition towards the estate tax beyond mere misinformation discussed by previous literature: emotional charge potentially triggered by political framing.

JEL-Classification: C90, D31, H21, H24

* Malte Chirvi, Institut für Betriebswirtschaftliche Steuerlehre, Humboldt-Universität zu Berlin, Dorotheenstrasse 1, 10117 Berlin, Germany, malte.chirvi@wiwi.hu-berlin.de.

\# Cornelius Schneider, Max Planck-Institut zur Erforschung von Gemeinschaftsgütern, Kurt-Schumacher Str. 10, 53113 Bonn, Germany, cschneider@coll.mpg.de.

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1 Introduction

In both the political and the academic sphere taxation of capital is an intensely debated topic with an emotionalized focus on the taxation of intergenerational wealth transfers. Especially against the background of increased wealth inequality (Alvaredo et al., 2013), capital taxation is not only at the heart of the debate on redistributive policies (and more specifically on equality of opportunity). Due to an increase of concentrated private wealth it also presents a growing source of potential government revenue (Piketty and Zucman, 2014; Drometer et al., 2018). Yet, the current worldwide trend of tax policies points towards repealing net wealth taxation (Drometer et al., 2018). Drometer et al. (2018) analyze 26 OECD countries and illustrate that, over the past 15 years, seven OECD economies abolished net wealth taxation and only three countries still maintain such a tax: Switzerland, Norway and Spain. Estate taxes or corresponding inheritance taxes are still levied in two thirds of the analyzed OECD countries but are constantly subject to the political debate and legal changes.

The current theoretical debate on capital taxation centers especially around the equity-efficiency trade-off (Straub and Werning; e.g. Piketty and Saez, 2013). In terms of evaluating the efficiency criteria for intergenerational wealth transfers, the underlying bequest motive appears to be decisive (Kopczuk, 2013). When comparing estate taxes and periodical net wealth taxes, it is often assumed that the estate tax is more effective and has lower administrative costs (Kopczuk, 2013; Bach, 2016; Bastani and Waldenström, 2018). However, this strand of research remains conceptual as it only peripherally considers empirical resources and ignores the public perception as well as the political support regarding *different* capital taxes. A fairly young development in the literature suggests incorporating public opinions - revealed preferences - on capital taxation into the optimal taxation framework (Weinzierl, 2014; Saez and Stantcheva, 2016). More recent studies suggest that people would prefer to reduce wealth inequality, e.g. by implementing some form of capital taxation (Kuziemko et al., 2015). Nonetheless, survey evidence strongly suggests that the majority of people opposes any form of taxes on intergenerational wealth transfers (Slemrod, 2006) and experimental work confirms this exceptional opposition (Alesina et al., 2018; Bastani and Waldenström, 2019). Although misinformation is assumed to be a main driver, it remains unclear if this explains the full story (Kuziemko et al., 2015).

To date, research on preferences towards capital taxation mainly focuses on either abstract normative concepts (Weinzierl, 2014) or emotionally loaded estate taxes. Yet, in order to

understand the evolution of capital taxation in developed economies, it is necessary to also account for preferences towards different instruments of capital taxation. The goal of this study is to fill this gap and present an investigation of preferences regarding diversified forms of capital taxation with tangible, real-word policy choices *beyond* estate taxation. More to the point: an investigation of individual preferences towards capital taxation across arguably equivalent tax instruments targeting the *entirety of all individual assets*. This entails examining non-utilitarian normative ideas that distinguish e.g. the estate tax from otherwise equivalent (periodical) wealth taxes. In particular, we focus on the effects of both tax-specific design features and personal as well as asset-related characteristics derived from political rhetoric on preferences regarding capital taxation. At the same time, we aim to shed light on the different channels leading up to people's strong opposition to the estate tax - beyond aspects of mere misinformation about estate taxation as discussed in the existing literature.

In doing so, our research design aims to isolate true normative value judgments from a) underlying personal efficiency concerns (i.e. different expected behavioral responses to different tax instruments) and b) bounded rationality (i.e. the mere inability of respondents to translate periodical tax rates into concentrated tax rates).

For this purpose, we conducted a factorial vignette survey experiment with over 3,200 respondents on Amazon's Mechanical Turk (MTurk). Each respondent was randomized into one of four question groups about different types of tax instruments: an estate tax, a one-time wealth tax at the age of 80, a decennial wealth tax or a yearly wealth tax. The between-subject variation of these different tax instruments accounts for a potential concentration bias (yearly vs. decennial tax) as well as potential framing effects (estate vs. one-time tax). For the assigned type of tax instrument, respondents were asked to state their preferred overall life-time tax burden for each of nine hypothetical individuals that differed across four dimensions: level of wealth, type of assets, source of wealth and the number of children. This methodology enables us to disentangle the effect of each dimension on the preferred level of taxation while identifying relative differences of these effects across the different tax instruments (between subjects). In taking a more comprehensive view on instruments for capital taxation, this novel approach has another advantage: It strengthens the robustness of our findings by using different tax instruments as reference points for each other.

While our results confirm well-established findings of previous literature, we show how differences in tax designs are indeed decisive for preferences regarding capital taxation. In general, respondents chose relatively high levels of capital taxation varying from 12.8 to 14.9

percent of overall lifetime tax burden across tax instruments. Proposed tax burdens are highest if assets are accumulated by luck and lowest if accumulated by effort (Alesina and Angeletos, 2005). Interestingly, on the one hand, we find strong indicators that our respondents perceive inherited wealth as rather luckily gained. On the other hand, and somehow contrary to political discussions, participants do not seem to differentiate between different types of assets (Bastani and Waldenström, 2018). Supporting the general finding on misinformation, only 5 percent of our respondents are aware of the actual population share affected by the current estate tax (Slemrod, 2006). These informed individuals propose significantly higher effective tax rates across *all* tax instruments.

In addition to this misinformation, we show that the specific design of tax instruments is indeed decisive for preferences over capital taxation, especially along the lines of concentrated (i.e. estate and one-time tax) versus periodical (i.e. yearly and decennial tax) taxes. While proposed effective tax rates of the estate tax and the one-time wealth tax show a significant progressivity, there is no clear pattern for both periodical taxes. Moreover, the effect of the number of children differs in this regard: While respondents in both concentrated tax treatments propose significantly lower effective tax rates in vignettes with three children compared to vignettes without children, we find no clear effects in both periodical tax treatments. With respect to the characteristics of our respondents, older respondents and those with own children strongly oppose particularly the estate tax (cf. bequest motives discussed by Cremer and Pestieau, 2006).

Finally, and most interestingly, the treatment effects starkly differ along partisanship. While Democrats clearly prefer concentrated taxes (both the estate and the one-time wealth tax) over periodical wealth taxes, Republicans' only articulated preference refers to the particular rejection of the estate tax. Especially remarkable is how this rejection does not hold for a perfectly congruent one-time wealth tax, for which they propose significantly higher tax rates. This finding is particularly intriguing since it constitutes novel empirical evidence distinguishing mere misinformation from apparent emotional charges, potentially triggered by political framing (Birney et al., 2006). By comparing different tax instruments, our research design provides two observations supporting this interpretation: First, Democrats unambiguously do not differentiate between these tax instruments, which indicates the actual similarity between the estate and one-time wealth tax treatments. Second, the influence of misinformation about both the design of the actual estate tax and the distribution of wealth affects all treatments to the same extent. Therefore, misinformation can be ruled out as a specific predictor of opposition to the estate tax compared to capital taxes in general and a perfectly

congruent one-time wealth tax in particular. Besides that, our results also confirm some previous findings along the partisanship: Republicans accept more inequality than Democrats (Cappelen et al., 2018) and prefer lower and less progressive tax rates. Moreover, they partially assess inherited assets similar to those accumulated by saving incomes, whereas Democrats consider them closer to luckily earned incomes.

This paper examines preferences towards different, tangible wealth-tax instruments in order to also account for tax-instrument-specific design and framing characteristics. Such a more comprehensive approach yields some methodological benefits: that way we attempt to disentangle true normative judgments from efficiency concerns as well as bounded rationality to identify drivers of opposition towards the estate tax beyond misinformation. Furthermore, the different tax instruments serve as reference points to each other and thus provide more robust interpretations of our results.

2   Related literature

The motivation for this paper originates in the relatively new realm of theoretical work that counteracts the classic conclusion of Atkinson and Stiglitz (1976), Chamley (1986) and Judd (1985) implying an optimal capital and wealth tax of zero. While a vast theoretical literature challenges this result from an equity-efficiency trade-off perspective[1], this paper especially ties in with the work of Weinzierl (2014) and Saez and Stantcheva (2016, 2018) who bridge the gap between standard models of optimal (capital) taxation and public preferences.[2] More specifically, Saez and Stantcheva (2016, 2018) provide a framework to augment the welfare analysis of optimal taxation by a broad range of fairness principles and value judgments determining the level of redistribution a society deems to be fair. It is important to note that these preferences are not necessarily linked to the individual utility (i.e. general social marginal welfare weights). Weinzierl (2014) elaborates on the strong normative assumptions standard models of optimal income taxation impose with objective functions mostly following either purely Utilitarian or Rawlsian rationales. Such normative criteria (i.e. for redistribution) are usually based on philosophical reasoning or, at the very least, aim for Pareto efficiency. Weinzierl (2014) finds that 81 percent of his respondents prefer policies other than purely Utilitarian or Rawlsian ones. Therefore, he proposes to empirically elicit public attitudes towards redistribution in order to enrich standard models of optimal taxation that eventually

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[1]   E.g. Straub and Werning , Diamond and Saez (2011) and Piketty and Saez (2013), Kopczuk (2013), Piketty and Saez (2013) with a strong focus on estate taxation in particular.

[2]   See e.g. Kopczuk (2013) and Seim (2017) for further remarks on behavioral responses and bounded rationality.

translate into tangible tax designs. Recent literature also assessed how the public opinion on taxes is taken into account by policymakers in terms of their political feasibility (Scheuer and Wolitzky, 2016; Bierbrauer et al., 2018).

The investigation of general preferences for redistributions already has a longer tradition in the literature. The fundamental contribution of Romer (1975) and Meltzer and Richard (1981) examine how voters support redistribution as long as the average income exceeds the median income. In contrast, Piketty (1995) and Benabou and Ok (2001) describe how individuals might overestimate social mobility and therefore vote against their own economic benefit. Alesina and La Ferrara (2005) empirically support these predictions and show how individual perceived fairness in *equality of opportunities* reduces demand for redistribution. Alesina et al. (2018) experimentally uncover a stark political polarization along these lines: pessimism on intergenerational mobility increases support for redistribution of left-leaning individuals whereas it does not increase the support of right-leaning individuals. This strong polarization is also documented by Fisman et al. (2017b) as well as Cappelen et al. (2018) who find that voting for the Democrats or Republicans can be predicted by different efficiency-equality trade-off preferences. Two further points are worth mentioning in the context of our project: Fisman et al. (2017b) conclude that voters are motivated by their underlying distributional preferences rather than their self-interest; Cappelen et al. (2018) emphasize that it is *not* different beliefs about behavioral responses to taxation but different redistributive preferences. Another established finding in this strand of literature is the importance of the source of wealth for redistributive preferences (Alesina and Angeletos, 2005; Weinzierl, 2017; Almås et al., 2019). Broadly speaking, individuals are more willing to tax wealth accumulated through luck than personal merit or effort. Fisman et al. (2017a) explicitly ask respondents for their preferences for taxing wealth either based on an inheritance or saved past earnings. They find significantly higher preferred taxes on inherited assets, providing a first indication that respondents might perceive inheritances rather in the sphere of luck than effort.

The investigation of how these general preferences translate into tangible preferences for specific policy instruments is still fragmented. While preferences for redistributive policies are primarily discussed against the background of intergenerational wealth transfers (i.e. inheritance or estate taxation) research on preferences for other instruments of net wealth taxation remains scarce.

Political and social scientists map out meticulously how policy makers exploit the sensitive context of death through a sophisticated use of rhetoric to gather political majorities to repeal

the estate tax (Bartels, 2006; Birney et al., 2006). The effectiveness of such strategies is well documented by e.g. Slemrod (2006) and Krupnikov et al. (2006) who show how a majority of Americans vastly overestimates the share of taxable estates. The same can be found looking at public opinion polls (see Bowman et al., 2017). In a survey experiment, Kuziemko et al. (2015) explore how addressing such misinformation on inequality, economic growth and insights about the specific design of the estate tax altered preferences for redistributive policies via income taxation, minimum wages and the estate tax. Interestingly, they find that the informational treatment does not increase the support for redistributive policies in general. However, the findings on the estate tax constitute an exemption: information about the actual fraction of people affected by the estate tax more than doubled the support for increasing the estate tax. In line with former findings, only 12 percent of the participants answered correctly what share of the population is actually affected. Still, it remains an open question if addressing misinformation fully explains the large treatment effect. Most relevant to our study, the treatment effects on the different proposed redistributive instruments are not comparable due to conceptual differences of these instruments. The authors admit that "*extrapolating from the estate tax effects would give vastly biased views of the ability of information to move other redistributive policy preferences [...]*"[3]. Thus, the inferences one could draw about preferences of such a controversial tax are very limited in terms of their generalizability to other net wealth taxes. Along the same lines, Bastani and Waldenström (2019) show how support for an inheritance tax in Sweden increases by 30 percent in response to an information treatment. Interestingly, they include an additional design-specific dimension by asking about the respondents' support for either a low- or a high-exemption inheritance tax. With a considerably larger support for a high exemption tax they provide further evidence that design features might as well shape preferences. Finally, Alesina et al. (2018) explore the preferences for estate taxation with respect to beliefs about intergenerational mobility. Even though they document a high support for equality of opportunity, the preferences for estate taxation appeared to be immune to pessimistic shifts of beliefs about social mobility. This can be interpreted as just another indicator of the exceptional role of estate taxes in the research on capital taxation.

This paper wants to identify the drivers of preferences beyond resolving misinformation. We want to examine how tangible design features drive preferences regarding capital taxation while comparing how these features interact with specific types of tax instruments (i.e. capital transfer taxes and net wealth taxes) for a more thorough identification of treatment effects.

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[3] See Kuziemko et al. (2015), p. 1498.

Moving away from estate taxation, the literature investigating wealth taxes across different instruments is still fairly scarce. Bird (1991) provides an overview on the different national implementations of both inheritance and yearly wealth taxation. He emphasizes the fact that these two forms of capital taxation constitute the only form of direct taxation imposed on personal wealth entailing a key role for egalitarian tax policies. In a detailed overview article Kopczuk (2013) elaborates specifically on the differences of the taxation of transfers (i.e. bequests) and the (net-)wealth. He suggests that capital taxation can be interpreted as taxation of bequests with each period corresponding to a different generation and shows how these taxes can be set in a nominal equivalent relationship. However, he points out some important differences between these instruments which potentially lead to different behavioral responses.[4] First, the estate tax is infrequent and thus, less burdensome with an increased horizon and rate of return. Second, an annual wealth tax distorts lifetime consumption which estate taxation doesn't (holding bequest constant). Third, tax planning decisions of the testator should be driven by expectations about the estate tax rather than its actual value.

Along the same lines, Hey et al. (2012) argues that the inheritance tax is supported as a tax with presumably fewer efficiency losses than an ongoing periodic wealth- or capital income tax. Closely related to our endeavor are two experimental papers by Fisman et al. (2017a) as well as Bastani and Waldenström (2018). The latter conduct an attitude survey in Sweden on different forms of property, inheritance and net wealth taxation. While they also report a "puzzlingly" strong opposition to the inheritance tax, one of their main findings is that the design and structure of taxes is of prime importance. In case of inheritance taxation, respondents express significantly higher support when only "large" bequests are taxed. For the property tax, a simple name change already has a great positive effect on its popularity. Still, the underlying drivers for perceptions remain unclear and insights beyond the single tax instruments are not inferable due their lack of comparability (i.e. differences in tax levels and tax bases). Most closely related to our paper, Fisman et al. (2017a) reveal public preferences for jointly taxing income and wealth in an experimental approach. Respondents had to indicate their preferred total tax bill for each one of a series of hypothetical individuals that differed in the levels of income, wealth and sources of wealth. They find preferred capital tax rates between 0.8 percent for wealth from saved incomes and 3.0 percent for wealth from inheritances. These findings are, however, restricted to a single period of joint income and capital taxation without exploring preferences regarding more specific capital tax instruments.

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[4]   Besides the administrative complexities and costs of the annual wealth tax in particular mentioned by Adam et al. (2011).

Taken together, research on preferences for redistribution gains more and more attention in the literature on optimal taxation and political feasibility. While empirical work on general redistributive preferences is comprehensive, the research on specific redistributive instruments remains limited and, moreover, predominantly focuses on inheritance taxation. We contribute to the literature in several ways. First, we explore how different dimensions shaping the political and public debate (i.e. source of wealth, type of assets, existence of children) translate into preferences regarding capital taxation. Second, we aim for a more holistic approach taking several potential structures of capital taxation into consideration. That way, we not only identify design specific preferences but also divert the focus in the discussion about capital taxation from the heavily emotionally charged inheritance tax. Third, to the best of our knowledge we are the first who aim to measure comparable treatment effects for equivalent tax instruments.

The rest of this paper is organized as follows. Section 3 explains how we conceptualize the comparison of tax instruments. Sections 4, 5 and 6 will give a detailed description of our experimental design, the data and our empirical strategy. In section 7 the results are presented followed by a brief discussion and concluding remarks.

3 Equivalence and comparability of tax instruments

One drawback of many studies dealing with preferences on capital taxation is the strong focus on one particular tax, e.g. the estate tax. [5] We are the first to consider several capital taxes, which *tax the entirety of all assets*[6] one owns and which are *formally comparable*, but differ in their tax design. Analyzing different tax instruments enables us to a) disentangle preferences that rely on a specific tax design and for capital taxation in general, b) reveal whether socio-economics affect preferences differently across tax types and c) strengthen the robustness of our results by using different tax instruments as reference points for each other.

Fortunately, different instruments of capital taxation already exist and thus can be used as a basis for our study. Besides the taxation of wealth transfers at the end of one's life, concepts of periodical (net worth[7]) wealth taxes have been discussed and implemented in other countries. [8] Regarding the *estate tax*, preferences may depend on its general characteristics as well as its

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[5] E.g. Kuziemko et al. (2015) compare treatment effects on different tax and redistribution instruments, which, however, are not straightfordly comparable.
[6] I.e., we do not consider taxes such as the property tax, which is only levied on some categories of assets.
[7] The frequently used term 'net' just clarifies something common to all capital taxes: Only the net wealth (assets after the deduction of liabilities) is subject to these taxes.
[8] Countries levying periodical (net) wealth taxes are e.g. Japan (only on real estate and business assets), Switzerland, Norway and Spain (Drometer et al. (2018)). See Piketty and Saez (2013), Seim (2017), Bird (1991), Kopczuk (2013) for further discussions.

(emotionally loaded) reputation. Therefore, we additionally consider a tax instrument that does not differ from the estate tax except for its name: a *one-time wealth tax* that is levied close to one's end of life. Additionally, in order to both analyze the effect of different levels of periodicity and to strengthen robustness in findings between concentrated and periodical taxes, we consider two different recurrent tax instruments: One that is levied every year (*yearly wealth tax*) and one that is levied every ten years (*decennial wealth tax*).

Despite the differences in their implementation, the formal comparability of concentrated and periodical capital tax instruments is straightforward to demonstrate. Concentrated and periodical tax payments can be compared by using measures such as the future value. In the absence of any taxes, the future value of an initial asset stock I_0 that grows for n years (e.g. until ones' death) by rate r can be easily calculated by:

$$FV_{n,no\ tax} = I_0 \times (1+r)^n$$

Considering a capital tax with tax rate t_e and tax exemption e_e that is levied once at the end of ones' lifetime, e.g. an estate tax, the formula has to be modified:

$$FV_{n,e} = I_0 \times (1+r)^n \times (1-t_e) + \min[I_0 \times (1+r)^n, e_e] \times t_e$$

The wealth accumulated over n years is simply reduced by the estate tax, which is levied on assets exceeding the exemption.

To illustrate the mechanism of periodical capital taxes, we look at a yearly wealth tax. Given a tax rate t_y and a tax exemption e_y, we have to take into account that the tax reduces the asset stock at the end[9] of every year, i.e.

$$FV_{1,y} = I_0 \times (1+r) - \max[I_0 \times (1+r) - e_y, 0] \times t_y$$
$$FV_{2,y} = FV_{1,y} \times (1+r) - \max[FV_{1,y} \times (1+r) - e_y, 0] \times t_y$$
$$...$$
$$FV_{n,y} = FV_{n-1,y} \times (1+r) - \max[FV_{n-1,y} \times (1+r) - e_y, 0] \times t_y$$

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[9]   Of course, this could also be any other date of every year.

If the asset stock never falls below the tax exempted value, we can transform this to:

$$FV_{n,y} = I_0 \times [(1+r) \times (1-t_y)]^n + e_y \times t_y \times \frac{1 - [(1+r) \times (1-t_y)]^n}{1 - [(1+r) \times (1-t_y)]}$$

The effective tax rate etr of any tax can always be calculated based on future values before and after the respective tax:

$$etr = 1 - \frac{FV_{with\ tax}}{FV_{without\ tax}}$$

Two taxes leading to the same future values can be seen as formal equivalent as the burden of taxation is equal. Furthermore, based on future values or effective tax rates, capital taxes can be easily compared quantitatively. However, some issues remain:

- Calculating the total tax burden based on (yearly) tax rates and (yearly) tax exemptions may not be straightforward for an average survey participant. Hence, asking for preferences regarding these parameters may lead to biased estimates of preferences towards different taxes.
- If growth is not fully exogenous, i.e. if the growth depends on the value of assets at any point of time, the burden of a periodical tax consists of two components: the levied tax and a restricted asset accumulation. Hence, the burden of a periodical tax may deviate from its revenue. People, including our survey participants, may therefore assess taxes differently.
- As discussed by e.g. Kopczuk (2013), taxpayers' saving or tax evasion behavior might depend on the design of the specific tax. If survey participants make assumptions about any tax-specific behavior, analyses comparing different tax instruments may be biased.

To avoid these issues, we choose a 'reduced' approach to analyze preferences over different capital taxes and take further precautions: First, we simply ask for the preferred *total tax burden* someone had to pay based on a given wealth level. This reduces the complexity of an otherwise demanding tax computation as one number is the sufficient answer, i.e. the total tax burden. Second, we describe the wealth accumulating processes in our tasks to be fully exogenous as we specify the source of assets as 'win in the lottery and lucky investments', 'received inheritance and gifts from family members' or 'saved salaries from employment'. Furthermore,

we only specify the wealth of assets at the end of the life of a person to not trigger thoughts about any endogenous growth in general. We prefer this approach over an explicit note on endogenous and exogenous growth as it keeps notes on assumptions lean and minimizes potential confusion. Referring to the calculations above, exogenous growth in case of periodical taxes can be expressed by simply specifying r: E.g., given an exogenous saving amount of \$$Z$ p.a., we set $r = Z \times \frac{1}{FV_{t-1,y}}$ in every period t. Third, we clarify some assumptions made at the beginning of our study. These include the absence of behavioral effects with respect to savings and tax evasion. Furthermore, respondents have to prove their comprehension of these assumptions based on control questions.

4   Experimental design

The main objective of this study is to shed light on how different personal and asset-related factors affect the attitudes towards capital taxation *across* different types of tax instruments, i.e. concentrated wealth taxes (such as an estate tax) as well as periodical wealth taxes (such as a yearly wealth tax). This direct comparison of different tax instruments comes along with some nontrivial challenges we had to address in our experimental design.

First, we did not want to ask respondents explicitly about how they assess one tax instrument relatively to another. We worried to prime our participants into favoring one tax over the other only due to possible aversions against a certain tax instrument. The idea is to reveal an actual ad-hoc preference without setting the specific tax instrument into relation to another, which also possibly triggers emotional charges that would not be associated in the first place. This issue might be particularly prominent with emotionally charged taxes like the estate tax.

Second, by asking only for the preferred overall lifetime tax burden we are able to reduce differences to the name of the respective tax instrument. More specifically, we fix the level of wealth a hypothetical individual would have accumulated in the absence of capital taxation and ask our respondents how much taxes this person should pay in *absolute* terms. This way, we are able to derive the implicit preferred tax schedule while keeping the cognitive load for our participants as low as possible.[10] This is particularly important due to the different levels of complexity of the tax instruments: the effective tax burden of a one-time tax is much easier to grasp than a periodical tax when looking at tax rates and tax exemptions. We are explicitly *not*

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[10]   According to Lenzner et al. (2010), difficult survey questions have a negative effect on both response rates and the quality of answers.

interested in measuring bounded rationality with respect to the tax instruments, but rather, all else equal, the attitudes towards the different tax designs. More to the point, participants in all treatments had to think about the exact same measure, namely the overall lifetime tax burden, while we only change the name of the respective tax instrument across treatments.

Third, the comparison of these tax instruments has to account for different underlying efficiency concerns of our participants. If our subjects assume behavioral responses to differ between tax instruments, stated preferences might not be fully comparable anymore. For this, we unambiguously state that this study assumes no behavioral response whatsoever to the final wealth of a person the understanding of which we test in multiple comprehension control questions.[11]

In light of the foregoing, this survey experiment comprises different approaches to uncover the various aspects in the context of capital taxation: First, based on a standard vignette design, we analyze the effect of including different personal and asset-related factors (i.e. type, value and source of assets as well as the existence of children) on preferences. Second, each respondent was randomized into one of four different treatment groups in a between-subject manner, each treatment representing a different tax instrument. In other words, we ran four identical vignette studies for four different tax instruments, whereas each respondent was randomized into only *one* tax instrument.

4.1   The vignette dimensions

Our *vignette sets* are all constructed to present hypothetical individuals who differ along four dimensions we expect to be decisive towards the preferences regarding capital taxation:

- **Value of assets**: A general issue of taxation concerns the progressivity of taxes, i.e. 'who has to bear what share of the tax burden'. This is strongly related to the question, of how people emphasize the redistributive character of a capital tax. To focus on the taxation of high levels of wealth, we consider only assets worth $1m or more.
- **Type of assets**: Especially with respect to the estate tax debate, people are worried that such a tax might threaten businesses.[12] Therefore we want to reveal, whether people prefer to differentiate between different types of assets or want an identical fiscal treatment.

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[11]   See chapter 5.1 and the screenshots in the appendix for the exact wording of our assumptions and the corresponding comprehension control questions.

[12]   See e.g. Birney et al. (2006). Bowman et al. (2017), p. 62, cite a public opinion poll according to which a great share of those who want to 'eliminate' the estate tax are afraid that it "might force the sale of small businesses and family farms".

- **Source of assets**: As carried out in the literature (Alesina and Angeletos, 2005), the source of assets, especially differentiating between wealth accumulation based on 'luck' and 'effort', plays an important role in the context of capital taxation. In their aim to contrast luck and effort, Fisman et al. (2017a) operationalize luckily gained assets as 'wealth, accumulated mostly from inheritance […]'. In this paper we want to empirically investigate this claim. Therefore, we add an additional purely 'luck' related category.

- **Number of children**: The transfer of accumulated wealth to descendants through lifetime gifts or bequests plays a key role in both the political (Graetz and Shapiro, 2011) and the theoretical debate (Cremer and Pestieau, 2006): parents potentially obtain utility by e.g. protecting their dynasty, exchanging money with elderly care (by their children) or simple altruistic motives ("warm glow of giving").

Each of these dimensions consists of three different levels (see table 1). In total, our vignette universe consists of $3^4 = 81$ vignette options. To avoid confounding of main and two-way interaction effects, the selection of vignettes shown to the respondents was not barely random but based on a randomized block confounded factorial design (RBCF-3^4).[13] Generating such a design leads to nine sets that consist of nine vignettes each.[14] Every respondent was randomly assigned to one set and had to answer all nine respective vignettes in random order.

Dimension	Categories
Value of asset	$1 million / $10 million / $30 million
Type of asset	Cash / Business shares / Real estate
Source of asset	Effort & hard work / Lottery & lucky investments / Inheritance
Number of children	None/ One / Three

Table 1: Overview of the different vignette dimensions and their respective categories.

4.2 Between subjects variation: the different tax instruments

At the end of every vignette, we asked for the proposed overall lifetime tax burden (in absolute values) each hypothetical individual should be burdened with. This is where we implemented the *between-subject* variation: conditional on the treatment group we asked our subjects what amount of taxes this person should pay in estate, yearly wealth, decennial wealth or one-time wealth taxes over the whole course of his or her life *in total*:

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[13] See Montgomery (2017), chapter 9; Su and Steiner (2018).
[14] Recent literature suggests nine vignettes being a reasonable number, see Sauer et al. (2011); Auspurg and Hinz (2014).

Consider a person who starts building assets at the age of 30. By the age of 80, the end of his or her life, these assets are worth [asset value]. The assets mainly consist of [asset type] and were mostly accumulated by [source of asset]. The person has [number of children].
If it were up to you, what amount should the person pay in [estate / yearly wealth / decennial wealth / one-time wealth] taxes [at the end of his or her life / over his or her entire life in total / at the age of 80]?

Furthermore, the introduction to the experiment varied in the short explanation of the respective tax instrument.

Treatment group	*If it were up to you, what amount should the person pay in…*
Estate tax	*estate taxes at the end of his or her life.*
Yearly wealth tax	*yearly wealth taxes over his or her entire life in total.*
Decennial wealth tax	*decennial wealth taxes over his or her entire life in total.*
One-time wealth tax	*one-time wealth taxes at the age of 80.*

Table 2: Overview of the between-subject variation.

The *estate tax* treatment is quite straightforward. Here, we simply asked what amount the presented hypothetical individual should pay in estate taxes at the end of his or her life. Respondents of this treatment were reading the following explanation in the introduction:

*This study is about an **estate tax**. An estate tax once taxes the entire assets, which the decedent owns at the end of his or her life. The taxed estate may include cash, account balances, real estate, and shares. Low asset values might be exempted.*

In the *yearly wealth tax* treatment our subjects were asked how much the presented hypothetical individual should pay in yearly wealth taxes over his or her entire life in total. We familiarized our respondents with the specific periodic character by stressing the similarity to the existent property tax in the introduction:

*This study is about a **yearly wealth tax**. A yearly wealth tax taxes the entire assets one owns at the end of each year. The taxed assets may include cash, account balances, real estate, and shares. The yearly wealth tax works similar to a property tax, but has to be paid based on all assets, not only real estate. Low asset values might be exempted.*

Followed by a short example for clarification:

Example: *If one owns assets over a period of 50 years, the total tax burden would be the sum of the 50 yearly payments. E.g. a total tax burden of $100 would be the sum of 50 payments that are on average $2 each.*

Furthermore, in order to emphasize the specific implementation of this periodical tax, participants were shown an interactive information below the input field of every vignette (in which they were asked to state the preferred tax bill) indicating the average yearly tax payment: *The Tax Authority charges an average tax payment of $X each year.* To calculate this number, we defined a standardized time frame of 50 years across all treatments during which our hypothetical individuals accumulate their wealth. Hence, this average yearly tax payment is derived by simply dividing the overall tax bill indicated by the participant by 50 years. We consider this feedback an important part of our design in order to convey the specific character of a yearly tax, which is non-existent in the US. To ensure the uniformity between treatment groups, similar information is given in each group.

The *decennial wealth tax* treatment comprises the same periodical characteristics as the *yearly wealth tax* treatment with the only difference of concentrating the payments to only one payment every ten years. Accordingly, we asked our subjects how much the presented hypothetical individual should pay in decennial wealth taxes over his or her entire life in total. In the introduction, respondents of this treatment were reading the following explanation:

> *This study is about a **decennial wealth tax**. A decennial wealth tax taxes the entire assets one owns at the end of every ten years. The taxed assets may include cash, account balances, real estate, and shares. The decennial wealth tax works similar to a property tax, but has to be paid every 10 years based on all assets, not only real estate. Low asset values might be exempted.*

Furthermore, they were given a short example for clarification:

> *Example:* *If one owns assets over a period of 50 years, the total tax burden would be the sum of 5 decennial payments. E.g. a total tax burden of $100 would be the sum of 5 payments that are on average $20 each.*

Again, in order to emphasize the specific mechanism of this periodical tax, the participants were shown an interactive information below the input field (in which they were asked to state the preferred tax bill) indicating the average decennial tax payment: *The Tax Authority charges an average tax payment of $X every ten years.* This average decennial tax payment is derived by

simply dividing the overall tax bill indicated by the participant by the five decades of capital accumulation indicated in the vignette.

The *one-time wealth tax* treatment mirrors exactly the *estate* treatment except for its wording / framing. In order to match the according time frame (and therefore also the tax base) in which this tax would apply with the other treatments, we asked our subjects how much the presented hypothetical individual should pay in one-time wealth taxes at the age of 80. It is important to note that it was mentioned in every single vignette that the age of 80 also marked the end of life. In that way, this treatment depicted essentially an estate tax but without its specific name.

> *This study is about a **one-time wealth tax**. A one-time wealth tax once taxes the entire assets one owns at a single point in life. The taxed assets may include cash, account balances, real estate, and shares. Low asset values might be exempted.*

Finally, we want to briefly elaborate on how we accounted for the standardization across tax instruments in the specific design of our vignettes. The vignette text shown in *table 2* was the same throughout all groups except for the name of the tax. We deliberately asked about absolute tax bills rather than desired tax rates in percentage terms. With this we tried to prevent our subjects to confuse yearly (decennial) tax rates in our yearly (decennial) treatment with the once occurring tax rate of the estate or one-time treatment. Furthermore, asking about absolute tax bills is a more conservative approach to elicit stated preferences for tax levels. McCaffery and Baron (2006) present how subjects choose higher tax rates when being asked about preferred taxation levels in percentages instead of absolute tax levels. For entering their preferred tax burden, respondents could only type in round numbers with an automatically appearing comma as thousands separator. They were also free to switch between vignettes, go back and adjust their inputs within the set of the nine vignettes.

4.3   Add-On: within-subject comparison of tax instruments

In order to enrich this study by another informative facet, participants were asked to state their preference not only for the assigned tax instrument, but also in relation to another tax instrument – including a motivation of their choice in an open-ended response format. After answering the vignette-based part about the assigned tax instrument, participants were presented one additional question where the initial allotted instrument was set in direct comparison to either the estate tax or, depending on the randomization, a periodical tax. To be precise, they were

asked if they would either prefer the already familiar tax instrument or the alternative instrument *holding the tax burden constant over the life course*.[15] Subsequently, they had to state their motivation for this choice in an open-ended response format question.

Treatment group	Compared tax instrument
Estate tax	Yearly wealth tax
Yearly wealth tax	Estate tax
Decennial wealth tax	Estate tax
One-time wealth tax	Yearly wealth tax

Table 3: Overview of the within-subject comparisons.

Such a within-subject comparison is insightful for several reasons. First, we gain understanding on how our subject would assess their allotted instrument while thinking about an alternative. This is not too far-fetched in light of political discussions as politicians can choose from a choice set of different tax instruments to meet revenue or redistributive targets. Second, the written motivation of their choice for or against the previously allotted tax instrument provides a deeper understanding of underlying motives and reasoning.

Following the vignette-based part of the study and this within-subject comparison of tax instruments, participants were finally asked a battery of socioeconomic background questions. Besides standard questions like age, education and party affiliation, we also included questions about previously received or expected inheritances and whether the (distant) family holds an own business. To learn about the level of information as well as our respondent's further preferences in the context of capital taxation, we additionally asked which part of the population they deem to be affected by the current estate tax legislation, to what extend the government should be involved in the redistribution of wealth, if they perceive inequality as a problem and if they perceive rather luck or effort as the basis for economic success. This questionnaire was placed at the end of our survey to exclude potential priming effects.

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[15] A screenshot can be found in the appendix.

5   Data

5.1   Data collection

Our respondents were recruited through the crowdsourcing marketplace Amazon's Mechanical Turk (MTurk)[16] between November 26 and December 11, 2018. MTurk is an online worker platform, which allows requesters to post human intelligence tasks (HITs) that can be performed by workers who are registered at MTurk and are continuously rated by requesters. These tasks are typically relatively simple and short. Following common practice (e.g. Fisman et al., 2017a) we decided for a neutral description when posting our HIT: "Please answer a series of short questions about your personal opinion on capital taxation". Guided by posts in worker forums and other recent studies we set the compensation for completing our survey to $2. Given the median processing time of 10.65 minutes[17], the payment corresponds to a median hourly wage of $11.27, which can be seen as rather generously compared to other tasks. A share of $1.50 was paid as a bonus only if control questions had been answered correctly in order to incentivize attention during the study.

The use of MTurk for academic and especially experimental purposes becomes increasingly prevalent with data being at least as reliable as data obtained via standard methods while requiring less money and time for their implementation (Horton et al., 2011; Berinsky et al., 2012). Nonetheless, a couple of well-known issues need to be accounted for in the research design. Most prominently indications for automated scripts ("bots") and the use of Virtual Private Servers (VPSs) by workers outside the US caused a recent decline in data quality (Kennedy et al. 2018). We went to great lengths to consider this concern: First, we implemented basic measures such as limiting the visibility of our survey to participants who signed up at MTurk with a US address and asking to confirm participants' US residency in the consent form. Next, participants had to pass a captcha-test that identifies non-human users on the first page. Moreover, we used a third-party web service, IP Hub, to ex-post identify all participants who used a VPS, VPN or proxy to potentially cover their location outside the US.[18] Furthermore, only workers with an approval rate of greater than or equal to 95 percent from previous tasks were allowed to participate in this study. To grant access also to the regular working population, we published this study only outside regular working hours. Further, we prevented workers

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[16]   Link to the survey: https://mpibonn.eu.qualtrics.com/jfe/form/SV_eyq4PeXKh3WxyvP. Screenshots can be found in the appendix.

[17]   Only about 5 percent off all respondents took less than half of the median time and only about 10 percent took more than twice this time.

[18]   Kennedy et al. (2019) show how studies that depend on language comprehension are especially vulnerable to fraudulent IPs outside the U.S.

from participating in our study more than once: Respondents had to enter their unique worker ID on the first page before they were able to start the survey and only at completion received a password to submit to MTurk. We clearly stated that any violation would be penalized by rejecting the HIT which would result in a significant reputational loss for workers on MTurk. Our analysis shows that only a negligible number of workers indeed attempted to participate multiple times and those were excluded from our data analysis.

As part of the introduction we presented some notes on our assumptions:

Important: *In this study we assume that individuals' <u>behavior is not affected</u> by the existence of taxes. In particular, the estate tax will not affect economic activity, savings behavior, or lead to tax avoidance/evasion. Furthermore, <u>no other capital taxes are levied</u>.*

Directly below these notes, we asked participants of our survey to evaluate three statements to incentivize re-reading the notes on our assumptions:

1. *"The existence and the amount of taxes does not affect economic activity and saving behavior."*

2. *"The existence and the amount of taxes does not affect the level of tax avoidance and evasion."*

3. *"The [...] tax AND other capital taxes are levied."*

We took an especially conservative approach for our data analysis in monitoring who understood our assumptions instantly: respondents did not receive any feedback on the correctness of their answer and thus had no second guess. As shown in *Table 4*, a significant share of respondents was not able to give correct answers, although we used very similar wording and structure for the text and the subsequent questions. While the comprehension of the third question may affect the general level of proposed taxes, it does not play a role for the main findings of this study. However, assessing the absence of behavioral responses captured by questions 1 and 2 correctly is crucial for the interpretation of our results *between* tax instruments. To strengthen the robustness of our results, we show in an additional analysis that estimates for the sub-sample of respondents who answered both questions correctly (54.78 percent of all respondents) point towards the same direction.

Question	Share of correct answers (in percent)
1	84.67
2	61.35
3	81.01

Table 4: Share of correctly answered control questions.

Respondents were only considered in our analysis if they met the following data quality requirements. First, respondents had to finish the whole survey. Second, we dropped those respondents, whose answers were inconsistent with respect to our principal question: the tax burden of wealthy individual. This includes:

1. Proposed tax burdens leading to tax rates higher than 100 percent in at least one of the nine indicated vignettes,

2. proposed tax burdens leading to tax rates higher than 0 percent, but lower than 1 percent in all of the nine vignettes and

3. tax burdens following some kind of 'random walk' independent of the indicated wealth levels. We assume this if the absolute tax amount for any three vignettes containing the same wealth level was on average higher than the tax burden for the three vignettes containing a higher wealth level.

In all three cases, we assume responses to be insincere as proposed tax levels do not fit the respective wealth levels of the vignettes. Furthermore, we dropped some obvious cases of nonsense like tax burdens of '$1,234' followed by '$5,678'. Our final sample contains 18,909 answers of 2,101 respondents (9 vignettes each; see *Table 5*)

Group	Pre-cleaning[19]	Low rates	High rates	Inconsistent	‚Nonsense'	Post-cleaning
Estate tax	792	114	23	103	1	**593**
Yearly wealth tax	782	181	40	128	11	**481**
Decennial wealth	771	182	37	147	8	**469**
One-time wealth tax	785	155	28	95	2	**558**
Total	**3,130**					**2,101**

Table 5: Number of observations pre- and post-cleaning.

There are some further inherent challenges in interpreting our survey results. First, we cannot fully parse genuine responses from insincere ones, although we went to great lengths to do so in our data cleaning process. Second, preferences stated in survey experiments may deviate

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[19] Respondents, who are US-residents and finished the survey. Based on our initial data we deleted 188 respondents uncovered as users with an IP-address from outside the US.

from 'real-world' (voting) behavior.[20] Third, data gained by a survey experiment might not be representative with respect to the real (US) population. The latter point is linked to the descriptive statistics analyzed in the next chapter.

5.2   Descriptive statistics

In *table 6* we show summary statistics of our analyzed respondents, separated by treatment groups. We compare these characteristics to data from the General Social Survey 2018[21] (GSS; except political preferences) and on votes from the US House of Representatives elections in 2018 (political preferences) to evaluate the representativeness of our sample.

Bold values indicate significant (on 5%-level) differences of characteristics compared to those of the US population. Respondents of our samples are younger, have less children, are better educated and differ regarding ethnicity and political preferences. Furthermore, most treatment groups consist of less female and less married individuals. Obviously, some characteristics as age and marital status as well as children are correlated. Despite of these differences, the randomization process of our survey worked fairly well as only two significant differences between treatment groups occur: the share of respondents with children is greater in the estate group compared to the yearly-wealth group (no differences in the number of children) and we find a greater share of respondents who describe their ethnicity as 'white' in the one-time wealth group compared to the estate group. A comparison of the geographical backgrounds of our survey participants and the US population shows very similar distributions among states (*figure 1*). Hence, the geographical coverage of our survey worked well. To control for differences between groups, a covariate vector will consider personal characteristics in our regression analyses.

Deviations from the 'real world' population are not a problem for the internal validity of our study. However, we need to be careful talking about external validity as the representativeness of our sample is limited and due to the reasons discussed at the end of the previous chapter. Despite this limitation, analyses, especially based on sample splits, may help understand the preferences regarding the taxation of wealth of different parts of the society and hence of the US population.

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[20]   See Hainmueller et al. (2015).

[21]   The General Social Survey (GSS) is a project of the independent research organization NORC at the University of Chicago, with principal funding from the National Science Foundation. A survey "is based on approximately 2,500 face-to-face interviews with a nationally *representative* sample of English and Spanish speakers who reside in the US"; see https://hub.jhu.edu/2019/04/10/general-social-survey-stephen-morgan/ (26.07.2019).

	estate	yearly wealth	decennial wealth	one-time wealth	GSS 2018
age	**36.5**	**36.5**	**36.3**	**36.8**	46.6
female	0.51	**0.49**	**0.46**	**0.48**	0.53
married	**0.43**	**0.43**	0.45	0.45	0.49
has children	**0.49**	**0.41**	**0.44**	**0.45**	0.71
# children	**1.02**	**0.90**	**0.97**	**0.92**	1.85
black	**0.08**	**0.07**	**0.09**	**0.07**	0.15
white	0.74	**0.78**	**0.77**	**0.79**	0.72
high school	**0.99**	**0.99**	**1.00**	**1.00**	0.88
bachelor	**0.56**	**0.56**	**0.57**	**0.58**	0.31
employed	0.70	0.73	0.74	0.72	0.71
republican	**0.28**	**0.29**	**0.26**	**0.29**	0.44
democrat	0.51	0.54	0.52	0.54	0.53
observations	593	481	469	558	2,348

Table 6: Descriptive statistics of our sample, by treatment group, and the US population based on the GSS 2018.
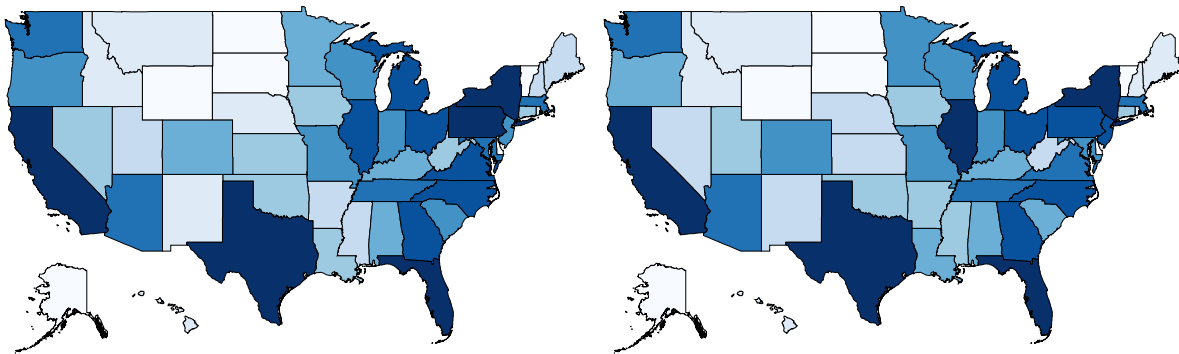
Figure 1: Number of our survey participants (left) and the real population (right) by state; the darker the color the higher the number of people from the respective state.

6   Empirical strategy

In general, our empirical analysis can be divided into three parts. In the main part of the study, we analyze results based on the *vignettes* and the *within-question* design described above. Subsequently, we show results of some further *minor questions* regarding the perception of inequality, the wealth accumulating process (i.e. luck vs. effort) and the actual estate tax as well as preferences toward redistribution.

For analyzing results generated by the vignette-based approach, we apply two methods. First, we show graphically differences in *average* effective tax rates between different tax instruments and vignette dimensions. To visualize heterogeneous treatment effects, we additionally perform analyses based on different subsamples and present the most insightful findings. As described above, our randomly ordered vignette-assignment procedure ensures that each vignette category is displayed to every respondent equally often and in combination with every other category.

Hence, all respondents are confronted with e.g. each of the three wealth levels ($1m, $10m, and $30m) *exactly three times*. Furthermore, each wealth level is displayed in combination with every category of every other dimension *exactly once*. Therefore, all sets of vignettes and average proposed tax burdens are 'balanced' with respect to the categories and combinations. The presented 95%-confidence intervals are calculated for these *average* effective tax rates per respondent.

Second, we estimate different regression equations to control for differences in socioeconomics between treatment groups. We analyze effects *between tax instruments* and *vignette effects*. The identification of effects between taxes is given by the equation:

$$etr_{ij} = \alpha + \beta_1 treat_i + \beta_2 X_i + \varepsilon_{ij} + u_i$$

Furthermore, we estimate vignette effects based on the following equation:

$$etr_{ij} = \alpha + \beta_1 value_{ij} + \beta_2 source_{ij} + \beta_3 type_{ij} + \beta_4 children_{ij} + \beta_5 X_i + \varepsilon_{ij} + u_i$$

In both cases, i indexes the respondent and j the vignette, etr_{ij} is the proposed effective tax rate[22] and X_i is a covariate vector capturing the respondents' characteristics[23]. As we gather nine observations of proposed tax burdens for each respondent, we cannot assume these observations to be independent. To consider the structure of our data, our estimations are based on a random effects model.

7   Results

In the following, we present different, complementary sets of results. After presenting some insights on the proposed general tax levels, we analyze average effects *between* taxes (i.e. comparing proposed effective tax rates and different vignette effects across our four treatment groups) as well as *vignette* effects within treatment-groups. Main analyses are based on the *full sample*, i.e. neglecting answers of the assumption control questions. However, as our analysis *between* tax instruments might be affected by the correct understanding of our 'behavioral

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[22]   I.e. the quotient of the proposed tax burden and the indicated level of wealth.
[23]   These include gender, age, ethnicity (dummies white, black), partisanship (dummies Republican, Democrat), education (ordinal), entrepreneurial activities within the family (dummy) and two wealth-related questions (dummies, whether the respondent has ever received a gift or inheritance greater than $10,000 in the past or expects to be affected by the estate tax in the future).

assumptions', we also account for respondents who wrongly answered this control question in a separate regression analysis. All regression estimates presented in this chapter are based on the full set of covariates and random effects on respondent-level. However, estimates for covariates are only reported whenever they are of interest. As our regression analyses confirm most of the findings shown graphically, regression results are only briefly summarized.

The aforementioned analyses of effects between tax instruments and vignette dimensions depict the centerpiece of our paper. Additionally, we present results based on the within-question and some further insightful questions of the socioeconomic questionnaire.

A general finding of this study is the high tax level respondents have chosen across all tax treatments – even for 'smaller' values of assets that are not taxed at all under current law. Due to an estate tax exemption of \$11.18m in 2018 this applies to values of \$1m and \$10m. The proposed lifetime tax burdens result in effective tax rates varying from 12.8 percent to 14.9 percent, depending on the tax instruments.[24] Greater differences between tax instruments occur when comparing treatment groups with respect to the share of respondents who choose a tax amount of \$0 throughout all vignettes. While only around 6 percent of respondents consistently reject taxes for the three 'wealth tax' instruments, almost 14 percent do so for the estate tax.[25]

As our analysis yields predominantly heterogeneous treatment effects of the different tax instruments and vignette dimensions on effective tax rates, most of the further analyses are based on subsamples.[26]

7.1 Analysis of effects between tax instruments

7.1.1 The role of partisanship

The first and most insightful split is between supporters of different parties. Asking respondents for their partisanship, we offer the choices "Republican", "Democrat" and "other". As we expect the group of "others" (404; 19.2 percent) to be rather heterogeneous, we focus on those who call themselves supporters of the Republicans (587; 27.9 percent) or the Democrats (1,109;

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[24] The exact numbers are: estate tax: 12.9 percent; yearly wealth tax: 12.9 percent; decennial wealth tax: 12.8; percent; one-time wealth tax: 14.9 percent.

[25] The exact numbers are: estate tax: 13.8 percent; yearly wealth tax: 5.8 percent; decennial wealth tax: 6.4; percent; one-time wealth tax: 6.6 percent. Only considering 'non-refusers' yields effective tax rates of: estate tax: 15.7 percent; yearly wealth tax: 13.7 percent; decennial wealth tax: 13.7 percent; one-time wealth tax: 15.9 percent.

[26] We analyzed the following sample splits based on respondents' characteristics: by partisanship, has no children vs. has children; below-median income vs. above-median income; 'young' (less than 35 years) vs. 'old' (at least 35 years); 'below-median education' (no bachelor) vs. 'above-median education' (bachelor or more); no entrepreneur in family vs. entrepreneur in family; (male vs. female). Furthermore, we consider sample splits based on our minor outcome variables for the between analysis.

52.8 percent).[27] Comparing average proposed effective tax rates, we find two interesting aspects (see *figure 2*)[28]: First, Republicans propose significantly lower taxes in general, and second, preferences for tax instruments follow different patterns. While tax levels proposed by Republicans are not significantly different between all three 'wealth tax' instruments (9.3 percent to 10.2 percent)[29], their proposed estate tax level is significantly lower (7.1 percent). This effect is driven by a large share of respondents, who entirely reject the estate tax: Rejection-rates are only around 10 percent for 'wealth taxes', but above 27 percent for the estate tax. Especially remarkable is how this rejection and the low effective tax rate do not hold for the perfectly congruent one-time wealth tax among Republicans. On the other hand, supporters of the Democrats seem to differentiate between taxes with concentrated and periodical payments: Effective tax rates are significantly higher for the estate tax (17.0 percent) and the one-time wealth tax (18.2 percent) compared to periodical taxes (both 14.2 percent). Rejection rates are in general much lower compared to those proposed by the Republicans with only a - in absolute terms - small peak in the estate tax group.

As partisanship is highly correlated with both the perception of inequality as a problem and preferences for redistribution, we want to briefly preempt some minor results: Supporters of the Democrats see inequality as a greater problem and prefer more distribution compared to those of the Republicans. Hence, it is not a surprise that these respondents propose significantly higher taxes.
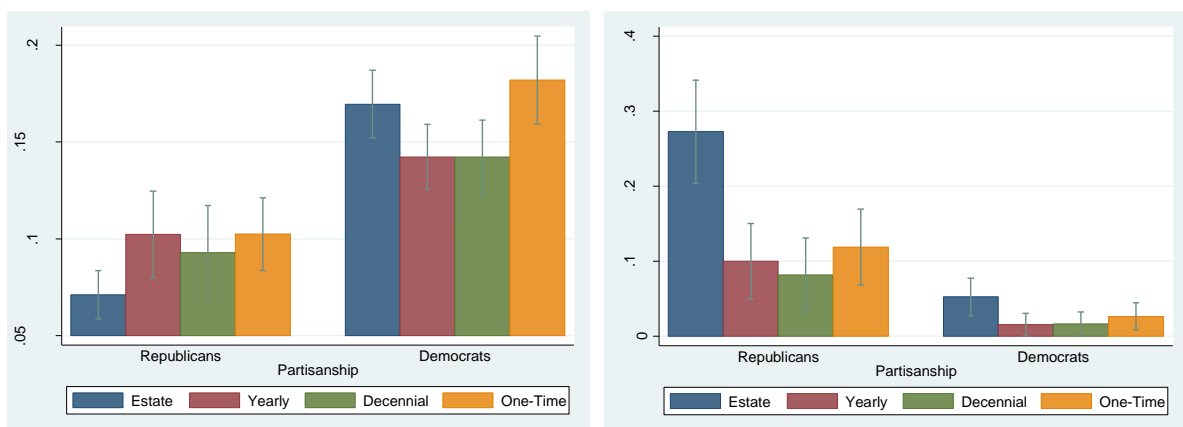
*Figure 2: Average effective tax rates (left) and share of rejecters (right) by **partisanship of the respondent** and **treatment group**; 95%-confidence intervals.*

In a next step, we want to verify our results using regression analyses. As described before, strengthening the robustness of our results *between* tax instruments, we not only estimate effects

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27 Furthermore, differences in average tax rates are not significantly different between tax instruments for the group of "others".
28 Interpreting confidence intervals, one has to keep in mind the different group sizes.
29 I.e. the yearly wealth tax, the decennial wealth tax and the one-time wealth tax.

based on the full sample, but also restrict it to a sample of those who have shown to be aware of our behavioral assumptions. Both analyses based on the full sample and the restricted sample lead to similar results. To avoid redundant remarks, only selected regression results are shown. Further regression tables can be found in the appendix.

As one of our main findings concerns the sample split by partisanship, we present these regression results in Table 7. Consistent with the previous analysis, effective tax rates proposed by supporters of the Republicans are lowest in the estate tax group (between 2.1 and 3.3 percentage points lower than in other groups), whereas supporters of the Democrats propose higher tax rates in the concentrated tax instruments compared to both periodical taxes. Considering only those respondents who understood our assumptions correctly, results are similar in levels, though only partially significant. Of course, one has to keep in mind the much smaller group sizes of the restricted sample when interpreting significance levels.

	full set			behavioral control question correctly		
	Republicans	Democrats	other	Republicans	Democrats	other
Base: one-time wealth						
estate tax	-0.033***	-0.006	0.014	-0.023	-0.005	0.018
	(-2.59)	(-0.43)	(0.65)	(-1.36)	(-0.26)	(0.60)
yearly wealth	-0.005	-0.037***	0.002	-0.004	-0.029	-0.012
tax	(-0.34)	(-2.69)	(0.09)	(-0.23)	(-1.60)	(-0.34)
decennial	-0.012	-0.038***	0.009	-0.005	-0.048***	0.008
wealth tax	(-0.88)	(-2.72)	(0.39)	(-0.29)	(-2.71)	(0.23)
Observations	5,283	9,981	3,636	2,664	5,688	1,998

t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

*Table 7: Between results (random effects model; full set of controls; dependent variable: effective tax rate); **by partisanship**.*

7.1.2   The role of information

In our socioeconomic questionnaire respondents had to state their belief about the share of the US population that is affected by the estate tax. To answer this question correctly, they not only need to know the current estate tax law, but also need to be aware of the current distribution of wealth. We therefore argue that respondents with answers closer to the true value (0.1 percent [30]) are better informed: Although the precision to identify the level of information may be subject to debate, 'close' answers demonstrate at least some intuition about the rarity of very high levels of wealth. Misinformation on who pays the estate tax is frequently seen as one main reason for the broad refusal of the tax. Our results confirm the existence of misperception: On

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[30]   See e.g. https://www.taxpolicycenter.org/briefing-book/how-many-people-pay-estate-tax (26.07.2019).

average, our respondents assumed 31 percent of the population being affected by the estate tax. About one third of all respondents expected less than 10 percent of all Americans to be affected. The correct[31] answer of '1 percent' was chosen by about 5 percent of our respondents.

			share paying estate taxes		
	Rebulicans	Democrats		low	high
partisanship	**35.7**	**28.6**	education	**34.1**	**29.5**
	no	yes		no	yes
has children	31.2	31.8	entrepreneur	30.7	33.1
	low	high		female	male
income	32.4	30.7	gender	32.5	30.5
	< 35 years	>= 35 years		no	yes
age	**34.2**	**28.1**	gift > $10k[32]	31.4	32.1

*Table 8: Responses 'What share of people have to pay the estate tax in the US'; significant differences are highlighted by **bold** values.*

Looking for differences between different subgroups gives some better insights about who has the better assessment of the actual estate tax. On average, these respondents support the Democrats, are older and better educated.

Splitting the sample into 'better informed' respondents (those who gave answers *not* higher than 10 percent, i.e. about one third of all respondents) and 'uninformed' respondents (those who gave answers higher than 10 percent), we find significantly lower proposed effective tax rates for the latter group (see *figure 3*). Differences in proposed effective tax rates across tax instruments are small, especially within the group of 'uninformed' respondents. This is especially remarkable since previous studies mainly highlight the effects of misinformation on preferences regarding *estate taxation*.[33] Our findings suggest that misinformation does not affect preferences for estate taxes in particular, but preferences for capital taxation in general.

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[31]   As the choice '1 percent' is the closest possible choice to the correct value of about 0.1 percent, this can be seen as the 'correct' answer. See: https://www.taxpolicycenter.org/briefing-book/how-many-people-pay-estate-tax (26.07.2019).

[32]   Yes, if respondent has received a gift worth $10k or more in the past.

[33]   E.g. Kuziemko et al. (2015).

*Figure 3: Average effective tax rates (left) and share of rejecters (right) by **level of information of the respondent** and **treatment group**; 95%-confidence intervals.*

7.1.3   The role of socio-economic characteristics

Other sample splits that lead to interesting findings are by the number of children as well as the respondent's age. While the age of respondents does not matter for the level of taxes in the wealth tax groups, older respondents propose significantly lower effective tax rates in the *estate tax treatment* compared to younger respondents. Differences between respondents who are younger than 35 years and older ones are shown in *figure 4*. Furthermore, there is a negative correlation between age and proposed effective tax rates across all age groups. This finding is again driven by differences in blunt rejection rates of older respondents: These are much higher for the estate tax compared to other instruments, especially the one-time wealth tax. Respondents with children propose (for the most part significantly) generally lower taxes than their childless counterparts. Again, this is particularly the case for the *estate tax*: Respondents with children do not only propose much lower estate tax levels compared to childless respondents, but also prefer the one-time wealth tax over the estate tax, whereas childless respondents are indifferent between both taxes (see *figure 5*).

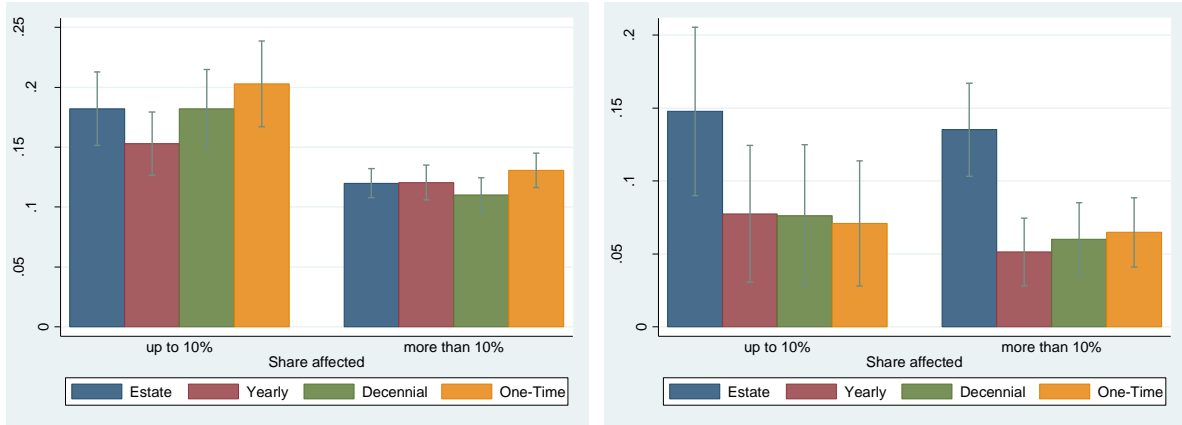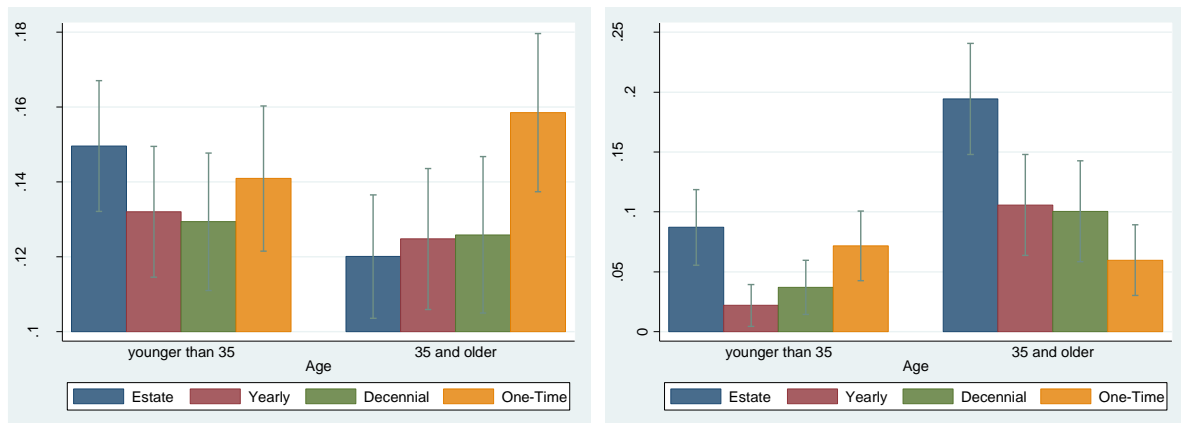*Figure 4: Average effective tax rates (left) and share of rejecters (right) by **age of the respondent** and **treatment group**; 95%-confidence intervals.*
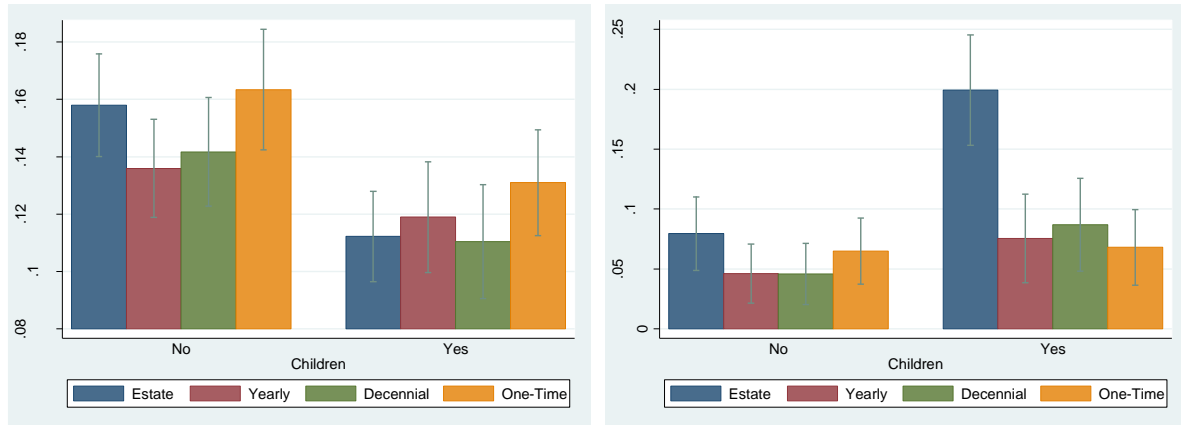
*Figure 5: Average effective tax rates (left) and share of rejecters (right) by **children of the respondent** and **treatment group**; 95%-confidence intervals.*

7.2   Analysis of vignette effects

In a next step, we explore the effects of the different categories implemented in the *vignette*-dimensions on proposed tax rates. General results are shown in *Figure 6*. As a reminder, our analyzed vignettes differ in the dimensions 'value of assets', 'source of assets', 'type of assets' and 'number of children'.

The effect of the value of assets clearly differs between concentrated and periodical taxes. While effective tax rates of the estate tax and the one-time wealth tax show a significant progressivity, no clear pattern exists for both periodical taxes. A similar result can be found with respect to the number of children considered in the vignettes: Again, results clearly differ between concentrated and periodical taxes. While no significant differences exist within the latter group of taxes, respondents in the estate tax group as well as the one-time wealth tax group propose significantly lower effective tax rates in vignettes with three children compared vignettes without children. Furthermore, tax rates strictly decrease with the number of children in both concentrated tax groups. When looking at variations in type and source of assets no (significant) differences *between* tax instruments can be found. As for the type of assets, tax levels are very similar independent of the category. Hence, our respondents seem to prefer a uniform taxation of all assets without differentiation.[34] The picture is different when it comes to the source of assets: Proposed tax burdens are highest on assets if they are accumulated by 'luck' (lottery and lucky investments) and lowest if accumulated by 'effort' (savings of earned income). Effective tax rates on inherited wealth are closer to those gained from lotteries and lucky investments. Comparing mean values, both values are not significantly different, whereas

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[34]   Although we consider three very different types of assets, we do not capture preferences regarding more 'emotionally charged' assets like ones' childhood home or family jewelry.

effective tax rates on saved earned income are significantly lower. Hence, inherited wealth tends to be perceived as rather luckily gained by the majority of respondents.
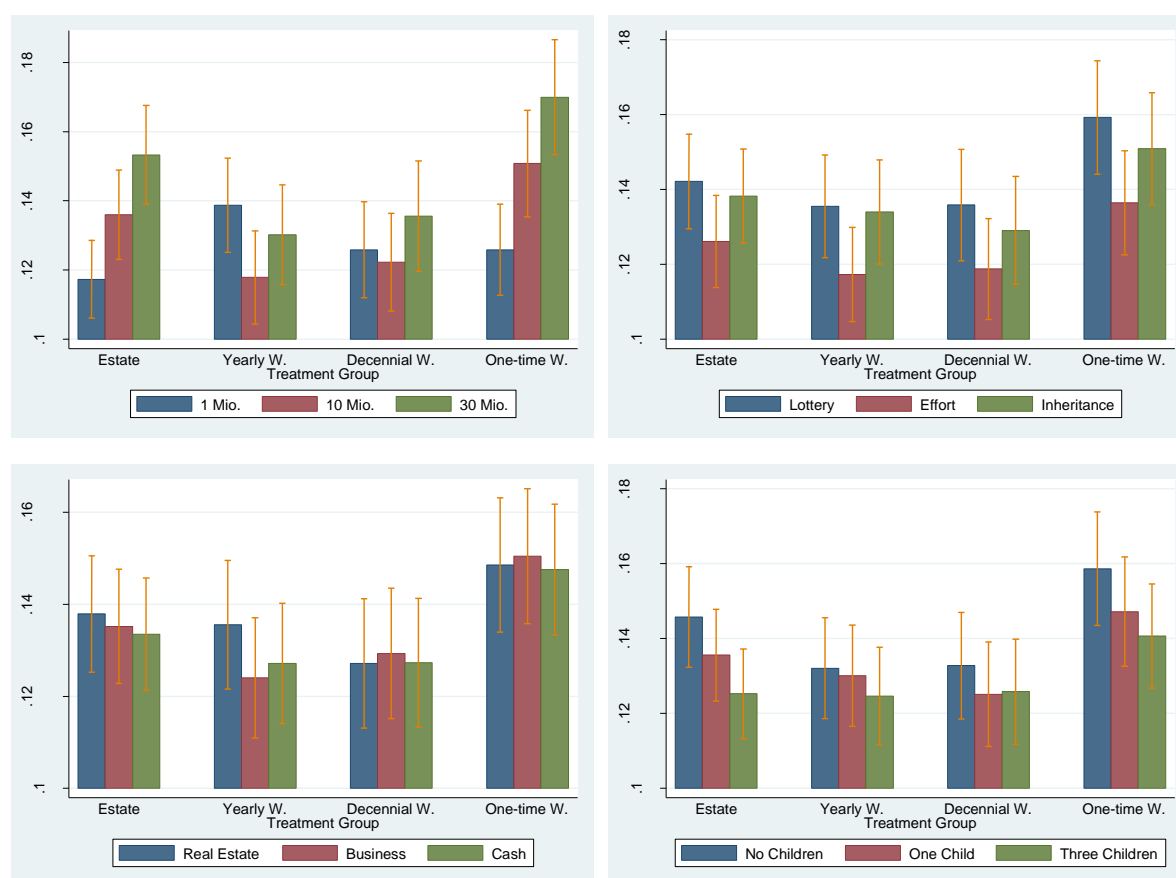
*Figure 6: Average effective tax rates; by **treatment group** and **vignette dimension**; 95%-confidence intervals.*

The regression analysis presented in Table 9 shows that, again, findings of our graphical analysis can be confirmed or become even clearer. Strictly and significantly increasing effective tax rates with respect to the value of assets and number of children can only be found for the estate tax and the one-time wealth tax. The effects of the type of assets are still small and taxes on inherited or 'luckily gained' wealth are higher compared to those on 'earned' wealth.

Furthermore, the estimates of considered covariates reveal characteristics that are correlated with the level of preferred or proposed taxes: Female respondents (for both concentrated taxes) and those with children (for all instruments except the yearly wealth tax) seem to prefer lower taxes. With respect to partisanship supporters of the Republicans propose the lowest taxes and supporters of the Democrats propose the highest taxes across all tax instruments. Differences are especially large in the estate tax group. Preferences of those who do not feel attached to one of the two major political parties lie in between.

	estate tax group	yearly wealth tax group	decennial wealth tax group	one-time wealth tax group
Vignette variables				
Base: $1m				
$10m	0.019***	-0.021***	-0.004	0.025***
	(5.90)	(-5.47)	(-1.07)	(7.76)
$35m	0.036***	-0.008**	0.010***	0.044***
	(11.36)	(-2.23)	(2.89)	(13.73)
Base: effort				
lottery/lucky	0.016***	0.018***	0.017***	0.023***
	(5.07)	(4.77)	(5.08)	(7.11)
inheritance	0.012***	0.017***	0.010***	0.014***
	(3.84)	(4.39)	(3.06)	(4.51)
Base: cash				
real estate	0.004	0.008**	-0.000	0.001
	(1.38)	(2.20)	(-0.05)	(0.32)
business shares	0.002	-0.003	0.002	0.003
	(0.53)	(-0.82)	(0.60)	(0.89)
Base: no children				
one child	-0.010***	-0.002	-0.008**	-0.011***
	(-3.23)	(-0.53)	(-2.28)	(-3.57)
three children	-0.021***	-0.007*	-0.007**	-0.018***
	(-6.49)	(-1.95)	(-2.07)	(-5.59)
Control variables				
female	-0.021*	-0.016	-0.002	-0.040***
	(-1.72)	(-1.18)	(-0.13)	(-2.80)
age	-0.001	-0.000	0.001	0.001
	(-1.04)	(-0.73)	(0.94)	(0.96)
has children	-0.025*	-0.009	-0.033**	-0.025*
	(-1.93)	(-0.60)	(-2.07)	(-1.66)
black	-0.019	0.008	0.027	0.016
	(-0.78)	(0.26)	(0.90)	(0.48)
white	-0.014	0.021	-0.002	0.032
	(-0.89)	(1.14)	(-0.11)	(1.56)
republican	-0.060***	-0.029	-0.038*	-0.030
	(-3.49)	(-1.45)	(-1.86)	(-1.42)
democrat	0.032**	0.012	0.001	0.058***
	(2.05)	(0.65)	(0.05)	(3.01)
education	0.006	0.009	0.022**	-0.000
	(0.92)	(1.35)	(2.55)	(-0.05)
entrepr. in family	0.022	0.002	0.005	0.016
	(1.63)	(0.10)	(0.35)	(1.05)
expect estate tax	-0.020	-0.013	-0.021	-0.014
	(-1.58)	(-0.94)	(-1.38)	(-0.89)
inherited in past	0.008	0.004	0.011	0.079***
	(0.50)	(0.24)	(0.53)	(3.81)
Observations	5,337	4,329	4,221	5,022

t statistics in parentheses; * p < 0.10, ** p < 0.05, *** p < 0.01

Table 9: Vignette results (random effects model; full set of controls; dependent variable: effective tax rate); by **treatment group***.*

Results of further regression analyses, which additionally consider interaction effects with respect to vignette dimensions, can be found in the appendix. In a nutshell, only a few of these effects are significant and we find no convincing new insights. Hence, we argue that main effects of all dimensions are rather homogenous and hardly depend on the specific (further) context of the vignette.

7.2.1 The role of partisanship

Next, we analyze subsamples to provide more nuanced results. For reasons of clarity and comprehensibility, we focus on the results of the two tax instruments with most distinctive characteristics, these are the estate tax and the yearly wealth tax. However, all groups are considered in our regression analysis. As shown in *Figure 7* and *Figure 8*, splitting our sample by partisanship yields two noteworthy findings. First, supporters of the Republicans favor less progressive estate tax rates than supporters of the Democrats.[35] Second, independent of the partisanship, proposed effective tax rates on luckily gained assets are always higher than those on wealth based on saved earned incomes. However, whether inherited assets should be taxed similar to luckily gained wealth or to assets from saved earned incomes, partially depends on partisanship: If randomized into the yearly wealth tax group, supporters of the Republicans propose effective tax rates similar to those on 'effort'-based assets[36], whereas Democrats propose taxes very close to those on 'luckily' gained assets.
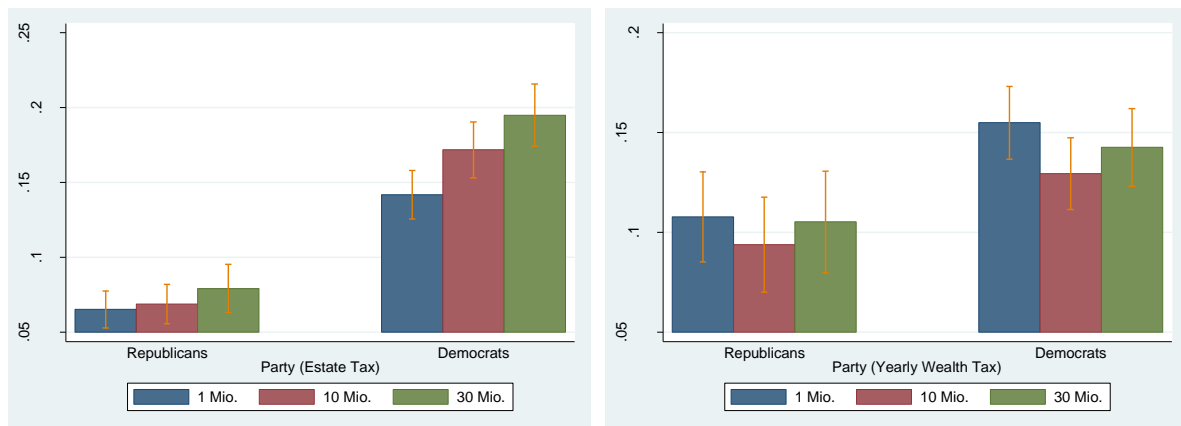
*Figure 7: Average effective tax rates in the estate tax group (left) and the yearly wealth tax group (right); by **partisanship of the respondent** and vignette dimension **'value of assets'**; 95%-confidence intervals.*

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[35] The same applies to the one-time wealth tax.
[36] Differences between the dimension 'luck'' and 'inheritance' are significantly different on 10%-level, whereas no significant differences can be found between 'effort' and 'inheritance'.
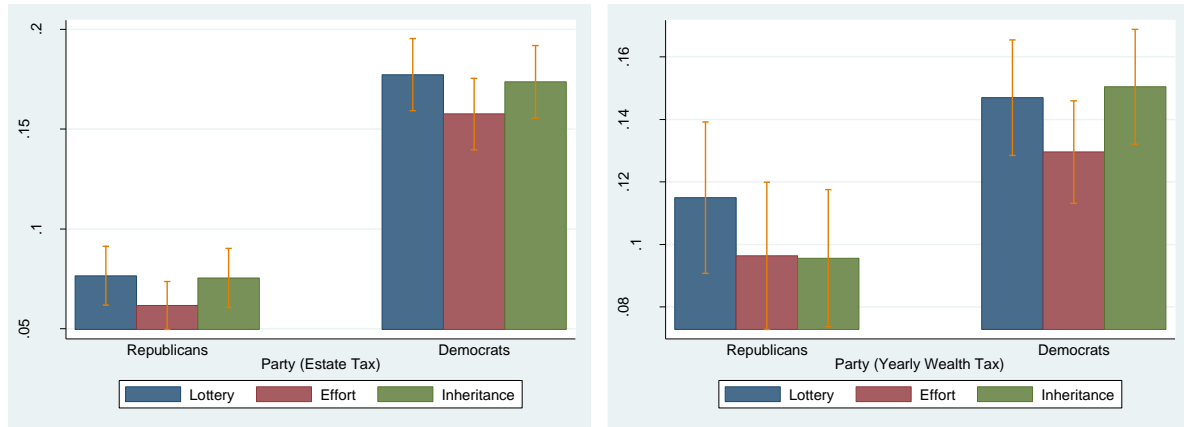
*Figure 8: Average effective tax rates in the estate tax group (left) and the yearly wealth tax group (right); by **partisanship of the respondent** and vignette dimension **'source of assets'**; 95%-confidence intervals.*

	estate tax group		yearly wealth tax group	
	Republicans	Democrats	Republicans	Democrats
Base: $1m				
$10m	0.004	0.030***	-0.014**	-0.025***
	(0.67)	(6.39)	(-2.34)	(-4.69)
$35m	0.014***	0.053***	-0.003	-0.012**
	(2.64)	(11.34)	(-0.42)	(-2.27)
Base: effort				
lottery/lucky	0.015***	0.020***	0.019***	0.017***
	(2.82)	(4.21)	(3.13)	(3.19)
inheritance	0.014***	0.016***	-0.001	0.021***
	(2.60)	(3.43)	(-0.12)	(3.84)
Base: cash				
real estate	0.002	0.006	0.005	0.006
	(0.41)	(1.23)	(0.85)	(1.19)
business shares	-0.001	0.002	-0.003	-0.002
	(-0.16)	(0.43)	(-0.50)	(-0.40)
Base: no children				
one child	-0.009*	-0.010**	-0.001	-0.001
	(-1.73)	(-2.15)	(-0.25)	(-0.23)
three children	-0.018***	-0.023***	0.002	-0.008
	(-3.33)	(-4.93)	(0.29)	(-1.47)
Observations	1,485	2,745	1,260	2,331

t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

*Table 10: Vignette results (random effects model; full set of controls; dependent variable: effective tax rate); **by partisanship**.*

Our regression analysis verifies these findings (see Table 17).[37] The effect of increasing values of assets on proposed estate tax rates is much stronger within the group of supporters of the Democrats.[38] The regression analysis also confirms findings regarding the source of assets:

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[37] A respective regression table for the decennial wealth tax and the one-time wealth tax can be found in the appendix.
[38] Very similar results can be found with respect to the one-time wealth tax (see appendix).

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While supporters of the Democrats propose significantly higher yearly wealth taxes on inherited and 'luckily' gained wealth compared to hard-earned wealth, supporters of the Republicans propose same levels for inherited and effort-based wealth.[39]

7.2.2   The role of further respondents' characteristics

As shown in *Figure 6*, the existence of children in our vignettes leads to lower proposed effective tax rates in all treatment groups – even though effects are only partially significant. However, some subgroups of respondents do not consider children as a reason to decrease one's tax burden in the yearly wealth group: respondents who are highly educated (i.e. hold a bachelor's degree or higher) and those who do not have children themselves.[40] The latter finding could be interpreted as some kind of self-concern. However, both findings are not statistically significant.

7.3   Within-Question

As described above, we enriched the study by an additional question, where respondents had to directly choose between two types of taxes. Most interesting insights can be found when looking at those, who were randomized into the estate tax group (compared against yearly wealth tax) or the yearly wealth tax (the other way around) since displayed types of taxes are the same in both groups. On average, 31.2 percent choose the estate tax and 48.0 percent choose the yearly wealth tax. The remaining 20.8 percent are indifferent ('doesn't matter to me'), whereby this indifference-rate is not significantly different between both groups. The following discussion considers only those who make a clear-cut decision.

When comparing answers of both treatment groups, we find significant differences with respect to the choices the respondents make. Being confronted with a certain type of tax (i.e. being randomized into that respective treatment group) seems to increase the likelihood to prefer this specific tax to the other. While the share of estate tax supporters is only 34.3 percent in the yearly wealth tax group, it 'increases' to significantly[41] higher 43.7 percent in the estate tax group. Of course, the same applies to the yearly wealth tax: 56.3 percent of the respondents who were randomized into the estate tax group choose the yearly wealth tax and 65.7 percent of those who were randomized into the yearly tax group. A logit regression including a full set of controls confirms that respondents being randomized into the estate tax group have a

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[39]   This finding cannot be confirmed for the decennial wealth tax: Republicans propose very similar effective tax rates independent of the source of assets.
[40]   Figures can be found in the appendix.
[41]   On 0.5%-level.

significant[42] higher probability to prefer the estate tax over the yearly wealth tax in the within setting. Therefore, it seems that getting used to a specific tax increases support or decreases rejection ('status-quo bias').

When linking our within-question design with the average effective tax rates proposed by our respondents, we find no significant differences between those who chose the estate tax and those who chose the yearly wealth tax.

Another interesting comparison is between the estate tax group and the one-time wealth tax group as in both groups respondents had the choice to switch to the yearly wealth tax. However, we find no significant differences between both groups in this regard.

7.4   Minor analysis

Besides our main analysis of proposed tax burdens on wealth, we asked respondents to answer some further questions in our socioeconomic questionnaire by the end of the study. We asked respondents to rate three statements on a seven-level Likert scale:

1. *To what extent do you agree with the following statement?*
   "Wealth inequality is a serious problem."
   (1=No problem; 7=Very serious problem)

2. *To what extent do you believe that it is the job of the government in Washington to counterbalance differences in wealth?*
   (1=Government should not redistribute; 7=Government should redistribute)

3. *Opinions vary on the fundamentals of wealth and economic success. Some see luck and the help of others as decisive factors, while others think these factors are hard work and personal commitment. In your opinion, which factors play a bigger role?*
   (1=Personal commitment & hard work; 7=Luck & the support of others)

An average answer of 5.2 for the first question suggests that inequality is seen as a problem. The value is not only far beyond 1 ('No problem'), but also significantly above the middle answer of 4. Answers to the second question are slightly lower (4.2), however, still above both

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[42]   On 1%-level.

1 ('Government should not redistribute') and the middle value of 4. Differences between treatment groups are not significant for both questions. Some variation can be observed for the third question: Varying between 3.7 (yearly wealth tax) and 3.9 (estate tax), respondents evaluate 'luck' as a (significantly[43]) more important factor for wealth accumulation after being randomized into a (more) 'concentrated' tax treatment.

However, all values are below the middle value of the scale, hence effort tends to be considered the more important factor.

	Inequality as a problem		Gov. should redistribute		Effort (1) vs. Luck (7)	
	Republicans	Democrats	Republicans	Democrats	Republicans	Democrats
Party	**3.7**	**6.1**	**2.8**	**5.1**	**3.0**	**4.3**
	No	Yes	No	Yes	No	Yes
Children	**5.4**	**4.9**	**4.4**	**3.9**	**4.0**	**3.6**
	Low	High	Low	High	Low	High
Income	**5.5**	**4.9**	**4.5**	**3.9**	**4.0**	**3.7**
	< 35 years	>= 35 years	< 35 years	>= 35 years	< 35 years	>= 35 years
Age	**5.4**	**4.9**	**4.5**	**3.8**	**4.0**	**3.6**
	Low	High	Low	High	Low	High
Education	5.1	5.2	4.2	4.2	3.8	3.9
	No	Yes	No	Yes	No	Yes
Entrepreneur	**5.3**	**4.9**	**4.3**	**3.9**	**3.9**	**3.7**
	Female	Male	Female	Male	Female	Male
Gender	**5.0**	**5.3**	**4.0**	**4.3**	**3.7**	**3.9**

*Table 11: Responses to three statements; by socioeconomic groups; significant differences are highlighted by **bold** values.*

As shown in Table 11, there were a lot of differences between the answers the various subgroups gave. Especially large gaps in preferences and perceptions can be found depending on partisanship, which is in line with other results of this study: Supporters of the Democrats see inequality as a greater problem, prefer more redistribution and see luck as a more important source of wealth compared to supporters of the Republicans. Further characteristics that lead to a more skeptical view towards the distribution of wealth and preferences for more redistribution are the absence of own children, low incomes, low ages, being no entrepreneur and being male. At the same time, respondents with these characteristics see 'luck' as the more important reason for wealth accumulation.

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[43] Difference between the yearly wealth tax on the one hand and both concentrated taxes on the other hand.

8 Discussion

Although we have demonstrated the formal equivalence of the analyzed tax instruments, we are aware of the differences that still exist between these instruments. Therefore, we acknowledge the possibility that our respondents form biased preferences, particularly due to underlying efficiency concerns (i.e. concerns about behavioral responses) and bounded rationality. Since we already discussed potential biases due to different complexities against the background of our design, concerns on bounded rationality are not the subject of this chapter.[44] Even though we went to great lengths to immunize our research design against behavioral concerns, this chapter discusses the differences between tax instruments and the potential effects on our results. We further elaborate on the internal validity of our results by presenting some remarks related to our methodology. Finally, our results and their interpretation are set into the context of existing policies.

8.1 Differences between tax instruments

A number of empirical works find indications for behavioral responses towards the taxation of intergenerational wealth: Estimated elasticities of the reported estate tax base with respect to the net-of-tax rate range from 0.1 to 0.2.[45] By contrast, the effect of recurrent wealth taxation on taxable wealth is estimated to have an elasticity between 0.1 and 0.85.[46] Nevertheless, it is important to bear in mind that these studies are highly sensitive to specific institutional settings and methodological approaches and are thus hardly comparable. An empirical claim as to which tax is more prone to these responses can therefore not be made. Here, we take a closer look at specific behavioral channels and how they might affect preferences towards the proposed tax instruments.[47] These are saving, consumption and wealth accumulation as well as different forms of tax avoidance (like mobility, reporting and timing).

Beyond the formal equivalence of tax instruments, economic behavior can depend on the tax design as the utility might differ due to certain time preferences for consumption. In case of differences between debit and credit interests or credit limitations, periodical taxes increase the price of consumption or reduce the consumption opportunities in early periods. However, as we a) only consider wealthy individuals who build up assets in the course of their lives, b) do not

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[44] Additionally to differences in complexity, we already mention in chapter 3 that – in case of endogenous growth – the tax instruments differ in their tax burden and thus might incentivize different behavioral responses to taxpayers. However, both issues won't be discussed in this chapter as they are addressed in our design and should not play a role in our results.

[45] See Kopczuk and Slemrod (2006), Holtz-Eakin and Marples (2001), Joulfaian (2006), Glogowsky (2016).

[46] See Brülhart et al. (2017), Seim (2017), Zoutman .

[47] See Kopczuk (2013) for a more detailed discussion on the differences of the taxation of transfers (i.e. bequests) and the (net-)wealth.

mention any consumption in our vignettes and c) always present an already completed wealth accumulating process, this should only play a minor role in the perception of our cases. One additional issue that may occur and is hard to control for is the scenario that individuals gain utility solely on the grounds of their wealth accumulating process, e.g. they enjoy their current account balance.

In addition to the differences in preferences due to the wide variety of assumptions with regard to lifetime consumption, tax-specific planning opportunities might play a role in the stated preferences. These comprise numerous channels of which mobility, (under)reporting and intertemporal shifting of the tax base are among the most prominent. While estimating tax base elasticities, the empirical literature remains unclear about the prominence of specific channels. Adam et al. (2011) argue in favor of taxing wealth during the entire course of one's life to prevent a long-time horizon that would enable the richest to plan tax avoidance. When large amounts of money are accumulated by the end of one's life, investments in tax avoidance become more attractive.[48] Moreover, current estate and inheritance tax schemes provide timing opportunities in the (partial) exemption of lifetime gifts. Even the timing of death seems to provide room for tax planning (Kopczuk and Slemrod 2003). These aspects suggest a potential bias in preferences for the annual wealth tax. However, we address such efficiency concerns by communicating behavioral assumptions as described in chapter 5.1. Although we are not able to fully cancel out this bias, we at least find similar results between the full sample and the sample restricted to those who understood our assumptions correctly.

An opposing bias could be induced by the potentially high administrative costs of periodical taxes. The assessment of taxes in general is time-consuming and associated with direct and indirect costs. In case of capital taxes, an additional challenge is the valuation of assets. Especially for real estate and businesses, a proper valuation is anything but straightforward and thus potentially very costly for both taxpayers and the fiscal authorities.[49] This issue may be even more severe for highly diversified asset portfolios. It is obvious that costs of general assessments and valuations increase with the frequency of taxation periods.

Finally, one important difference between (periodical) wealth taxes and the estate tax is the (mis)perceived transfer tax related character of the latter: Whereas a recurrent wealth tax presumably only limits one's own consumption (at short sight), the estate tax likely affects two (or more) related parties, which potentially involves externalities. Cremer and Pestieau (2006)

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[48] Kopczuk (2013) notes that estate tax planning might be driven by expected tax rates rather than the actual tax scheme.
[49] See Hey et al. (2012) Part B, Chapter IV.

show how the optimal tax structure crucially depends on the underlying bequest motive. With a high proportion of accidental motives, the optimal tax should be higher. On the contrary, altruistic and strategic motives are more prone to distortive effects regarding economic behavior. This potentially induces not only a preference bias towards periodical wealth taxes, but also towards the one-time wealth tax, which does not imply a transfer due to its name.[50] We believe that our research design takes this into account: The existence of children was stressed in the (periodical) wealth tax treatments just as the non-existence of children was stressed in some vignettes of the estate tax[51].

8.2 Potential anchoring bias of our vignette design

One 'common worry' (see e.g. Fisman et al., 2017a) of vignette studies is the so-called anchoring bias, i.e. respondents might be oriented towards early answers throughout all subsequent responses. One major consequence would be a loss of variation and therefore biased effects of vignette dimensions. Although the variation within the respondents' answers does not suggest serious anchoring issues, we also analyze the dataset solely on the basis of the first vignettes presented to the respondents. Most of our main findings can be confirmed even with this much smaller sample: Patterns between tax instruments differentiated by partisanship, level of information, age and the existence of children at respondent level look similar. Furthermore, progressivity of effective tax rates is more pronounced in the concentrated tax groups, whereas the existence of children within the vignettes shows clear effects only in the estate tax group. When including the specific categories of the first displayed vignette as explanatory (factor) variables into the basic regression equation, proposed taxes are only significantly higher if the first presented assets are worth $10m. As both lower ($1m) and higher ($30m) values lead to lower effective tax rates, this finding is hard to rationalize. Apart from this, all estimates of controls are small and insignificant.

8.3 Measures and interpretation of results

The external validity of our results has already been discussed in chapters 5.1 and 5.2. This section briefly discusses some further remarks including the interpretability of our simplified tax framework.

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[50] Regarding the important comparison of the one-time wealth tax and the estate tax, one could argue that the name of the estate tax actually triggers some perception of a transfer payment. However, in both questions we asked about the tax at "the age of 80", which was described as the end of one's life in the vignette text

[51]: Of course, (periodical) wealth taxes also burden inter-vivos giving.

To assess whether the answers of our respondents are affected by existing taxes, we analyzed the effect of the existence of estate or inheritance taxes on the state level[52] as well as the level of income and property taxes on the state level on proposed effective tax rates. In our regression analyses we find no significant correlation between actual taxes that are levied in the state of the respondent and their proposed tax burdens.[53]

As the effective tax rates analyzed in this study present the share of assets that has to be paid as taxes, it has to be kept in mind that they already include any tax exemptions. Statutory tax rates would be even higher given existing tax exemptions. As an example, the average effective estate tax rate of 15 percent on assets worth $30m as proposed by our respondents translates into a statutory tax rate of about 24 percent, given an actual tax exemption for a single person of $11.18m. Also proposed effective tax rates in other treatment groups are at similar levels. However, even these fairly high proposed effective tax rates might be underestimated for the following reasons:

First, chosen tax levels are affected by the respondents' comprehension of our stated assumption that no other capital taxes exist. This is due to the fact that people might be supportive of taxation of wealth in general, but unsupportive of *additional* capital taxes. The comparison of average effective tax rates reveals that those who are aware that no other capital taxes exist propose significantly higher tax rates (14.1 percent) than those who are not (11.2 percent). However, this finding should not affect the results of our between-analysis and vignette-analysis as it affects all tax treatments.

Second, we ask for the tax burden *in US-Dollars* and not the effective tax rate (in percent). McCaffery and Baron (2006) show that responses in Dollars lead to lower progression and lower effective tax rates for higher tax bases compared to responses in percent.

9   Conclusion

The understanding of preferences for redistributive policies gained more and more momentum in the theoretical literature and was subject to extensive empirical research over the past decade. Especially against the background of increased wealth inequality and income-wealth ratios documented by Piketty (2015) and Saez and Zucman (2016), the literature aimed to explore ambiguous empirical findings on the preferences regarding capital taxation and conceptualize

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[52]   We consider the existence rather than the level of estate and inheritance taxes as tax levels are not comparable due to a huge variation in tax exemptions.

[53]   A more detailed discussion can be found in the appendix.

public opinions ruling the political debate. Yet, the current research frontier on preferences regarding capital taxation centers around either rather abstract normative concepts (Weinzierl, 2014) or the emotionally loaded estate tax. Whereas Fisman et al. (2017a) and Kuziemko et al. (2015) do find preferences for a positive capital taxation, ample literature presents an exceptionally strong opposition towards the estate tax. Kuziemko et al. (2015) indicate that the fundamental opposition towards the estate tax might be driven by misinformation, however, they admit that it remains unclear if misinformation actually fully explains this phenomenon. Bastani and Waldenström (2018) are among the first ones who survey participants on different instruments of capital taxation: They conclude that there are "some clues" about mechanisms behind the emotional load of taxing wealth.

This study presents an experimental investigation of preferences regarding capital taxation with tangible, real-word policy choices beyond estate taxation. In addition to the effect of various dimensions derived from the public debate, we aim to identify the role of tax-specific design features on preferences regarding capital taxation and their interactions. In doing so, we are explicitly not interested in the underlying personal efficiency concerns or bounded rationality in comparison with these instruments.

We run a factorial vignette survey experiment with over 3,200 respondents on Amazon's Mechanical Turk (MTurk). Whereas our treatments capture other general channels that influence the preferences they crucially reflect design specific differences between the taxes. Our novel methodology enables us to disentangle the effect of general policy dimensions (i.e. value of assets, existence of children etc.) on the preferred level of taxation while identifying relative differences of these effects across the different tax instruments (between-subject). This comprehensive view on instruments for capital taxation has another advantage: it strengthens the robustness of our findings by using different tax instruments as reference points for each other.

Our results connect and contribute to the existing literature in several ways. First, we are able to confirm major findings of previous literature: misinformed individuals propose a significantly lower level of capital taxation across *all* tax instruments (Kuziemko et al., 2015); the source of wealth is decisive (Alesina and Angeletos, 2005) as assets accumulated by luck or inheritances are taxed significantly higher than savings from past salaries; the existence of children leads to a lower proposed tax burden (Cremer and Pestieau, 2006) and Republicans prefer much lower and less progressive tax rates than Democrats (Cappelen et al., 2018). Second, we show how the specific design of tax instruments is indeed decisive for preferences

towards capital taxation, especially along the lines of concentrated (i.e. estate and one-time tax) versus periodical (i.e. yearly and decennial tax) taxes. While proposed effective tax rates of concentrated taxes show a significant progressivity, this pattern does not exist for periodical taxes. Third, these differences differ starkly along partisanship. Whereas Democrats clearly prefer concentrated taxes (both the estate and the one-time wealth tax) over periodical wealth taxes, Republicans only reject the estate tax in particular. Finally, we present strong evidence for drivers of opposition towards the estate tax beyond the well documented misinformation: Republicans do not reject the perfectly congruent one-time wealth tax, for which they propose significantly higher tax rates than for the estate tax. This constitutes novel experimental clues for emotional charges, potentially triggered by political framing (Birney et al., 2006). Remarkably, Democrats unambiguously do not differentiate between these tax instruments.

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Appendix

A Experimental design (screenshots)

The following questions are about **your personal opinion** on how much hypothetical people should pay in taxes on their wealth.

In order to finance public spending, taxes are levied. For this, the government employs different types of taxes, e.g. on income, consumption, or assets. If the government aims to collect a certain tax revenue, every increase in one tax should decrease other taxes by the same amount.

This study is about an **estate tax**. An estate tax once taxes the entire assets, which the decedent owns at the end of his or her life. The taxed estate may include cash, account balances, real estate, and shares. Low asset values might be exempted.

Important: *In this study we assume that individuals' behavior is not affected by the existence of taxes. In particular, the estate tax will not affect economic activity, savings behavior, or lead to tax avoidance/evasion. Furthermore, no other capital taxes are levied.*

Control Question:

Which of the following assumptions should be kept in mind when participating in this study? For this, multiple answers are allowed.

> The existence and the amount of taxes does not affect economic activity and saving behavior.

> The existence and the amount of taxes does not affect the level of tax avoidance and evasion.

> The estate tax AND other capital taxes are levied.

Figure 9: Screenshot of explanations and control questions (estate tax group).

The following questions are about **your personal opinion** on how much hypothetical people should pay in taxes on their wealth.

In order to finance public spending, taxes are levied. For this, the government employs different types of taxes, e.g. on income, consumption, or assets. If the government aims to collect a certain tax revenue, every increase in one tax should decrease other taxes by the same amount.

This study is about a **yearly wealth tax**. A yearly wealth tax taxes the entire assets one owns at the end of each year. The taxed assets may include cash, account balances, real estate, and shares. The yearly wealth tax works similar to a property tax, but has to be paid based on all assets, not only real estate. Low asset values might be exempted.

Example: If one owns assets over a period of 50 years, the total tax burden would be the sum of the 50 yearly payments. E.g. a total tax burden of $100 would be the sum of 50 payments that are on average $2 each.

Important: In this study we assume that individuals' behavior is not affected by the existence of taxes. In particular, the yearly wealth tax will not affect economic activity, savings behavior, or lead to tax avoidance/evasion. Furthermore, no other capital taxes are levied.

Control Question:

Which of the following assumptions should be kept in mind when participating in this study? For this, multiple answers are allowed.

> The existence and the amount of taxes does not affect economic activity and saving behavior.

> The existence and the amount of taxes does not affect the level of tax avoidance and evasion.

> The yearly wealth tax AND other capital taxes are levied.

Figure 10: Screenshot of explanations and control questions (yearly wealth tax group).

Consider a person who starts building assets at the age of 30. By the age of 80, the end of his or her life, these assets are worth **$30,000,000**. The assets mainly consist of **cash** and were mostly accumulated by **a received inheritance and gifts from family members**. The person has **no children**.

If it were up to you, what amount should the person pay in estate tax at the end of his or her life?

$ 100,000

The Tax Authority charges a tax payment of **$100,000** at the end of his or her life.

←   →

Figure 11: Example of a single vignette (estate tax group).

Consider a person who starts building assets at the age of 30. By the age of 80, the end of his or her life, these assets are worth **$30,000,000**. The assets mainly consist of **cash** and were mostly accumulated by **a win in the lottery and lucky investments**. The person has **one child**.

If it were up to you, what amount should the person pay in yearly wealth taxes over his or her entire life in total?

$ 100,000

The Tax Authority charges an average tax payment of **$2,000** each year.

←   →

Figure 12: Example of a single vignette (yearly wealth tax group).

An estate tax once taxes the entire assets, which the testator owns at the end of his or her life. The taxed estate may include cash, account balances, real estate, and shares. Low asset values might be exempted.

The state decides to tax wealth and has two different taxes at its disposal for this: the yearly wealth tax, as described in the first part of this survey, or the estate tax, explained just now.

What kind of taxation would you prefer for a person, who owns $10,000,000 before taxes over a period of 50 years? **The lifetime tax burden is identical in both cases.**

| An estate tax of $1,000,000 by the end of one's life.	An average yearly wealth tax of $20,000.	Doesn't matter to me.

→

Figure 13: Within-question (yearly wealth tax group).

B Effective tax rates by region

We analyzed effects of the existence of estate or inheritance taxes on state level[54] as well as the level of income and property taxes on state level on proposed effective tax rates. However, we find no significant correlation between actual taxes that are levied in the state of the respondent and her proposed tax burdens. Due to the very small number of observations for some states, we display aggregated values per region. Average proposed effective tax rates based on different regions of the United States are shown in *Figure 14*. Defining these, we follow the Bureau of Economic Analysis and split the country into eight different regions:[55] Far East, Rocky Mountains, Plains, Great Lakes, Mideast, New England, Southeast and Southwest. In general, respondents living in southern regions tend to propose lower taxes compared to those living in the north. The lowest average tax rates can be found in the Southwest, whereas the survey participants living in the Plains proposed the highest taxes.
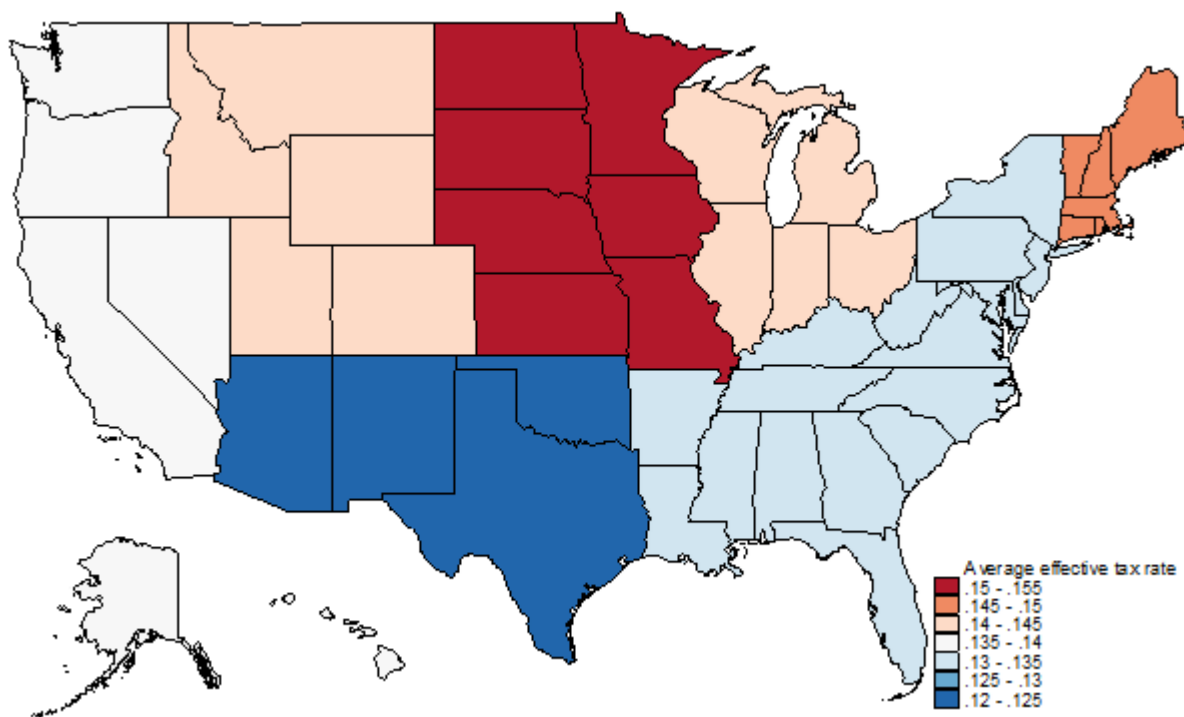
Figure 14: Proposed average effective tax rates of respondents by region

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[54] We consider the existence rather than the level of estate and inheritance taxes as tax levels are not comparable due to a huge variation in tax exemptions.
[55] See https://apps.bea.gov/regional/docs/regions.cfm (22.07.2019).

C Further between results

	full set	behavioral control question correctly
base: one-time wealth		
estate	-0.010	-0.005
	(-1.13)	(-0.42)
yearly wealth	-0.020**	-0.020
	(-2.13)	(-1.54)
decennial wealth	-0.021**	-0.025**
	(-2.24)	(-1.99)
base: $1m		
$10m	0.006***	0.014***
	(3.72)	(6.38)
$35m	0.022***	0.034***
	(13.00)	(15.28)
base: effort		
lottery/lucky	0.019***	0.021***
	(10.93)	(9.47)
inheritance	0.013***	0.015***
	(7.89)	(6.67)
base: cash		
real estate	0.003**	0.004*
	(2.00)	(1.87)
business shares	0.001	-0.000
	(0.57)	(-0.20)
base: no children		
one child	-0.008***	-0.007***
	(-4.77)	(-3.00)
three children	-0.014***	-0.015***
	(-8.14)	(-6.86)
female	-0.020***	-0.024***
	(-2.94)	(-2.63)
age	-0.000	-0.000
	(-0.02)	(-1.09)
has children	-0.022***	-0.015
	(-3.08)	(-1.52)
black	0.006	-0.047**
	(0.42)	(-2.28)
white	0.006	-0.000
	(0.61)	(-0.02)
republican	-0.041***	-0.065***
	(-4.11)	(-4.73)
democrat	0.027***	0.014
	(3.06)	(1.17)
education	0.009**	0.010*
	(2.31)	(1.91)
entrepr.family	0.013*	0.016
	(1.76)	(1.58)
exp. tax	-0.017**	-0.026***
	(-2.33)	(-2.63)
inher. past	0.025***	0.013
	(2.61)	(0.96)
Observations	18,909	10,359

t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 12: Between results (random effects model; full set of controls; dependent variable: effective tax rate).
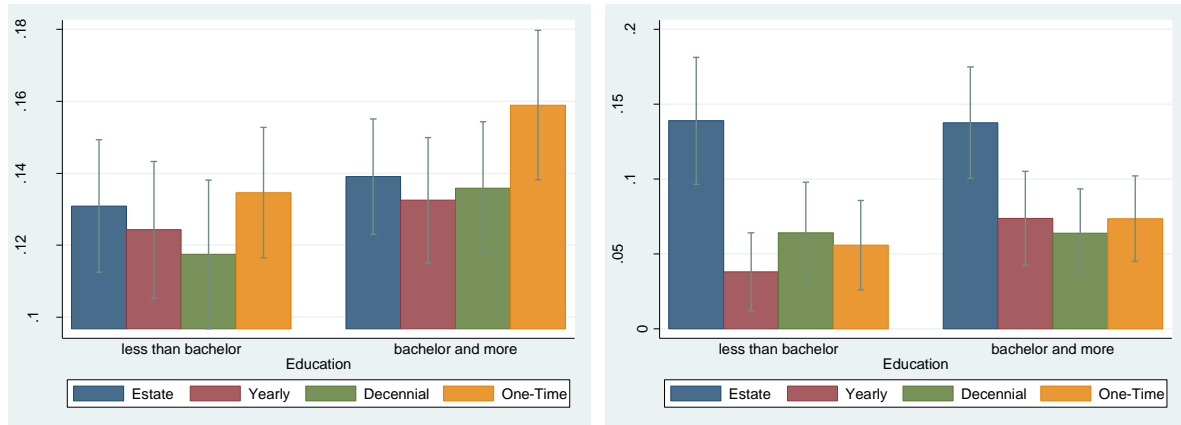
*Figure 15: Average effective tax rates (left) and share of rejecters (right) by **education** and **treatment group**; 95%-confidence intervals.*

	full set		behavioral control question correctly	
	<=10% affect.	>10% affect.	<=10% affect.	>10% affect.
	coeff./t	coeff./t	coeff./t	coeff./t
Base: one-time wealth				
estate	-0.022	-0.008	-0.011	-0.008
	(-1.05)	(-0.82)	(-0.40)	(-0.59)
yearly wealth	-0.054**	-0.011	-0.050*	-0.010
	(-2.47)	(-1.11)	(-1.81)	(-0.72)
decennial wealth	-0.020	-0.022**	-0.030	-0.027*
	(-0.89)	(-2.21)	(-1.09)	(-1.95)
Observations	4,833	14,076	3,024	7,335

t statistics in parentheses; * p < 0.10, ** p < 0.05, *** p < 0.01

*Table 13: Between results (random effects model; full set of controls; dependent variable: effective tax rate); **by information**.*

	full set		behavioral control question correctly	
	age < 35y	age >= 35y	age < 35y	age >= 35y
Base: one-time wealth				
estate	0.009	-0.032**	0.019	-0.027
	(0.73)	(-2.51)	(1.06)	(-1.64)
yearly wealth	-0.011	-0.030**	0.002	-0.042**
	(-0.87)	(-2.20)	(0.13)	(-2.35)
decennial wealth	-0.017	-0.028**	-0.021	-0.029
	(-1.34)	(-1.98)	(-1.16)	(-1.62)
Observations	10,440	8,469	5,499	4,860

t statistics in parentheses; * p < 0.10, ** p < 0.05, *** p < 0.01

*Table 14: Between results (random effects model; full set of controls; dependent variable: effective tax rate); **by age**.*

	full set		behavioral control question correctly	
	no childr.	has childr.	no childr.	has childr.
base: one-time wealth				
estate	-0.003	-0.016	-0.006	-0.001
	(-0.27)	(-1.32)	(-0.38)	(-0.04)
yearly wealth	-0.025*	-0.012	-0.033*	0.004
	(-1.86)	(-0.90)	(-1.84)	(0.24)
decennial wealth	-0.024*	-0.020	-0.051***	0.009
	(-1.78)	(-1.56)	(-2.83)	(0.53)
Observations	10,386	8,523	5,922	4,437

t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

*Table 15: Between results (random effects model; full set of controls; dependent variable: effective tax rate); **by children**.*

	full set		behavioral control question correctly	
	no bachelor	bachelor	no bachelor	bachelor
base: one-time wealth				
estate	-0.005	-0.015	-0.003	-0.005
	(-0.36)	(-1.24)	(-0.16)	(-0.29)
yearly wealth	-0.015	-0.024*	-0.013	-0.027
	(-1.14)	(-1.87)	(-0.70)	(-1.52)
decennial wealth	-0.023*	-0.021	-0.033*	-0.023
	(-1.68)	(-1.58)	(-1.72)	(-1.31)
Observations	8,136	10,773	4,491	5,868

t statistics in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

*Table 16: Between results (random effects model; full set of controls; dependent variable: effective tax rate); **by education**.*
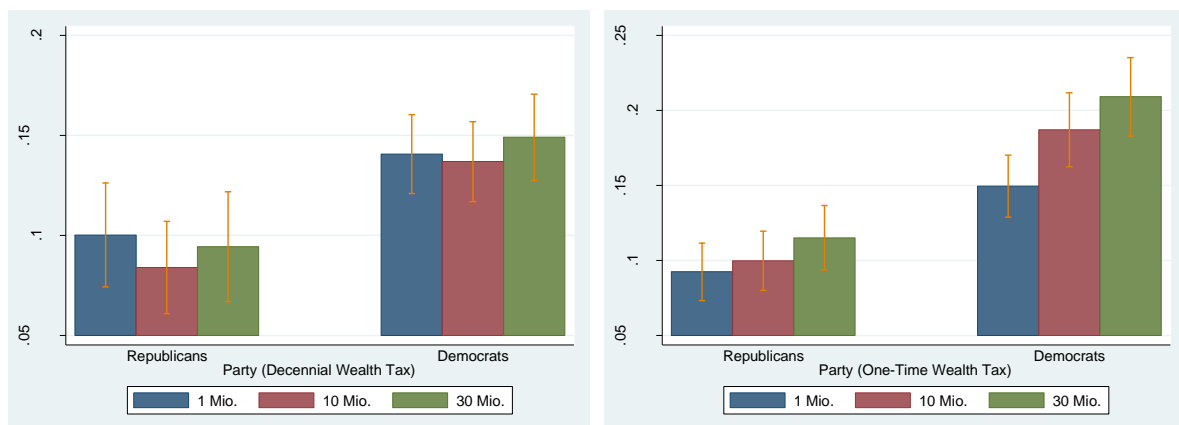
D Further vignette results

*Figure 16: Average effective tax rates in the decennial wealth tax group (left) and the one-time wealth tax group (right); by **partisanship of the respondent** and vignette dimension **'value of assets'**; 95%-confidence intervals.*
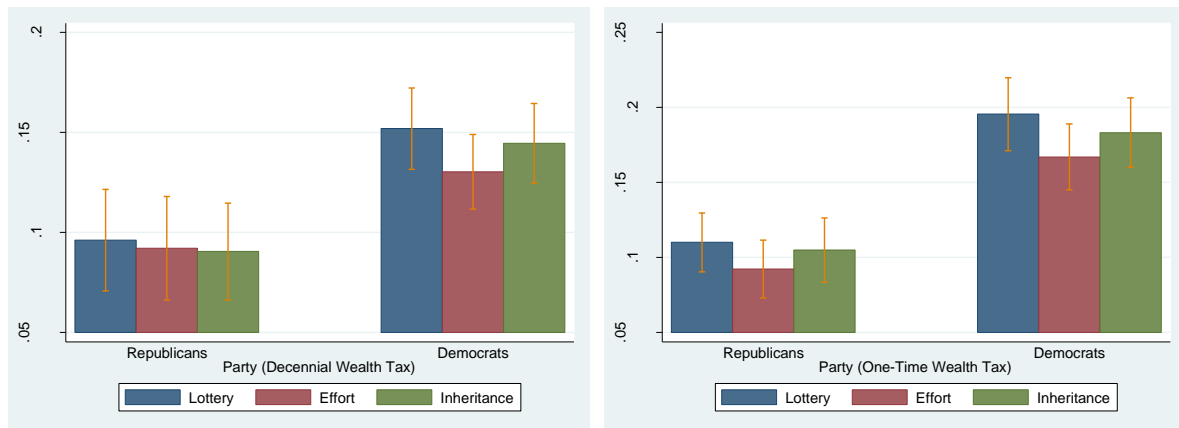
*Figure 17: Average effective tax rates in the decennial wealth tax group (left) and the one-time wealth tax group (right); by **partisanship of the respondent** and vignette dimension **'source of assets'**; 95%-confidence intervals.*
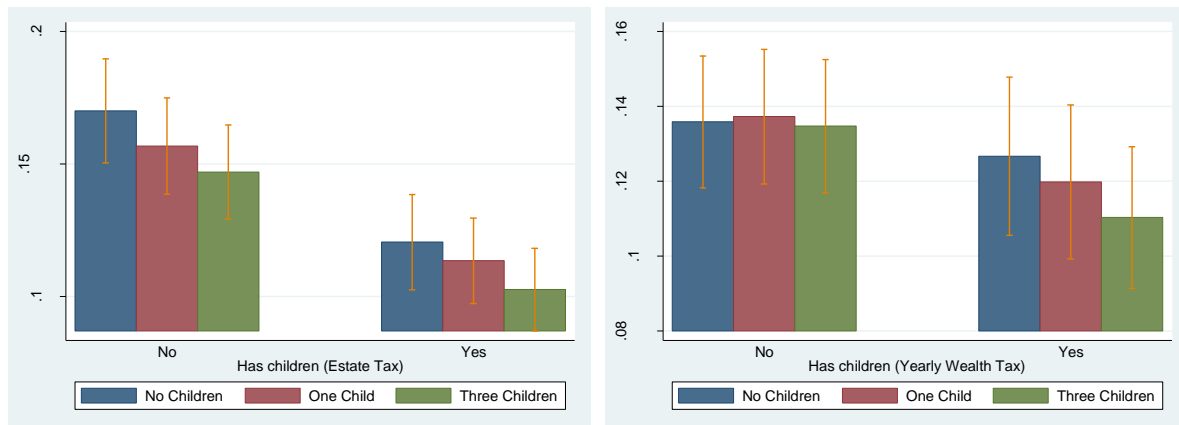

*Figure 18: Average effective tax rates in the estate tax group (left) and the yearly wealth tax group (right); by **children of the respondent** and vignette dimension **'number of children'**; 95%-confidence intervals.*
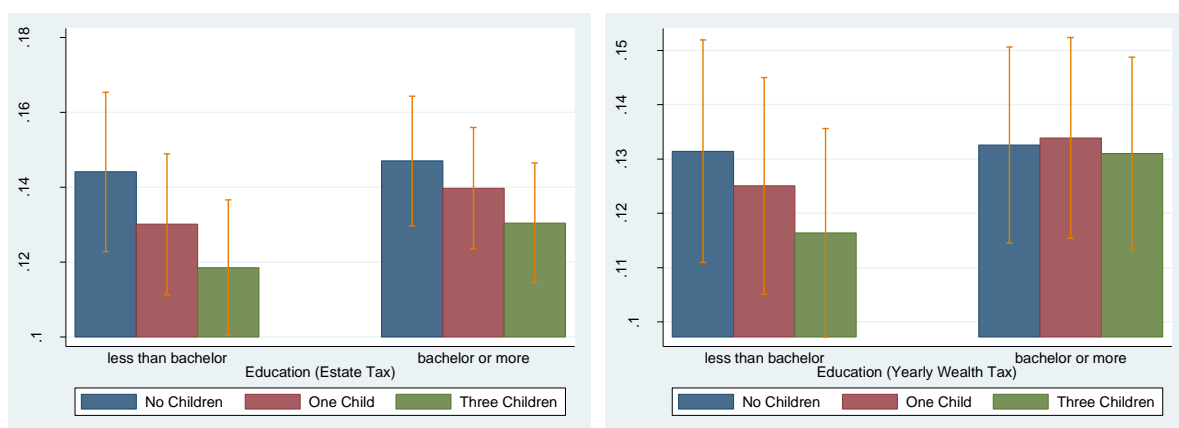

*Figure 19: Average effective tax rates in the estate tax group (left) and the yearly wealth tax group (right); by **education of the respondent** and vignette dimension **'number of children'**; 95%-confidence intervals.*

| | decennial wealth tax group | | one-time wealth tax group | |
	Republicans	Democrats	Republicans	Democrats
base: $1m				
$10m	-0.016***	-0.004	0.007	0.037***
	(-2.95)	(-0.77)	(1.36)	(7.95)
$35m	-0.006	0.008*	0.023***	0.060***
	(-1.07)	(1.70)	(4.25)	(12.62)
base: effort				
lottery/lucky	0.004	0.022***	0.018***	0.028***
	(0.75)	(4.40)	(3.33)	(6.04)
inheritance	-0.002	0.014***	0.013**	0.016***
	(-0.29)	(2.92)	(2.40)	(3.44)
base: cash				
real estate	-0.001	0.001	-0.008	0.003
	(-0.19)	(0.12)	(-1.50)	(0.62)
business shares	0.006	0.003	-0.001	0.003
	(1.08)	(0.59)	(-0.19)	(0.55)
base: no children				
one child	-0.005	-0.011**	-0.009*	-0.013***
	(-0.84)	(-2.26)	(-1.69)	(-2.81)
three children	-0.003	-0.008*	-0.018***	-0.017***
	(-0.53)	(-1.65)	(-3.35)	(-3.66)
Observations	1,098	2,196	1,440	2,709

t statistics in parentheses; * p < 0.10, ** p < 0.05, *** p < 0.01

Table 17: Vignette results (random effects model; full set of controls; dependent variable: effective tax rate); **by partisanship**.

	estate tax group	yearly wealth tax group	decennial wealth tax group	one-time wealth tax group
Base: $1m				
$10m	0.014*	0.003	-0.013	0.022***
	(1.65)	(0.26)	(-1.44)	(2.60)
$35m	0.034***	0.011	0.014	0.042***
	(4.11)	(1.07)	(1.61)	(4.95)
Base: effort				
lottery/lucky	0.015*	0.024**	0.013	0.025***
	(1.85)	(2.35)	(1.46)	(2.90)
inheritance	0.004	0.019*	-0.007	0.017**
	(0.44)	(1.90)	(-0.79)	(2.03)
Base: cash				
real estate	-0.003	0.035***	0.009	-0.009
	(-0.33)	(3.45)	(0.97)	(-1.10)
business shares	0.009	0.012	0.012	-0.007
	(1.09)	(1.18)	(1.36)	(-0.78)
Base: no children				
one child	-0.012	0.014	-0.011	-0.028***
	(-1.40)	(1.42)	(-1.27)	(-3.32)
three children	-0.011	0.005	0.004	-0.034***
	(-1.27)	(0.51)	(0.46)	(-4.02)

$10m X lottery/lucky	0.008	-0.005	0.003	0.004
	(1.03)	(-0.57)	(0.39)	(0.53)
$10m X inheritance	0.008	-0.008	0.024***	0.002
	(1.04)	(-0.86)	(2.93)	(0.27)
$35m X lottery/lucky	0.008	-0.004	-0.005	-0.007
	(0.97)	(-0.44)	(-0.60)	(-0.88)
$35m X inheritance	0.014*	-0.003	0.013	-0.005
	(1.82)	(-0.30)	(1.55)	(-0.69)
$10m X real estate	0.005	-0.027***	-0.005	-0.004
	(0.65)	(-2.86)	(-0.65)	(-0.48)
$10m X business shares	-0.000	-0.013	-0.004	0.001
	(-0.06)	(-1.43)	(-0.51)	(0.10)
$35m X real estate	0.001	-0.025***	-0.002	-0.002
	(0.16)	(-2.69)	(-0.23)	(-0.30)
$35m X business shares	-0.006	-0.012	-0.003	0.002
	(-0.71)	(-1.32)	(-0.34)	(0.24)
$10m X one child	-0.006	-0.008	0.006	0.003
	(-0.79)	(-0.85)	(0.77)	(0.39)
$10m X three children	0.000	-0.009	0.004	0.002
	(0.05)	(-1.00)	(0.51)	(0.28)
$35m X one child	-0.007	-0.011	-0.005	0.007
	(-0.96)	(-1.16)	(-0.60)	(0.94)
$35m X three children	-0.005	-0.002	-0.011	0.010
	(-0.63)	(-0.25)	(-1.31)	(1.22)
lottery/lucky X real estate	-0.006	-0.006	-0.004	-0.004
	(-0.78)	(-0.63)	(-0.45)	(-0.52)
lottery/lucky X bus. shares	-0.005	0.008	-0.009	-0.012
	(-0.67)	(0.87)	(-1.07)	(-1.52)
inheritance X real estate	0.010	0.003	0.007	0.004
	(1.23)	(0.37)	(0.90)	(0.48)
inheritance X bus. shares	-0.000	-0.003	0.008	-0.000
	(-0.05)	(-0.32)	(1.03)	(-0.03)
lottery/lucky X one child	0.006	-0.001	0.019**	0.013*
	(0.77)	(-0.10)	(2.34)	(1.70)
lottery/lucky X three child.	-0.009	-0.009	0.008	-0.001
	(-1.12)	(-0.93)	(0.94)	(-0.11)
inheritance X one child	0.002	0.000	0.005	-0.003
	(0.23)	(0.03)	(0.67)	(-0.41)
inheritance X three child.	-0.008	0.003	-0.007	-0.006
	(-0.97)	(0.32)	(-0.80)	(-0.73)
real estate X one child	0.013*	-0.016*	-0.010	0.012
	(1.74)	(-1.76)	(-1.17)	(1.52)
real estate X three children	-0.002	-0.009	-0.013	0.025***
	(-0.22)	(-1.00)	(-1.54)	(3.21)
bus. shares X one child	-0.003	-0.014	-0.006	0.019**
	(-0.37)	(-1.48)	(-0.74)	(2.37)
bus. shares X three child.	-0.007	-0.011	-0.015*	0.019**
	(-0.95)	(-1.16)	(-1.82)	(2.40)
Observations	5,337	4,329	4,221	5,022

t statistics in parentheses; * p < 0.10, ** p < 0.05, *** p < 0.01

Table 18: Vignette results (random effects model; full set of controls; dependent variable: effective tax rate); additional interaction effects; by treatment group.