Wealth Taxation and Charitable Giving*

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Abstract

We provide novel evidence on capital taxation and charitable giving on three fronts. First, we use quasi-experimental variation in the annual Norwegian wealth tax to study how wealth taxation affects giving. Inconsistent with the notion that households give more to reduce future tax liabilities, we find that wealth taxation reduces the amount that households give. Second, we study bunching at an income-tax exemption threshold for giving, and find a modest own-price elasticity that is decreasing in income and in wealth. Third, we show that these nominally unrelated tax incentives interact: wealth taxation increases the own-price elasticity of giving.

Keywords: Charitable giving, wealth taxation, tax incentives
JEL codes: H24, H31, H41, D64

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1 Introduction

The use of tax incentives to promote charitable giving is ubiquitous. These incentives typically take the form of an income tax deduction that lowers the marginal price of giving (Saez 2004; Diamond 2006; List 2011). Such policies are in place in nearly all OECD countries (OECD, 2020) and have produced fertile grounds for a large empirical literature. The main focus of this literature has been to estimate the own-price elasticity of giving that is needed for determining the optimal tax incentives (Saez, 2004). The non-direct effects of other types of taxation, such as those on household savings, have been neglected. This is despite a surging interest in taming wealth inequality through policies such as more comprehensive capital taxation (Bastani and Waldenström 2020b; Scheuer and Slemrod 2021; Saez and Zucman 2019a). Importantly, these policies may also tame households' willingness to voluntarily redistribute their wealth through charitable giving. Yet, these cross effects have seen little empirical attention nor played a role in the growing optimal capital taxation literature (see, e.g., Straub and Werning 2020; Rotberg and Steinberg 2021; Broer et al. 2021; Guvenen et al. 2021; Gaillard and Wangner 2021; Boar and Knowles 2022).

This paucity of empirical evidence is problematic as there are clearly defined but theoretically ambiguous links between capital taxation and household giving behavior. Capital taxation in the form of a wealth, capital income, or capital gains tax reduces the after-tax return on savings that households can achieve. This renders current consumption as well as charitable giving relatively more attractive than saving for the future, which causes households to give more through an intertemporal substitution effect. Put differently, households may want to give more today in order to reduce how much they must pay in taxes during their lifetime. On the other hand, by reducing lifetime after-tax wealth, capital taxation may also reduce charitable giving through an income effect. Whether these linkages should be a first-order concern in optimal taxation is an open question.

Empirically studying the effect of capital taxation on giving is challenging due to (i) a scarcity of identifying variation in the after-tax return on savings that is both exogenous and plausibly uncorrelated with other determinants of charitable behavior; and (ii) limited data on household giving. In many settings, charitable giving is self-reported, which leaves it unclear whether one is observing changes to reporting or actual giving behavior (Tazhitdinova, 2018). We overcome these challenges by using rich Norwegian administrative data and exploiting quasi-experimental variation in the annual taxation of net wealth.

We present new evidence on taxation and charitable giving along three dimensions. First, we provide novel empirical evidence on how capital taxation affects charitable giving, obtaining identifying variation from changes to the wealth tax treatment of housing wealth. In the Norwegian wealth tax, housing wealth is a main component of the tax base. It enters at a discounted rate relative to its estimated market value, where the discount rate depends on whether the housing asset is considered the taxpayer's primary or secondary residence. From 2013 to 2018, the discount rate on secondary housing was gradually removed, while the discount rate on primary housing remained constant. This implies that secondary-home owners saw their taxable wealth inflated relative to those who only owned primary homes. The nature of the reform allows us to control for overall estimated housing wealth while obtaining identification from pre-reform portfolio allocation into secondary versus primary housing wealth. We use this variation in a difference-in-differences (DiD) instrumental-variables (IV) framework.

We find a modest, negative, and statistically significant effect of wealth taxation on charitable giving. For each additional NOK of annual wealth taxes, charitable giving is reduced by NOK 0.012 (SE=0.003). Theoretically, this estimate is the combination of a negative income effect and a positive intertemporal substitution effect. This implies that the absolute value of our estimate is a lower bound for the implicit marginal propensity to give out of unearned income, which should not include substitution effects.

In order to shed more light on the relative contribution of income and substitution effects, we exploit the rich first-stage heterogeneity that progressive wealth taxation offers. Due to the progressive nature of the wealth tax, where only wealth above a certain threshold is taxed, the reform increased both (i) secondary homeowners' likelihood of paying a wealth tax and (ii) how much they paid in wealth taxes on average. This means that we have a setting in which (i) secondary-home owners who were initially closer to the threshold are more likely to be affected on the extensive margin. While the effect on their wealth-tax bill might be small, they are considerably more likely to pay a wealth tax now and in the future. This affects their marginal tax rate on wealth and should thus induce an intertemporal substitution effect. In contrast, (ii) households initially well above the wealth-tax threshold will primarily see an intensive-margin effect on their wealth tax exposure. This means that their current and future annual wealth tax bills increase, which produces an income effect. At the same time, there is no substitution effect as their marginal tax rate on wealth remains the same. This motivates an approach where we flexibly interact our instrument (ex-ante secondary housing wealth) with initial distance to the wealth tax threshold. Using an IV approach, we can then separately identify the effects of paying a wealth tax versus paying more in wealth taxes, which we then attribute to substitution and income effects, respectively.

We find that the negative effect on giving is, in accordance with theory, driven by households' paying more in wealth taxes on the intensive margin. Interestingly, we find no evidence of offsetting positive effects of paying a wealth tax on the extensive margin. Our point estimate is negative and close to zero (t-statistic=-1.5). In terms of the implied compensated semi-elasticity, this result implies that we can rule out that a 1 percentage point increase in the marginal tax rate on savings increases giving by more than 3.8%.[1] Given the empirical evidence of weak intertemporal

[1] This refers to the conventional 5% level of significance. A 1 percentage point reduction in the marginal after-tax rate-of-return is essentially the difference between paying and not paying a wealth tax.

substitution effects, 0.012 may be interpreted as an estimate, rather than a lower bound, for the marginal propensity to give out of unearned income.

Second, we use a bunching framework to estimate the elasticity of charitable giving with respect to its after-tax price. In the Norwegian tax code, charitable giving is deductible from the income tax base, up to a certain limit. This creates a setting in which the marginal (after-tax) price of giving increases from 0.72 to 1 at the exemption limit for all taxpayers, regardless of their income levels. This setting allows us to make novel use of established bunching estimators to infer the after-tax own-price elasticity of giving. We find that the average elasticity is about -0.37. By using regression-based techniques to uncover bunching heterogeneity, we find that the magnitude of the elasticity is decreasing in income, wealth, and age.

Third, we study whether there is an interaction between these two nominally unrelated tax incentives: the wealth tax and the income-tax deductibility of giving. We do this by combining our two empirical approaches, the DiD-IV framework and the bunching methodology, which allows us to estimate the causal effect of wealth taxation on the own-price elasticity of giving. This analysis addresses the theoretically ambiguous interaction between capital taxation and income-tax incentives that lower the price of giving. As with the effect of capital taxation on how much households chose to give, there are at least two opposing forces. (a) Taxpayers subject to the wealth tax may become less price elastic because any additional savings are less valuable when they are subject to the wealth tax. In our case, the income-tax reduction from charitable donations is less valuable, since each NOK saved from the tax deduction is now subject to the wealth tax. However, (b) wealth taxation also reduces lifetime after-tax wealth and disposable income. Thus, to the extent that the price sensitivity of giving is negatively related to income and wealth, this channel leads wealth taxation to increase the price sensitivity. We find that this income-like effect dominates: wealth taxation causes charitable giving to become substantially more price elastic: a 0.1 percentage point increase in the average wealth tax rate (wealth tax divided by wealth) increases the own-price elasticity by about 0.1.

Literature. Our paper contributes to a growing empirical literature on the effects of capital taxation (see, e.g., Lavecchia and Tazhitdinova 2021; Agersnap and Zidar 2021; Glogowsky 2021; Nekoei and Seim 2021; Martínez-Toledano 2020; Boissel and Matray 2021; Arefeva et al. 2021; Agrawal et al. 2020), and in particular, the literature on household responses to wealth taxation (Seim 2017; Zoutman 2018; Durán-Cabré et al. 2019; Londoño-Vélez and Ávila-Mahecha 2020a; Londoño-Vélez and Ávila-Mahecha 2020b; Jakobsen et al. 2020; Brülhart et al. 2021; Ring 2020; Berg and Hebous 2021). Our main contribution to this literature is to consider the effect on charitable giving. This contribution is important for three reasons. (i) Any effect on giving may amplify or muzzle the intended redistributional effects of wealth taxation. (ii) There is no direct evidence on how wealth taxation affects consumption, charitable giving included. (iii) In our setting, charitable giving is third-party reported and not nominally (dis)incentivized by the wealth tax scheme (as in e.g., Cage and Guillot 2021), which allow us to isolate real responses. The existing wealth tax literature primarily either focuses on evasion or considers combined evasion, avoidance, and real responses to wealth taxes. A central finding in the wealth tax literature is that reported wealth is very sensitive to taxation. Extrapolating from this, one might expect to find that a way in which households reduce their wealth tax burden is to increase their giving. Our findings do not support this notion.

We further add to the body of research on the role of tax incentives in charitable giving. This literature is particularly concerned with the own-price elasticity of giving (see, e.g., Feldstein 1975; Randolph 1995; Auten et al. 2002; Meer 2014; Meer and Priday 2020; Bakija and Heim 2011; Fack and Landais 2010; Duquette 2016; Almunia et al. 2020; Hungerman and Ottoni-Wilhelm 2021; and Cage and Guillot 2021). Our most direct contribution is to estimate the tax price elasticity using a methodology that is new to this literature in combination with third-party reported data on giving. Few papers in this literature exploit non-linear price schedules, as we do, likely because exemption caps are typically not fixed, but depend on taxable income, as in the U.S. federal tax code.[2] The fact that we employ third-party reported data on giving allows us to focus on actual giving rather than itemization responses to tax incentives (Meer and Priday, 2020). Consequently, our price elasticity of -0.37 is considerably smaller in magnitude than the elasticity of around -1 found in several of the analyses based on U.S. data.[3]

Our main addition to this literature is to consider the effects of capital taxation.[4] By documenting how capital taxation affects giving, we shed new light on the intertemporal aspects of charitable giving (see, e.g., Breman 2011; Andreoni and Serra-Garcia 2021; and Meier 2007). In particular, our finding of weak intertemporal substitution effects implies that households care not only about how much they give but also *when* they give it. This has implications for how one should model preferences for giving. Our paper also provides novel evidence on income effects. By studying the response to wealth taxation, we provide information on the marginal propensity to give out of unearned income. To our knowledge, few such quasi-experimental estimates exist (see Drouvelis et al. 2019 for an overview). We also document how capital taxation can affect the *own*-price elasticity of giving. This is related to the notion that behavioral elasticities are not immutable parameters, but can rather be influenced by various policy instruments at the tax authorities' disposal (Slemrod and Kopczuk, 2002). While, e.g., Fack and Landais (2016) document the effect of tax enforcement on the price elasticity of giving, there is no evidence on whether

[2]A notable exception is Hungerman and Ottoni-Wilhelm (2021) who exploit a state-specific \$400 exemption threshold in Indiana. However, they estimate a price elasticity based on donations to a single charitable organization (a university), rather than to the total universe of charities (as in the present study).

[3]It should be noted that the U.S. evidence does not unambiguously point to large estimates. While Bakija and Heim (2011) conclude that the price elasticity is close to -1, Randolph (1995) reports estimates ranging from -0.3 to -0.5. Our estimate is larger than the intensive margin elasticity of -0.2 found by Almunia et al. (2020), based on U.K. data but close to that found by Fack and Landais (2010), with data from France.

[4]Cage and Guillot (2021) exploit a wealth tax reform that has direct effects on the after-tax price of giving. More specifically, they use the removal of a charity wealth-tax deduction to study the price sensitivity of substitution between support to charities and political parties. Thus, the focus is on the relative price of charitable versus political giving, rather than the effects of a shock to the after-tax return on savings (as in our setting).

nominally unrelated tax parameters, such the tax rate on wealth, may alter this elasticity.

Relatedly, we also contribute to the rich literature that studies crowd-out effects in charitable giving (see, e.g., Deryugina and Marx 2021; Gruber and Hungerman 2007; Andreoni and Payne 2003; Okten and Weisbrod 2000; Meer 2017; Payne 1998; Nyborg and Rege 2003; and Boberg-Fazlić and Sharp 2017). This literature is particularly concerned with how government spending crowds out private giving. However, little attention is given to how the *financing* of government spending through taxation may play an additional role. Our paper addresses whether financing through capital taxation leads to additional crowd-out, driven by income effects, or to offsetting crowd-in, driven by intertemporal substitution effects.

We further add to the literature using regression-based bunching approaches to study heterogeneity in the responses to taxation (Bastani and Waldenström 2020a; Fagereng and Ring 2021). The approach in this literature is to use indicators for whether households bunch (and are thus sensitive to some tax kink) as a dependent variable in a regression framework. Bastani and Waldenström (2020a) consider responsiveness to income taxation, whereas Fagereng and Ring (2021) consider responses to a (de-facto) income tax in which there is a substantial time gap between when taxes are accrued and when they are to be paid. Here, we use this approach to explore heterogeneity in the responsiveness of charitable giving to the after-tax price.

The paper proceeds as follows. Section 2 introduces the data and describes the wealth tax scheme and the tax treatment of charitable donations of the personal income tax. Section 3 considers the effect of wealth taxation on charitable giving. In section 4, we use the bunching approach to obtain standard tax price elasticity estimates and show how this price elasticity is influenced by the taxation of wealth. Section 5 concludes.

2 Data and Institutional Setting

2.1 Data

We employ administrative register data on households' income and wealth over the period 2010–2018 (Statistics Norway, 2019). These data contain information on how much a given household pays in wealth taxes each year and the composition of taxable wealth. In particular, estimated housing wealth is one of the key contributors to households' taxable wealth. In assigning housing wealth, the tax authorities distinguish between primary (regular abode) and secondary housing wealth. Importantly for our approach, we observe this distinction in our data.

We combine these administrative data on income and wealth with third-party reported data on charitable giving, recently available from administrative registers for the 2012–2018 period. Since charitable giving is tax deductible in the personal income tax, the tax authorities keep records of how much taxpayers give to charitable organizations. In order to limit the scope for tax evasion and reduce the the administrative burden for the taxpayer, the tax authorities require these amounts to be reported directly by the recipient organizations. The tax authorities maintain a comprehensive list of qualified charitable and religious organizations, and all of these report yearly donated amounts at the individual level to the tax authorities. Importantly, data are not truncated at the personal income tax deduction threshold; full amounts are reported. This provides us with rather unique, as well as comprehensive, panel data of charitable giving at the household level. It follows that these data are not affected by issues related to self-reporting.

2.2 The Norwegian Wealth Tax

Norway has a long tradition of annually taxing net wealth using a progressive scheme. As of 2009, the wealth tax has taken a relatively simple form, where households pay wealth taxes according to the following formula:

$$wtax_{h,t} = \tau_t(TNW_{h,t} - T_t)\mathbb{1}[TNW_{h,t} > T_t], \tag{1}$$

which states that for household h, observed at the end of year t, any taxable net wealth (TNW) in excess of a threshold, T_t, is taxed at a rate of τ_t.[5] Tax rates and allowances (2011–2018) are presented in Panel A of Table 1. The basic allowance increased from NOK 750,000 (USD 80,000; EUR 70,000) in 2012 to NOK 1,480,000 (USD 157,000; EUR 138,000) in 2018.[6]

The tax revenue from wealth taxation is relatively modest. In 2020, it accounted for 1.2% of total tax revenue and 0.4% of GDP. However, this is not necessarily caused by enforcement issues, but is rather due to the policy choice of a modest nominal tax rate, as well as favorable treatment of some of the TNW components.[7] In particular, while financial wealth predominantly enters at third-party reported market values, taxable (estimated) housing wealth is set a discounted value, as indicated by

$$\text{Taxable Value of Housing Wealth} = (1 - d_t^{primary})MVHP_t + (1 - d_t^{secondary})MVHS_t, \tag{2}$$

where $d_t^{primary}$ and $d_t^{secondary}$ refer to the discount rates for the different types of housing assets. $MVHP$ is the estimated market value for primary housing.[8] This refers to the value of the habitual abode of households, the address at which households are registered to live in according to government registers. $MVHS$ refers to secondary homes, which are homes that, based on their construction code in real-estate registers, would qualify for permanent residency. However, they are categorized as secondary rather than primary housing only because of their registered current use: taxpayers may only own one unit of primary housing, but multiple units of secondary

[5] We account for the fact that married households are subject to two times the nominal threshold.

[6] We use exchange rates for 2020 to recalculate to U.S. dollars (USD) and euros (EUR).

[7] Enforcement issues appear limited to the very wealthiest households who may hide wealth abroad. See, e.g., Alstadsæter et al. (2019) and Alstadsæter et al. (2018) for more on this.

[8] From 2010 and onwards the tax administration has been operating a completely new valuation procedure for primary and secondary housing. The new procedure is based on hedonic regressions to predict the market value for each Norwegian house. See Ring (2020) for a detailed discussion of the methodology.

housing.

The evolution of the valuation discount rates, and how they changed for different types of housing, is our central source of identifying variation in wealth tax exposure. The valuation discount on primary housing, $d_t^{primary}$ has been been fixed at 75% over the whole period, while the discount on secondary housing, $d_t^{secondary}$, decreased from 60% in 2011 to 10% in 2018. This implies that even if we keep the total value of housing wealth, $MVH = MVHP + MVHS$, constant, households who hold more $MVHS$ will see a rapid increase in TNW over time. From equation (1), we see that this may cause both a higher annual wealth tax bill, as well as a higher propensity to face a lower marginal return on any marginal saving (working through τ_t).

The presence of a wealth tax threshold in equation (1), as represented by the indicator function, $\mathbb{1}[TNW_{h,t} > T_t]$, is a key ingredient in this institutional setting. If the tax were linear, changes in the discount rates on estimated housing wealth would not affect marginal rates-of-return on savings, and therefore intertemporal substitution effects would not be present.

2.3 Tax Treatment of Charitable Giving

Since 2003, donations to nonprofit charitable and religious organizations are tax deductible in the "ordinary income" tax base.[9] The list of exemption-approved organizations is comprehensive (Sivesind, 2015) and includes international organizations such as Amnesty International, the Red Cross, and Doctors Without Borders. The ordinary income tax base is taxed at a flat rate, which implies that the after-tax price of giving does not depend on an individual's taxable income. This differs from other countries, such as the U.S., where charitable giving is also deductible in the tax bases that are subject to progressive taxation. For the 2021 tax year, for example, the government refunded 22% of donations up to a limit of NOK 50,000 (USD 5,300; EUR 4,700).

More generally, a taxpayer, i, gets a tax refund of τ_t^g on any charitable giving, $g_{i,t}$, that does not exceed the exemption cap, K_t. This creates a jump in the marginal net-of-tax price of 1 NOK worth of giving from $1 - \tau_t^g$ to 1. The Norwegian tax treatment of charitable giving thus offers a tax-induced kink in the (after-tax) price, which allows the use of the bunching estimator (Saez 2010; Kleven 2016) to derive conventional tax-price elasticity estimates for charitable giving.

We summarize these tax rates and exemption caps in Panel A of Table 1. Over the period for which we have data, the after-tax price of giving has increased, but at the same time, the exemption caps have risen, allowing more giving to be deductible from the income tax. The tax rate, τ_t^g, has gone down from 28% in 2012 to 23% in 2018, the maximum deduction, K_t has moved from NOK 12,000 (USD 1,300; EUR 1,100) in 2012 to NOK 40,000 (USD 4,300; EUR 3,700) in

[9] Norway does not have a particularly strong philanthropic tradition (Sivesind 2015). Whereas giving measured as percentage of GDP is 1.4 in the U.S. and 0.54 in the U.K., it is only 0.11 in Norway, close to Switzerland (0.09), France (0.11), Japan (0.12), and Finland (0.13), according to OECD (2020). A standard explanation for limited private donations in the Norwegian case is that social democratic policies have not supported philanthropy because the Scandinavian type welfare state reduces the need for such support.

2018.[10]

Importantly, while the Norwegian income tax scheme directly incentivizes charitable giving through lowering its after-tax price, the wealth tax does not. This differs from wealth taxation in other settings. For example, in the U.S. estate tax, charitable donations are deductible from the estate tax base (Bakija et al., 2003), and in France, charitable giving was partially deductible from the base of the annual wealth tax (Cage and Guillot, 2021). Thus, in these settings, capital taxation *directly* affects giving incentives through altering its after-tax price.

2.4 Summary Statistics

In Panel B of Table 1, we present some main descriptive statistics of our data. Our sample consists of households with TNW between -1.5 and 3 million NOK (MNOK), and a strictly positive (estimated) market-value housing wealth (MVH) as of 2012. The table shows that 20% of the individuals in our sample paid a wealth tax in any given year, and conditional on paying the tax, they paid about NOK 14,000 (USD 1,490; EUR 1,300) on average. Approximately 15% of the households in our sample owned a secondary house. We further see that 24% of the households in our sample donated in any given year, and conditional on giving, they gave on average approximately NOK 4,600 (USD 500; EUR 430).

We make a few adjustments to mitigate the impact of outliers. We bound the amount of wealth taxes paid, $wtax_{h,t}$, to 10% of $TNW_{h,2012}$. This adjustment affects only a modest number of households (who saw a cumulative TNW increase of at least 1000%). In addition, to account for moderate level increases from a small initial TNW, we limit $wtax_{h,t}$ to 10% of 1 MNOK if $TNW_{h,2012}$ is below 1 MNOK. We also limit both individual and household-level annual giving to NOK 100,000 (USD 10,640; EUR 9,330). This affects very few households: conditional on giving a positive amount, the 99th percentile of household giving is NOK 50,000. Finally, gross income is shifted by an inflation-adjusted NOK 10,000 prior to taking the natural logarithm, in order to not ascribe too much significance to very small level differences.

3 The Effect of Wealth Taxation on Charitable Giving

Before turning to our empirical results, we briefly discuss the theoretical effects of wealth taxation on giving.

A straightforward way to produce hypotheses about the effect of wealth taxation on charitable giving is to consider charitable giving as a form of consumption. In that case, the theoretical effect is ambiguous due to offsetting income and substitution effects. The income effect lowers the amount of charitable giving, as more wealth taxation lowers lifetime after-tax wealth under

[10]The tax rate reductions follow from a reduction in the corporate tax. The rate was reduced from 28% in 2013 to 22% in 2019 and as the Norwegian dual income tax system maintains a link between the corporate tax and the tax on ordinary income in the personal income tax scheme, the tax price on charitable giving changed accordingly.

Table 1: Institutional Details and Summary statistics

Notes: Panel (A) provides details on wealth taxation during our sample period. Panel (B) provides summary statistics for the main analysis sample, at the individual level, which is restricted to households with TNW between -1.5 and 3 million NOK (MNOK) and a strictly positive market-value adjusted housing wealth (MVH). Charitable giving and age are measured at the individual level. Wealth taxes, income, and wealth variables are measured at the household level, but a married household will appear twice for the purposes of the summary statistics.

Panel A: Institutional Details

	2011	2012	2013	2014	2015	2016	2017	2018
Contribution to TNW, $(1 - d_t^{(\cdot)})$								
Primary, MVHP	25%	25%	25%	25%	25%	25%	25%	25%
Secondary, MVHS	40%	40%	50%	60%	70%	80%	90%	90%
Wealth tax rate, τ_t	1.1%	1.1%	1.1%	1.0%	0.85%	0.85%	0.85%	0.85%
Wealth tax threshold, T_t (MNOK)	0.7	0.75	0.87	1	1.2	1.4	1.48	1.48
Giving tax deduction rate, τ^g	28%	28%	28%	27%	27%	25%	24%	23%
Giving deduction cap, K_t (NOK 1,000)	12	12	12	16.9	20	25	30	40

Panel B: Summary Statistics, main sample, 2012–2018

	N	mean	p25	p50	p75
$1[\text{Giving}_{i,t} > 0]$	13,993,105	0.24			
$\text{Giving}_{i,t}$ if > 0	3,303,327	4,565	1,375	2,880	4,440
$1[wtax_{h,t} > 0]$	13,993,105	0.20			
$wtax_{h,t}$ if > 0	2,795,237	14,089	3,410	8,524	18,050
As of 2012:					
$\text{MVH}_{h,2012}$, MNOK	2,079,218	3.04	1.79	2.58	3.73
$\text{MVHS}_{h,2012}$ if >0, MNOK	309,450	1.88	0.89	1.54	2.42
$\text{Age}_{i,2012}$	2,079,218	53	41	53	65
$\log(\text{gross income}_{h,2012})$	2,079,218	13.37	12.98	13.42	13.79
Number of adults_h	2,079,218	1.65	1.00	2.00	2.00

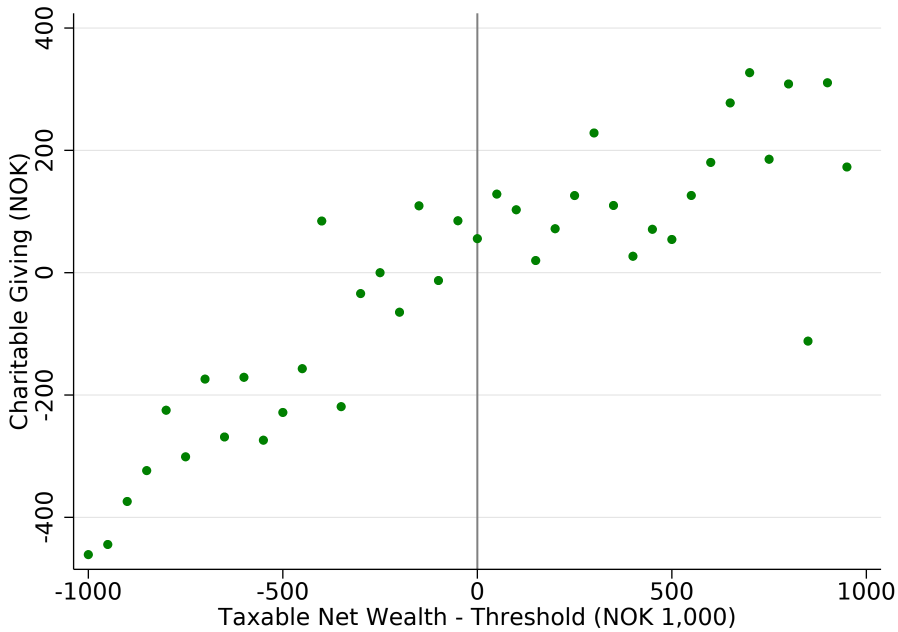
the assumption that a charitable transfer is a normal good. The substitution effect causes more giving by changing the relative price of consumption across periods. More specifically, future consumption becomes relatively more expensive, which incentivizes households to consume (and give) more today rather than in the future.

3.1 Descriptive Evidence on Charitable Giving Around the Wealth Tax Threshold

In this section, we provide descriptive evidence on the relationship between wealth taxation and charitable giving. Recall that taxes are only levied on households whose taxable net wealth (TNW) exceeds a given threshold, T_t (see Table 1). Therefore, our first-pass analysis examines variation in giving behavior around the threshold of the wealth tax.

Figure 1: Descriptive Evidence on Charitable Giving Around the Wealth Tax Threshold

This figure shows the relationship between charitable giving and households' position relative to the wealth tax threshold. Households with taxable net wealth above the threshold, pay a wealth tax on the excess amount. The scatter points are obtained by regressing the amount of charitable giving, at the individual level, on NOK 50,000 TNW bins, reordered such that 0 corresponds to the wealth tax threshold applicable to the household. This regression includes controls for age, log household gross income, as well as year fixed effects. Scatter points are normalized, such that the negative 250,000 TNW bin takes a value of zero.



Our initial (admittedly naive) hypothesis of the empirical relationship is based on a set of facts and theories: (i) Wealthier households tend to consume more charitable giving (Andreoni 2006; Meer and Priday 2021; Thoresen et al. 2021); (ii) Above the wealth tax threshold, the after-tax rate of return is lower, making it cheaper to give today rather than in the future. Thus, we expect to see a jump in giving behavior above the threshold, consistent with this intertemporal substitution effect; (iii) As we move further above the threshold, lifetime after-tax wealth is reduced by the existence of a wealth tax, while the marginal after-tax return is kept constant. Thus, we expect to see a change in the slope of the relationship between giving and taxable net wealth at the wealth tax threshold. Essentially, we expect to see a less positive or more negative relationship above the threshold.

We present graphical evidence by regressing the amount of giving in any given year, $g_{i,t}$, on NOK 50,000 TNW bins, with controls for age, log household gross income, as well as year fixed effects, see Figure 1. Our initial hypotheses find mixed support: we see a weak positive relationship between charitable donations and wealth taxation around the threshold, but do not observe any evidence of considerably lower charitable giving (i.e., anything resembling a discontinuity) right above the threshold. However, there is some visual indication of a change in the slope above the threshold, which is consistent with higher tax payments generating income effects that reduce giving.

3.2 Quasi-Experimental Evidence from Housing Assessments

The strong positive relationship between wealth, wealth taxation, and charitable giving presents serious challenges in estimating a causal relationship between wealth taxation and charitable giving. Our solution is to employ quasi-experimental variation in wealth tax exposure caused by changes in the wealth tax scheme. Specifically, we exploit the decrease in the assessment discount rate on secondary housing over the period 2013–2018 as a shock to wealth tax exposure, which is increasing in initial ownership of secondary housing.

3.2.1 Description of Quasi-Experiment

The empirical framework builds on the fact that households with the same estimated total housing wealth will see differential taxation from 2013 to 2018, depending on the share of taxable housing wealth due to secondary housing. This is achieved by using an instrumental variable approach, where we use the following system of two equations to identify the effect of wealth tax exposure, x, on some outcome, y.

$$\begin{aligned} x_{i,t} &= f_t(MVHS_{h,12}, TNW_{h,12})P_{t>2012} + \tilde{f}^{FS}(MVHS_{h,12}, TNW_{h,12}) \\ &+ g_t^{FS}(MVH_{h,12}, TNW_{h,12}) + \alpha_t^{FS} + \eta_t^{FS} C_{i,t} + \epsilon_{i,t}^{FS}, \end{aligned} \tag{3}$$

$$\begin{aligned} y_{i,t} &= \beta x_{i,t} + \tilde{f}^{RF}(MVHS_{h,12}, TNW_{h,12}) \\ &+ g_t^{RF}(MVH_{h,12}, TNW_{h,12}) + \alpha_t^{RF} + \eta_t^{RF} C_{i,t} + \epsilon_{i,t}^{RF}, \end{aligned} \tag{4}$$

where MVH is the total market value of primary ($MVHP$) and secondary housing ($MVHS$), g_t^{FS} and g_t^{RF} are estimated as time-varying polynomial functions, which take the same functional form as f, $\tilde{f}^{FS}$, and $\tilde{f}^{RF}$.[11] $C_{i,t}$ is a vector of individual and household-level controls, which includes third-order polynomials in $TNW_{h,2012}$ and age, as well as a second-order polynomial in family size. $C_{i,t}$ further includes a dummy variable for whether there are two adults in the household and controls for log household labor income in 2012. We also include a 2012-valued indicator variable for ownership in secondary or recreational housing.[12] α_t^{FS} and α_t^{RF} are year fixed effects, and $\epsilon_{i,t}^{FS}$ and $\epsilon_{i,t}^{RF}$ are the error terms.

The instrumental variation comes from $f_t(MVHS_{h,2012}, TNW_{h,2012})$, which provides iden-

[11] For each function, g_t^{FS}, g_t^{RF}, f_t, $\tilde{f}^{FS}$, and $\tilde{f}^{RF}$, we estimate three parameters, as indicated by equation (5).

[12] A third category of housing, recreational housing (as cabins and other recreational dwellings) is assessed at historical cost (often initial construction cost) as the applicable assessment scheme has not yet been revised. This indicator variable thus controls for whether the household owns more than one housing unit.

tifying variation for $t > 2012$, when the post-2012 indicator, $P_{t>2012}$, turns on. This exploits exogenous variation in wealth tax exposure driven by an increased contribution of $MVHS$ to the wealth-tax base over time, which allows us to estimate β, the coefficient of interest. The $\tilde{f}(\cdot)$ terms take out a baseline (2012) effect from the instrument. In other words, we employ a DiD-IV specification.

In order to estimate differential effects with respect to extensive and intensive margin wealth tax exposure, we allow the first-stage effect of $MVHS_{h,12}$ to vary by TNW in 2012. A reasonable assumption is that households with higher initial TNW (and who therefore are further away from the wealth tax threshold) see relatively larger intensive margin effects. To the extent that this holds, we will be able to separately identify the effects of intensive and extensive margin variation in wealth tax exposure.[13] We parameterize this as

$$f_t(MVHS, TNW) \equiv \eta_{1,t}MVHS + \eta_{2,t}MVHS \cdot (TNW - T_{12})/T_{12} + \eta_{3,t}MVHS \cdot [(TNW - T_{12})/T_{12}]^2, \tag{5}$$

where T_{12} refers to the wealth tax threshold in 2012.[14] η_1, η_2, and η_3 are separate parameters to be estimated for each t.

We aggregate giving to the household level. However, when estimating the price elasticity of giving, we keep the data at the individual level, since the tax treatment applies to the individual. Standard errors are clustered at the household level.

3.2.2 Results on Giving Behavior

Graphical, reduced-form evidence. We first provide reduced-form evidence in Figure 2 on how secondary-housing ownership affects wealth tax exposure and charitable giving over time.

In the reduced-form analyses underlying Figure 2, f_t is simplified to $f_t(MVHS) = \eta_{1,t}MVHS$. In other words, we restrict the effect of $MVHS_{h,2012}$ to be linear in both the first and second stage, but we allow the slope to vary by year. This lets us plot both first-stage and reduced-form effects against time (x-axis). We normalize such that $\eta_{1,2012} = 0$, to take out the fixed effect of $MVHS_{h,2012}$ on $y_{i,t}$.

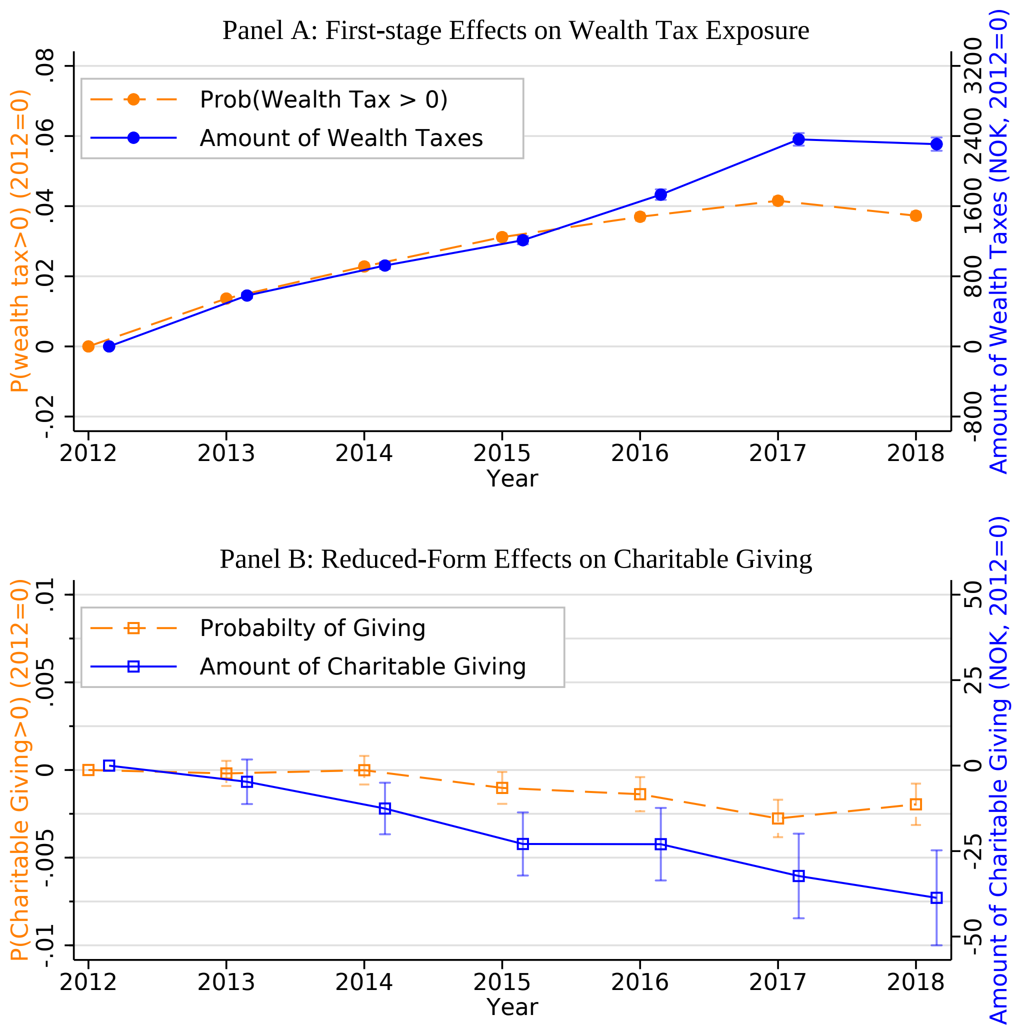
Panel (A) of Figure 2 shows that initial ownership of more secondary housing, $MVHS_{h,2012}$, provides a strong predictor for wealth tax exposure along both the extensive (dotted line) and the intensive margin (solid line). One additional million NOK (USD 106,000; EUR 93,000) in $MVHS_{2012}$ leads to an increase in the annual amount of wealth tax of about NOK 2,400 (USD 300; EUR 250) by 2018. We further see that this increases the probability of paying the wealth

[13] See Gruber and Saez (2002) for an implementation of this approach in the context of labor income taxation, and Ring (2020) in the context of saving responses to wealth taxation.

[14] While there is no household-level subscript on T_{12}, we account for the fact that married households face a double threshold by using 2012 marital status.

Figure 2: Wealth Taxation and Charitable Giving: Quasi-Experimental Evidence from the Tax Valuation of Secondary Housing

Notes: In Panel (A), we plot the effects of owning more secondary housing ($MVHS_{h,12}$), while controlling for total housing wealth ($MVH_{h,12}$), on wealth tax exposure along two dimensions: (i) the dashed orange line shows extensive-margin exposure and the (ii) solid blue line shows intensive-margin exposure in terms of the amount of wealth taxes accrued in a given year. The point estimates come from regressing the wealth tax exposure measures on the amount (in MNOK) of secondary housing owned, as of 2012. See text for description of additional control variables. In Panel (B), the dashed orange line describes the estimated effect on extensive-margin giving, i.e., whether or not charitable giving is strictly positive. The solid blue line provides the estimated effect on the (unconditional) amount of charitable giving. The point estimates come from estimating equations (3) and (4), simplifying $f(\cdot)$ to be a year-specific linear function of $MVHS_{h,2012}$ alone.



tax by almost 4 percentage points.

In terms of the reduced-form effects in Panel (B), we see that larger $MVHS$ is associated with households both being less likely to give and to give less, on average. Comparing the estimates in panels (A) and (B) for the year 2018, we find that for each NOK 1,000 increase in the annual wealth tax bill, households give about NOK 15 less.

IV results. In Table 2, we present results from the full DID-IV estimation strategy. Columns (1) and (2) describe the first-stage relationships between instruments and wealth tax exposure. Column (1) considers extensive margin exposure and shows that more secondary housing wealth has a smaller effect whenever the initial TNW is larger relative to the wealth tax threshold, T_{12}, and increasingly so due to the second-order interaction term also being negative. Column (2) finds the opposite relationship for intensive margin exposure. We find intuitively plausible first-stage results: households initially closer to the threshold are more likely to get pushed above (i.e., an extensive-margin effect), while households initially located far above the threshold, primarily see more of their wealth exposed to the tax (on the intensive margin). The large t-statistics on the interaction terms (and different signs across the two first columns) suggest that we have enough first-stage heterogeneity to separately identify extensive and intensive margin tax effects—if they are present.

Table 2: Wealth Taxation and Charitable Giving: IV Regressions

Notes: The table provides the key coefficients from estimating the system of equations in (3)-(4). Columns (1) and (2) present the first-stage effects on whether households pay a wealth tax and how much they pay. Column (3) provides reduced-form effects on charitable giving. Column (4) treats both $1[wtax > 0]$ and $wtax$ as endogenous variables, thus exploiting information in columns (1)-(3). Column (5) considers only $wtax$ as the endogenous variable, and thus uses information from columns (2) and (3). Similarly, column (6) uses information from columns (1) and (3). Standard errors are clustered at the household level. One, two, and three stars indicate statistical significance at the 10%, 5%, and 1% levels.

		(1)	(2)	(3)	(4)	(5)	(6)
		First-stage		Red.-form	IV	IV	IV
Dependent var	=	$1[wtax_{h,t} > 0]$	$\text{wtax}_{h,t}$	$G_{h,t}$	$G_{h,t}$	$G_{h,t}$	$G_{h,t}$
$1[\text{wtax}_{h,t}>0]$					-218.250		-439.417***
					(144.958)		(113.312)
$\text{wtax}_{h,t}$					-0.009**	-0.012***	
					(0.004)	(0.003)	
$\text{MVHS}_{i,2012}$		0.047***	1319.650***	-20.894***			
		(0.001)	(23.637)	(5.550)			
$\text{MVHS}_{i,2012}\times(TNW_{h,2012}-T_{12})/T_{12}$		-0.008***	515.994***	-1.132			
		(0.000)	(20.543)	(3.084)			
$\text{MVHS}_{i,2012}\times(TNW_{h,2012}-T_{12})/T_{12})^2$		-0.012***	51.983***	0.443			
		(0.000)	(15.277)	(2.424)			
rk-F-statistic					1267.82	1493.61	2546.77
N		9301446	9301446	9301446	9301446	9301446	9301446

Column (3) shows the reduced-form estimates. It reveals a statistically significant negative relationship between our instrument and charitable giving at the household-year level, $G_{h,t}$. However, the interaction terms with initial TNW are not significant, which suggests that the effect is fairly linear in $MVHS$. Since both the extensive (column 1) and intensive-margin (column 2) effects are increasing in $MVHS$, the observed heterogeneity leaves little room for signing the two effects differently.

Column (4) shows the resulting IV estimates. This reveals negative coefficients on both margins of exposure. The coefficient on the amount of wealth tax takes a theoretically reasonable negative sign, consistent with negative income effects. However, the coefficient on the extensive-margin variation is also negative. From a simplified theoretical perspective, we would expect to find a positively signed coefficient on $1[wtax > 0]$. This is because, all else equal, $1[wtax > 0]$ reduces the marginal rate of return on savings, which induces households to front-load consumption through an intertemporal substitution effect. In light of this, we interpret the point-estimate as being supportive of a positive extensive-margin effect that is close to zero rather than the effect actually being negative. The fact that our IV specification cannot ascribe statistically significant effects to intensive as well as extensive-margin variation in wealth taxation follows from the limited reduced-form heterogeneity: we obtain non-significant interaction terms with initial threshold distance in the reduced-form regressions–but not in the first-stage regressions.

We interpret the evidence in column (4) as consistent with the extensive-margin wealth-tax effect being very small rather than negative. Therefore, we use the regression statistics to provide a lower-bound compensated semi-elasticity. The implied 95% lower-bound (LB) on the compensated elasticity of giving with respect to the after-tax rate of return can be calculated in the following back-of-the-envelope manner:

$$\begin{array}{l}\text{95\% LB comp.} \\ \text{semi-elasticity}\end{array} = \frac{\text{95\% LB coeff/avg giving}}{\text{change in after-tax rate}} = \frac{(-218 + 1.96 * 145)/1,808}{-0.96\%} = -3.8.^{15} \qquad (6)$$

In words, this says that we can rule out that a 1 percentage point increase in the marginal after-tax rate reduces charitable giving by more than 3.8%. There is nothing to directly compare this lower bound with, but it rings fairly small relative to tax-base elasticities found elsewhere in the empirical wealth tax literature,[16] and may thus serve as a relevant reference point for future research on capital taxation and giving, in which the tax variation primarily affects the marginal (rather than the average) after-tax rate of return.

Considering the intensive margin (column 5) and the extensive margin variation (column 6) in wealth taxation separately makes it clear that more exposure to wealth taxation reduces the amount that households give. The resulting estimates provide useful quantities to summarize our findings. In column (5), we see that each additional NOK 1,000 paid in wealth taxes reduces giving by about NOK 12. This number is quite close to 15, which was the number implied by the simplified analysis in connection to Figure 2. In column (6), we see that households subject to wealth taxation give about NOK 265 (USD 38; EUR 25) less each year, compared to the non-taxed.

[15] Where -218+1.96*145 comes from the column (4) of Table 2; 1808=0.24*4,565*1.65, where 0.24 is the fraction who gives, 4,565 is the conditional amount of giving, and 1.65 is the number of adults per household, which we use since the summary statistics are at the individual level, and 0.96% is the mean nominal wealth tax rate over the period from 2013 to 2018.

[16] See the summary in Appendix Table A.1 in Brülhart et al. (2021) for an overview.

Since estimates appear to be driven by income effects, it is useful to compare our findings to studies that strictly consider income effects on giving. For this, we rely on Drouvelis et al. (2019) who provide a summary of existing estimates. This shows that existing non-experimental estimates on the marginal propensity to give (MPG) out of total income range from 0.024 to 0.093. These estimates are somewhat larger than our estimate of 0.012. Estimates from windfall gains may be more closely aligned with our quasi-random variation in wealth taxation, and these are considerably larger, ranging from 0.16 to 0.74 (Drouvelis et al. 2019). Our findings thus suggest that negative disposable-income shocks coming from taxation have much more modest effects than those found in other settings. In a lab-experiment setting, Drouvelis et al. (2019) estimate MPGs that are statistically indistinguishable from zero with respect to earned income, and quite large and highly significant MPGs for unearned income. The results of our study suggest that (quasi-) random variation in taxes affect giving behavior in a way more similar to earned rather than to unearned income.

Notably, our findings indicate that intertemporal substitution effects in giving are rather small. This is an interesting finding in accordance with recent evidence showing that the intertemporal substitution effect with respect to general consumption is low (Best et al. 2020; Ring 2020). For example, using a different quasi-experimental setting, Ring (2020) shows that income effects dominate substitution effects in household saving responses to wealth taxation. In order to offset the adverse effects of wealth taxes on life-time consumption, households save and work more. However, one may reasonably expect that giving behavior is more intertemporally elastic: while individuals need to consume certain goods and services on a daily basis, it is not ex-ante obvious that preferences dictate that giving must be smoothed out over time as well, which is what our findings suggest.

In Table A.1, we report quantitatively similar results when incorporating first-stage heterogeneity in a more flexible way: instead of allowing the impact of higher $MVHS_{h,12}$ to vary with a second-order polynomial in initial distance to the wealth-tax threshold, we bin households by their initial distance and estimate separate reduced-form and first-stage coefficients for each bin. This increases precision somewhat, but still uncovers an extensive-margin effect of wealth taxation that is essentially zero (t-stat=-1.12).

3.2.3 Discussion of Potential Confounding Factors

The fact that wealth-tax payers (by construction) are wealthier poses important challenges in obtaining causal effects of wealth taxation. The standard approach is to exploit wealth tax reforms that change marginal tax rates for households above the wealth tax threshold. This facilitates the removal of confounders that do not vary with time (i.e., fixed effects). However, identification relies on comparing households who differ in terms of their pre-reform (taxable) wealth (see, e.g., Jakobsen et al. 2020 and Brülhart et al. 2021). Our empirical approach is more focused in that we can *control* for pre-reform wealth and isolate variation coming from changes to the tax authorities' *assessment rules.* Hence, we are not subject to the standard concern that wealthier households may be changing their behavior for research unrelated to wealth taxation. The causal interpretation of our findings is only limited to the extent that households with larger $MVHS$ in 2012—keeping over-all wealth and housing wealth fixed—increased or decreased their giving during 2013–2018 for reasons unrelated to wealth taxation.

Since we address differential trends that may be driven by differences in initial overall taxable wealth, total housing wealth, income, age, and family size—any confounding factors would be limited to the convex allocation of housing into primary and secondary housing assets. We address this to some extent by including a control variable that captures whether a household owns either secondary housing or *recreational* housing. Recreational housing units (e.g., cabins) are often qualitatively similar to secondary housing but are treated in a particularly tax-favored way, due to a different valuation system, and does therefore not give much variation in wealth tax exposure.[17] Thus, this control dummy may largely take out differential trends arising from owning a second housing unit, while retaining considerable first-stage predictive power on wealth tax exposure. In our opinion, this likely removes potential confounding effects arising due to changes in the economies of scale in homeownership.[18] Unfortunately, the fundamentally different ways in which secondary and recreational housing are valued precludes the use of recreational-housing owners as a (exclusive) control group.

At the cost of losing considerable precision, we do show that our findings are qualitatively robust to implementing a triple differences-in-differences specification in Appendix Table A.2. Using households with lower initial TNW as a control group to take out a baseline effect of owning more secondary housing, we find almost unchanged point estimates. This addresses the general concern that households with more $MVHS$ reduced giving for non-wealth tax reasons.

Another potential challenge, given the identification strategy, may come from municipality-level property taxation. Keeping overall housing wealth (MVH) fixed, the common presence of per-house exemption thresholds for property taxation favors strictly convex allocation of housing wealth into primary *and* secondary housing. It is thus conceivable that we identify effects from households that are paying less in property taxes. Assuming that more property taxation lowers giving through an income effect, this would lead to an *upward* bias in our estimates (i.e., toward zero). Given our findings, this is not a material concern in terms of the qualitative conclusions. Furthermore, the DiD methodology will mitigate this channel to the extent that it was present in the base year, 2012. Moreover, it should be noted that effective tax rates are low in comparison

[17] Upon construction, houses are typically categorized as either housing (primary or secondary) or recreational housing by the Norwegian Tax Administration. While tax values for primary and secondary housing are estimated using a hedonic pricing model, recreational housing is assigned a value shortly after construction, which is inflated by using nationwide multiples up until 2010. After 2010, the assigned values have remained fixed, and are typically thought to severely understate the true market value. Older dwellings in areas with high cumulative house price growth since the date of construction are particularly likely to be undervalued.

[18] Keeping total housing wealth fixed, it may have become more or less lucrative to allocate this wealth into two or more distinct housing units.

to, for example, the U.S.[19]

Finally, it is worth noting why potential house price effects of the reform do not affect how we interpret the findings. Most importantly, price effects do not lead to additional income effects that can explain our findings. Any price effect simply decreases the attractiveness of households' undoing the treatment of the discount-rate change by liquidating their housing position. If they sell, some of the benefits (lower tax bill) is offset by a lower sales price. We find that it is useful to think of the income or wealth effects of the reform in terms of a decision tree. If households never liquidate their secondary-housing position, the income effect is driven only by higher wealth tax payments. If households do liquidate, the wealth-tax income effect ceases and the price effect materializes. Importantly, the two effects are not at play simultaneously. This means that price effects may make the income effects more persistent—but not larger than what is implied by having to pay higher wealth taxes. Secondly, price effects are likely limited. Recall that a given house is categorized as primary or secondary based on its current rather than potential use. If (current) primary and secondary homes are homogenous, there should not be any price effect. However, following the reductions in the valuation discount rates, ownership in secondary housing becomes less attractive for the subset of households who anticipate being above the wealth-tax threshold.[20] Thus, to the extent that secondary homes are more likely to be re-sold as secondary homes, due to their particular location or features, we would expect a negative house-price capitalization effect.

Data limitations prevent us from considering pre-trends in charitable giving behavior. However, we consider the association between our identifying variation and income trajectories in Figure A.1 in the Appendix. This reveals that households with more secondary housing wealth were not on different income trajectories. We can rule out that a 1 MNOK increase in $MVHS$ is associated with a 2010–2012 excess growth rate outside of $\pm$ one-tenth of a percentage point. Interestingly, however, the figure reveals a noticeable, positive effect on post-period income, consistent with the positive effect of wealth taxation on labor supply documented in Ring (2020).

4 The Own-Price Elasticity of Charitable Giving

Next, we turn the attention to how the wealth tax interacts with the conventional after-tax own-price elasticity of charitable giving. First, we derive unconditional tax price elasticity estimates and perform descriptive analyses to uncover heterogeneity with respect to income,

[19]In Norway, effective local property tax rates rarely exceed 0.5% and many municipalities do not collect property taxes. While *some* municipalities began using the tax authorities' assessment values for property taxation as of 2015 (they were either not allowed or strongly discouraged during 2010–2014, see discussion in Ring 2020), the change in discount rates would not affect the values provided to municipalities, as these are not discounted.

[20]42% of secondary-home owners paid a wealth tax as of 2018. Among these wealth-tax-paying secondary-home owners, if we consider secondary-housing wealth to be the marginal asset class subject to the wealth tax, approximately 66% of it was subject to the wealth tax. In other words, the presence of the wealth-tax threshold shielded about 72%=1-42%×66% of taxable secondary housing wealth from taxation.

wealth, age, and wealth taxation. Then we examine the causal effect of wealth taxation on the price elasticity of giving by employing our DiD-IV setup from section 3.2.

Recall that the tax treatment of charitable donations by the personal income tax is characterized by the tax price, defined as one minus the marginal tax rate, and the maximum deduction, as defined in Section 2. As donations to charitable organizations are deductible in the ordinary income tax base, the marginal tax price of charitable donations has changed, along with the ordinary-income tax rate, over the time period we have data for; from $1 - 0.28 = 0.72$ in 2012 to $1 - 0.23 = 0.77$ in 2018 (see Table 1).[21] To offset the effect of the increased price, the maximum deduction has been increased, from NOK 12,000 (USD 1,280; EUR 1,120) in 2012 to NOK 40,000 (USD 4,260; EUR 3,730) in 2018.

This creates a setting where the marginal after-tax price of giving jumps at a pre-specified threshold. This allows us to complement the existing literature on tax-price elasticities of giving by using a bunching estimator (Saez 2010) to identify a standard tax-price elasticity.

4.1 Bunching Methodology

The bunching methodology exploits the fact that the marginal after-tax price of giving jumps from $1 - \tau_t^g$ to 1 at the exemption cap, K_t and allows us to estimate the giving elasticity,

$$e = \frac{\Delta G^*/K^*}{\Delta \log(1 - \tau^g)}, \tag{7}$$

where ΔG^* is the reduction in earnings of the marginal buncher who is at an interior optimum at the exemption cap, K^* (i.e., the kink). The bunching mass is denoted B. By construction (see Saez 2010 and Kleven 2016 for graphical intuition), B equals $\int_{G^*}^{K^*+\Delta G^*} h_0(G)dG$, where $h_0(G)$ is the counter-factual (absent a kink) probability density function of giving. We apply the standard approximation

$$B = \int_{K^*}^{K^*+\Delta G^*} h_0(G)dG \approx -h_0(K^*)\Delta G^*. \tag{8}$$

Dividing through by K^*, we may write the (approximated) relative change in earnings of the marginal buncher as

$$\frac{\Delta G^*}{K^*} = \frac{-B}{h_0(K^*)K^*} \equiv \frac{-b}{K^*}. \tag{9}$$

This is equation represents one of the central insights in the bunching literature, namely that the marginal buncher's response to the kink is proportional to the excess mass at the kink.

We empirically estimate b, which we refer to as the bunching estimate, using the methodology

[21] Note that the last step, down to 22%, was taken in 2019.

in Chetty et al. (2011).[22] The empirical analog of K^* is the (average) exemption cap for giving denominated in the same units (NOK 100) as the empirical giving bins.[23] We write our estimated compensated labor earnings elasticity as

$$\hat{e} = \frac{-\hat{b}/\bar{K} \cdot 100}{-\log(1-\tau^g)}, \tag{10}$$

where we have used that $\Delta \log(1-\tau^g) = \log(1) - \log(1-\tau^g) = -\log(1-\tau^g)$. In our main approach, we pool observations across years. We use K_t to sort households into bins and calculate $\hat{b}$, but use the across-year averages for K_t and τ_t^g, which are denoted without t subscripts, to compute $\hat{e}$ according to equation (10).

4.2 Estimating the Unconditional Price Elasticity

Panel A of Figure 3 describes the observed bunching behavior according to a histogram. The y-axis measures the raw frequency of observed observations for a given NOK 100 giving bin, where giving is measured in excess of that year's prevailing deduction cap. The spikes of the diagram clearly illustrate that there are reasons to expect tax-motivated adjustments to the tax-favorization scheme. In Panel B, the frequency is adjusted for round-number bunching.[24] The dotted line (at the bottom of Panel B) shows the adjusted frequency, while the solid line describes the counterfactual density. The counterfactual density is calculated by estimating a 5th order polynomial on all observations outside the bunching region, $BR_t \equiv [K_t - 1000, K_t + 1000]$, measured in NOK.

The estimated $\hat{b}$ is 23.67. This number says that there are 2,367% excess givers at the kink. Inserting $\hat{b} = 23.67$, $\bar{K}/100 = 20.240$, and $\tau^g = 0.27$ into equation (10) then produces an elasticity estimate, $\hat{e}$, of -0.37.

Our price elasticity of -0.37 is considerably smaller than the elasticity of around -1 found in several analyses based on U.S. data. Finding a smaller elasticity in Norway than in the U.S. is reasonable as a U.S. price elasticity reflects both actual giving responses and itemization responses, where the latter reflects whether taxpayers choose to deduct charitable giving (Meer and Priday, 2020). The self-reporting aspect is also present in the U.K., where Almunia et al. (2020) document an intensive margin elasticity of only -0.2. However, in the U.K., the after-tax price is likely lowered by a combination of tax deductibility and governmental matching of private donations.

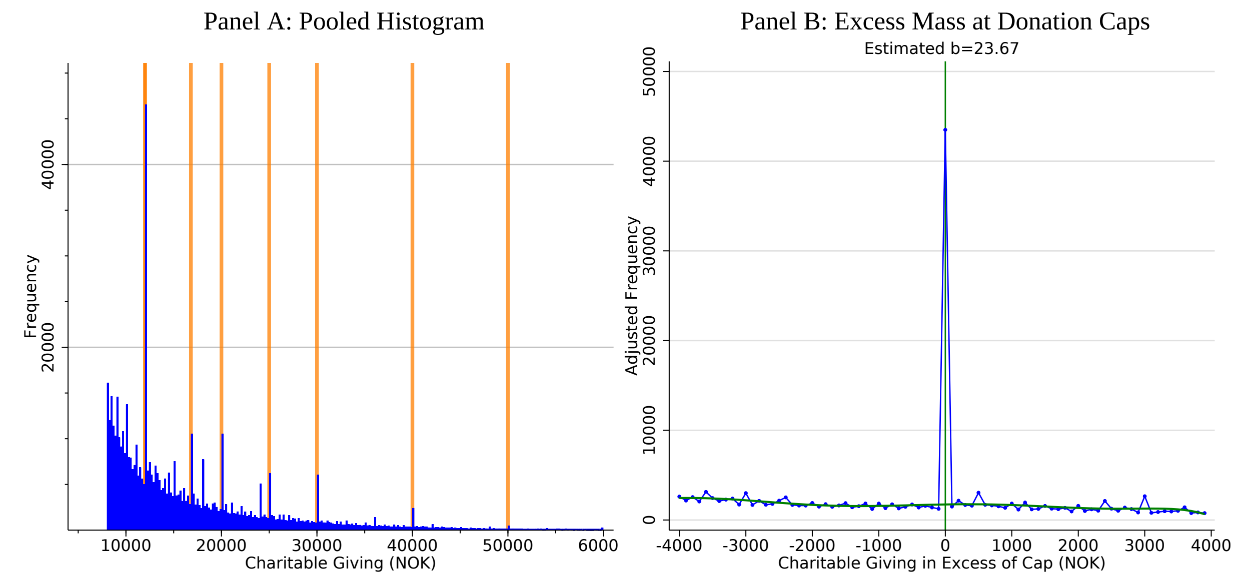
[22]See Seim (2017) for another study that combines the Saez (2010) and Chetty et al. (2011) methodologies.

[23]Thus $K^* = \bar{K}_t/100$. Alternatively, we could multiply $\hat{b}$ by the width of the earnings bins (NOK 100), and let K equal the threshold in NOK.

[24]This is done by first deducting the mean frequency, at the "giving-bin-year" level, in a leave-me-out fashion. For round-number bins, defined as multiples of NOK 1,000, this involves calculating the mean frequency across other years in which the deduction cap was different. Then to obtain a baseline frequency, absent round-number bunching, the mean frequency of two adjacent bins is added. If the resulting adjusted frequency is below the mean of the two adjacent bins, which occurs for a handful of bins, the value is set to the mean of the adjacent bins. Frequencies are then calculated at the bin level by aggregating across sample years. This adjustment procedure lowers the estimated bunching elasticity by 12%.

Figure 3: Sensitivity of Charitable Giving to Deductibility Cap

Notes: The vertical orange lines, from left to right, in Panel A, represent the deductibility caps for 2012–2013, 2014, 2015, 2016, 2017, and 2017, respectively. The average amount of charitable giving at the kink point in panel B is NOK 20,240, and the bin width is NOK 100. The implied price elasticity is -0.37. In Panel B, the frequency is adjusted for round-number (thousands) bunching.



Beyond the different research designs, the possibility that taxpayers value matching less than deductions may explain the different findings: for example, using an experimental design, Karlan and List (2007) find that intensive margin increases in match ratios have no effect on giving.

Compensated or uncompensated elasticity. Despite the large change in the relative price of giving at the threshold, intuition suggests that the income effect of the threshold has a limited impact on the elasticity estimates. To see this, consider the households counterfactually located far beyond the exemption cap in Panel B of Figure 3. Absent the exemption cap, these households would pay NOK 4,000 times 27% less in tax. This is about NOK 1,100 (USD 120; EUR 100). If we use the point estimate of Table 2, column (4), for intensive margin wealth tax variation, we obtain a point estimate of -0.009. Applying this to NOK 1,100, the predicted effect is around NOK 13 (USD 1.6; EUR 1.2). This implied income effect is thus much too small to have a meaningful effect on the implied elasticity. Although the interpretation of implied elasticity estimates as reflecting compensated effects is subject to notable caveats (Blomquist et al. 2021), we adopt the convention of considering our bunching estimate as a compensated elasticity.[25]

We also note that this is a *local* elasticity: it rationalizes observed giving behavior of individuals near the exemption cap. Without structural assumptions, it is not directly informative of the price elasticity of individuals who either barely give (and are thus far below the cap) or those

[25]See also Kleven (2016) for a discussion on the interpretation of bunching estimates as being informative of compensated versus uncompensated price elasticities.

who give well in excess of the cap.

4.3 Regression-based Methodology for Uncovering Bunching Heterogeneity

Before we in the next subsection discuss the relationship between wealth taxation and the tax-price elasticity estimates in a quasi-experimental setting, we provide descriptive evidence on how elasticity estimates vary with respect to income and wealth. To our knowledge, there is limited evidence on heterogeneity in the tax price elasticity of giving that is derived from third-party reported data. This allows us to test the intuitive notion that higher-income or higher-wealth individuals are less price elastic without having to address the concern that wealthier individuals are presumably more likely to itemize or remember to deduct their charitable giving expenses.

We begin by estimating a linear probability model to understand the effect of various characteristics, Z, on the probability to bunch, $\mathbb{P}[G_{i,t} \in BR_t]$. This is done by estimating the following regression equation,

$$\mathbb{1}[G_{i,t} \in BR_t] = \alpha_t + \delta \mathbf{Z}_{i,t} + p(G_{i,t}) + \varepsilon_{i,t}, \tag{11}$$

where α_t takes out year fixed effects and $\mathbf{Z}_{i,t}$ is a vector of characteristics of interest. $p(G_{i,t})$ is a third-order polynomial in the amount of charitable giving, which is essentially a control for bunching being correlated with the amount donated.[26] We run these regressions for observations where $G_{i,t} \in SR_t \equiv [K_t - 10\ 000, K_t + 10\ 000)$,[27] and report the results in Table 3.

4.3.1 Relating Bunching Heterogeneity to Price-Elasticity Heterogeneity

We now discuss how we relate the estimated coefficients for equation (11) to changes in the tax-price elasticity. The estimated relative excess mass of givers at the threshold, $\hat{b}$, can be rewritten as the relative excess probability of observing an individual at the threshold,

$$\hat{b} = \frac{\hat{P}^a[G_i \in BR] - \hat{P}^{cf}[G_i \in BR]}{\hat{P}^{cf}[G_i \in BR]}, \tag{12}$$

[26] Roughly, we may think that this correlation problem occurs when the threshold location differs from the mean amount of donations in the sample or estimation region. Since many characteristics correlate with G_i, we control flexibly for the amount of charitable giving, $G_{i,t}$, in order to minimize the risk of picking up spurious correlations with bunching behavior. Of course, we may not control too flexibly for $G_{i,t}$: for example, granular fixed-effect bins are in danger of completely absorbing the dependent variable, the bunching indicator. A third-order polynomial, on the other hand, seems to be a reasonable way to address correlations between G_i and Z_i without absorbing the correlation between Z_i and $\mathbb{1}[G_{i,t} \in BR_t]$.

[27] We consider a wider sample region than in Figure 3 in order to obtain a larger sample. A larger sample will be very useful once we introduce the IV methodology, in which more observations allow us to more precisely estimate the first-stage relationship between secondary housing wealth and wealth-tax exposure.

where $\hat{P}^a$ denotes the actual empirical probability of observing anyone in the bunching region, BR, and $\hat{P}^{cf}$ refers to the estimated counterfactual probability. We thus rewrite $\hat{e}$ as

$$\hat{e} = -\frac{\hat{P}^a[G_i \in BR] - \hat{P}^{cf}[G_i \in BR]}{\hat{P}^{cf}[G_i \in BR]} \frac{100}{\overline{K}} \frac{1}{-\log(1-\tau^g)}, \tag{13}$$

where $100/\overline{K} = 1/K^*$. Using this, we estimate the effect of a unit increase in some covariate, $Z_{i,t}$, on e as

$$\widehat{\frac{de}{dZ}} = -\hat{\delta} \frac{1}{\hat{P}^{cf}[G_i \in BR]} \frac{100}{\overline{K}} \frac{1}{\log(1-\tau^g)}. \tag{14}$$

We obtain the estimate for the scaling parameter $\hat{P}^{cf}[G_i \in BR]$ by solving equation (12), using the bunching-sample mean $\hat{P}^a[G_i \in BR] = 5.09\%$ and the estimated $\hat{b}$ from Figure 3. This implies that $\hat{P}^{cf}[G_i \in BR] = \frac{5.09\%}{23.67-1} = 0.2245\%$. We further use $\tau^g = 27\%$, and thus get

$$\widehat{\frac{de}{dZ}} = -\hat{\delta} \frac{1}{0.2245\%} \frac{100}{20\,240} \frac{1}{-\log(1-0.27)} \approx -\hat{\delta} \times 7. \tag{15}$$

4.3.2 Own-Price Elasticity Heterogeneity Results

Table 3 shows that the probability to bunch (a measure of price sensitivity) is decreasing in age, income, wealth (see column 4). An interesting observation is that the role of income is severely reduced (by three quarters) when we include wealth as an explanatory variable. This can be seen by comparing columns (2) and (4)

To illustrate the economic meaning of the regression estimates, consider column (4) of Table 3. A coefficient of -0.3258 for log household gross income implies the following: a 50% increase in household income is associated with a reduction in the magnitude of the price elasticity of giving of $\frac{0.3258}{100} \times 0.5 \times 7 = 0.011$. This negative effect is relatively small compared to the unconditional elasticity of -0.37, and not fully compatible with the intensive margin results reported in Bakija and Heim (2011) and Almunia et al. (2020), both pointing to *increasing* responsiveness with respect to income.[28] These differences may possibly be explained by differences in the reporting regimes. For example, Meer and Priday (2020) find that the main driver of their estimated price elasticity is households' beginning to report charitable giving on the extensive margin, i.e., starting to itemize. In our setting, individuals cannot choose whether their donations are reported to the tax authorities, thus the extent to which higher-income taxpayers are more diligent in claiming tax deductions from giving does not play a role.

[28] However, Almunia et al. (2020) find that both price and income elasticities fall with respect to income at the extensive margin (of charitable giving).

Table 3: Heterogeneity in the After-Tax Own-Price Elasticity

Notes: The dependent variable is a bunching indicator (multiplied by 100). The unconditional sample mean is 5.09 (%). Market-value net wealth is often negative, hence the log argument is shifted upward by an inflation-adjusted 1 MNOK. The implied effect on the tax-price elasticity can be obtained by multiplying the point estimates by the elasticity multiplier near the bottom of the table. To calculate the multipliers, the sample-specific estimates for b are used (see Figure 3).

	Bunching Probability (%)			
	(1)	(2)	(3)	(4)
$\text{Age}_{i,t}$	-0.0934***			-0.1027***
	(0.0024)			(0.0025)
$\log(\text{Gross Income}_{h,t})$		-0.4950***	0.9747***	-0.3258**
		(0.0646)	(0.1474)	(0.1457)
$\log(\text{Net Wealth}_{h,t})$			-3.1732***	-1.9526***
			(0.3349)	(0.3328)
$f(G_{i,t})$	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Unconditional Probability	5.09%			
$\hat{P}^{cf}[G_i \in BR]$	0.2245%			
Multiplier for Elasticity	7			
R^2	0.2438	0.2398	0.2399	0.2446
N	789820	789820	789820	789820

4.4 Quasi-Experimental Evidence on the Relationship between Wealth Taxation and the After-Tax Own-Price Elasticity

Next, as charitable giving is influenced both by tax deductibility and wealth taxation, we proceed by examining how these nominally unrelated tax incentives interact.

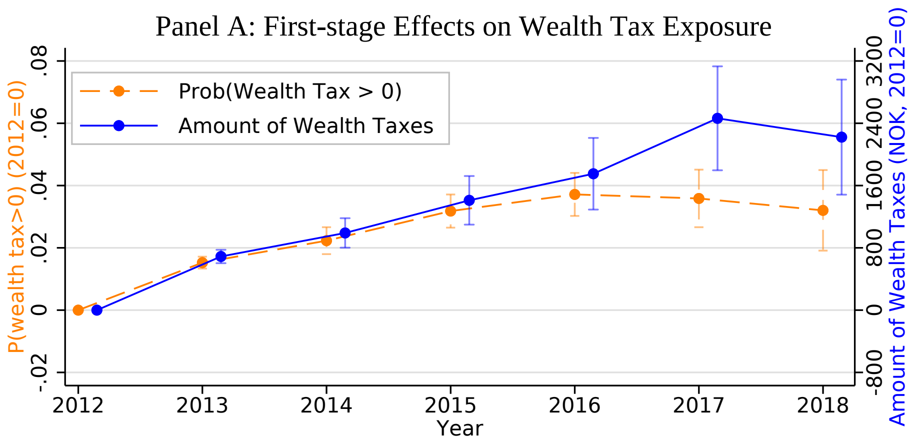
Conjectures. We may think of wealth taxation, or capital taxation in general, as affecting the price elasticity of giving through two channels. Firstly, wealth taxation reduces the marginal after-tax rate of return on savings. This essentially lowers the lifetime utility of additional tax savings caused by more charitable giving. Each additional dollar of tax refund is now worth less, since any portion of what is saved now enjoys a lower after-tax rate of return. Thus, this extensive margin effect will lower the price sensitivity of charitable giving.

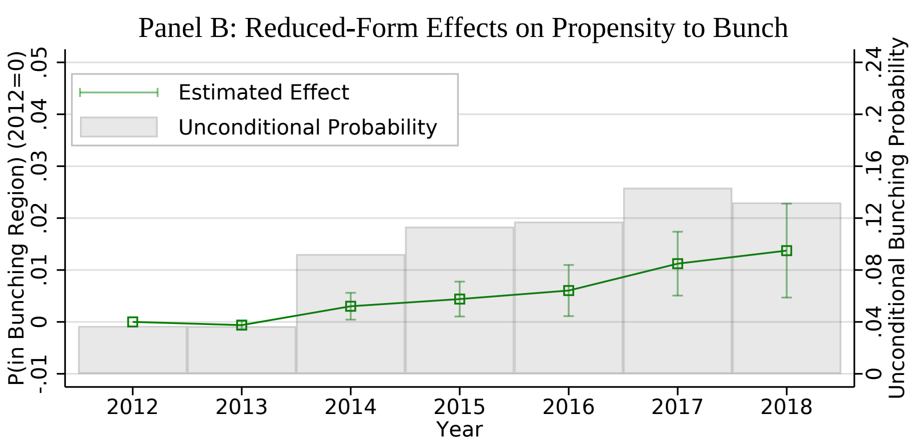
Secondly, a wealth tax also reduces lifetime wealth. The more of a household's wealth that is subject to the wealth tax, the more is the lifetime after-tax purchasing power reduced by the tax. Given that bunching is negatively correlated with income and wealth, see Table 3, we would expect this intensive margin wealth tax channel to contribute to higher price sensitivity. In sum, the extensive and intensive margin effects of wealth tax exposure likely work in opposite directions, and the net effect is ambiguous.

In order to further explore these effects empirically, we return to the quasi-experimental framework used to study the effects on overall charitable giving, replacing charitable giving with

Figure 4: Secondary-housing Assessment, Wealth Tax Exposure, and the Tax Price Elasticity of Charitable Giving

Notes: In Panel (A), we plot the effects of owning more secondary housing ($MVHS_{h,12}$), while controlling for total housing wealth ($MVH_{h,12}$) on wealth tax exposure along two dimensions: (i) the dashed orange line shows extensive-margin exposure and the (ii) solid blue line shows intensive-margin exposure in terms of the amount of wealth taxes accrued in a given year. The point estimates come from regressing the wealth tax exposure measures on the amount (in MNOK) of secondary housing owned, as of 2012. Controls include TNW as well as total estimated housing wealth. In Panel (B), the solid green line provides the reduced-form effect on the propensity to locate at or near the donation threshold. The gray bars indicate the unconditional probability of locating at or near the threshold for each year. By comparing the point estimates with the values of the gray bars, we may obtain the relative effects on the probability of bunching.





a measure of bunching. Note that in this part of our analysis, we use data only on households that give to charitable organizations.

First stage. In Figure 4, Panel (A), we provide year-by-year estimates of the first-stage effects. A 1 million NOK (USD 106,000; EUR 93,000) increase in the amount of secondary housing wealth ($MVHS_{h,2012}$), keeping total housing wealth fixed, causes a steady increase in yearly wealth tax that reaches approximately NOK 2,200 by 2018. By 2013, a 1 million NOK increase in $MVHS$ leads to an increase in the probability of paying a wealth tax by 3 percentage points. This effect rises to around 5.5 percentage points by 2018. These first-stage effects are estimated less precisely than those reported in Figure 2, since we are now only considering the subsample of taxpayers who are engaged in charitable giving.

Reduced form. In Panel B of Figure 4, we use the first-stage equation to estimate the reduced-form effects on the propensity to bunch near the exemption threshold. The connected line provides the reduced-form effects, whereas the shaded gray bars provide the unconditional bunching probabilities.[29] From these numbers, we see that a 1 million NOK (USD 106,000; EUR 93,000) increase in $MVHS_{h,2012}$ has little effect on the propensity to bunch until 2016–2018. By 2018, a 1 million NOK increase in $MVHS_{h,2012}$ leads to an increase in the bunching probability of approximately 1.25 percentage points.

IV Approach. The results from estimations of the system of equations (3)–(4) with respect to bunching are provided in Table 4. The outcome variable is now the bunching indicator, $\mathbb{1}[G_{i,t} \in BR_t]$. Columns (1)–(2) show the estimated first-stage coefficients. Columns (5) and (6) provide IV estimates when incorporating only one endogenous variable at a time. In column (5), we see that for each additional NOK 1,000 (USD 106; EUR 93) paid in wealth tax, households are 0.153 percentage points more likely to bunch, whereas column (6) shows that wealth-tax paying households are about 6.8 percentage points more likely to bunch at the deduction cap. When jointly estimating these effects in column (4), both coefficients enter positively, but neither are statistically different from zero.

Our empirical variation is thus not sufficient to empirically distinguish between effects at the extensive and intensive margin with respect to the effect of the wealth tax. As we discussed in section 3.2.2, this is not necessarily driven by a lack of first-stage heterogeneity, but rather by limited reduced-form heterogeneity, as we can glean from the non-significant interaction effects in column (3). Thus our estimates can still be used to create bounds on these effects that are reasonably precise and informative for future research.[30]

We now translate the IV estimates from columns (5) and (6) into effects on the magnitude of the price elasticity. Using the methodology introduced in section 4.3.1, we find that the estimated coefficients must be multiplied by 6.74.[31] Applying this to column (5), our estimate of 0.153 implies that an additional NOK 1,000 (USD 106; EUR 93) in wealth taxes causes an increase in the magnitude of the price elasticity of about 0.01. Similarly, the estimate in column (6) implies that households who are subject to the wealth tax have a price elasticity that is 0.46 (=

[29] The jump in the unconditional probability from 2013 to 2014 is driven by the sample selection procedure. Specifically, it is caused by 2012 and 2013 having the same threshold, which is lower than the 2014 threshold. The fixed bandwidth in terms of NOK thus implies that the 2014-sample includes considerably more households to the left of the threshold. Hence, there are more donors and non-bunchers in 2012-2013, which lowers the unconditional probability, relative to 2014 and subsequent years.

[30] Since empirically distinguishing between extensive and intensive-margin effects of wealth taxes on giving is novel to this paper, we cannot compare the precision of our estimates to other studies.

[31] The difference now is that $\hat{P}^a[G_{i,t} \in BR_t] = 5.2837\%$, which implies that $\hat{P}^{cf}[G_{i,t} \in BR_t] = 0.2330\%$. Thus the multiplicative factor becomes 6.74=(1/0.002330)*(100/20240)*(1/ln(1-0.27)).

TABLE 4: WEALTH TAXATION AND THE PRICE ELASTICITY OF GIVING: INSTRUMENTAL VARIABLES APPROACH

Notes: This table provides the key coefficients from estimating the system of equations in (3)-(4). Columns (1) and (2) consider the first-stage effects on whether households pay a wealth tax (*wtax*) and how much they pay. Column (3) provides reduced-form effects on the propensity to bunch at the deduction cap; to improve formatting, this indicator is multiplied by 100. Column (4) treats both $1[wtax > 0]$ and *wtax* as endogenous variables, thus exploiting information in columns (1)-(3). Column (5) considers only *wtax* as the endogenous variable, and thus uses information from columns (2) and (3). Similarly, column (6) only uses the first-stage estimate in column (1). Column (7) uses the average wealth tax rate (AWTR) as the endogenous variable: $wtax_{h,t}$ divided by market-value net wealth. Standard errors are clustered at the household level. One, two, and three stars indicate statistical significance at the 10%, 5%, and 1% levels. Point estimates may be multiplied by 6.74 to obtain the effect on the magnitude of the price elasticity.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	First-stage		Red.-form	IV	IV	IV	IV
Dependent var =	$1[wtax_{h,t} > 0]$	$\text{wtax}_{h,t}$	Indicator for Bunching at Deduction Cap ×100				
$1[\text{wtax}_{h,t}>0]$				5.091		6.793**	
				(3.844)		(3.019)	
$\text{wtax}_{h,t}$ (NOK 1,000)				0.064	0.153**		
				(0.085)	(0.068)		
AWTR (%)							15.571**
							(6.666)
$\text{MVHS}_{h,2012}$	0.031***	0.842***	0.216**				
	(0.002)	(0.064)	(0.096)				
$\text{MVHS}_{h,2012}$	-0.004***	0.362***	0.008				
$\times(TNW_{h,2012} - T_{12})/T_{12})$	(0.001)	(0.060)	(0.059)				
$\text{MVHS}_{h,2012}$	-0.007***	0.010	-0.040				
$\times(TNW_{h,2012} - T_{12})/T_{12})$	(0.001)	(0.046)	(0.046)				
rk F-stat				85.25	87.04	155.85	279.39
N	702315	702315	702315	702315	702315	702315	702315

6.793/100×6.74) higher. Larger responses in terms of the tax price elasticity of charitable giving is in accordance with concurrent descriptive findings by Thoresen et al. (2021), who derive results by employing a standard fixed effects panel data approach, reporting extensive and intensive margin effects for all and for households in wealth-tax position alone.

When simultaneously estimating the effects of extensive and intensive-margin variation in wealth tax exposure in column (4), we find no support for our hypothesis that changes in the marginal wealth tax rate lowers the price sensitivity. Hence, we interpret the positive but statistically insignificant point estimate as a zero, and consider column (5) to most accurately depict our findings: each additional NOK 1,000 of wealth taxes reduces the own-price elasticity of giving by 0.01. However, given the unit (i.e., currency) dependency of this empirical moment, in column (7) we scale $wtax_{h,t}$ by (estimated) market-value net wealth. This ratio equals the average wealth tax rate (AWTR). Thus we can use the estimate in column (7) to obtain the effect of changing the AWTR on the own-price elasticity of giving. The resulting estimate says that a 0.1 percentage point increase in AWTR increases the own-price elasticity by about 0.1.[32] This is a substantial

[32]We multiply the estimate of 15.571 by 6.74/100 and then 0.1. The price-elasticity to tax rate sensitivity is about

cross elasticity. It suggests that decreasing the progressivity of the wealth tax (i.e., equating marginal and average tax rates) can have large effects on price elasticities.

5 Summary

The public finance literature has devoted significant attention to why and how the personal income tax system can be used to encourage charitable giving (see, e.g., Saez 2004, Diamond 2006, and List 2011)). To what extent donation behavior could be influenced by capital taxation, in the form of a wealth, capital income or capital gains tax, has been largely neglected. New evidence thus seems prudent in light of the surging interest for using capital taxation, and wealth taxes in particular, as a policy instrument to address economic inequality, see for example Saez and Zucman (2019b).

To our knowledge, this paper is the first to present empirical evidence on how wealth taxation affects charitable giving. We first examine how the wealth tax affects charitable giving directly. Does the wealth tax crowd out donations in the sense that agents would have given their seized wealth to charity if not taxed? We find that it does, but to a very small extent. The fact that there is a negative impact on giving is consistent with income effects dominating the substitution effects in how (the consumption of) charitable giving responds to capital taxation.

Moreover, we also provide new evidence on the (standard) tax-price elasticity itself, using a bunching design that exploits a non-linear tax schedule along with third-party reported data on giving. Our findings reveal a modest elasticity. To explore heterogeneity in the price elasticity, we develop a regression-based methodology that essentially regresses a bunching indicator on observable characteristics and relates this variation to the implied price elasticity. This allows us to document price-elasticity heterogeneity across multiple dimensions. We find that the after-tax elasticity is decreasing in income and wealth, in line with economic intuition. Moreover, we examine the extent to which the wealth tax may affect this elasticity. Using our quasi-experimental variation in wealth-tax exposure, we find that wealth taxation increases the price sensitivity; consistent with the notion that price elasticities are decreasing in (after-tax) wealth.

In sum, this paper provides a rich set of new findings related to wealth taxation and charitable giving that may be useful in guiding more comprehensive optimal taxation models. We summarize our key findings in Table 5.

References

Agersnap, O. and Zidar, O. (2021). The tax elasticity of capital gains and revenue-maximizing rates. *American Economic Review: Insights*, 3(4):399–416.

105.

Table 5: Wealth Taxation and Charitable Giving: Summary of Main Findings

Notes: This table provides the main quasi-experimental results of the paper. See text for discussion and additional results.

			References
$\frac{d[Giving]}{d[Wealth\ tax]}$	-0.012	Propensity to give out of amount paid	Table 2, column (5)
Elasticity of giving w.r.t. marginal τ^{wealth}	≈ 0	Cross elasticity (semi-elasticity)	Table 2, column (4)
Elasticity of giving w.r.t marginal $1-\tau^{giving}$	-0.37	After-tax own-price elasticity	Figure 3, Panel B
$\frac{d[\text{Elasticity of giving w.r.t marginal } 1-\tau^{giving}]}{d[\text{Marginal } \tau^{wealth}]}$	≈ 0	(Second-order) cross elasticity	Table 4, column (4)
$\frac{d[\text{Elasticity of giving w.r.t marginal } 1-\tau^{giving}]}{d[\text{Average } \tau^{wealth}]}$	105	(Second-order) cross elasticity	Table 4, column (7)

Agrawal, D. R., Foremny, D., and Martinez-Toledano, C. (2020). Paraísos fiscales, wealth taxation, and mobility. EB Working Paper No 2020/15, Columbia Business School.

Almunia, M., Guceri, I., Lockwood, B., and Scharf, K. (2020). More giving or more givers? The effects of tax incentives on charitable donations in the UK. *Journal of Public Economics*, 183:104–114.

Alstadsæter, A., Johannesen, N., and Zucman, G. (2018). Tax evasion and tax avoidance. NBER Working Paper 23772, National Bureau of Economic Research.

Alstadsæter, A., Johannesen, N., and Zucman, G. (2019). Tax evasion and inequality. *American Economic Review*, 109(6):2073–2103.

Andreoni, J. (2006). Philanthropy. In Kolm, S.-C. and Ythier, J. M., editors, *Handbook of the Economics of Giving, Altruism and Reciprocity*, pages 1201–1269. Elsevier.

Andreoni, J. and Payne, A. A. (2003). Do government grants to private charities crowd out giving or fund-raising? *American Economic Review*, 93(3):792–812.

Andreoni, J. and Serra-Garcia, M. (2021). Time inconsistent charitable giving. *Journal of Public Economics*, 198.

Arefeva, A., Davis, M. A., Ghent, A. C., and Park, M. (2021). The effect of capital gains taxes on business creation and employment: The case of opportunity zones. *Available at SSRN 3645507*.

Auten, G. E., Sieg, H., and Clotfelter, C. T. (2002). Charitable giving, income, and taxes: An analysis of panel data. *American Economic Review*, 92(1):371–382.

Bakija, J. and Heim, B. T. (2011). How does charitable giving respond to incentives and income? New estimates from panel data. *National Tax Journal*, 64(2):615–650.

Bakija, J. M., Gale, W. G., and Slemrod, J. B. (2003). Charitable bequests and taxes on inheritances and estates: Aggregate evidence from across states and time. *American Economic Review*, 93(2):366–370.

Bastani, S. and Waldenström, D. (2020a). The ability gradient in bunching. CEPR Discussion Paper No. DP14599, Centre for Economic Policy Research.

Bastani, S. and Waldenström, D. (2020b). How should capital be taxed? *Journal of Economic Surveys*, 34(4):812–846.

Berg, K. and Hebous, S. (2021). Does a wealth tax improve equality of opportunity? CESifo Working Paper No. 9174, CESifo, Munich.

Best, M. C., Cloyne, J. S., Ilzetzki, E., and Kleven, H. J. (2020). Estimating the elasticity of intertemporal substitution using mortgage notches. *The Review of Economic Studies*, 87(2):656–690.

Blomquist, S., Newey, W. K., Kumar, A., and Liang, C.-Y. (2021). On bunching and identification of the taxable income elasticity. *Journal of Political Economy*, 129(8):2320–2343.

Boar, C. and Knowles, M. P. (2022). Optimal taxation of risky entrepreneurial capital. NBER Working Paper 29961, National Bureau of Economic Research.

Boberg-Fazlić, N. and Sharp, P. (2017). Does welfare spending crowd out charitable activity? Evidence from historical England under the poor laws. *The Economic Journal*, 127(599):50–83.

Boissel, C. and Matray, A. (2021). Dividend taxes and the allocation of capital. Working Paper, Princeton University.

Breman, A. (2011). Give more tomorrow: Two field experiments on altruism and intertemporal choice. *Journal of Public Economics*, 95(11-12):1349–1357.

Broer, T., Kohlhas, A., Mitman, K., and Schlafmann, K. (2021). Information and wealth heterogeneity in the macroeconomy. *CEPR Discussion Paper No. DP15934*.

Brülhart, M., Gruber, J., Krapf, M., and Schmidheiny, K. (2021). Taxing wealth: Evidence from Switzerland. *American Economic Journal: Economic Policy*, forthcoming.

Cage, J. and Guillot, M. (2021). Is charitable giving political? Evidence from wealth and income tax returns. *SSRN Working Paper*.

Chetty, R., Friedman, J. N., Olsen, T., and Pistaferri, L. (2011). Adjustment costs, firm responses, and micro vs. macro labor supply elasticities: Evidence from danish tax records. *The Quarterly Journal of Economics*, 126(2):749–804.

Deryugina, T. and Marx, B. M. (2021). Is the supply of charitable donations fixed? Evidence from deadly tornadoes. *American Economic Review: Insights*, 3(3):383–98.

Diamond, P. (2006). Optimal tax treatment of private contributions for public goods with and without warm glow preferences. *Journal of Public Economics*, 90(4-5):897–919.

Drouvelis, M., Isen, A., and Marx, B. (2019). The bonus-income donation norm. CESifo Working Paper No 7961, CESifo, Munich.

Duquette, N. J. (2016). Do tax incentives affect charitable contributions? Evidence from public charities' reported revenues. *Journal of Public Economics*, 137:51–69.

Durán-Cabré, J. M., Esteller-Moré, A., and Mas-Montserrat, M. (2019). Behavioural responses to the (re)introduction of wealth taxes: Evidence from Spain. IEB Working Paper 2019/04.

Fack, G. and Landais, C. (2010). Are tax incentives for charitable giving efficient? Evidence from France. *American Economic Journal: Economic Policy*, 2(2):117–41.

Fack, G. and Landais, C. (2016). The effect of tax enforcement on tax elasticities: Evidence from charitable contributions in France. *Journal of Public Economics*, 133:23–40.

Fagereng, A. and Ring, M. A. K. (2021). Financial frictions and the non-distortionary effects of delayed taxation. *Available at SSRN 3791384*.

Feldstein, M. (1975). The income tax and charitable contributions: Part I–Aggregate and distributional effects. *National Tax Journal*, 28(1):81–100.

Gaillard, A. and Wangner, P. (2021). Wealth, returns, and taxation: A tale of two dependencies. *Available at SSRN 3966130*.

Glogowsky, U. (2021). Behavioral responses to inheritance and gift taxation: Evidence from Germany. *Journal of Public Economics*, 193.

Gruber, J. and Hungerman, D. M. (2007). Faith-based charity and crowd-out during the great depression. *Journal of Public Economics*, 91(5-6):1043–1069.

Gruber, J. and Saez, E. (2002). The elasticity of taxable income: Evidence and implications. *Journal of Public Economics*, 84(1):1–32.

Guvenen, F., Kambourov, G., Kuruscu, B., and Ocampo, S. (2021). Taxing wealth and capital income with heterogeneous returns.

Hungerman, D. M. and Ottoni-Wilhelm, M. (2021). Impure impact giving: Theory and evidence. *Journal of Political Economy*, 129(5):1553–1614.

Jakobsen, K., Jakobsen, K., Kleven, H., and Zucman, G. (2020). Wealth taxation and wealth accumulation: Theory and evidence from Denmark. *The Quarterly Journal of Economics*, 135(1):329–388.

Karlan, D. and List, J. A. (2007). Does price matter in charitable giving? Evidence from a large-scale natural field experiment. *American Economic Review*, 97(5):1774–1793.

Kleven, H. J. (2016). Bunching. *Annual Review of Economics*, 8:435–464.

Lavecchia, A. M. and Tazhitdinova, A. (2021). Permanent and transitory responses to capital gains taxes: Evidence from a lifetime exemption in Canada. Working Paper 28514, National Bureau of Economic Research.

List, J. A. (2011). The market for charitable giving. *Journal of Economic Perspectives*, 25(2):157–80.

Londoño-Vélez, J. and Ávila-Mahecha, J. (2020a). Behavioral responses to wealth taxation: Evidence from Colombia. Working Paper, University of California, Los Angeles.

Londoño-Vélez, J. and Ávila-Mahecha, J. (2020b). Enforcing wealth taxes in the developing world: Quasi-experimental evidence from Colombia. *American Economic Review: Insights*, 3(2):157–165.

Martínez-Toledano, C. (2020). House price cycles, wealth inequality and portfolio reshuffling. WID. world Working Paper No 2020/02, World Inequality Lab.

Meer, J. (2014). Effects of the price of charitable giving: Evidence from an online crowdfunding platform. *Journal of Economic Behavior & Organization*, 103:113–124.

Meer, J. (2017). Does fundraising create new giving? *Journal of Public Economics*, 145:82–93.

Meer, J. and Priday, B. A. (2020). Tax prices and charitable giving: Projected changes in donations under the 2017 Tax Cuts and Jobs Act. *Tax Policy and the Economy*, 34(1):113–138.

Meer, J. and Priday, B. A. (2021). Generosity across the income and wealth distributions. *National Tax Journal*, 74(3):655–687.

Meier, S. (2007). Do subsidies increase charitable giving in the long run? Matching donations in a field experiment. *Journal of the European Economic Association*, 5(6):1203–1222.

Nekoei, A. and Seim, D. (2021). How do inheritances shape wealth inequality? Theory and evidence from Sweden. CESifo Working Paper No 9017, CESifo, Munich.

Nyborg, K. and Rege, M. (2003). Does public policy crowd out private contributions to public goods. *Public Choice*, 115(3):397–418.

OECD (2020). *Taxation and Philantropy.* Organisation for Economic Co-operation and Development, Paris, OECD Publishing.

Okten, C. and Weisbrod, B. A. (2000). Determinants of donations in private nonprofit markets. *Journal of Public Economics*, 75(2):255–272.

Payne, A. A. (1998). Does the government crowd-out private donations? New evidence from a sample of non-profit firms. *Journal of Public Economics*, 69(3):323–345.

Randolph, W. C. (1995). Dynamic income, progressive taxes, and the timing of charitable contributions. *Journal of Political Economy*, 103(4):709–738.

Ring, M. A. K. (2020). Wealth taxation and household saving: Evidence from assessment discontinuities in Norway. Working Paper, University of Texas, at Austin.

Rotberg, S. and Steinberg, J. B. (2021). Tax evasion and capital taxation. Department of Economics, University of Toronto.

Saez, E. (2004). The optimal treatment of tax expenditures. *Journal of Public Economics*, 88(12):2657–2684.

Saez, E. (2010). Do taxpayers bunch at kink points? *American Economic Journal: Economic Policy*, 2(3):180–212.

Saez, E. and Zucman, G. (2019a). Progressive wealth taxation. *Brookings Papers on Economic Activity*, Fall 2019:437–533.

Saez, E. and Zucman, G. (2019b). *The Triumph of Injustice: How the Rich Dodge Taxes and How to Make Them Pay.* WW Norton & Company.

Scheuer, F. and Slemrod, J. (2021). Taxing our wealth. *Journal of Economic Perspectives*, 35(1):207–30.

Seim, D. (2017). Behavioral responses to wealth taxes: Evidence from Sweden. *American Economic Journal: Economic Policy*, 9(4):395–421.

Sivesind, K. H. (2015). Giving in Norway: An ambitious welfare state with a self-reliant nonprofit sector. In *The Palgrave Handbook of Global Philanthropy*, pages 230–248. Palgrave Macmillan, London.

Slemrod, J. and Kopczuk, W. (2002). The optimal elasticity of taxable income. *Journal of Public Economics*, 84(1):91–112.

Statistics Norway (2019). *Income and Wealth Statistics for Households.* https://www.ssb.no/en/inntekt-og-forbruk/statistikker/ifhus.

Straub, L. and Werning, I. (2020). Positive long-run capital taxation: Chamley-Judd revisited. *American Economic Review*, 110(1):86–119.

Tazhitdinova, A. (2018). Reducing evasion through self-reporting: Evidence from charitable contributions. *Journal of Public Economics*, 165:31–47.

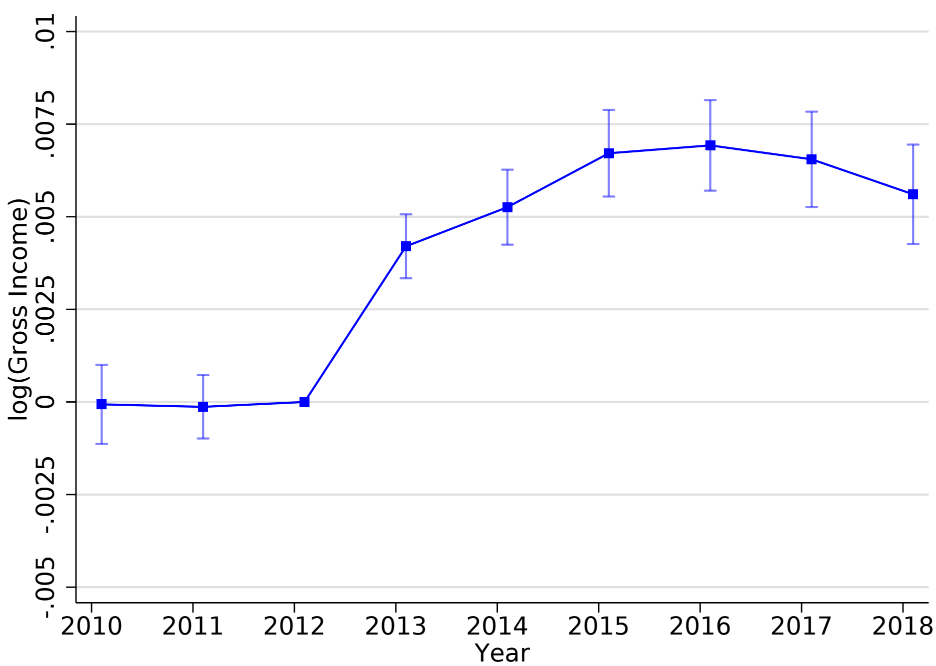
Thoresen, T. O., Ring, M. A. K., Epland, J., and Nygård, O. E. (2021). A wealth tax at work. Discussion Papers No. 960, Statistics Norway.

Zoutman, F. T. (2018). The elasticity of taxable wealth: Evidence from the Netherlands. Working Paper, Norwegian School of Economics.

A Appendix

FIGURE A.1: QUASI-EXPERIMENTAL VARIATION AND HOUSEHOLD INCOME TRAJECTORIES

Notes: This figure provides the reduced-form effect of secondary-housing ownership on households' log gross taxable income. The point estimates come from estimating equation (4), simplifying $f(\cdot)$ to be year-specific linear function of $MVHS_{h,2012}$ alone. The 2010 point estimate is -0.000064 (SE=0.005453) with a 95% confidence interval of [-0.001, 0.001].



A.1 More granular first-stage heterogeneity

Table A.1 provides IV coefficients from estimating the system of equations in (3)-(4), with the modification that the first-stage effects (on whether households pay a wealth tax and how much they pay) and reduced-form effects (on giving) of initial ownership in secondary housing may vary by *bins* of initial taxable wealth. This contrasts with the main specification where heterogeneity is limited to a second-order interaction with initial taxable wealth.

More specifically, the initial specification for from the definition in equation (5) is changed to

$$f(MVHS, TNW) = \sum_i \eta_{b_i} \mathbb{1}[b_i <= TNW - T_{12} \geq b_{i+1}] \cdot MVHS, \tag{16}$$

where $b_i = -0.5M, -0.4M, ..., 0.3M, 0.4M, 0.6M, 0.8M, 1.2M, 1.6M, 2M, \infty$, and the sample is limited to households with $TNW_{h,12} - T_{12} \geq b_1$.

A.2 Triple Differences in Differences Specification

Table A.2 provides the key coefficients from estimating the system of equations in (3)-(4), with the modification represented by equation 16). In addition, households with $TNW_{h,12} - T_{12} \in [-1, 0)$ MNOK are included in the sample, but only serve as controls. Essentially, they facilitate estimating a baseline effect of $MVHS$ on giving that we use to turn our differences-in-differences specification into a triple difference specification.

This Triple DiD specification addresses the concern that households with higher $MVHS_{h,12}$ may have been different giving trajectories unrelated to wealth taxation due to unobserved confounding factors, but relies on the assumption that lower-TNW households can be used to construct a valid counterfactual. For example, if each additional $MVHS_{h,12}$ confounds our estimate by a constant, then this procedure would purge this constant effect and only identify wealth tax effects based on interactions between $MVHS_{h,12}$ and $TNW_{h,12}$.

Reassuringly, Table A.2 provides nearly identical estimates as our main specification in Table 2. The only difference is that estimates are less precisely estimated due to the third layer of differencing.

Table A.1: Wealth Taxation and Charitable Giving: IV Regressions with additional first-stage heterogeneity

Notes: The table provides the key coefficients from estimating the system of equations in (3)-(4), with the modification that $f(MVHS, TNW) = \sum_i \eta_{b_i} \mathbb{1}[b_i <= TNW - T_{12} \geq b_{i+1}] \cdot MVHS$, where $b_i = -0.5M, -0.4M, ..., 0.3M, 0.4M, 0.6M, 0.8M, 1.2M, 1.6M, 2M, \infty$. Column (1) provides the IV estimates, and column (2) provides the reduced-form estimates, and columns (3) and (4) provide the first-stage coefficients. One, two, and three stars indicate statistical significance at the 10%, 5%, and 1% levels. See Table 2 for results according to the original equations (3)-(4).

		(1)	(2)	(3)	(4)
		IV	Red.-form	First-stage	
Dependent var	=	$G_{h,t}$	$G_{h,t}$	$1[wtax_{h,t} > 0]$	wtax$_{h,t}$
1[wtax$_{h,t}$ >0]		-36.582			
		(127.173)			
wtax$_{h,t}$		-0.011***			
		(0.003)			
1[b=-0.5M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$			-4.253	0.049***	863.038***
			(21.427)	(0.002)	(65.724)
1[b=-0.4M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$			-24.146	0.053***	961.709***
			(23.857)	(0.002)	(68.798)
1[b=-0.3M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$			-17.500	0.059***	982.777***
			(16.776)	(0.002)	(81.177)
1[b=-0.2M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$			-8.921	0.070***	1174.378***
			(17.960)	(0.003)	(90.016)
1[b=-0.1M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$			6.866	0.078***	1012.817***
			(17.988)	(0.003)	(79.606)
1[b= 0.0M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$			-14.938	0.091***	1310.843***
			(18.724)	(0.003)	(93.542)
1[b= 0.1M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$			-60.234***	0.068***	1312.355***
			(22.323)	(0.003)	(89.477)
1[b= 0.2M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$			-14.132	0.061***	1693.943***
			(21.579)	(0.003)	(99.473)
1[b= 0.3M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$			-7.639	0.045***	1359.533***
			(20.047)	(0.003)	(96.389)
1[b= 0.4M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$			-11.851	0.030***	1683.178***
			(16.796)	(0.002)	(79.322)
1[b= 0.6M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$			-20.475	0.017***	1869.702***
			(18.840)	(0.002)	(97.197)
1[b= 0.8M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$			-13.038	0.009***	2156.130***
			(13.255)	(0.002)	(88.151)
1[b= 1.2M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$			-43.582***	0.005***	2191.867***
			(16.724)	(0.002)	(113.685)
1[b= 1.6M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$			-25.364	0.006***	2388.677***
			(18.542)	(0.002)	(134.713)
1[b= 2.0M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$			-22.260	0.006***	2415.382***
			(14.435)	(0.001)	(120.488)
rkf		264.88			
r2		-0.0005			
N		4007561	4007561	4007561	4007561

Table A.2: Wealth Taxation and Charitable Giving, Robustness: Triple-Difference IV Regressions Using Additional First-stage Heterogeneity to Remove Baseline Effect of Owning More Secondary Housing

Notes: The table provides the key coefficients from estimating the system of equations in (3)-(4), with the modification that $f(MVHS, TNW) = \sum_i \eta_{b_i} \mathbb{1}[b_i <= TNW - T_{12} \geq b_{i+1}] \cdot MVHS$, where $b_i = -0.5M, -0.4M, ..., 0.3M, 0.4M, 0.6M, 0.8M, 1.2M, 1.6M, 2M, \infty$. Column (1) provides the IV estimates, and columns (2) provides the reduced-form estimates, and columns (3) and (4) provide the first-stage coefficients. One, two, and three stars indicate statistical significance at the 10%, 5%, and 1% levels. See Table 2 for results according the original equations (3)-(4). The difference relative to Table A.1 is that we now include households with $TNW_{12} - T_{12} \in [-1, 0)$ MNOK as control households that allow us to take out a baseline effect of having more $MVHS$ on *post 2012* giving.

	(1)	(2)	(3)	(4)
	IV	Red.-form	First-stage	
Dependent var =	$G_{h,t}$	$G_{h,t}$	$1[wtax_{h,t} > 0]$	wtax$_{h,t}$
1[wtax$_{h,t}$ >0]	-163.922			
	(304.116)			
wtax$_{h,t}$	-0.013			
	(0.013)			
Taking out baseline effect				
$MVHS_{h,12} \times \mathbb{1}_{t>2012}$	7.308	-12.680	0.052***	909.968***
	(31.470)	(8.333)	(0.001)	(26.039)
Instruments				
1[b= 0.0M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$		-3.483	0.040***	413.070***
		(20.101)	(0.003)	(94.711)
1[b= 0.1M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$		-48.947**	0.017***	416.196***
		(23.442)	(0.003)	(91.308)
1[b= 0.2M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$		-2.616	0.010***	794.694***
		(22.860)	(0.003)	(101.091)
1[b= 0.3M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$		4.009	-0.006*	465.889***
		(21.383)	(0.003)	(98.317)
1[b= 0.4M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$		-0.006	-0.022***	782.643***
		(18.438)	(0.002)	(81.904)
1[b= 0.6M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$		-8.652	-0.034***	972.505***
		(20.321)	(0.002)	(99.227)
1[b= 0.8M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$		-0.908	-0.042***	1252.715***
		(15.323)	(0.002)	(90.256)
1[b= 1.2M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$		-31.336*	-0.046***	1283.978***
		(18.566)	(0.002)	(115.474)
1[b= 1.6M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$		-13.061	-0.045***	1476.793***
		(20.109)	(0.002)	(136.224)
1[b= 2.0M]$\times MVHS_{h,12} \times \mathbb{1}_{t>2012}$		-9.457	-0.046***	1487.323***
		(16.536)	(0.001)	(122.644)
rk F-statistic	18.08			
N	5711191	5711191	5711191	5711191