Saving effects of a real-life imperfectly implemented wealth tax: Evidence from Norwegian micro data

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Despite their recent popularity in policy and academic circles, wealth taxes are currently used only in a few countries. This form of taxation is difficult to implement for two main reasons. First, it requires regular valuation of assets, often in absence of arms-length transactions or other means of easy assessment. Second, taxing assets rather than realized income raises liquidity concerns. In practice, policy makers may either push ahead, therefore leading to costly and difficult administration and discontent of taxpayers, or pursue practical compromises that make valuation and liquidity concerns easier to handle.[1]

We use Norwegian context to illustrate complexity of an actual implementation of a wealth tax and show that sensitivity of saving to taxation depends on this complexity.

I. Complexity of wealth tax implementation

Empirical evaluations of behavioral responses to wealth taxes naturally focus on the base of the tax as implemented in practice (Seim, 2017; Londoño-Vélez and Ávila-Mahecha, 2021; Jakobsen et al., 2020; Brülhart et al., 2022). However, each context corresponds to a different base that is never equivalent to taxpayers' net worth due to exemptions, valuation rules or differences in effective tax treatment of different assets: there is not a single "wealth tax".

Figure 1 illustrates this issue in the context of the Norwegian wealth tax. Prior to 2013 the top statutory rate was set at 1.1% and then reduced to 0.85% by 2015; a lower rate of 0.9% applied until 2008 and the threshold for being subject to the tax evolved substantially from NOK 151,000 net taxable wealth in 2005 to NOK 1,480,000 in 2018, the last year that our data covers. These changes barely start to describe the tax system though, because the *base* of the tax changed repeatedly during that period. Special rules applied to housing, listed and unlisted shares and business real estate.

Prior to 2010, valuation of housing was based on historical cost with annual adjustments; starting in 2010 it is assessed by the Statistics Norway based on market transactions in the same area. Real estate is included in taxable wealth with a discount — 75% for primary housing and a smaller discount for second houses that declined from 60% to 10% over time. Business real estate is assessed based on rental value and at a discount that evolved over time, mimicking treatment of second houses until 2016 and treatment of businesses since. Business shares were discounted before 2008 and since 2016, with additional changes over time, but there is also disparity between subclasses. While listed shares are taxed at market value, unlisted shares are included at book value, therefore leading to undervaluation (which is not reflected on Figure 1 because we do not observe the economic value). Finally, only since 2017 asset and associated debt are treated jointly for valuation purposes.

In what follows, we will exploit variation

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[1] See Saez and Zucman (2019) for a wealth tax proposal and Kopczuk (2019) and Scheuer and Slemrod (2021) for discussions of problems with this approach.

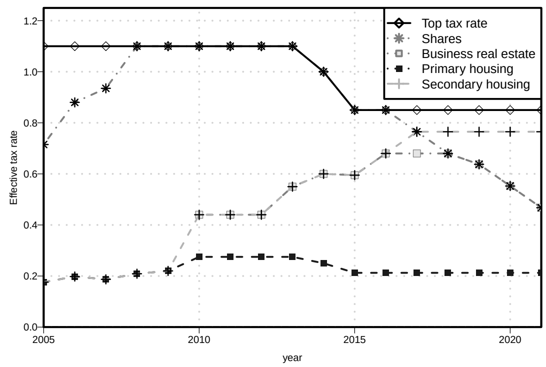

FIGURE 1. WEALTH TAX RATES

Note: Statutory tax rates taking into account asset-class specific discounts and, for housing prior to 2010, effective tax rate accounting for undervaluation due to reliance on historical assessments, as described in text.

generated by these rules to shed a light on behavioral responses to the wealth tax.

II. Data

We rely on detailed administrative tax data that contains information on assets subject to the wealth tax, demographic information, and covers the period from 2005 to 2018. In our estimation, we use the universe of all 40-75 old Norwegian residents with at least NOK 100,000 (in 2015 NOK, using National Insurance inflation adjustments) in gross wealth. We impute pre-2010 values of real estate based on observed change in the median tax value from 2009 to 2010 within each census tract and, for prior years, the annual rule-driven adjustments of tax values, assuming that market values follow housing price index. The largest data limitation involves valuing unlisted shares that we only observe at book value rather than their true economic value.

Figure 2 shows the underlying composition of assets as shares of net worth (assets minus debt, not accounting for discounts). Housing is by far the largest category. It increased in importance over time and its growth has been driven (when we can separate) by particularly tax-advantaged primary housing. Debt increased over time, in particular after 2007. Unlisted assets, despite undervaluation in our data, are a significant component, while listed assets are small and further shrunk over the years.[2]

III. Empirical strategy

Our empirical strategy builds on the basic taxable income elasticity framework (Saez, Slemrod and Giertz, 2012). For a given outcome y, we relate it to the net-of-tax rate $\ln(1-\tau)$ and virtual wealth z, where τ and z can be calculated based on actual behavior and the tax system in place.[3]

There are three challenges to an approach like this. First, we study wealth, a stock, rather than income, a flow. Second, tax rate and virtual wealth are obviously endogenous. Third, as we have just discussed, describing the tax system by the tax rate alone misses other aspects of the base and in particular base changes. We discuss how we tackle each of these issues in turn.

We study the impact on changes over two-year period, $(y_{t+2} - y_t)/y_t^B$ where y is variable of interest and y_t^B is a base year normalization variable (gross wealth). We present annualized results (divided by

[2]Our definition of wealth does not include pension wealth. Directly-owned private retirement assets are small in Norway (less than 0.5% of pension wealth).

[3]The virtual wealth is defined as $z = \max(0, \text{net taxable wealth})) \cdot \tau -$ actual tax liability, and interpretable as a wealth effect. Changes in the base have potentially large effect on average tax rate and are reflected in virtual wealth. In particular, separating between average and marginal tax rate has been shown to be important in the context of responses to the 2010 change in housing assessments (Ring, 2020).

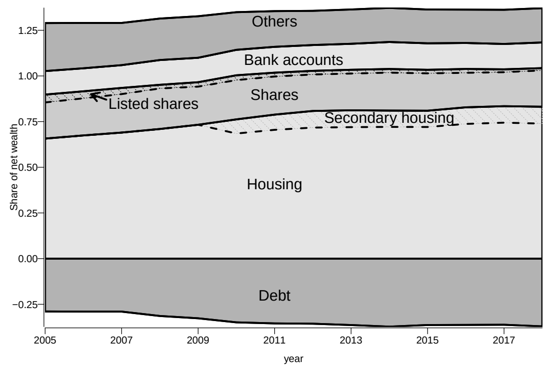

FIGURE 2. COMPOSITION OF NET WEALTH

Note: The figure shows decomposition of net wealth, with positive and negative parts (debt) adding up to 100%, for those aged 40-75 with gross wealth over NOK100,000 (the estimation sample, but without winsorizing or conditioning on reporting in year $t+2$). Separate information about secondary housing only available starting in 2010.

two) and use the same normalization for other NOK-denominated variables. This approach raises a question of how to think about heterogeneity of rates of return of assets in taxpayers' portfolio that gives rise to mechanical changes in the value of net worth. Such effects may be important. For example, findings of Brülhart et al. (2022) suggest that observed response of wealth tax base to local variation in wealth tax rates is partly due to market level changes in value of real estate. Heterogeneity in rates of returns leads to different changes in wealth of taxpayers with different portfolios, absent any action. To focus on *active* saving, our main strategy is to modify y_t to remove the mechanical effect (due to aggregate asset-specific rate of return) and include mechanical changes in portfolio components as controls; we show results for total saving as a robustness check."

In order to isolate the exogenous impact of reforms, we first, as in taxable income literature, calculate simulated tax system variables that use period $t+2$ tax system, but rely on information at time t. Still, information at time t is likely to be correlated with changes between t and $t+2$ for variety of reasons, including mean-reversion (a major concern in taxable income literature) or due to persistence of the stock variable.

To deal with this identification issue, we follow the approach from the work on social welfare programs (Røed, Jensen and Thoursie, 2008; Fevang, Hardoy and Røed, 2017). We compute and control for simulated wealth tax parameters that *would have applied* in period t under each of the tax regimes during the data period (2007-2018). This corresponds to 12 different sets of tax system variables (indexed by calendar years and hence distinct from tax parameters of interest that's indexed by current current t) that share association with the residual due to reliance on base year, but do not reflect t to $t+2$ tax change.

Finally, we deal with changes in the base by extending the approach of Kopczuk (2005) who studied sensitivity of income to tax rate and tax base. We account for tax rate τ and a measure of tax base $1-\gamma$, with the elasticity to the tax rate allowed to vary with γ. A simple implementation of this idea is to use the *actual* person-specific tax base — in our context, we define $1-\gamma$ as the ratio of taxable wealth to total wealth. This variable varies between zero and one and can be constructed both at a point in time and as a simulated value using tax system and information from another period. Thus, the approach applied to the tax rate easily extends to γ. Given specification

$$y = \varepsilon \cdot \ln(1-\tau) + \beta \cdot \gamma \ln(1-\tau) + ...$$

our interest is in parameters ε and β, with the tax system characterized by base of γ corresponding to the elasticity of $\varepsilon + \beta\gamma$. In particular, ε would be the elasticity under a comprehensive tax base while $\varepsilon + \beta$ would be the elasticity under a system that effectively has null base. Hence, a strong (out-of-sample and assuming linearity) testable prediction of this approach is that $\beta = -\varepsilon$.

IV. Results

Table 1 shows the effect on net assets. Controlling for the tax rate alone corresponds to the elasticity of about 2.[4] Controlling for virtual wealth strengthens the effect and adding the tax base changes the results quite a bit. First, the elasticity under comprehensive base is 7.4, much larger. This is not though the elasticity that characterizes the tax system — that parameter is $7.369 - \gamma \cdot 5.154$ reflecting the presence of a base effect. It can be evaluated for any particular year or situation by using the corresponding value of γ. When evaluated at the average value for individuals subject to the wealth tax in our data, $\gamma = 0.477$, it corresponds to the elasticity of 4.91.

While coefficients on $\ln(1-\tau)$ and $\gamma \ln(1-\tau)$ are not exactly equal in absolute values, they are of similar magnitude. The final column shows that focusing on total rather than active saving makes a minor difference.

Table 2 shows results for components of net worth. The effect is primarily driven by gross assets. Given close to null direct effect on debt, the total tax effect at realistic positive values of γ is negative, indicating that debt increases in response to higher tax rates when the tax base is not comprehensive. This is consistent with debt being used for tax avoidance. Housing is the main driver of the response, possibly due to local price effects, with coefficients mimicking the overall effect on gross or net assets. The effects on listed and unlisted assets are generally small, while the effect on deposits goes in the unexpected direction, but may be consistent with Ring (2020) who found small liquidity-motivated increases in saving using a different identification strategy.

The results imply a strong active saving response under a comprehensive system that becomes weaker under imperfect implementations. Note that we studied the effect on real active saving rather than on *taxable* wealth: a weaker response of saving to an easier to avoid tax is consistent with taxable wealth responding more strongly.

V. Conclusion

Actual wealth taxes are complex and cannot be characterized by tax rates alone. The Norwegian wealth tax, in particular, treats different asset classes differently and it varied this disparate treatment over time. We sketched a strategy to parsimoniously incorporate both base and rate effects to study behavioral impacts of the wealth tax.

[4]Noting that the tax of interest is on wealth rather than income helps in interpreting the magnitude. A 1% wealth tax is comparable to a 20% capital income tax when the rate of return is about 5%. Hence, a change in *capital income* tax rate by 1pp is of the same order of magnitude as a 20 times smaller change in the wealth tax and thus – if the economic impact were similar – wealth tax elasticity should be 20 times larger. Adjusting by a factor of 20 makes the elasticity of 2 comparable to elasticity of saving to capital income tax of 0.1.

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Table 1—Response of net assets

$\ln(1-\tau)$	1.991	3.928	7.369	6.609
	(0.032)	(0.061)	(0.180)	(0.173)
γ			-0.072	-0.030
			(0.003)	(0.003)
$\gamma\ln(1-\tau)$			-5.154	-5.261
			(0.201)	(0.197)
z		5.749	8.389	7.419
		(0.178)	(0.223)	(0.216)
N	14424284	14424284	14424284	14424284
R^2	0.071	0.072	0.104	0.074

Note: Data winsorized at 1% and 99%, by year. Standard errors in parenthesis, clustered at individual level. Regression estimated has the form of $y = \varepsilon\ln(1-\tau) + \beta\gamma\ln(1-\tau) + \delta z + \xi\gamma + \sum_{i=2007}^{2018}(\varepsilon_i \ln(1-\tau_i) + \beta_i\gamma_i\ln(1-\tau_i) + \delta_i z_i) + \pi d + \epsilon$ where d are demographic and other controls. Specifications 1-3 show active saving and control for mechanical rate-of-return changes in asset values; specification 4 shows effect on total saving as a robustness check.

Table 2—Components of net wealth

	Gross	Debt	Housing	Unlisted	Listed	Bank accounts
$\ln(1-\tau)$	7.730	0.361	8.726	-0.091	-0.601	-2.364
	(0.224)	(0.145)	(0.201)	(0.066)	(0.030)	(0.095)
γ	-0.059	0.013	-0.043	0.006	-0.007	0.002
	(0.004)	(0.003)	(0.004)	(0.001)	(0.000)	(0.001)
$\gamma\ln(1-\tau)$	-6.904	-1.750	-8.216	0.044	0.677	2.761
	(0.251)	(0.155)	(0.227)	(0.075)	(0.034)	(0.107)
z	7.751	-0.639	8.728	-0.162	-0.628	-2.004
	(0.276)	(0.171)	(0.254)	(0.073)	(0.035)	(0.125)
N	14424284	14424284	14424284	14424284	14424284	14424284
R^2	0.048	0.029	0.060	0.021	0.040	0.024

Note: See notes under Table 1.

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