Distributional implications of municipal property tax

Lars-Erik Borge & Ole Henning Nyhus

Department of Economics

Norwegian University of Science and Technology

Preliminary draft

February 2012

Abstract

This paper investigates the distributional effects of municipal property tax in a sample of Norwegian municipalities. The distributional effects are assessed by calculating a Suits-index for each municipality. The property tax comes out as regressive in five municipalities, as roughly proportional in three municipalities, and as progressive in one municipality. We investigate the impacts of alternative tax designs and show that increased basic deduction makes the property tax less regressive, and also that distributional concerns may be handled by differentiated tax rates rather than by a basic deduction. A tax reform where the current wealth tax is replaced by an extended property tax is under debate in Norway. We show that such a reform may have adverse distributional implications with large gains for the richest households.

Keywords: Property tax, local taxation, tax distribution, Suits Index

JEL Classification: H22, H24, H71

1. Introduction

Economists tend to consider the property tax as a good local tax because it is visible and has relatively low mobility. The high visibility may increase the awareness of the cost of public programs, while the low mobility results in a low deadweight loss and a more efficient tax system. Politically the property tax is more controversial, and one of the main concerns is its distributional impact. It is argued that the tax is regressive as it is falls disproportionally on low income households, and also that it is a heavy burden for pensioners with limited incomes. This paper contributed to the debate on the property tax by providing an empirical analysis of the distributional implications of residential property tax in Norway.

Most existing research on the distributional effects of property taxes uses data from the US, a country that for a long time has relied on property taxation in the financing of local governments. A seminal contribution is Suits (1977) who developed a measure of tax progressivity (later known as Suits index) and applied it to study the distributional effects of the property tax. Suits found the property tax to be progressive. Later studies have found the distributional effects of the property tax to be less favorable. Phares (1980), Metcalf (1994), and Van Wychen (2011) find that the property tax is regressive, while Plummer (2003) concludes that it is approximately proportional. The variation in results may reflect differences in the type of property (residential, commercial), the income measure (annual, lifetime), the method used to allocate taxes to households, and the years examined.

In Norway the property tax is a voluntary tax for the municipalities, and in the recent years it has been the object of quite extensive research. Borge and Rattsø (2004) and Fiva and Rattsø (2007) analyze how the local choice of property taxation is affected by economic and political variables, while Borge and Rattsø (2008) and Fiva and Rønning (2008) study the effect of residential property tax on efficiency in local service provision. The study by Borge and Rattsø (2004) is of greatest relevance for our analysis. They analyze how the municipal choice between residential property tax and user charges is affected by the income distribution in the electorate. The key finding is that are more unequal (before tax) income distribution leads to a shift in the local tax structure from user charges to property tax. This result provides some indirect evidence that the property is redistributive, at least in comparison to user charges. In this paper we provide a more comprehensive analysis of the distributional effects of the Norwegian property tax.

The rest of paper is organized as follows: Section 2 provides the necessary empirical and institutional background. The lack of good data is probably the main reason that the distributional effects of property taxation in Norway are not analyzed earlier. In this project much effort is devoted to the construction of a suitable household level dataset for a sample of nine municipalities. The data set is described in detail in section 3.

In section 4 the distributional effects are assessed by calculating Suits-indices for each of the nine municipalities. Moreover, we use bootstrapping in order to evaluate whether the property tax is regressive or progressive in a statistical sense. It appears the property tax is

regressive in five municipalities, roughly proportional in three, and progressive in one. Section 5 analyzes alternative designs for the handling distributional objectives. In the current system a basic deduction is the main distributional instrument. An increase in the basic deduction makes the property tax less regressive or more progressive, but has the disadvantage that fewer households pay property tax. We show that distributional objectives alternatively can be handled by a design where the tax rate is differentiated (or graduated). Then distributional objectives can be achieved without reducing the share of households paying property tax. Norway is one of the few European countries that still have a wealth tax, and in section 6 we simulate the distributional effects of a tax reform where the current wealth tax is replaced by an extended property tax. The simulations indicate that such a tax reform will make the tax system less progressive. The reduced progressivity is mainly driven by tax reductions for the richest households. Section 7 offers some concluding remarks.

2. The municipal property tax in Norway

In Norway the property tax is a voluntary tax for the municipalities. The tax applies to both residential and commercial property, and land and structures (on the land) are taxed at the same rate.[1] In 2010 a total of 309 (out of 430) municipalities collected property tax. The municipalities can levy property tax on certain facilities (notably hydroelectric power plants) without taxing residential or other commercial property. Residential property tax was levied in 170 municipalities in 2010. It is the distributional effects of the residential property tax that is the topic of this study.

The property tax is locally administered and the property values are assessed by the municipalities. The assessment must be based on a visual inspection of each property. However, the assessed value is normally calculated from available information of the property (lot size, house size, whether there is a garage, etc). Different parameters may be used for different geographical areas within the municipality. The visual inspection mainly serves as check on the registered information. Reassessment of property values can be done every 10th year.

For residential property the municipality can decide whether to have a basic deduction or not, as well as the size of the basic deduction. The basic deduction is a fixed amount per residence that can be altered every year. As an illustration, a detached house with a main residence and a renter unit will receive two basic deductions. The main purpose of the basic deduction is to make the property tax more progressive or less regressive, and it can be compared to the homestead exemption in the US context. The difference is that the homestead exemption only applies to residential property where the homeowner resides, and that a household can claim no more than one exemption.

[1] The efficiency argument for the property tax is stronger for land than for structures, see e.g. Brueckner (1986). The distributional effects of a graded property tax (with a lower tax rate for land) are analyzed by England and Zhao (2005) and Plummer (2010).

The property tax rate must be in the interval 0.2 -0.7 percent. The tax rate cannot be set higher the 0.2 percent the year a property tax is introduced, and it cannot be increased by more than 0.2 percentage points per year. On the other hand, there are no such restrictions for reductions in the property tax rate.

For a property with one residence the property tax is calculated as:

$$property\ tax = (assessment\ value - basic\ deduction) \times tax\ rate$$

The role of the basic deduction can be illustrated by dividing by the assessment value in the above equation:

$$\frac{property\ tax}{assessment\ value} = \left(1 - \frac{basic\ deduction}{assessment\ value}\right) \times tax\ rate$$

The term on the left hand side may be interpreted as the effective property tax rate, i.e. the ratio between property tax payment and assessment value. It appears that with a basic deduction, the effective property tax rate is higher the higher the assessment value of the residence. Given the reasonable assumption that richer households on average have more valuable properties, it is evident that a basic deduction makes the tax more progressive or less regressive. Moreover, when comparing across municipalities, it is the size of the basic deduction relative to the average assessment value that is of relevance in a distributional context.

Table 1: Municipal sample and property tax characteristics

Municipality	Population	Year of assessment	Basic deduction (NOK)	Tax rate (‰)	Basic deduction as pct. of assessment
Trondheim	158,613	2004	500,000	3.7	40.0
Stavanger	115,117	2006	360,000	2.0	29.5
Porsgrunn	33,550	2006	0	4.3	0.0
Ringsaker	31,923	2006	100,000	2.0	12.0
Stange	18,591	2005	100,000	2.0	9.2
Vestvågøy	10,797	2003	100,000	2.0	16.2
Sogndal	6,836	2006	0	7.0	0.0
Nord-Fron	5,843	2006	300,000	7.0	62.2
Åmot	4,348	2006	150,000	3.5	21.0

Note: Basic deduction is per residence.

The analysis in this paper is based on a sample of nine Norwegian municipalities with residential property tax. The sample is listed in table 1 and includes two larger cities (Trondheim and Stavanger), two minor cities (Porsgrunn and Ringsaker), three regional centers

(Stange and Vestvågøy), and two minor rural communities (Nord-Fron and Åmot). Compared to the population of Norwegian municipalities, there is overrepresentation of large municipalities. The main reason is that the residential property tax is more widely used by larger municipalities. By design, the sample only comprises municipalities with recent reassessment of property values that have chosen basic deductions of very different sizes. Two of the municipalities have no basic deduction, while the maximum deduction is NOK 500,000 (USD 85,000). The basic deduction ranges from 0 to above 60 percent when measured as share of assessment value per residence.

3. The household level data set

In Norway there is little information on property tax on the household level. The property tax is locally administered and is not included in the tax returns that are the basis for official statistics on income, wealth, and taxes. A major part of this project has been to establish a household level data set for property tax payment for a sample of nine municipalities. Detailed information on property tax from municipal registers is merged with household information from Statistics Norway.

Information about households is obtained from administrative registers in Statistics Norway. The registers include all households and offer information about income, wealth, and other household characteristics. At the time of data collection (2008 and 2009), 2006 was the latest year where data for household income was available.

Most municipalities use the same administrative software for assessment, calculation, and collection of property tax. The systems are up-to-date, but cannot generate historical data. This was a challenge for us since only historical income data was available. A national property tax data base (GAB) was used to generate information on ownership in 2006. Since none of the municipalities had undertaken a reassessment since 2006, property taxes for 2006 could be calculated even if the systems only provided up-to-date information. The municipal property tax registers and the administrative registers in Statistics Norway were merged using a common personal identifier.

Some households own parts of housing cooperatives. Each cooperative pays property tax for the whole property. This means that these households pay the property tax indirectly, and that we cannot identify the exact amount each household pay. There is also no information about which cooperative the households own a part in. To account for this problem, we use data from the income register. All owners of a cooperative residence have reported a wealth tax assessed value in their tax form. To calculate a property assessment for parts in housing cooperatives we use the ratio between assessed property wealth and average assessed

property wealth for each municipality, multiplied with average property tax assessment for a single residence in housing cooperatives in each municipality[2].

The construction of the data set implies that the property tax is assigned to the owner of the property. This means that we implicitly assume that the tax burden is not shifted over to renters. Owners are assumed to bear the full burden of the property tax, both for the residence where they reside and for rental units.[3] This handling of renters is likely to overestimate the regressivity of the property tax.

Table 2: Households and property tax

Municipality	Number of households	Share that pays property tax (%)	Average property tax, all households (NOK)	Average property tax, households paying tax (NOK)
Trondheim	93,042	45.9	1,448	3,157
Stavanger	55,802	65.1	1,339	2,057
Porsgrunn	15,967	70.7	2,121	3,000
Ringsaker	13,962	34.3	619	1,802
Stange	8,126	42.8	909	2,122
Vestvågøy	4,584	46.4	493	1,063
Sogndal	3,704	28.0	1,749	6,242
Nord-Fron	2,590	39.9	604	1,515
Åmot	2,278	26.5	587	2,215

Table 2 provides information on the share of households that pay property tax and average property tax payment per household. The share of households paying property tax varies from below 30 percent in Sogndal to above 70 percent in Porsgrunn. The share of households paying property tax is determined by a number of factors. The most important are the share of renters, the size of the basic deduction, and the whether the property tax applies to all areas of the municipality. In addition new buildings can be exempt from property tax for up 20 years. In our sample of municipalities, Vestvågøy does not collect property tax for new buildings the first five years. The average property tax payment is in general highest in the largest municipalities. However, Sogndal stands out with the highest average property tax among households paying property tax.

To analyze the distributional effect of property tax, information about household income is essential. Our measure of income is gross income, which includes all taxable incomes.[4] Table 3

[2] Since there often are limitations to hiring out and owning more than one residence in each cooperative, we assume that households only own one residence in housing cooperatives.
[3] In the case where the rental unit is located in the same municipality as their residence.
[4] Includes income from employment/work, income from self-employment, pensions, and capital income

shows that there is large variation in average household income across the municipalities. The first column shows gross income. To take into account that a household with more than one person needs a larger income than a household with one person to obtain the same level of utility, we also apply an alternative income measure that takes household size into account. We use the so called OECD scale where the first adult weighs 1, other adults weigh 0.7, and children weigh 0.5. Compared to other equivalence scales, the OECD scale assumes relatively low economies of scale in consumption.

Table 3: Average household income, in thousand NOK

Municipality	Gross income	OECD equivalence
Trondheim	412	261
Stavanger	586	360
Porsgrunn	473	291
Ringsaker	453	268
Stange	460	274
Vestvågøy	434	257
Sogndal	392	237
Nord-Fron	439	269
Åmot	383	243

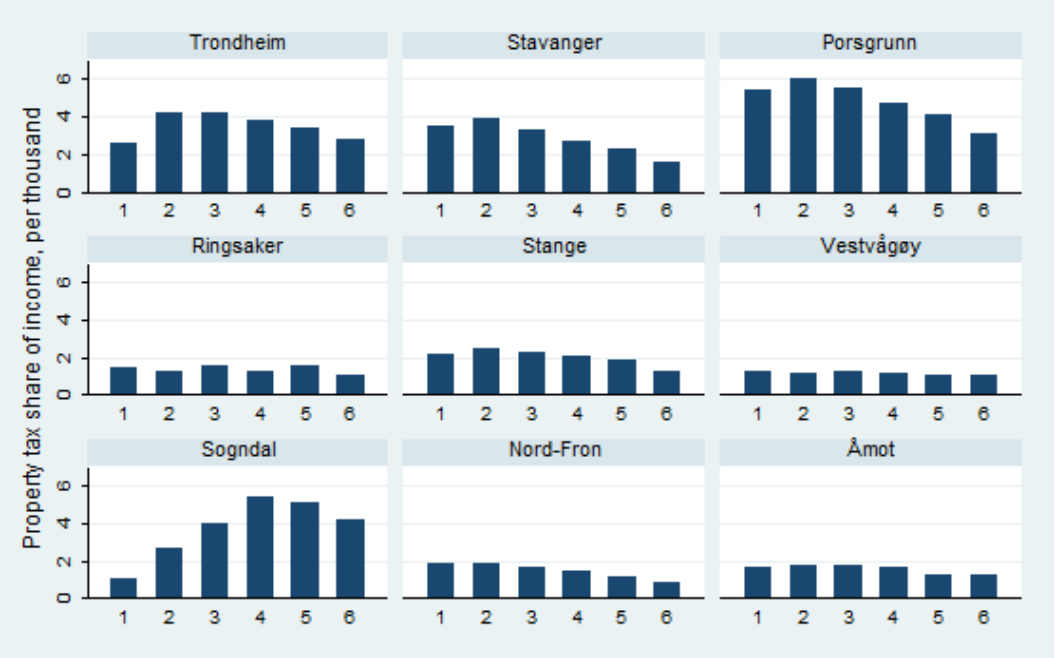
4. The distributional impact of the current property tax

A tax is progressive if the tax as share of (household) income increases when income increases, and regressive if the tax is reduced as share of income when income increases. Figure 1 displays the property tax as share of household income for different income groups, and is a natural starting point for the distributional analysis. It appears that the property tax as share of income decreases with income in most municipalities. In one municipality, Sogndal, the share increase for income groups up to NOK 700,000, and decrease for households with income above this amount. In Ringsaker and Vestvågøy, the share seems to be relatively constant, indicating a proportional distribution.

Our main measurement of tax progressivity is the so called Suits-index developed by Suits (1977). Figure 2 is helpful in explaining the index. In the figure the households are ranked by increasing income. The horizontal axis measures the cumulative share of total income and the vertical axis measure the cumulative share of the tax. The Lorenz-curve describes the relationship between the cumulative share of income and the cumulative share of the tax. Two Lorens-curves (OCB and OC'B) are drawn in the figure. If the Lorenz-curve is below the line of

proportionality, as is the case for OCB, the tax is progressive since households with low income pay a lower share of the tax than their share of income. If the Lorenz-curve is above the line of proportionality, as is the case with OC'B, low income households pay a higher share of the tax than their share of income. The tax is then regressive.

Figure 1: The property tax share of household income, per thousand



Note: 1; consists of households with income lower than NOK 150,000 (approximately $26,000), 2; 150' to 250', 3; NOK 250' to 450', 4; NOK 450' to 700', 5; NOK 700' to 1 million, and 6; income above NOK 1 million (approximately $172,000).

The Suits-index (*S*) is defined as

$$S = 1 - \frac{L}{P}$$

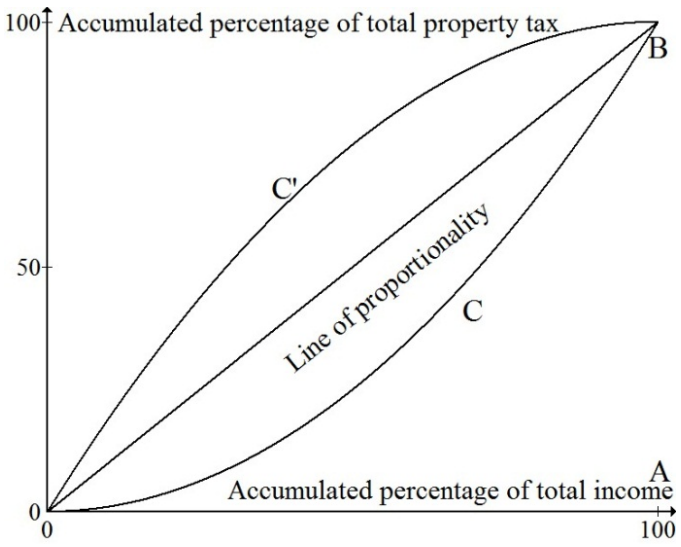
where *L* is the area under the Lorenz-curve and *P* is the area under the line of proportionality. The Suits-index varies between -1 and 1. If the tax is progressive (the Lorenz-curve is below the line of proprtonality), the Suits-index is positive since $L < P$. If the tax is regressive (the Lorenz-curve is above the line of proportionality), the Suits-index is negative since $L > P$. A Suits-index equal to zero means that the tax (on average) is proportional.

We have calculated the Suits-index by using the formula:

$$S = 1 - \frac{1}{5000}\int_{0}^{100} T(y)dy \approx 1 - \frac{1}{5000}\sum_{i=1}^{N}\left\{\frac{1}{2}[T(y_i) + T(y_{i-1})][y_i - y_{i-1}]\right\}$$

where y is the cumulative percentage of total income and T(y) the cumulative percentage of total tax. The integral represent the area under the Lorenz curve, and 5000 represent the area under the line of proportionality.

Figure 2: Lorenz Curve



The calculated Suits indices are shown in table 4. A first observation is that the results are robust to whether income is adjusted for household size or not. In most municipalities the Suits index comes out as negative, which indicates that the property tax in general is regressive. The only exception is Sogndal where the property tax comes out as progressive. Since Sogndal does not have a basic deduction, this finding is a bit surprising. However, despite no basic deduction, the share of households paying property tax is relatively low in Sogndal. This may reflect a high share of renters, that property tax is not collected in all areas, and also a tax credit that applies to households living on minimum pension.

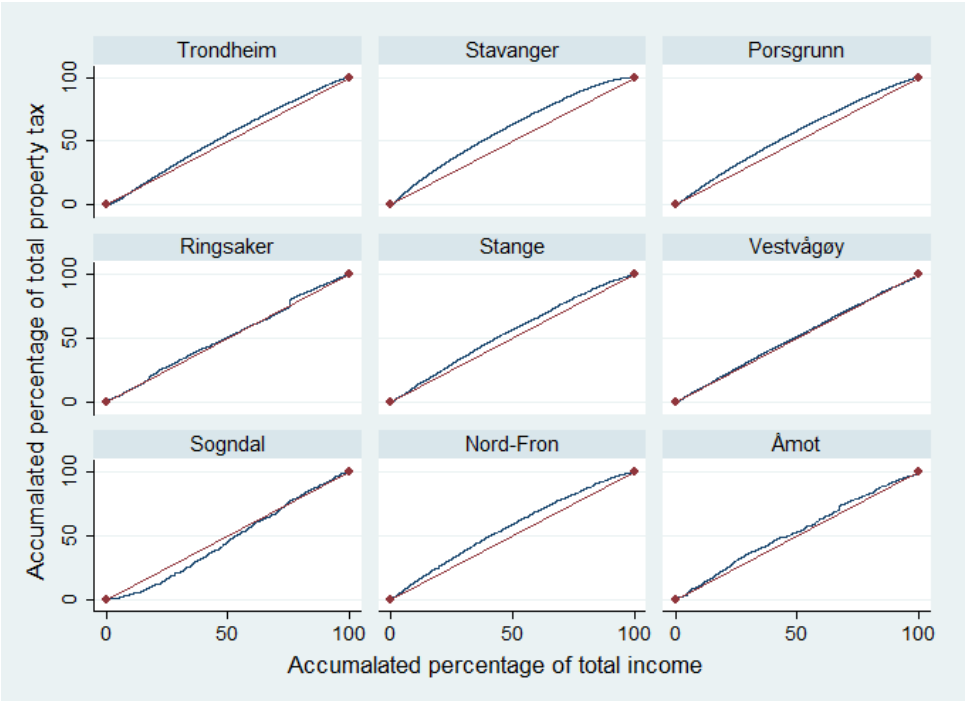
There is substantial variation in the Suits indices across municipalities. Stavanger comes out with the most regressive property tax with an index value of about -0.2. The property tax is close to proportional in Ringsaker and Vestvågøy. The large variation in Suits indices is consistent with findings from the US. Van Wycken (2011) reports Suits indices for each state for income, sales and property taxes. For property taxes the Suits index varies from -0.02 (Alabama and Michigan) to -0.23 (Connecticut), with an average of -0.12.

Table 4: Suits indices, gross income and equivalent gross income

Municipality	Gross income	Equivalent gross income
Trondheim	-0.068	-0.075
Stavanger	-0.195	-0.201
Porsgrunn	-0.115	-0.118
Ringsaker	-0.026	-0.035
Stange	-0.094	-0.086
Vestvågøy	-0.022	-0.011
Sogndal	0.078	0.041
Nord-Fron	-0.123	-0.096
Åmot	-0.059	-0.071

Figure 3 show the Lorenz curve for our sample of municipalities. The Lorenz curves confirm the distributional effects suggested by the Suits indices, but provide a richer picture on how the distributional effect varies with household income. In Sogndal the property tax is regressive for middle and lower incomes and proportional for higher incomes.

Figure 3: Lorenz curves, property tax, gross income



The Suits index is deterministic and does not come with standard errors to indicate the precision. This is clearly a weakness. It would be interesting to test whether the calculated Suits index is significantly different from zero and whether it differs significantly between the municipalities in the sample. In this paper we follow the methodology suggested by Anderson et al. (2003) to estimate nonparametric standard errors and confidence intervals for the Suits index. The bootstrapped standard errors are based on 5000 sample drawings.

Table 5: Bootstrap[5] results for the Suits Index values on property tax

Municipality	Gross income			Equivalent gross income		
	Suits Index	Std. dev.	Conf. interval 95 %	Suits Index	Std. dev.	Conf. interval 95 %
Stavanger	-0.195*	0.00623	<-0.207, -0.183>	-0.201*	0.00621	<-0.213, -0.189>
Nord-Fron	-0.123*	0.01532	<-0.153, -0.093>	-0.096*	0.01558	<-0.127, -0.065>
Porsgrunn	-0.115*	0.00411	<-0.123, -0.107>	-0.118*	0.00414	<-0.126, -0.110>
Stange	-0.094*	0.00853	<-0.111, -0.077>	-0.086*	0.00868	<-0.103, -0.069>
Trondheim	-0.068*	0.00362	<-0.075, -0.061>	-0.075*	0.00370	<-0.082, -0.068>
Åmot	-0.059	0.03285	<-0.124, 0.006>	-0.071	0.03403	<-0.138, -0.004>
Ringsaker	-0.026	0.03153	<-0.088, 0.036>	-0.035	0.04169	<-0.117, 0.047>
Vestvågøy	-0.022	0.01553	<-0.053, 0.009>	-0.011	0.01575	<-0.042, 0.020>
Sogndal	0.078*	0.02026	<0.038, 0.118>	0.041	0.02284	<-0.004, 0.086>

* indicates p<0.01

The results from the bootstrapping procedure are displayed in table 5. In most municipalities the Suits-index is quite precisely estimated. When using gross income, the property tax comes out as significantly negative in five municipalities, significantly positive in one, and as not significantly different from zero in three municipalities. In other words, the property tax comes out as regressive in five municipalities, as roughly proportional in three municipalities, and as progressive in one municipality. In terms of non-overlapping confidences intervals, the property tax is significantly more regressive in Stavanger than in the other municipalities. And it is significantly more progressive in Sogndal than in the other municipalities. Most of these findings carry over when we instead use equivalent household income. The main exception is Sogndal, where the property does not come out as progressive in a statistical sense.

The distributional effects of taxes may be different in a life cycle perspective where tax payment is related to permanent or life time income. This is of particular relevance for the property tax since household make housing investments based on expectations about future

[5] The bootstrap results are based on 5,000 sample drawings

incomes, see e.g. Fischel et al (2011). With income data only for a single year the possibility to handle this objection is limited. In order to shed some light on this issue, we have performed separate analyses of households in similar phases of life. More specifically, we look at households without children where the adults are 45-66 years of age, households with children, and households where the youngest child is 6-17 years of age. In most cases the Suits-indexes for the subgroups are similar to the Suits indices for the whole population, at least there is no evidence that property tax become more regressive when focusing on households in similar phases of life. This indicates that our results may carry over to a life cycle perspective.

Table 6: Suits Index values, different cohorts

	Households where oldest member are 45-66 years, no children		Households where youngest child is 6-17		All households with children	
Municipality	Suits	95 % C.I.	Suits	95 % C.I.	Suits	95 % C.I.
Trondheim	-0.100	<-0.114, -0.086>	-0.119	<-0.133, -0.105>	-0.100	<-0.109, -0.091>
Stavanger	-0.232	<-0.254, -0.210>	-0.209	<-0.226, -0.192>	-0.177	<-0.190, -0.164>
Porsgrunn	-0.114	<-0.129, -0.099>	-0.118	<-0.135, -0.101>	-0.104	<-0.116, -0.092>
Ringsaker	-0.058	<-0.096, -0.020>	-0.090	<-0.156, -0.024>	-0.076	<-0.123, -0.029>
Stange	-0.104	<-0.137, -0.071>	-0.084	<-0.118, -0.050>	-0.086	<-0.110, -0.062>
Vestvågøy	0.030	<-0.037, 0.097>	-0.059	<-0.107, -0.011>	-0.014	<-0.054, 0.026>
Sogndal	-0.074	<-0.166, 0.018>	0.003	<-0.075, 0.081>	-0.022	<-0.076, 0.032>
Nord-Fron	-0.045	<-0.095, 0.005>	-0.101	<-0.172, -0.030>	-0.108	<-0.157, -0.059>
Åmot	-0.173	<-0.283, -0.063>	0.065	<-0.113, 0.243>	0.023	<-0.083, 0.129>

5. Alternative designs for handling distributional objectives

The distributional effect of property tax reflects the underlying distribution of the tax base and municipal tax design. In this section, we analyze how the distributional effects are influenced by changes in the tax design. One alternative design which is assumed to make the distribution effect less regressive (more progressive) is to increase the basic deduction. We have chosen to double it, or to induce a deduction of NOK 100,000 for municipalities with no initial basic deduction. An alternative to achieve distributional objectives is to differentiate the tax rate, i.e. to apply a higher tax rate for higher property values. We have analyzed the effects of abolishing the basic deduction and cutting the tax rate for property values below average to the half. For a property with assessment above average, the property tax is calculated as:

$$Property\ tax = (property\ assessment - average\ assessment)\ (tax\ rate) + (average\ assessment)\ \frac{(taxe\ rate)}{2}$$

The property tax for properties with assessment below average is calculated as:

$$Property\ tax = (property\ assessment)\frac{(tax\ rate)}{2}$$

Compared to the alternative with differentiated tax rate, increased basic deduction decreases the share that pays property tax from 48 percent to 33 percent in the largest city, Trondheim. In one of the smallest municipalities, Nord-Fron, double basic deduction almost excludes households from paying property tax.

Table 7: Suits indices, alternative property tax designs

Municipality	Existing design	No basic deductions		Double basic deduction[6]		Differentiated tax rate[7]	
		Index	95 % C.I.	Index	95 % C.I.	Index	95 % C.I.
Trondheim	-0.068	-0.115	<-0.122, -0.108>	0.013	<0.003, 0.023>	-0.106	<-0.115, -0.097>
Stavanger	-0.195	-0.222	<-0.234, -0.210>	-0.163	<-0.176, -0.150>	-0.192	<-0.205, -0.179>
Porsgrunn	-0.115	-0.115	<-0.123, -0.107>	-0.095	<-0.104, -0.086>	-0.106	<-0.115, -0.097>
Ringsaker	-0.026	-0.039	<-0.096, 0.018>	-0.012	<-0.080, 0.056>	-0.022	<-0.107, 0.063>
Stange	-0.094	-0.100	<-0.117, -0.083>	-0.087	<-0.104, -0.070>	-0.087	<-0.105, -0.069>
Vestvågøy	-0.022	-0.038	<-0.066, -0.010>	0.003	<-0.031, 0.037>	-0.013	<-0.049, 0.023>
Sogndal	0.078	0.078	<0.038, 0.118>	0.093	<0.050, 0.136>	0.083	<0.036, 0.130>
Nord-Fron	-0.123	-0.147	<-0.176, -0.118>	-0.067	<-0.319, 0.185>	-0.147	<-0.179, -0.115>
Åmot	-0.059	-0.075	<-0.135, -0.015>	-0.033	<-0.111, 0.045>	-0.060	<-0.141, 0.021>

The effects of alternative property tax designs are reported in table 7. For comparison we also report the effects of eliminating the current basic deductions. As expected, a higher basic deduction makes the tax less regressive or more progressive, but for most municipalities the classification of the tax as regressive, proportional, or regressive is not affected. The only exception is Trondheim (with the largest initial basic deduction) where the property tax goes from being regressive to somewhat progressive.

An increase in the basic deduction implies that fewer households pay property tax. This may reduce voter control and monitoring of local officials. The alternative with a differentiated tax rate has the opposite effect since the share of households paying property tax increases compared to the current design. As can be seen from table 7, the Suits indices with a differentiated tax rate are very similar to current design with a basic deduction. This means

[6] Set to NOK 100,000 for municipalities with basic deduction equal 0
[7] Basic deductions are eliminated

that distributional objectives can be achieved without reducing the share of households paying property tax.

6. Tax reform: Replacing the wealth tax with property tax

Norway is one of the few European countries that still have a wealth tax. A tax reform that is currently being discussed is to replace the wealth tax with an extended property tax. In this section we analyze the distributional effects of such a tax reform. The starting point for the analysis is the current wealth and property taxes. The Suits-index for the sum of wealth and property tax is reported in the first column of table 8. It appears that the sum of wealth and property tax is significantly progressive in five municipalities, roughly proportional in three, and significantly regressive in one. In all municipalities except Åmot, the Suits index is higher for the sum of wealth and property taxes than for property tax alone. This reflects that the wealth tax in general is more progressive than the property tax.

Table 8: Suits indices, replacing the wealth tax with property tax

	Wealth & Property			New property tax	
Municipality	Suits-index	Std. dev.	95% C.I.	95 % C.I.	Tax rate (‰)
Trondheim	0.127*	0.0156	<0.096, 0.158>	<-0.075, -0.061>	9.13
Stavanger	0.187*	0.0328	<0.123, 0.251>	<-0.207, -0.183>	8.61
Porsgrunn	0.064	0.0372	<-0.009, 0.137>	<-0.123, -0.107>	9.28
Ringsaker	0.075*	0.0260	<0.024, 0.126>	<-0.088, 0.036>	9.49
Stange	-0.006	0.0288	<-0.063, 0.051>	<-0.111, -0.077>	6.77
Vestvågøy	0.123*	0.0396	<0.045, 0.201>	<-0.053, 0.009>	9.89
Sogndal	0.120*	0.0325	<0.056, 0.184>	<0.038, 0.118>	17.54
Nord-Fron	0.025	0.0829	<-0.138, 0.188>	<-0.153, -0.093>	38.79
Åmot	-0.088*	0.0345	<-0.156, -0.020>	<-0.124, 0.006>	15.56

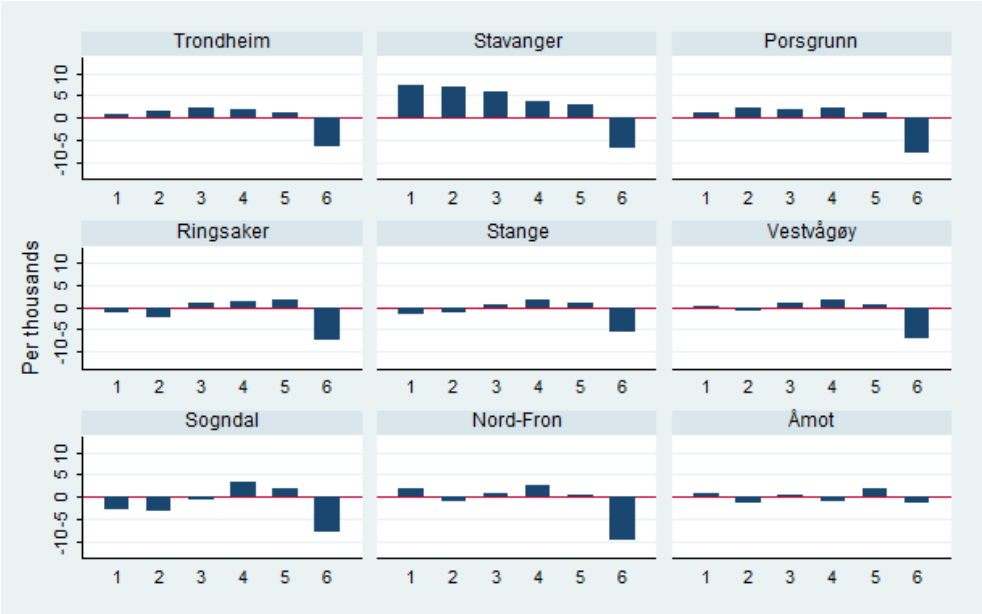
* indicates p<0.01

In the tax reform simulations we assume that revenue loss associated with the abolishment of the wealth tax is replaced by increasing the property tax rate, keeping the basic deduction fixed. The Suits indices for the hypothetic post reform situation is therefore identical to the Suits-indexes reported in table 5. The confidence intervals for the pre and post reform

situations are non-overlapping in seven of the 9 municipalities, indicating that a switch from wealth tax to property tax will reduce the overall progressivity of the tax system. The exceptions are the two smallest municipalities where the Suits-indexes are rather unprecisely estimated.

The effects of the tax reform for different income groups are shown in figure 4. It appears that the reduced progressivity documented in table 9 mainly is driven by tax reductions for the richest households. The tax increases for the other income groups are relatively modest, except for Stavanger where the tax increase for the poorest households is larger than the tax reduction for the richest (when measured as share of income).

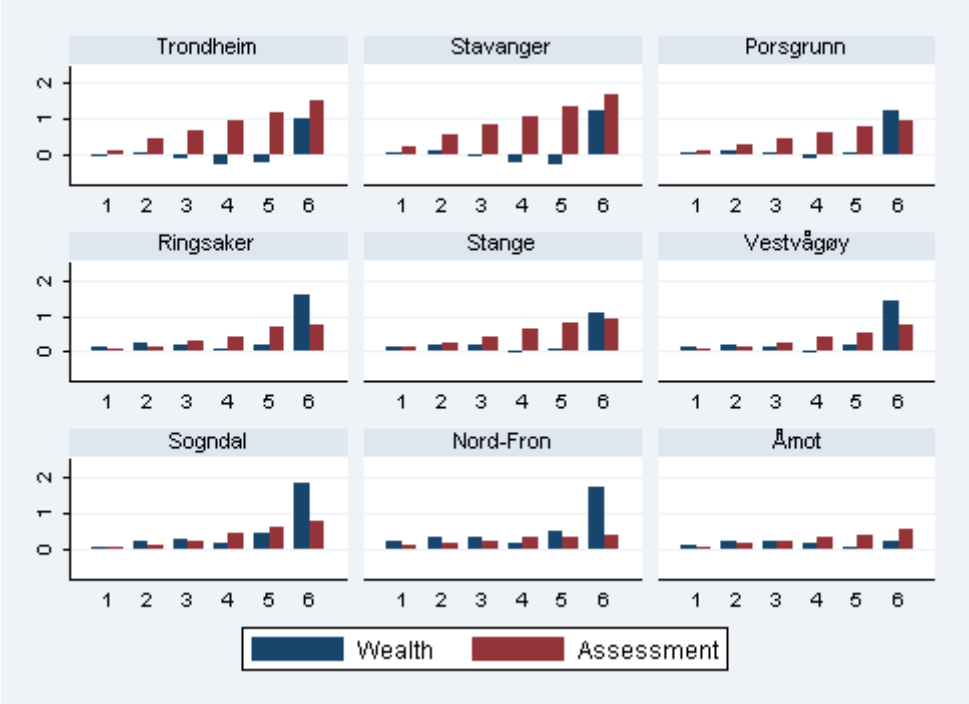
Figure 4: Change in tax as share of income when replacing the wealth tax with property tax



Note: 1; consists of households with income lower than NOK 150,000 (approximately $26,000), 2; 150' to 250', 3; NOK 250' to 450', 4; NOK 450' to 700', 5; NOK 700' to 1 million, and 6; income above NOK 1 million (approximately $172,000).

Wealth and property values for the different income groups are displayed in table 5. In six of the nine municipalities it is evident that taxable wealth is higher than assessed property values for the richest households, and this explains the sharp tax reduction in figure 4. For the richest households in Trondheim and Stavanger assessed property values exceeds taxable wealth, but they still benefit from the reform. The explanation for this not so intuitive result is that the richest households pay a higher share of the wealth tax than of the property tax. In figure 5

Figure 5: Wealth and assessed property value



7. Concluding remarks

The purpose of the paper was to analyze the distributional implications of the municipal property tax in Norway. We find that the distributional effect varies substantially across municipalities across the nine municipalities included in the study. The property tax comes out as regressive in five municipalities, as roughly proportional in three municipalities, and as regressive in one municipality. An increase in the basic deduction improves the distributional effects of the property tax, but has the disadvantage that fewer households will pay property tax. The analysis indicates that distributional objectives rather can be handled by differentiated tax rates. Finally, a tax reform that replaces the current wealth tax with an extended property tax will reduce the overall progressivity of the tax system.

References

Anderson, J. E., Roy, A. G., & Shoemaker, P. (2003). Confidence Intervals for the Suits Index. *National Tax Journal, Vol. 56, No. 1, Part 1*, pp. 81-90.

Borge, L.-E. and J. Rattsø (2004). Income distribution and tax structure: Empirical test of the Meltzer-Richard hypothesis. European Economic Review 48, 805-826.

Borge, L.-E. and J. Rattsø (2008). Property taxation as incentive for cost control: Empirical evidence for utility services in Norway. European Economic Review 52, 1035-1054.

Brueckner, J.K. (1986). A modern analysis of the effects of site value taxation. National Tax Journal 39, 49-58.

Davis, C., Davis, K., Gardner, M., McIntyre, R. S., McLynch, J., & Sapozhnikova, A. (2009). *Who Pays? A Distributional Analysis of the Tax Systems in All 50 States.* Institute on Taxation and Economic Policy.

England, R.W. and M.Q. Zhao (2005). Assessing the distributive impact of a revenue-neutral shift from a uniform property tax to a two-rate property tax with a uniform credit. National Tax Journal 58, 247-260.

Fischel, W., Oates, W., & Youngman, J. (2011). Are local property taxes regressive, preogressive, or what?

Fiva, J.H. and J. Rattsø (2007). Local choice of property taxation: Evidence from Norway. Public Choice 132, 457-470.

Fiva, J.H. and M. Rønning (2008). The incentive effects of property taxation: Evidence from Norwegian school districts. Regional Science and Urban Economics 38, 49-62.

Lavine, D. (2007). Who pays Texas taxes? *Center for Policy Priorities Policy*.

Metcalf, G.E. (1994). The lifetime incidence of state and local taxes: Measuring changes during the 1980s. IN J. Slemrod (Ed.) Tax progressivity and income inequality, Cambridge University Press, Cambridge, England, 59-94.

Oates, W.E. (2001). Property taxation and local government finance: An overview and some reflections. In W.E. Oates (Ed.) Property taxation and local government finance, Lincoln Institute of Land Policy, Cambridge, MA, 21-31.

Phares, D. (1980). Who pays state and local taxes? Oelgeschlager, Gunn, and Hain, Cambridge, MA.

Plummer, E. (2003). Evidence on the incidence of residential property taxes across households. National Tax Journal 56, 739-753.

Plummer, E. (2010). Evidence on the distributional effects of a land value tax on residential households. *National Tax Journal, Vol. 63, No. 1*, pp. 63-92.

Suits, D. B. (1977). Measurement of tax progressivity. American Economic Review *67*, 747-752.

Van Wychen, J. (2011). Minnesota's tax fairness retreat: A 50-state study. Minnesota 2020, Saint Paul, MN.