Minimum tax rates and tax competition: Evidence from property tax limits in Finland

PRELIMINARY AND INCOMPLETE

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Abstract

This paper analyzes how minimum local property tax rates affect local tax policy choice. In Finland, the central government has raised the limits to property tax rates several times in the past 30 years. I construct a measure of forced tax rate increases caused by these reforms and examine how municipalities' respond to forced increases in nearby municipalities. Event Study regression results for the property tax on business properties indicate that neighbors' forced tax rate increases lead to higher tax rates, after a reform of the tax base equalization system which increased incentives to compete on tax base. Before the equalization reform the tax rates on business properties were unaffected by neighbors' forced tax rate increases. I find some indications that forced increases in the residential property tax rate lead to lower tax rates in neighboring municipalities four years after the reforms. Analysis of government bills on tax rate bounds suggests that the increases in minimum tax rates were at least partly motivated by vertical tax competition between central and local governments on income and corporate taxes. Forced property tax rate increases have a clear and lasting effect on tax revenue in affected municipalities, implying that the tax capacity of the central government as regards other tax bases likely increased as intended.

Key words: Fiscal interaction, tax competition, property tax, minimum tax rates
JEL codes:

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1 Introduction

The coordination of tax policy and the use of tax rate limits imposed by higher level governments on lower level governments has received significant attention in recent years. This trend is exemplified by the EU's recent introduction of a minimum corporate tax rate, which is intended to combat harmful tax competition. The national governments have even greater power to constrain tax policies of lower level sub-national governments. In addition to restricting the range of tax instruments available to local governments, central governments often impose limits on tax rates as well. Understanding how these limits to taxing powers affect local policy choice is important for policy design.

The focus of this study is on property taxes on business and residential real estate, which are an important source of revenue for local governments in many countries. This study sheds light on the effects of minimum property tax rate increases, and provides insights into how tax competition shapes local tax policies. I use panel data from Finland and a quasi-experimental research design to study horizontal fiscal interaction triggered by changes in minimum property tax rates. Additionally, the study considers vertical tax competition between the central and local governments as a cause for minimum tax rates set by the central government.

In Finland, municipalities choose property tax rates for different types of real property within tax rate bounds set by the central government. The government has raised minimum and maximum tax rates several times over the past 30 years, and this study analyzes the effects of these changes on the directly affected municipalities and on nearby municipalities. First, I describe the developments in the tax rate distribution over time as bounds for the tax rates change. Second, I construct a measure of forced tax rate increases resulting from the minimum tax rate hikes, and use it as a treatment variable in an Event Study type regression framework to investigate how the affected municipalities and their neighbor municipalities responded to the forced tax rate increases.

The results indicate that when municipalities are forced to increase their property tax rates on business properties, the tax rates of their neighbors' do not not change, when a strong tax base equalization system is in place. However, I find some indication of positive effect of forced increases on tax rates of nearby municipalities after a reform of the tax base equalization system, which strengthened the incentives to compete on the tax base. On the other hand, forced increases in the residential property tax rate appear to lead to lower tax rates in nearby municipalities four years after the reforms.

Property tax limits in Finland have been analysed previously by Lyytikäinen (2012), who used increases in lower bounds of property tax rates in the year 2000 as a quasi-experimental setting to study tax competition among local governments. I revisit the 2000 reform, but extend the analysis to previously overlooked outcomes (tax base and tax revenue) and later increases in the limits to property tax rates in 2010, 2015 and 2017. Moreover, this paper uses a transparent Event Study approach and estimates reduced form effects of minimum rate increases, rather than a spatial instrumental variables strategy used by Lyytikäinen (2012) to estimate tax policy reaction functions. Since the year 2000, there have been two important changes in the institutional setting that may affect competition with property taxes. Firstly, property tax base was removed from the tax base equalization scheme in 2012. Secondly, the number of municipalities has decreased by roughly 30% through municipality mergers.

These changes have altered the context of local tax policy decisions, and the results suggest that they may have affected strategic interaction among municipalities.

The discussion on the Finnish institutional setting documents justifications for increases in property tax limits found in government law proposals. This analysis suggests that the increases in minimum tax rates were to some extent motivated by vertical tax competition between central and local governments on labor income and corporate taxes, although tax capacity of the central government is not explicitly mentioned. Horizontal tax competition among local governments was not discussed in the proposals. When analysing the direct effects of forced tax rate increases, I find that forced increases have a clear and lasting effect on tax revenue in the affected municipalities, which implies that the potential revenue of the central government from other tax bases likely increases as intended.

This paper belongs to a growing branch of quasi-experimental empirical work on tax competition among local governments. The critique of standard spatial econometric approaches by Gibbons and Overman (2012) has been influential in the emergence of in this field. Applications include Lyytikäinen (2012), Baskaran (2014), Agrawal (2015)... Review on local policy choice (Agrawal et al., 2022). Theoretical insights on tax rate limits Keen and Konrad (2013)... LITERATURE REVIEW TO BE COMPLETED

The paper is organized as follows. Section 2 discusses the role of property taxes in the Finnish local public finance system. Section 3 discusses the likely relevance of potential sources of horizontal fiscal interaction in the Finnish setting. Section 4 describes the data and provides a descriptive analysis of property tax bounds and the the distribution of property tax rates. Section 5 lays out the estimation strategy and Section 6 presents the results. Section 7 concludes.

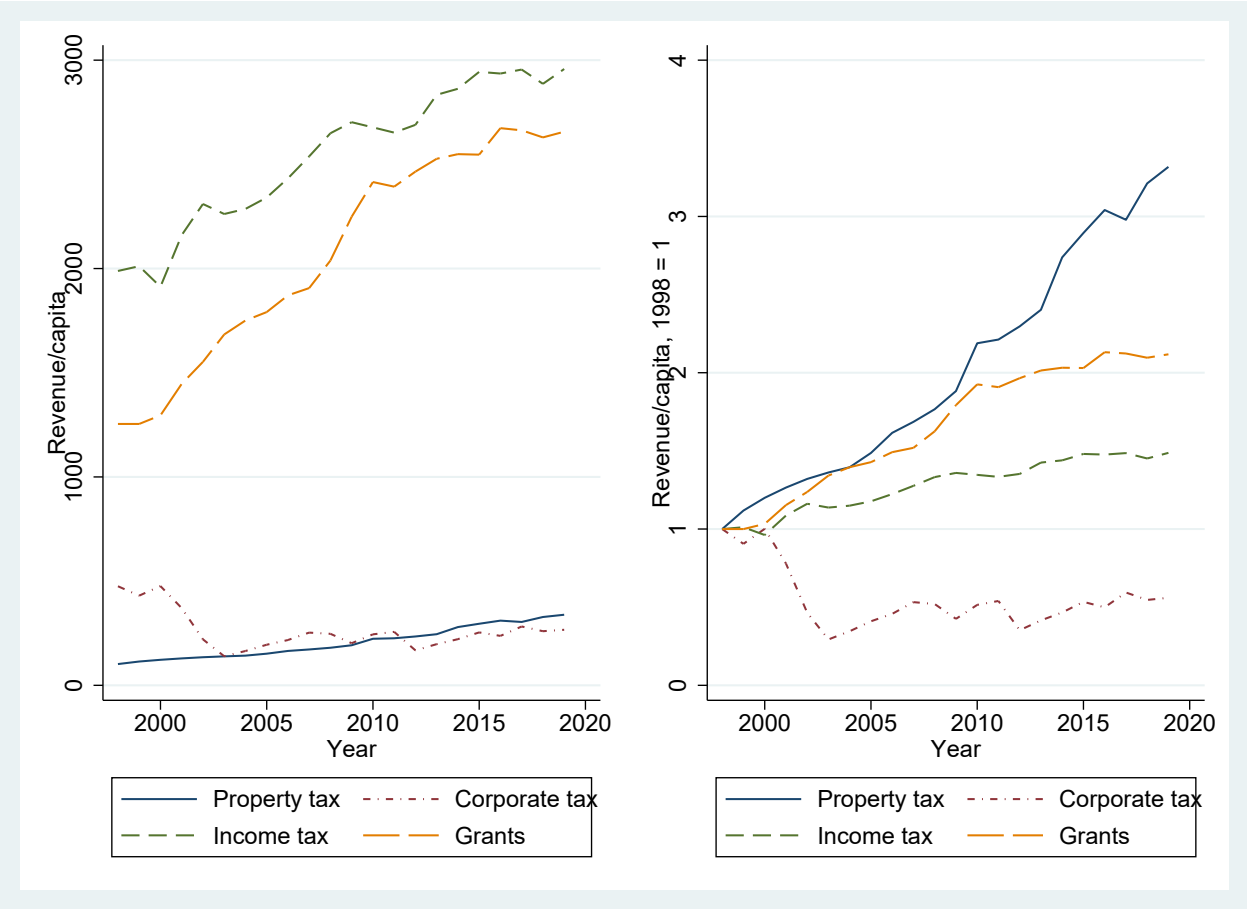
2 Institutional setting

2.1 Local public finance system

During the study period ending in 2022, local governments (municipalities) in Finland were responsible for several key public services, including elementary schools, health care, day care for children, and elderly care.[1] Local public expenditure is roughly 20% of GDP, funded through grants from the central government and own tax revenue, consisting of local income tax, municipalities' share of corporate tax, and property taxes. Figure 1 presents the development of average tax revenue per capita from different sources, as well as central government grants, from 1998 to 2019. The graph on the left shows that local income tax is the main source of own revenue and, together with central government grants, covers the bulk of local public expenditure. Property taxes are relatively unimportant in terms of revenue, but the graph on the right shows that their share of revenue has increased over time.

[1] This changed in 2023 when social and health services were take over by new middle tier governments called 'well being service counties'.

Figure 1: Average tax revenue and grants per capita 1998-2019



Notes: The Figure shows the average tax revenue and grants per capita in Finnish municipalities in 1998-2019. The left graph presents the level of revenue in nominal terms. The right graph presents the development relative to 1998.

Next Section describes the Finnish property tax system in more detail. The main alternative to property taxes as a source of own revenue is the local income tax. It is a residence based flat tax on earned income (labor income) but a deduction set by the central government means that it is applied to labor income above a threshold (currently roughly 16,000 EUR/year). There are no restrictions on the local income tax rate which currently varies between 17% and 23.5%. The government taxes earned income at a progressive schedule. Capital income is taxed separately from labour income only by the central government at a mildly progressive tax rate. Additionally, municipalities receive their portion of national corporate tax revenue. The government has adjusted this share up and down several times. In recent years municipalities' share has been around one third of corporate tax revenue.

2.2 Property taxes

Local property taxes were introduced in Finland in 1993 to replace a disintegrated system of various national and local taxes and fees on real property.[2] A committee preparing the reform proposed uniform national property tax rates, following the Swedish example. However, the government decided that municipalities should have the freedom to choose their local tax rates within bounds set by the central government. [3] The property tax rate can vary by type of property. The two main components of the property tax system are the general property tax (GPT) and the residential property tax (RPT) which apply to different types of real estate and have different allowed ranges.[4]

The general property tax is applied to land and non-residential buildings. The taxable value of land is based on the estimated market value of a similar undeveloped site, regardless of whether the site is actually developed.[5] Hence, the taxable value of land is independent of the development decisions of the land owner and the general property tax is a neutral land tax, to the extent that it is applied to land (Lyytikäinen, 2009). However, the general property tax is also levied on commercial and industrial buildings, valued at the estimated construction cost less depreciation. The part of the general property tax that falls on buildings makes investment less profitable and may cause capital to relocate implying a lower tax base in the long run. Hence, municipalities may use the general property tax as a means to attract business capital.

Residential buildings are taxed at a separate tax rate, which has a lower allowed range than the GPT. The assessed value of residential buildings is based on estimated construction costs less depreciation, similar to commercial buildings. A higher residential building tax rate, other things constant, makes housing investment in the municipality less profitable and may lead to a lower tax base over time. Therefore, the residential property tax could be used as an instrument in the competition for housing capital. Section 3 discusses also other potential sources of fiscal interaction.

As both GPT and RPT have the potential to give rise to horizontal tax competition, one possible reason for changes in minimum allowed tax rates is prevention of harmful tax competition. In addition, increases in lower bounds for property tax rates could be driven by vertical tax competition between the central and the local governments. Both levels of government tax labour income and the revenue form corporate tax is divided between them. Therefore, the central government could use increases in minimum property tax rates to force municipalities to collect additional revenue from other tax bases than labour income, and to alleviate the pressure to increases municipalities' share of corporate tax revenue, thereby improving the revenue capacity of the central government.

[2]The property tax system replaced a tax on imputed rental income and wealth tax (both had low revenue due to deductions and concessions that narrowed the tax base) and some local fees and charges.

[3]The property tax committee also proposed that 5% of the revenue should go to the central government, but the government decided that all of the revenue would go to municipalities.

[4]In addition, the municipalities have the option to apply higher (than GPT) tax rates on vacation homes and power stations and undeveloped lots, and they can exempt non-profit organizations.

[5]The target taxable value of land is 73.5% of market value, but in practice assessed values of land follow market values sluggishly and assessed values have lagged behind the target.

2.3 Stated aim of minimum tax rates

This section discusses briefly the stated justifications for the minimum tax rates based on government proposals for the introduction of property taxes in 1993 and subsequent changes in the minimum tax rates in 2000, 2010, 2015 and 2017. The purpose is to see if either horizontal or vertical tax competition was explicitly mentioned in the proposals as a rationale for minimum tax rates, or whether there are implicit indications of tax competition being one reason behind minimum tax rate increases.

Introduction of the property tax in 1993

The government proposal for the law on local property taxes in 1992 did not discuss horizontal tax competition. However, the increased international mobility of other tax bases (business profits, labor income and consumption) in the context of deepening international economic integration[6] was seen as an important rationale for the introduction of the property tax.

TO BE ADDED: Look into the report of the 'property tax committee'.

Minimum tax rate increases in 2000

The government proposal for increases in minimum property tax rates did not refer to horizontal tax competition suggesting it was not seen as an important reason for the reform. The explicit aim of the reform was to prevent increases in local income tax rates. This can be interpreted as evidence of vertical tax compeition although tax capacity of the central government was not explicitly mentioned in the bill.

Minimum tax rate increases in 2010

The reform of 2010 was at least partly motivated by the weakening outlook of municipalities' finances due to the financial crisis. The government wanted to increase the weight of the property tax in municipal finances, because the property tax was seen to provide a stable source of revenue free of cyclical shocks compared to the corporate tax in particular. The reasoning that the property tax is better suited for municipalities than the corporate tax seems to suggests that vertical tax competition played a role in the reform. Previously municipalities' share of the corporate tax had often been adjusted upward to support municipalities when they faced negative shocks. As in the reform of 2000, the increase in tax rate limits was also seen as a tool to reduce pressure to tax labor income, which can be seen as another indication of vertical tax competition between central and local governments. The government saw the property tax base as 'immobile', suggesting that the possibility of construction investment responding to property taxes was not considered. Hence, horizontal fiscal interaction did not seem to be an important justification for the reform.

Minimum tax rate increases in 2015 and 2017

[6]Finland became a member of the EU in 1995.

The stated aims of the reforms of 2015 and 2017 were very similar to earlier reforms. The proposals paint a picture were property tax base is seen as immobile, and therefore provides a good and stable source of revenue for municipalities. Increases in property taxes are also thought to prevent hikes in local labor income taxes.

2.4 Fiscal equalization

The local government grant system includes a tax base equalization component which transfers resources from rich to poorer municipalities. The system dampened the incentives to compete on property tax base until 2012, when property taxes were removed from the equalization system. This implied that the mobility of property tax base across municipalities has become more relevant has become a more relevant concern for them.

The equalization system is based on imputed revenues per capita that are calculated applying the average municipal income tax rates and property tax rates to the tax base of each municipality and adding corporate tax revenue. Municipalities above an equalization limit (roughly 90% of average imputed per capita revenue in 2000) give up about 60% of their imputed revenue exceeding the limit and this revenue is used to raise the imputed revenues of poorer municipalities to the limit.[7] The system weakens incentives to attract tax base, but municipalities above the limit still benefit from a higher tax base as they can keep 40% of the increase in imputed revenues due an increase in tax base. For a municipality below the limit an increase in the tax base may have little direct effect on revenues, but it may benefit from higher business capital indirectly through, for example, better employment opportunities.

Public discussion on municipal finances around the equalization reform suggested that there is a wide spread misunderstanding that the equalization system applies to actual tax revenue rather than imputed revenue. Hence, some municipalities may erroneously make tax policy choices assuming that a change in revenue due to a tax rate change affects their equalization transfer. Baskaran (2014) argues that there is a similar pervasive wrong belief among German municipalities that choosing a tax rate multiplier smaller than a certain reference value of the equalization system will directly result in lower transfers, although the transfer is based on tax base. It is not clear how common these kinds of misperceptions are but these consideration suggest that local tax policy may not always be based on very sophisticated reasoning and full understanding of the incentive structure.

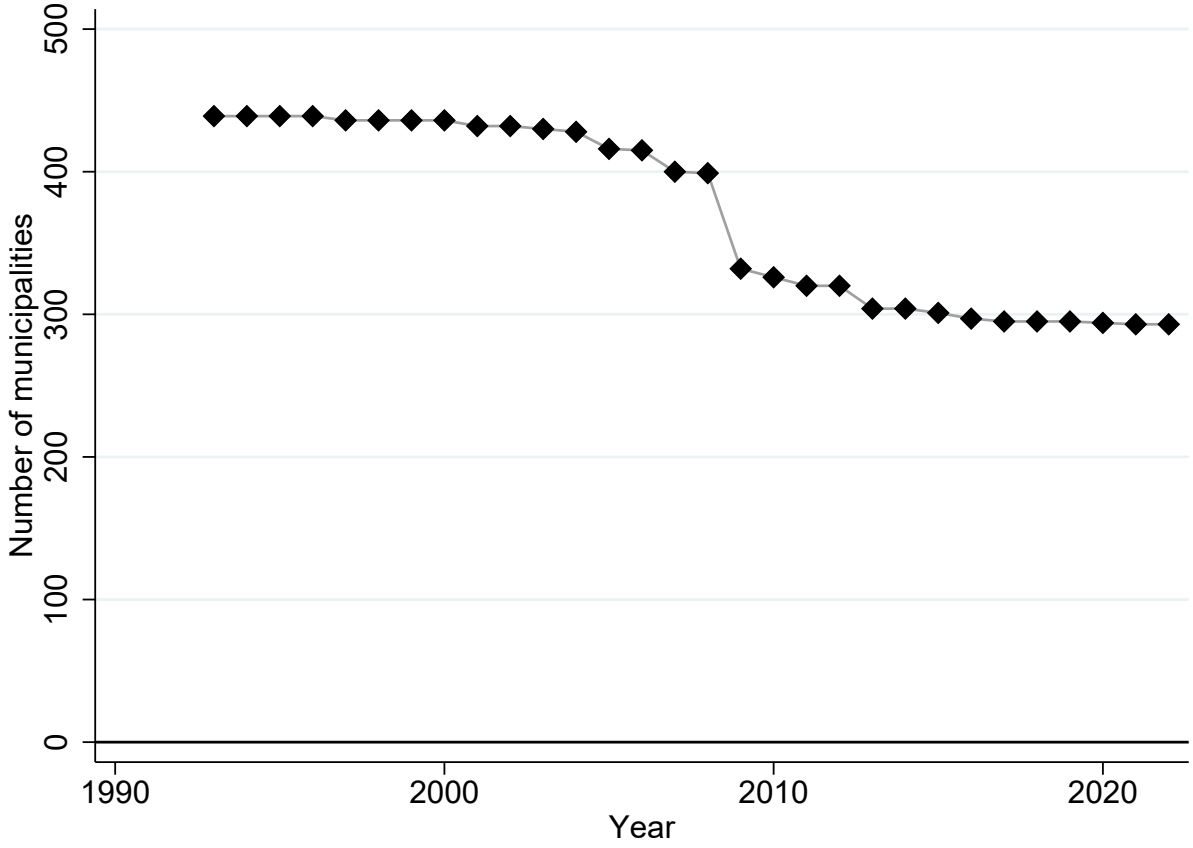
2.5 Municipality mergers

Figure 2 shows that the number of municipalities have decreased through municipality mergers throughout the study period. In 2009, there was a large merger wave due to a central government policy program that offered incentives for mergers (See e.g. Saarimaa and Tukiainen, 2015). The motivation for the program was to improve the efficiency of public service provision through economies of scale.

[7] In 2015, there was a grant reform which altered the limits and the functional form of the equalization system.

In the empirical analysis I omit municipalities that disappeared during the event window around each reform due to mergers. Larger merger partners that retain their initial municipality ID are included in the analysis.

Figure 2: Number of municipalities 1993-2022



Notes:

3 Sources of tax rate interaction

Three main sources of local government fiscal interaction identified in the literature are 1) expenditure spillovers 2) competition on mobile tax base 3) yardstick competition of local politicians. This section discusses the relevance of these mechanisms for the Finnish setting largely following Lyytikäinen (2012), but adds new perspectives, such as the role of tax salience and the implications of changes in the institutional context (equalization reform and mergers).

Expenditure spill-overs arise if residents of a jurisdiction can benefit or are harmed by services provided by other jurisdictions (e.g. Case et al., 1993). Arguably, expenditure spillovers are unlikely to be an important source of fiscal interaction in the Finnish setting

since the bulk of services provided by the municipalities are publicly provided private goods. Competition for tax base and politically motivated yardstick competition are more potential sources of spatial interdependence in tax rates in Finland.

In the competitive versions of tax competition models there are many relatively small jurisdictions that take the net return of capital as given, and hence, strategic behavior is absent (Zodrow and Mieszkowski, 1986). If jurisdictions are sufficiently large to affect the net rate of return, tax rates are set strategically taking into account tax rates in other jurisdictions (Wildasin, 1988). For the purposes of empirical work on local taxes it is important to note that strategic tax competition among jurisdictions in the same region requires that capital is not fully mobile but to some extent fixed to the region. Brueckner and Saavedra (2001) combine heterogeneous preferences of mobile households and locally fixed tax base and show that in a model with two jurisdictions competing for a fixed amount of capital, the relationship between capital tax rates in the jurisdictions may be positive or negative (or flat).

The property taxes studied in this paper fall partly on business and housing capital. This implies that a higher property tax rate lowers the profitability of investment in the municipality and may cause capital to locate in other municipalities, which makes competition with tax rates in an attempt to attract capital possible. As discussed above, the sign of tax rate interaction due to the tax base competition mechanism is ambiguous a priori. Lyytikäinen (2009) finds evidence that property tax incentives affect housing starts, suggesting that tax base mobility is a relevant concern for local politicians.[8] Changes in the Finnish institutional setting imply that fiscal competition may have changed over time. The removal of property taxes from the tax base equalization scheme in 2012 increased incentives to compete on tax base (see Section 2.4). Also the reduction in the number of municipalities through mergers (see 2.5)in the study period may have strengthened fiscal interaction. When there are fewer municipalities in the area, strategic interaction is more probable.

So called yardstick competition or tax mimicking arises if the true costs of providing public services are known only by the local government and not observed by voters but tax rates are common knowledge (Besley and Case, 1995). In this setting, voters may utilize the fact that the costs of providing services in their jurisdiction are likely to be correlated with other jurisdictions in the area to assess the performance of their government. Relatively high taxes may indicate that the government is inefficient or rent seeking and should be voted out of office. As a result, governments are forced to imitate their neighbors in order to stay in office.

Yardstick competition may be relevant to the Finnish case since Finnish municipalities are governed by elected councils. Information on tax rates is easily available, but comparing the efficiency of service provision across municipalities is difficult. Municipalities provide a wide range of services and there are no commonly used performance rating systems. Hence, voters may use tax rates as a benchmark when evaluating the performance of their council relative to other councils in the area. One can of course question the relevance of forced tax increases due to the actions of the central government for yardstick competition among

[8]The evidence on the negative effect of property taxes on housing starts is based on an analysis of the surcharge on undeveloped lots, which created a large incentive to develop. The point estimates on the effect of the residential property tax are negative too but imprecise.

local politicians. On the other hand, voters may be unaware of the exact causes of the tax increases they observe. Moreover, property taxes are a highly salient form of tax for property owners and often rank as the most hated tax in surveys, which could make property taxes more important for yardstick competition than income taxes. [9]

As the observed patterns of tax rate interaction with Finnish data are likely to be a combination of tax base competition (sign ambiguous), yardstick competition (positive) and possibly benefit spillovers (positive), the expected effect of a change in the tax rate of one municipality on nearby municipalities is ambiguous. It should be noted that the empirical strategy based on variation generated by forced increases is not necessarily informative of responses to voluntary increases.

4 Data and descriptive analysis

I use panel data on property tax rates in Finnish mainland[10] municipalities from 1993 to 2022, and other municpality charateristics for varying shorter periods. The Event Study analysis on the impacts of forced tax rate increases use data from 1996 - 2020. Summary statistics for key variables in this data set are reported in Table 1. During this period GPT rates range from 0.2% to 1.9% and RPT rates vary between 0.1% and 0.9%. There is huge variation in GPT base and revenue while RPT base and revenue varies less. This is likely due to regional differences in land values which influence the tax base of GPT but differences in the stock of business buildings may play a role too. Same kind of residential buildings have the same taxable value everywhere and therefore tax base of the RPT varies less. There is large variation in the size on municipalities. Population ranges from a few hunder to over 650,000 in the city of Helsinki.

Table 1: Summary statistics for 1996 - 2020.

	Mean	Std. dev.	Min	Max
GPT rate %	0.731	0.242	0.2	1.9
RPT rate %	0.338	0.122	0.1	0.9
GPT base, EUR/capita	9049	6171	1574	100700
RPT base, EUR/capita	15247	3641	8102	28192
GPT revenue, EUR/capita	72.6	66.3	3.8	921.3
RPT revenue, EUR/capita	54.8	31.1	9.2	220.9
Population	14268	39618	233	653835

Notes: The table show summary statistics for main variables used in the empirical analysis. Sample size is 8,904.

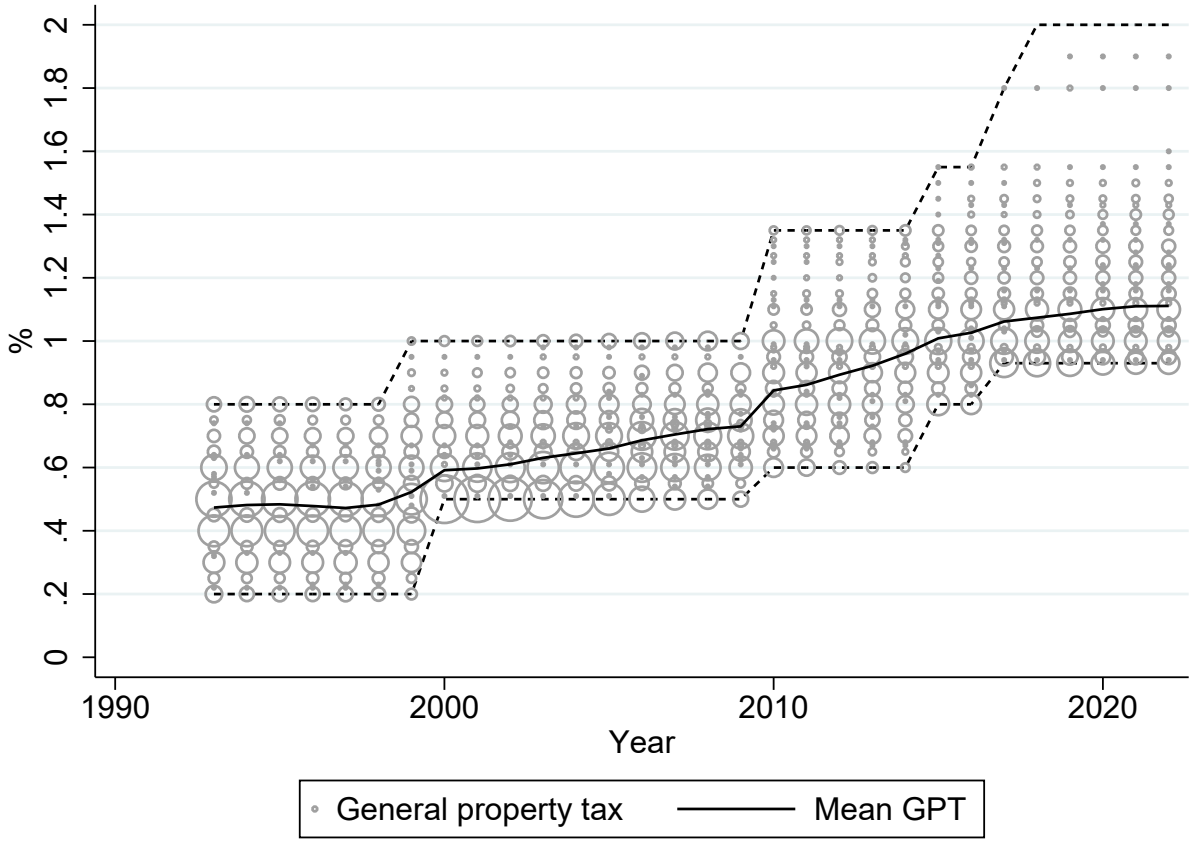
[9] Income taxation is highly automated in Finland through a witholding system and pre-filled tax returns. The property tax bill is sent by mail to the property owners each year and paying the tax requires more effort and attention than the income tax. Cabral and Hoxby (2012) provide evidence that higher salience of the property tax is associated with stronger opposition towards property taxes.

[10] Municipalities in Åland Islands are dropped due to missing data and differences in the institutional setting.

Figures 3 and 4 present the evolution of statutory bounds for the general property tax rate and residential property tax rate, together with the distribution of tax rates and the mean tax rate in 1993-2022. Size of the circles indicates the number of municipalities in the cell.

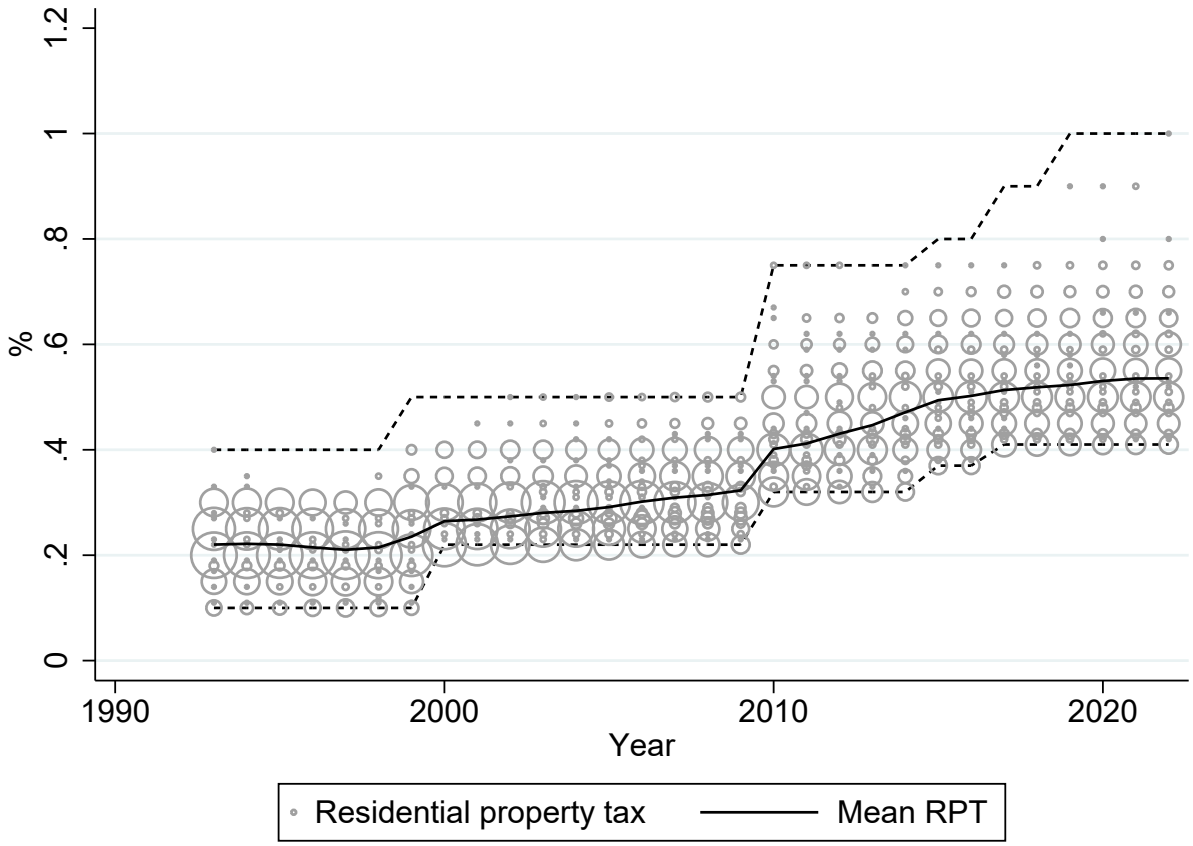
Figure 3 shows that before the reform of 2000 mean GPT was flat at about 0.5%. The increase in the lower bound in 2000 was binding for a large share of municipalities. After the reform of 2000 the number of municipalities at the lower bound decreased gradually and mean GPT increased through voluntary tax hikes. There was a clear upward shift in mean GPT in 2010 when the bounds were raised again, and the upward trend continued after the reform. The upward trend continued through the reforms of 2015 and 2017 until 2020, after which it flattened. The bounds for the RPT (Figure 4) were lower than GPT throughout the period and there are only a few observations at the upper limit of RPT.

Figure 3: General property tax rates in 1993 - 2022



Notes: The Figure shows the statutory bounds for the general property tax rate, the distribution of tax rates and the mean tax rate in 1993-2022. Size of the circle indicates the number of municipalities in the cell.

Figure 4: Residential property tax rates in 1993 - 2022



Notes: The Figure shows the statutory bounds for the residential property tax rate, the distribution of tax rates and mean tax rate in 1993-2022. Size of the circle indicates the number of municipalities in the cell.

Figures 5, 6 and 7 illustrate the spatial distribution of property tax rates in 1997, 2007 and 2017. There is clearly positive spatial correlation in all years in both property tax rates. All maps have clusters of high and low tax rate municipalities.

Figure 5: Property tax rates in 1997

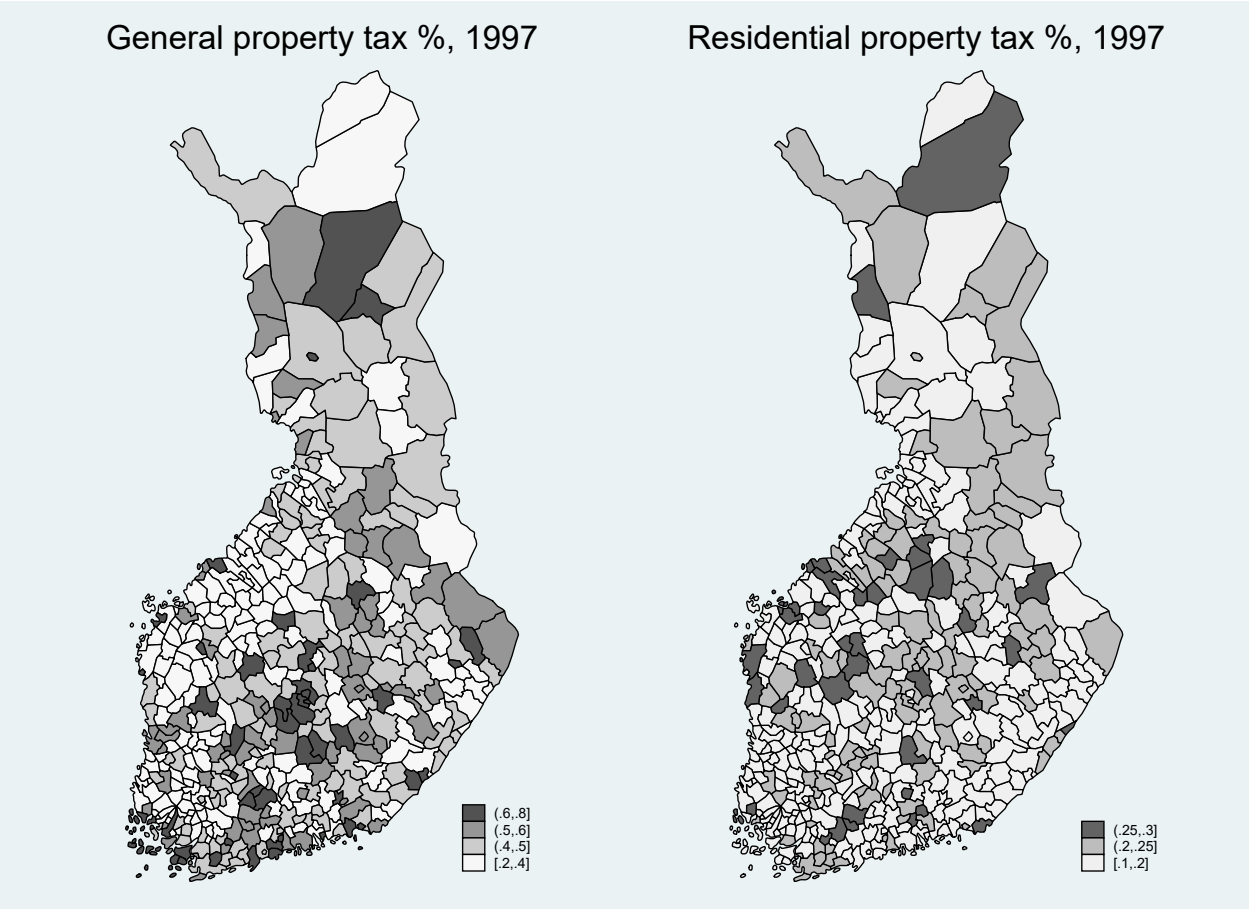


Figure 6: Property tax rates in 2007

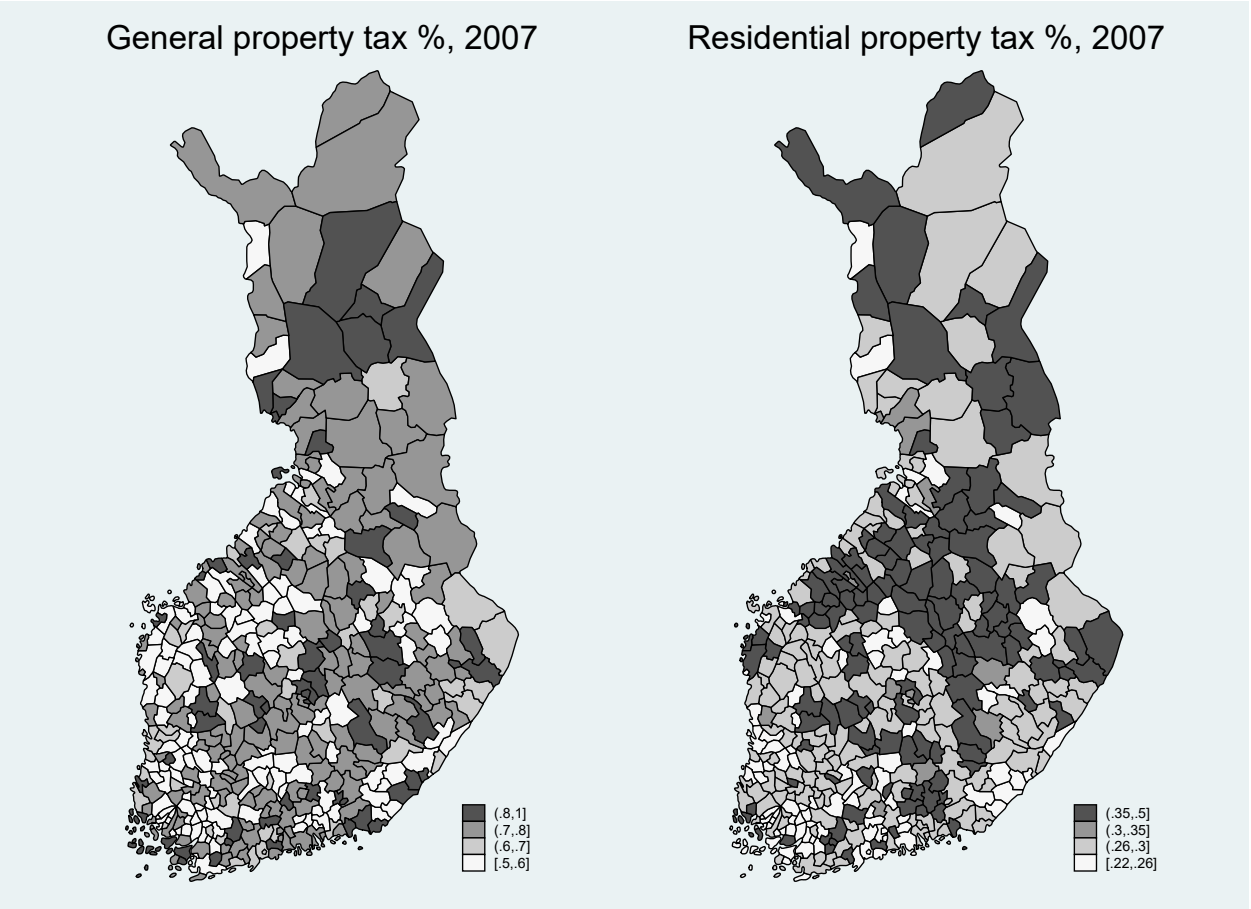
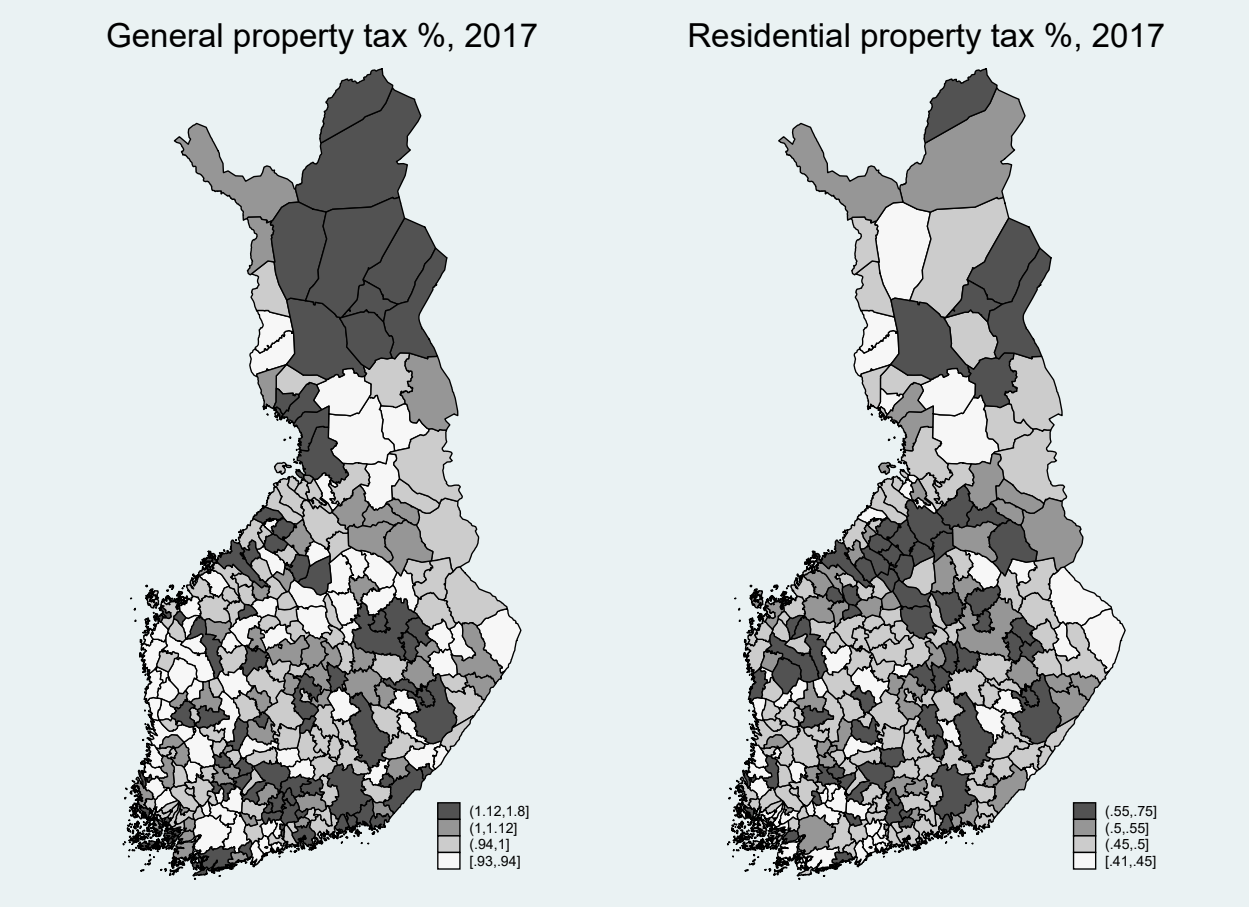


Figure 7: Property tax rates in 2017



5 Empirical strategy

Increases in the minimum property tax rate force municipalities where the limit is binding to increase their tax rates. The purpose of the empirical analysis is to test how these tax policy shocks affect their neighbors' tax rate choices, as well as their own tax rate, revenue and tax base.

Drawing on Lyytikäinen (2012) I construct a measure of 'forced increases' in the property tax rates due the reforms. The forced increase is the difference between the new lower bound $\underline{T}_t$ for the property tax rate T in year t and tax rate in year $t-1$ for municipalities with tax rate below the new lower bound. For municipalities above $\underline{T}_t$ in $t-1$ the forced increase is zero.

$$Z_{it} = D(\underline{T}_t > T_{it-1})(\underline{T}_t - T_{it-1}), \tag{1}$$

For example, a municipality with general property tax rate 0.2% in 1999 was forced to increase it's GPT by at least 0.3%-points in 2000 when the lower bound for GPT was raised to 0.5%, and thus $Z_{i2000} = 0.3$ for this municipality. The forced increases do not necessarily translate one-to-one into changes in actual tax rates because the municipality might have

increased it's tax rate also in the absence of the reform or increase it's tax rate by more than the minimum required amount.

Because the reforms of 2015 and 2017 were close to each other and small in magnitude I combine these reforms by summing up the forced increases in these years into one ($Z_{i2015\_17} = Z_{i2015} + Z_{i2017}$). The reforms of 2000 and 2010 are analyzed separately.

I use the forced increase as the treatment variable in Event Study type two-way fixed effects regressions. The forced increase for each municipality is held constant within the event window around the reform. Interest lies on the interaction of the force increase with year dummies. The model for the impact of own forced increases on outcome Y is:

$$Y_{it} = \beta_t Z_i + \kappa_i + \lambda_t + u_{it}, \tag{2}$$

The parameter of interest is β_t, which measures the impact of a one %-point forced tax rate increase relative to the base year (one year before the reform). Municipality fixed effects κ_i and year fixed effects λ_t control for time-invariant municipality characteristics and common time effect, and u_{it} is the error term. Standard errors are clustered at municipality level.

When analysing spatial interaction in tax rate setting, the treatment variable is the weighted average of imposed increases in nearby municipalities. I use a simple nearest neighbours weighing matrix where all municipalities that share border with municipality i get equal weights $1/N_i$ (where N_i is the number of i's neighbours) and other municipalities get zero weight.[11] The spatial interaction model is written as:

$$Y_{it} = \beta_t \sum_{j \neq i} (w_{ij} * Z_j) + \kappa_i + \lambda_t + u_{it}, \tag{3}$$

where w_{ij} denote spatial weights. Again, year before the reform is the base year, and controls include municipality fixed effects and year fixed effects. This model differs from Lyytikäinen (2012) who used neighbours' forced increases as an instrument for actual tax rate changes (1-4 year differences) to estimate tax competition reaction functions. Here my purpose is to estimate a reduced form model examining the effects of forced tax increases without making assumptions on whether the estimates are informative of responses to tax changes due to other factors.

I estimate a separate model for each reform and use data from four years before and four years after the reforms of 2000 and 2010 (when available). For the 2015_17 reform the event window is 2011-2020.

6 Results

6.1 Own forced tax rate increases

Before analyzing the spatial strategic interactions caused by the reforms, I will examine how own forced tax increases affects the actual tax rates, tax base, and tax revenues of municipal-

[11] Lyytikäinen (2012) tests for the robustness of his results to population weights or the inclusion of neighbours' neighbours. The findings regarding tax rate interaction are not sensitive to alternative weighing schemes.

ities.[12] I will present the results in the form of graphs that plot the Event Study coefficients for each outcome variable for all three reforms. I will begin with the forced increases in the general property tax, followed by those for the residential property tax.

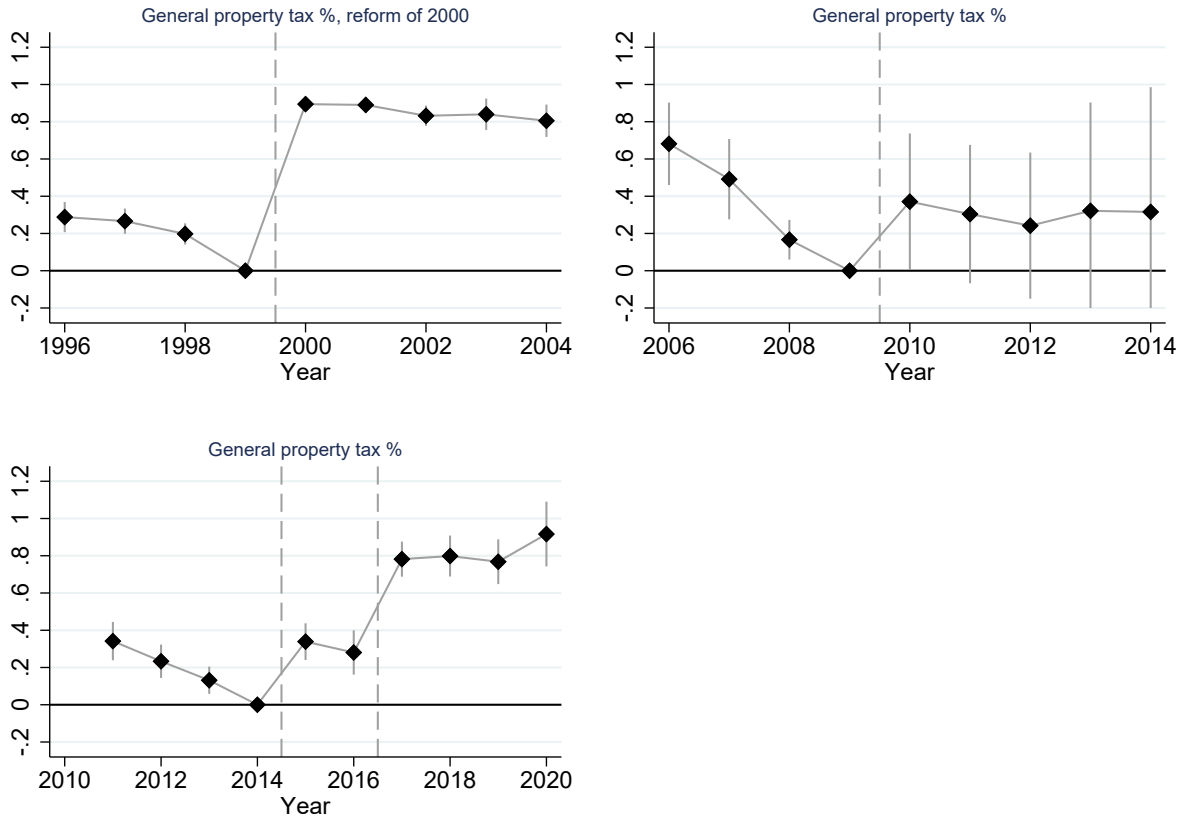
General property tax

Figure 8 shows the effect of own forced GPT increases on actual tax rates. The top left graph shows the results for the reform of 2000, top right graph for the reform of 2010, and the bottom left graph show the 2015_17 reform. Coefficient of 1 would mean that forced GPT increase lead to an equally large increase in actual GPT.

Starting from the the reform of 2000, the estimates for the impact of forced GPT increase are between 0.8 and 0.9 after the reform. Before the reform there is a slight downward trend indicating that GPT lagged behind other municipalities in municipalities that received large forced increases in 2000. This downward pre-trend is not surprising as municipalities with low tax rates in 1999 can not have raised tax rates in recent years. The negative pre-trend is even stronger in the top-right graph (2010 reform) and the impact of the forced increases on actual tax rates seems less pronounced than ten years earlier. Confidence bands are large because the reform was small in magnitude. Forced increases due to the 2015 and 2017 reforms (bottom-left) were related with a relative decline in GPT before the reform and large increases after the reform.

[12] Alas, there is not enough statistical power to study the effects on several other interesting outcomes, such as local spending or the local income tax rate, because property taxes are still a relatively unimportant source, although their importance has increased as shown in Section 2.

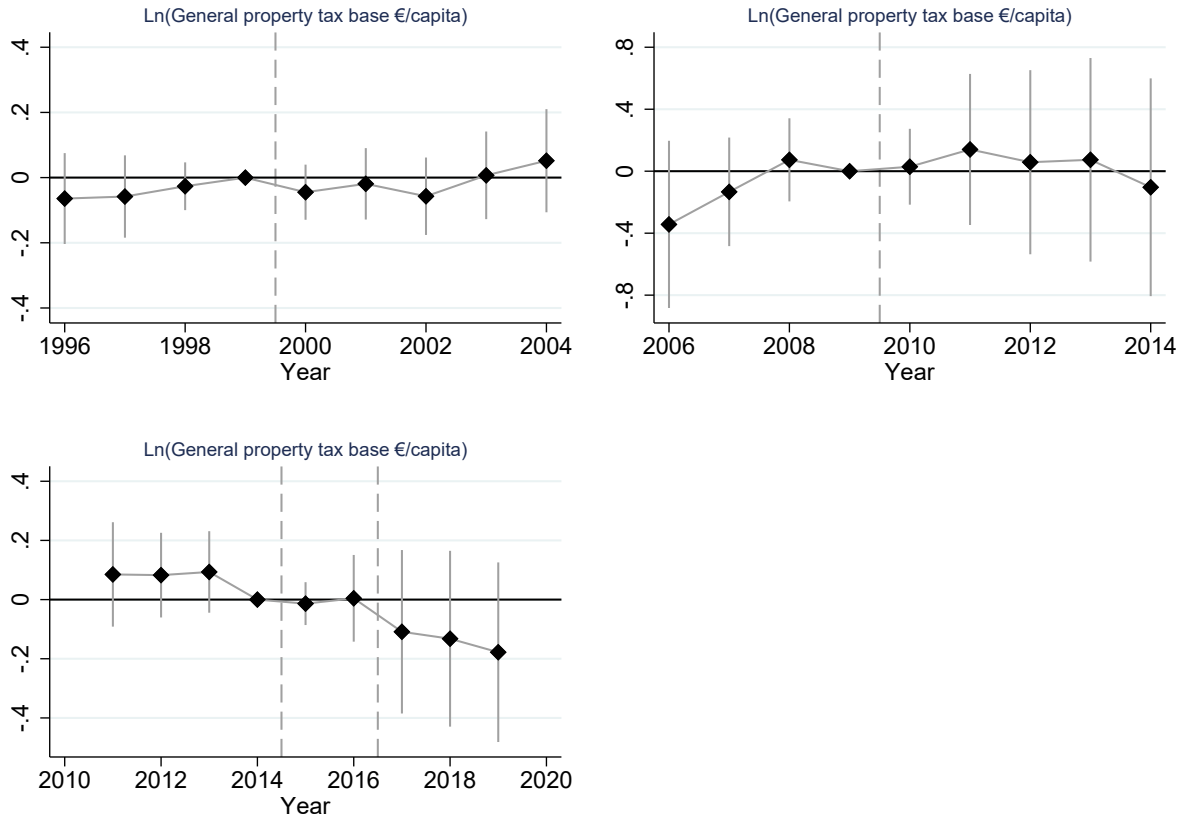
Figure 8: Own forced increases and own actual tax rate, GPT



Notes: The Figure plots coefficients on the interaction of forced tax rate increase and year dummies for the reforms of 2000 (top-left), 2010 (top-right) and 2015_17 (bottom-left). The spikes indicate 95% confidence intervals. Controls include municipality fixed effects and year fixed effects. The sample excludes municipalities with own forced increases in the reform year and municipalities for which the upper limit to the tax rate was binding one year before the reform.

Figure 9 examines the impact of forced increases on tax base. The dependent variable is log on tax base per capita, and hence the estimates are semi-elasticities of tax base per capita with respect to tax rate. There is no clear evidence of deterioration of tax base due to a foeced GPT increase, but standard errors are quite large especially after the 2010 and 2015_17 reforms and economically significant effects can not be rule out.

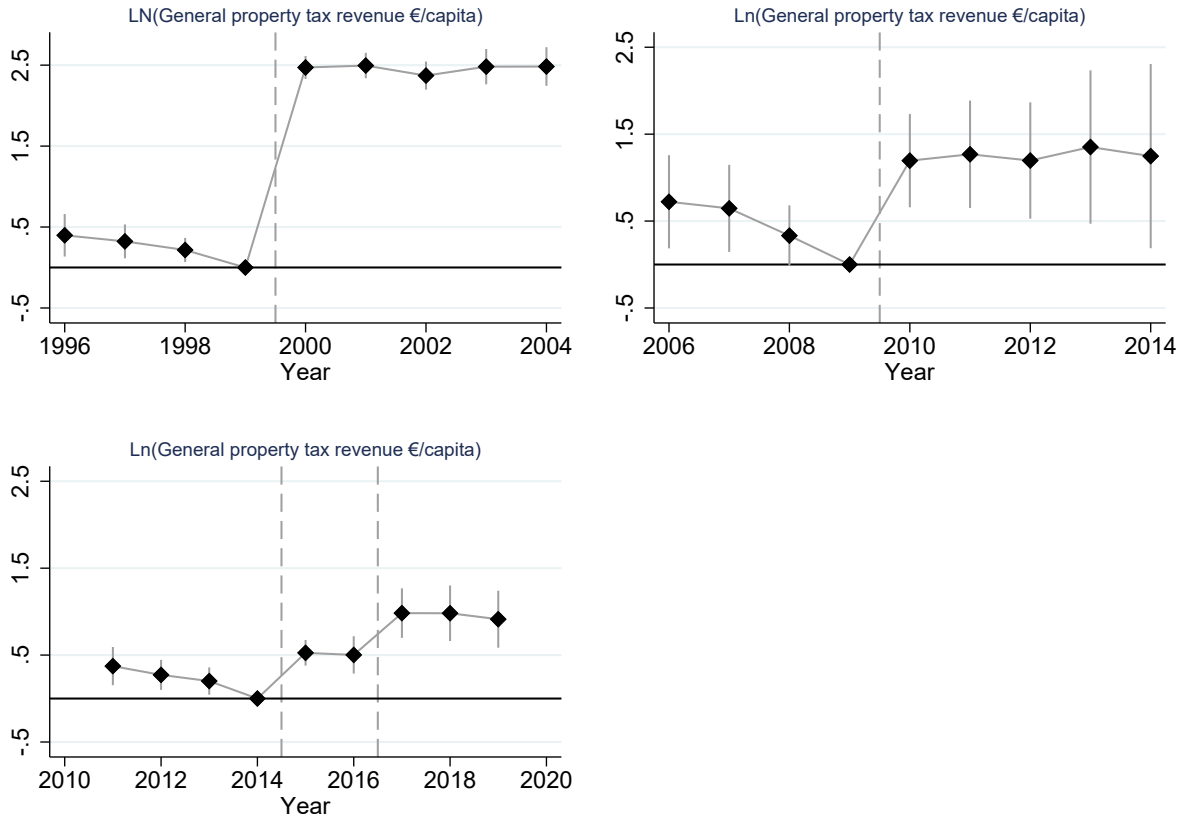
Figure 9: Own forced increases and tax base, GPT



Notes: The Figure plots coefficients on the interaction of forced tax rate increase and year dummies for the reforms of 2000 (top-left), 2010 (top-right) and 2015_17 (bottom-left). The spikes indicate 95% confidence intervals. Controls include municipality fixed effects and year fixed effects. The sample excludes municipalities with own forced increases in the reform year and municipalities for which the upper limit to the tax rate was binding one year before the reform.

The results for tax revenue are presented in Figure 10. Forced GPT increases lead to clear and lasting increases in revenue after all three reforms.

Figure 10: Own forced increases and tax revenue, GPT

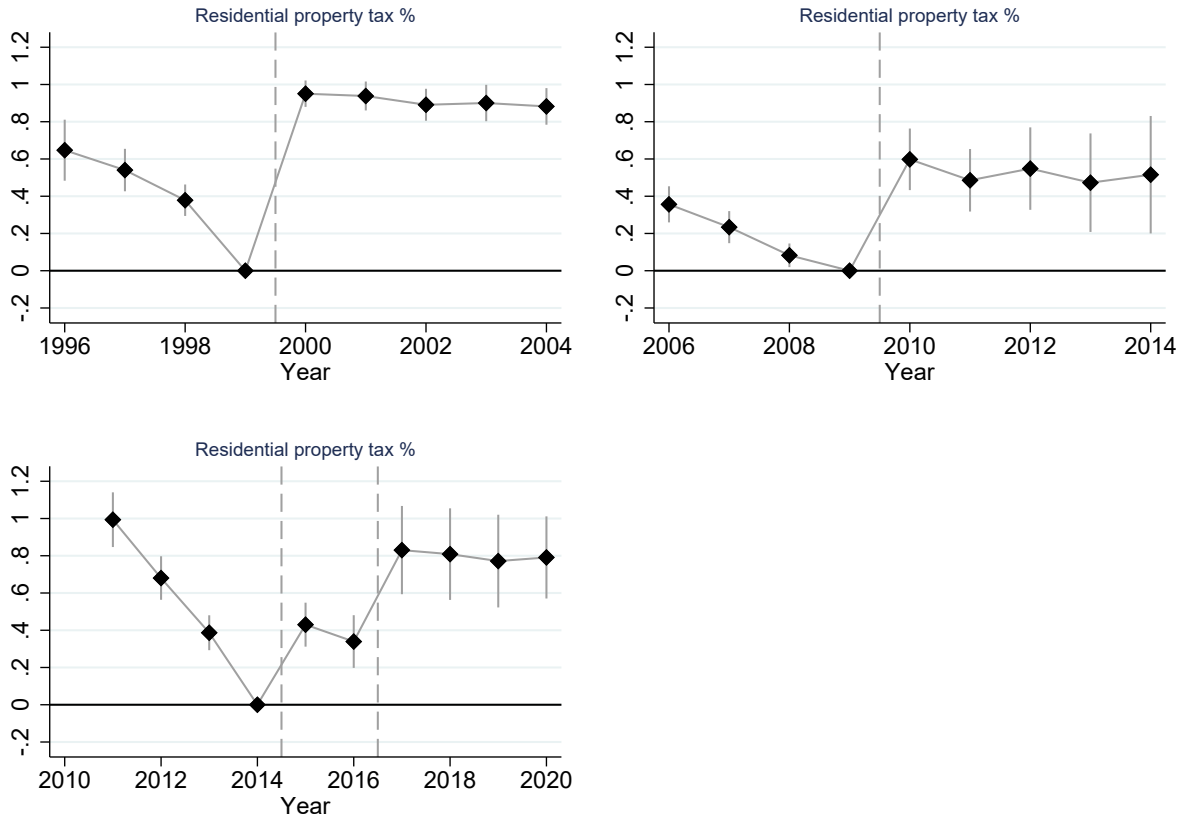


Notes: The Figure plots coefficients on the interaction of forced tax rate increase and year dummies for the reforms of 2000 (top-left), 2010 (top-right) and 2015_17 (bottom-left). The spikes indicate 95% confidence intervals. Controls include municipality fixed effects and year fixed effects. The sample excludes municipalities with own forced increases in the reform year and municipalities for which the upper limit to the tax rate was binding one year before the reform.

Residential property tax

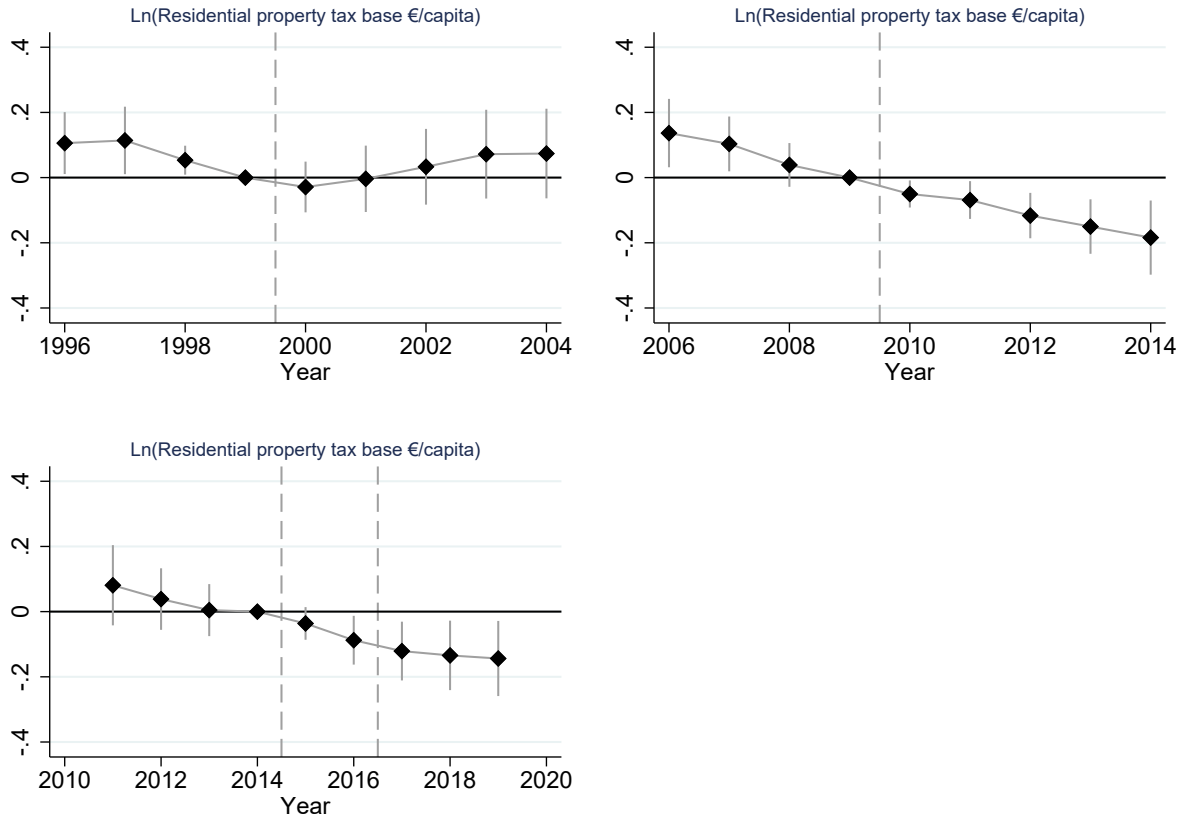
Turning to the residential property tax, Figure 11 shows that own forced RPT increases led to clear increases in actual tax rates. After the reform of 2010 the effect is less pronounced than the other reforms. Figure 12 presents the results for tax base. The estimates are not consistent with a decrease in tax base after forced increases. There is a downward trend in tax base associated with forced increases before all reforms, which continues after the reforms of 2010 and 2015_17, but is reversed after the reform of 2000. Similar to GPT, the results for tax revenue from RPT in Figure 13 show a clear and persistent increase in revenue due to forced increases.

Figure 11: Own forced increases and actual tax rate, RPT



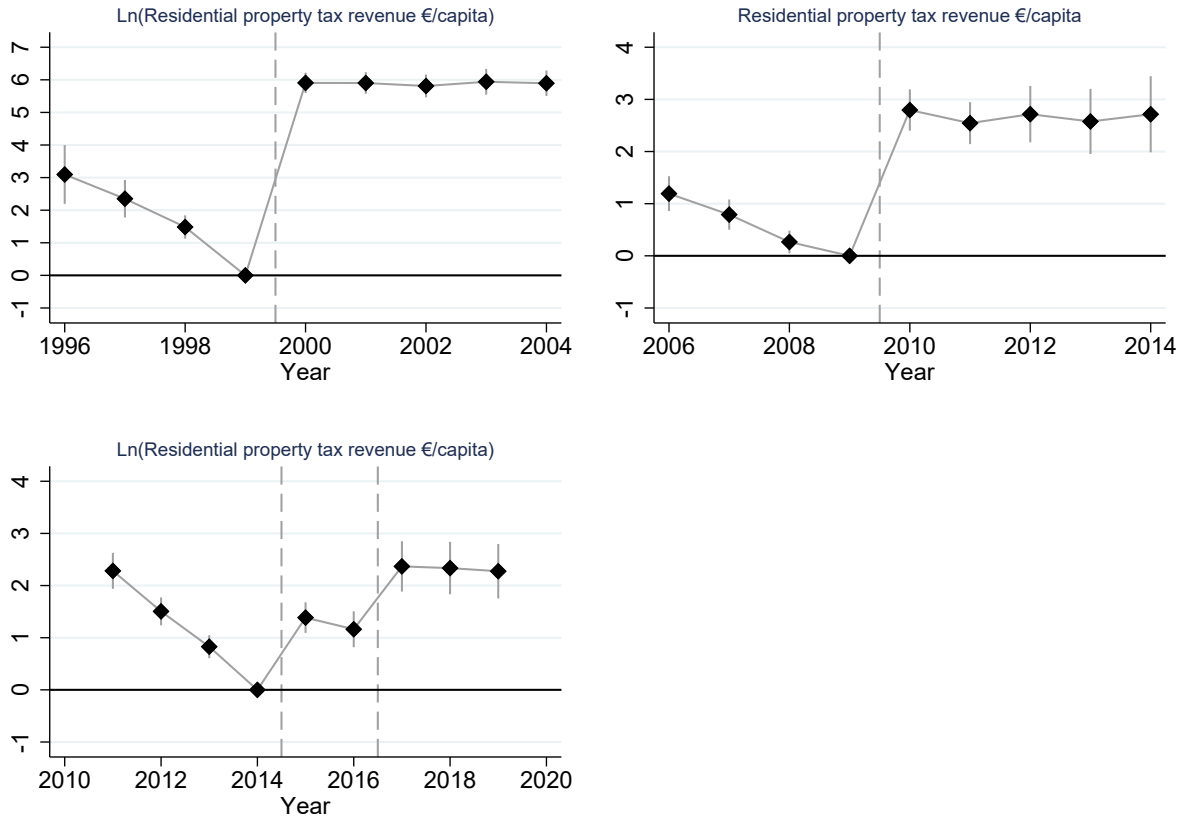
Notes: The Figure plots coefficients on the interaction of forced tax rate increase and year dummies for the reforms of 2000 (top-left), 2010 (top-right) and 2015_17 (bottom-left). The spikes indicate 95% confidence intervals. Controls include municipality fixed effects and year fixed effects. The sample excludes municipalities with own forced increases in the reform year and municipalities for which the upper limit to the tax rate was binding one year before the reform.

Figure 12: Own forced increases and tax base, RPT



Notes: The Figure plots coefficients on the interaction of forced tax rate increase and year dummies for the reforms of 2000 (top-left), 2010 (top-right) and 2015_17 (bottom-left). The spikes indicate 95% confidence intervals. Controls include municipality fixed effects and year fixed effects. The sample excludes municipalities with own forced increases in the reform year and municipalities for which the upper limit to the tax rate was binding one year before the reform.

Figure 13: Own forced increases and tax revenue, RPT

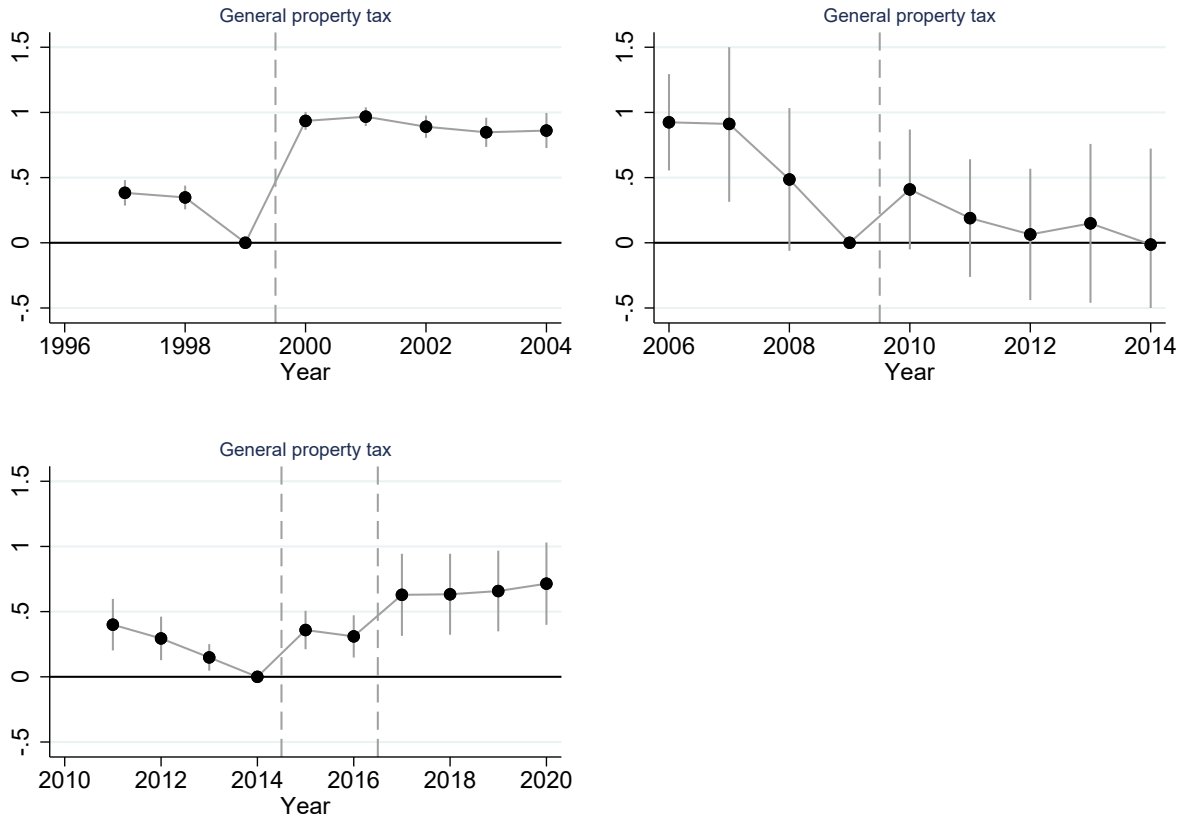


Notes: The Figure plots coefficients on the interaction of forced tax rate increase and year dummies for the reforms of 2000 (top-left), 2010 (top-right) and 2015_17 (bottom-left). The spikes indicate 95% confidence intervals. Controls include municipality fixed effects and year fixed effects. The sample excludes municipalities with own forced increases in the reform year and municipalities for which the upper limit to the tax rate was binding one year before the reform.

6.2 Spatial interaction

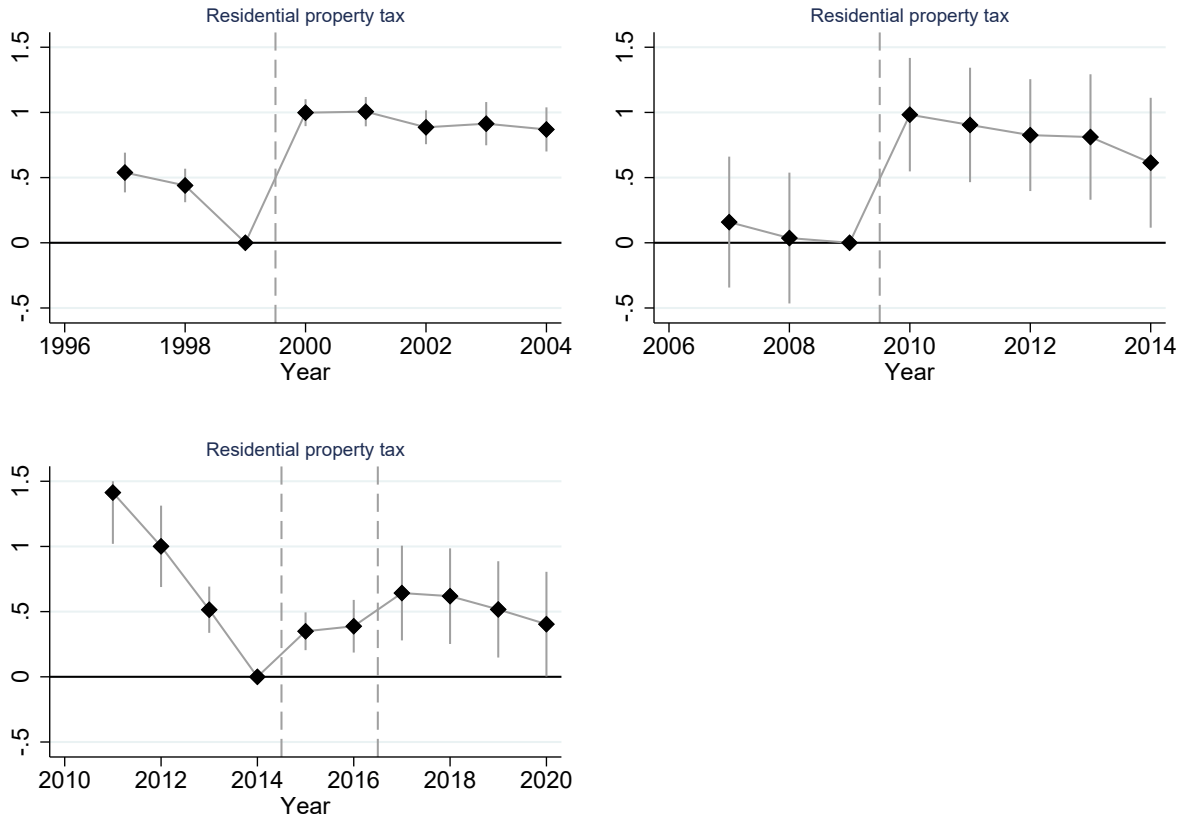
Next I turn to spatial interaction in tax rates triggered by the minimum tax rate increases. To assess whether forced increases caused significant variation in spatially weighted average tax rates I first estimate a model where spatially weighted actual tax rate is the outcome variable. Figure 14 show the results for GPT. The 2010 reform, which increased the minimum GPT rate by oly 0.1%-points, did not seem to cause as clear increases in GPT as the other reforms. Figure 15 presents the findings for RPT. Forced RPT increases lead to clear increase in actual rates after all reforms. Before the 2015_17 there is a strong negative pretrend.

Figure 14: Neighbors' forced increases and neighbors' actual tax rates, GPT



Notes: The Figure plots coefficients on the interaction of neighbors' average forced tax rate increase and year dummies for the reforms of 2000 (top-left), 2010 (top-right) and 2015_17 (bottom-left). The spikes indicate 95% confidence intervals. Controls include municipality fixed effects and year fixed effects. The sample excludes municipalities with own forced increases in the reform year and municipalities for which the upper limit to the tax rate was binding one year before the reform.

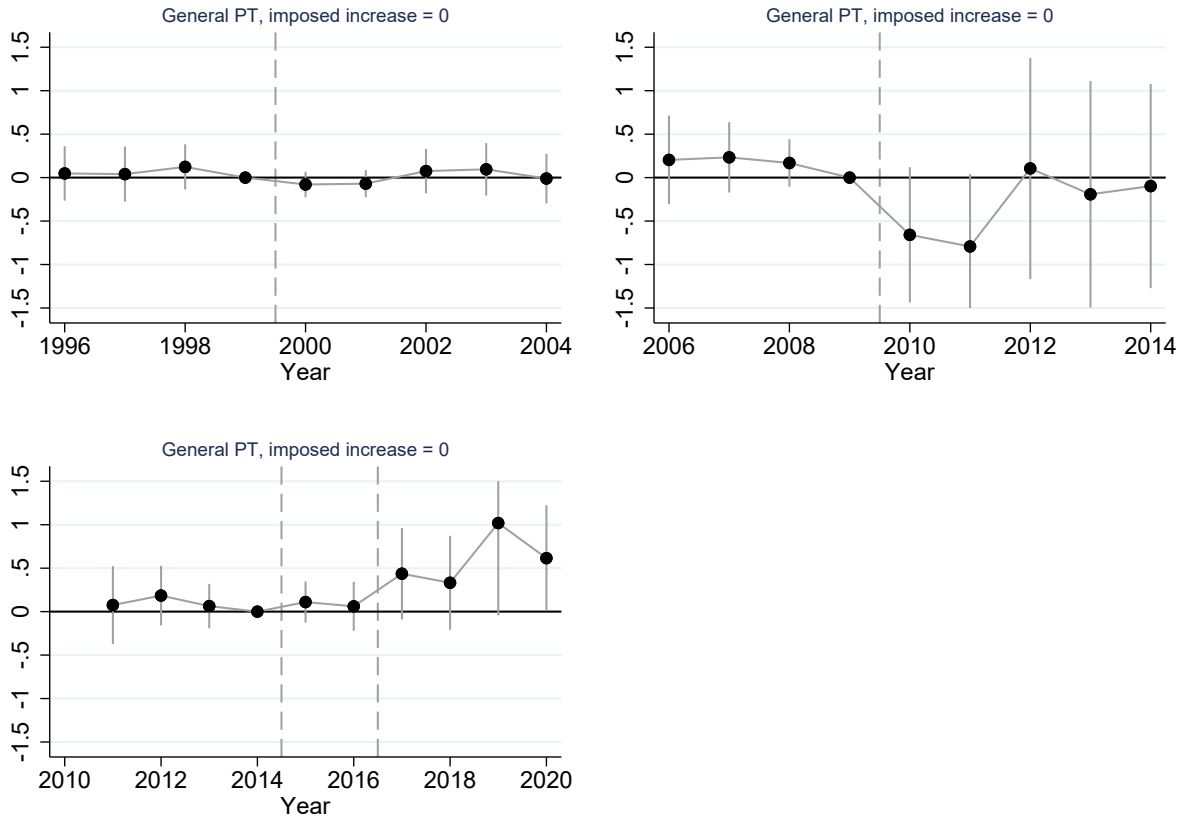
Figure 15: Neighbors' forced increases and actual tax rates, RPT



Notes: The Figure plots coefficients on the interaction of neighbors' average forced tax rate increase and year dummies for the reforms of 2000 (top-left), 2010 (top-right) and 2015_17 (bottom-left). The spikes indicate 95% confidence intervals. Controls include municipality fixed effects and year fixed effects. The sample excludes municipalities with own forced increases in the reform year and municipalities for which the upper limit to the tax rate was binding one year before the reform.

Figure 16 presents the findings on how the choice of GPT rate is affectd by neighbours forced GPT increases. The results for the 2000 reform, indicate that GPT is unaffected by forced increases in nearby municipalities. This finding is in line with Lyytikäinen (2012). The results for the relatively small reform in 2010 are too imprecise to be informative. Forced increases due to the reform of 2015_17 seem to lead to tax increases in neighboring municipalities. A possible reason for the difference between the findings from the 2000 reform and the 2015_17 reforms is the equalization reform which removed property taxes from the tax base equalization scheme. Also the decrease in the number of municipalities may have increased strategic interaction. It should be however noted that the event study estimates have large standard errors and we can not rule out economically insignificant zero coefficients with a large degree of confidence.

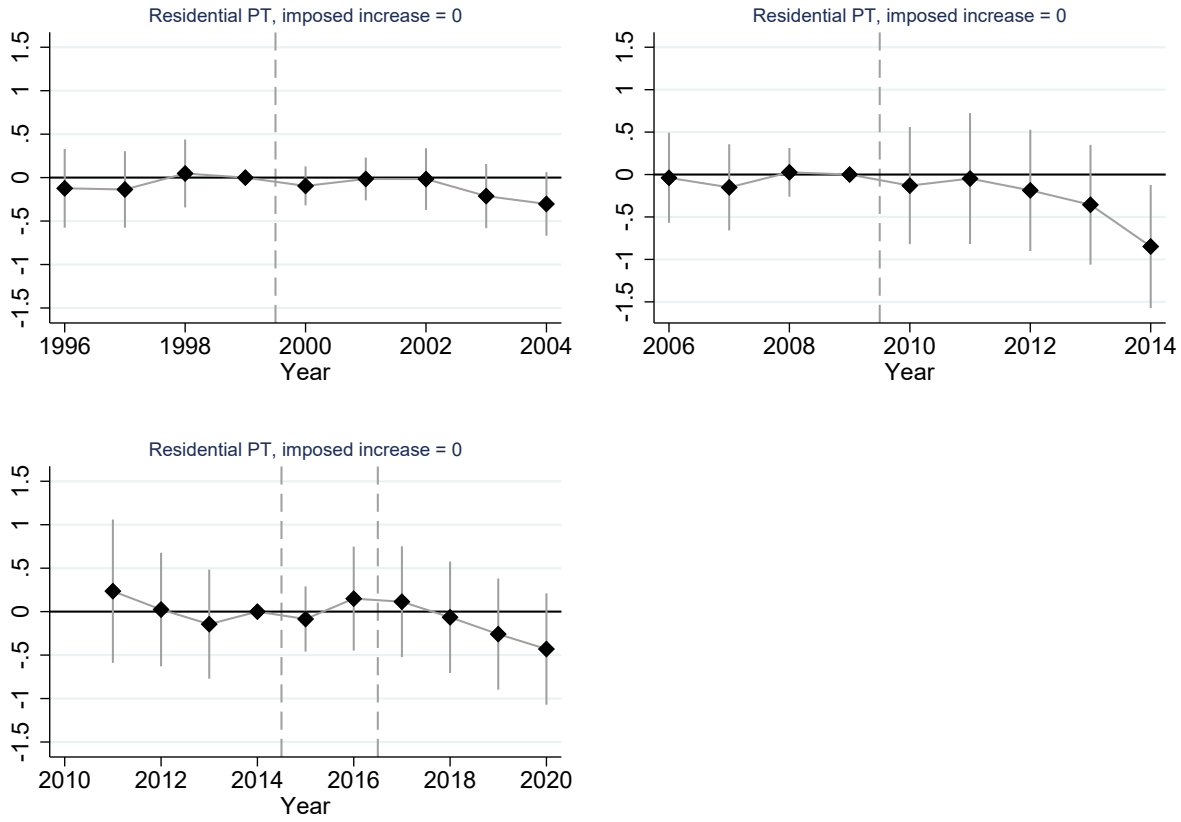
Figure 16: Tax rate interaction, GPT



Notes: The Figure plots coefficients on the interaction of neighbors' average forced tax rate increase and year dummies for the reforms of 2000 (top-left), 2010 (top-right) and 2015_17 (bottom-left). The spikes indicate 95% confidence intervals. Controls include municipality fixed effects and year fixed effects. The sample excludes municipalities with own forced increases in the reform year and municipalities for which the upper limit to the tax rate was binding one year before the reform.

Figure 17 presents the tax rate interaction findings for RPT. The Event Study estimates show a similar pattern after all three refomrs. Neighbors' forced tax rate changes seem to lead to gradual decline in RPT rates 3-5 years after the reform, and there is significant negative coefficient five years after the reform of 2010. This consistent pattern point towards neighboring municipalities' RPT rates being strategic substitutes. A potential mechanism could be one where municipalities expect that their neighbors' forced RPT increase will lead to an increase in their tax base and they can therefore lower their RPT without losing revenue.

Figure 17: Tax rate interaction, GRT



Notes: The Figure plots coefficients on the interaction of neighbors' average forced tax rate increase and year dummies for the reforms of 2000 (top-left), 2010 (top-right) and 2015_17 (bottom-left). The spikes indicate 95% confidence intervals. Controls include municipality fixed effects and year fixed effects. The sample excludes municipalities with own forced increases in the reform year and municipalities for which the upper limit to the tax rate was binding one year before the reform.

7 Conclusions

This paper analyses empirically the effects of minimum property tax rates using panel data for Finnish municipalities and an Event Study research design.

I find that neighbors' forced increases of the general property tax rates did not trigger responses after the reform of 2000. This is consistent with the findings of Lyytikäinen (2012) for the same reform using a somewhat different estimation strategy. The results for the reform of 2010 regarding spatial interaction of GPT rates are too imprecise to be informative. The reforms of 2015 and 2017 indicate that forced increases lead to GPT increases in nearby municipalities. This would be consistent with intensified competition on commercial real estate after the removal of property taxes from the tax base equalization scheme in 2012.

As regards spatial interaction of RPT rates, I find some indication that neighbors' forced

increases in RPT rates lead to lower tax rate choices by their neighbors. The ES estimate is negative four years after each of the three reforms studied, albeit statistically significant only after the 2010 reform.

Forced property tax rate increases have a clear and lasting effect on own tax revenue in the affected municipalities, implying that the tax capacity of the central government as regards other tax bases likely increased. Interestingly, analysis of government bills on tax rate bounds suggests that the increases in minimum tax rates were at least partly motivated by vertical tax competition between central and local governments on income and corporate taxes.

There is no clear evidence of detrimental effects on tax base leading to loss of revenue four years after the reform. This is perhaps not surprising as the stock of housing and business buildings can adjust only gradually through new construction and demolition. Limited time horizon and large statistical uncertainty mean that I can not rule out economically significant tax base effects in the longer run.

References

Agrawal, D.R., 2015. The tax gradient: Spatial aspects of fiscal competition. American Economic Journal: Economic Policy 7, 1–29.

Agrawal, D.R., Hoyt, W.H., Wilson, J.D., 2022. Local policy choice: theory and empirics. Journal of Economic Literature 60, 1378–1455.

Baskaran, T., 2014. Identifying local tax mimicking with administrative borders and a policy reform. Journal of Public Economics 118, 41–51.

Brueckner, J.K., Saavedra, L.A., 2001. Do local governments engage in strategic property—tax competition? National Tax Journal 54, 203–229.

Cabral, M., Hoxby, C., 2012. The hated property tax: salience, tax rates, and tax revolts. Technical Report. National Bureau of Economic Research.

Case, A.C., Rosen, H.S., Hines Jr, J.R., 1993. Budget spillovers and fiscal policy interdependence: Evidence from the states. Journal of public economics 52, 285–307.

Gibbons, S., Overman, H.G., 2012. Mostly pointless spatial econometrics? Journal of regional Science 52, 172–191.

Keen, M., Konrad, K.A., 2013. The theory of international tax competition and coordination. Handbook of public economics 5, 257–328.

Lyytikäinen, T., 2009. Three-rate property taxation and housing construction. Journal of Urban Economics 65, 305–313.

Lyytikäinen, T., 2012. Tax competition among local governments: Evidence from a property tax reform in finland. Journal of Public Economics 96, 584–595.

Saarimaa, T., Tukiainen, J., 2015. Common pool problems in voluntary municipal mergers. European Journal of Political Economy 38, 140–152.

Wildasin, D.E., 1988. Nash equilibria in models of fiscal competition. Journal of public economics 35, 229–240.

Zodrow, G.R., Mieszkowski, P., 1986. Pigou, tiebout, property taxation, and the underprovision of local public goods. Journal of urban economics 19, 356–370.