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Effects of Municipal Mergers on Voter Turnout

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Abstract

We study the effects of municipal mergers on voter turnout in a difference-in-differences framework, using data from a wave of municipal mergers in Finland in 2009. Analysing two pre-merger elections and three post-merger elections, spanning a total of 17 years, we find that municipal mergers decrease voter turnout by 4 percentage points in the long run in the relatively small municipalities compared to similar small municipalities that did not merge. As the average turnout rate prior to merging in this group was around 69%, this is a substantial effect. We also find that virtually nothing happens to turnout in the municipalities that were relatively large within their merger. Furthermore, mergers are associated with a decrease in voters' political efficacy and turnout decreases more in those municipalities that experience larger decreases in efficacy.

Keywords: Difference-in-differences, jurisdiction size, municipal mergers, quasi-experiment, turnout.

Word count: 6780

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1. Introduction

In the last 60 years, municipal merger reforms have been implemented in a vast number of countries (see, e.g., Blom-Hansen et al. 2016). Policy-makers view municipal mergers as having many benefits. In addition to realizing economies of scale, mergers may be beneficial due to internalization of interjurisdictional spillovers, and due to increased fiscal and service provision capacity to bear expenditure or revenue shocks. Moreover, they may lead to increased state capacity arising from the ability to attract more competent municipal employees and politicians and having scope for them to specialize.

However, merging also involves trade-offs as also a small size may have its own benefits. Besides a multitude of economic concerns with large jurisdictions (Miceli 1993; Besley and Case 1995; Alesina and Spolaore 1997; Ellingsen 1998; Blom-Hansen et al. 2014; Blom-Hansen et al. 2016), mergers may have consequences for the functioning of local democracy. In small localities, it is easier for politicians to be informed about citizens' needs as voters are closer to the decision-makers. This may make voters feel more efficacious and make politics less abstract (Verba and Nie 1972; Dahl and Tufte 1973; Oliver 2000; Treisman 2007; Lassen and Serritzlew 2011). Moreover, it may be easier to develop a sense of community in small jurisdictions, which may encourage political participation. These concerns, in turn, may feed back to the economic effects of mergers (Harjunen et al. 2017). On the other hand, it is possible that only large jurisdictions can sustain meaningful contested politics.

These concerns have not gone unnoticed in the prior literature on municipal mergers. Lassen and Serritzlew (2011) find that mergers in Denmark decreased citizens' political efficacy based on survey responses. They attribute this finding to increasing jurisdiction size. Similarly, Danish voters have lower levels of political trust (Hansen 2013) and are less satisfied with their local governments (Hansen 2015) following local government consolidations. Saarimaa and Tukiainen (2016), using the same Finnish mergers as the current study, find that mergers had large effects on candidate selection and that voters care for local (pre-merger municipality level) political representation and

pool votes to local candidates in order to guarantee representation in the post-merger council in the first post-merger elections.[1]

To our knowledge, the only paper that looks at turnout effects of municipal mergers is Koch and Rochat (2017), who find that mergers have a detrimental effect on turnout in Switzerland, especially in the relatively smaller merger partners. Roesel (2017) analyses the turnout effects due to mergers of large county-level governments (districts) in Germany and finds that they also decrease turnout. Clearly, more research is needed from different institutional contexts to shed light on how voters' actual behaviour is affected by local government mergers.

In this paper, we answer this call for more research by taking advantage of municipal mergers in Finland in 2009 to study voter turnout at municipal council elections. Using voting data at the level of polling districts, we reconstruct measures of voter turnout at the level of pre-merger municipalities for the three elections that followed the merger wave. To address the non-random selection of municipalities into mergers, we follow the recent methodological contribution in Harjunen et al. (2017) and combine merger simulations, nonparametric nearest-neighbour matching and difference-in-differences methods.

Our setting presents a number of advantages. First, having data at the pre-merger municipality level allows us to analyse heterogeneity in the effects with respect to the relative size of the municipalities. Second, we can follow the evolution of turnout over a relatively long time period (two pre-merger elections and three post-merger elections, spanning a total of 17 years). Third, we can combine our analysis of turnout with an analysis of political efficacy using survey data, thus linking two literatures usually considered in isolation. On the other hand, we highlight the issues in trying to understand the mechanisms behind the turnout effects.

Our main finding is that municipal mergers (and the accompanying increase in jurisdiction size) decrease voter turnout substantially in the relatively small municipalities compared to similar small municipalities that did not merge. The decrease happens gradually. In the first post-merger elections, nothing happens to turnout in these

[1] Earlier literature also suggests that political considerations have played a role in the merger decisions in different countries (Bhatti and Hansen 2011; Saarimaa and Tukiainen 2014; Hyytinen et al. 2014 and Bruns et al. 2015).

municipalities. This may be explained by the fact that these first elections were held before the voters had any experience on the functioning of the new municipality, or that mergers were a high-salience policy issue. Then in the subsequent two elections, turnout decreases by 4 percentage points. As the average turnout rate prior to merging in this group was around 69%, this is a substantial effect. We also find that virtually nothing happens to turnout in the municipalities that were relatively large within their merger.

Regarding political efficacy, we find that mergers are associated with a decrease in efficacy. We also find that turnout decreases more in those municipalities that experience larger decreases in efficacy. It should be noted, however, that our data on political efficacy is not as extensive as our data on turnout. Moreover, this evidence is not conclusive as political efficacy may be correlated with other factors that influence turnout. Nonetheless, we find these results to be interesting as they suggest that political efficacy and participation are closely connected.

The rest of the paper is organized as follows. In section 2, we present a short theoretical background on the mechanisms through which mergers could affect turnout. In Section 3, we describe the Finnish municipalities and the 2009 merger reform. In Section 4, we describe our data and research design. In Section 5, we present the results. The last section concludes.

2. Theoretical background

There are many mechanisms through which mergers could affect turnout. The standard tool of analysing turnout in political science is the rational voting model (Downs 1957; Riker and Ordenshook 1968). In this model, voting is costly, and voters get both instrumental and expressive benefits from voting. Voting affects the instrumental benefits only if the voter is pivotal.

Mergers can affect all the components of this model. First, mergers may increase the costs of voting as voters need to acquire information about new candidates from the merger partners, many of which live far away from the voters.

Second, mergers may increase or decrease the instrumental benefits of voting. On the one hand, mergers may increase instrumental benefits as larger municipalities are responsible for more money (Anderssen et al. 2014). Moreover, the stakes may increase, especially in remote small municipalities that face the threat of losing local services

(Harjunen et al. 2017). On the other hand, in small localities, it is easier for the politicians to be informed about the citizens' needs. By worsening the politicians' information on the needs of the voters, mergers may decrease the instrumental benefits received by voters. However, this effect could be mitigated by the increased probability of voters finding a better match for their preferences from a larger set of candidates. Indeed, Saarimaa and Tukiainen (2016) report that the Finnish mergers analysed in the current study increased the number of overall candidates to choose from for voters in small merged municipalities in the first elections after the mergers.

Third, mergers typically decrease the probability of a voter being pivotal as they lead to more voters per candidate and per available council seat. Lyytikäinen and Tukiainen (2016) show that pivotal probabilities in Finnish municipalities are non-negligible in magnitude. They also show that turnout is responsive to pivotal probability.

Fourth, there are various ways that mergers may affect the expressive components of the model. For example, it may be easier to develop a sense of community in small municipalities, which encourages political participation due to expressive motives such as duty (Koch and Rochat 2017). As municipal size increases these motives may become weaker. Moreover, social pressure to vote is likely to be higher in small municipalities (Gerber *et al*. 2008; Funk 2010; DellaVigna *et al*. 2017).

In addition to the rational voting model, political science literature has also emphasised the connection between political efficacy and participation (Clarke and Acock 1989; Pollock 1983). As documented by Lassen and Serritzlew (2011), mergers may reduce internal political efficacy of the voters, and thus, be detrimental for participation.

Mergers also change district magnitude, which in turn affects the proportionality of the elections, as with more available seats, party vote shares map more accurately to seat shares. Increased proportionality also implies that the minimum vote share required for the seat decreases. Therefore, in more proportional systems voters may perceive that fewer votes are wasted, and thus, turnout is higher (Karp and Banducci 2008; Gallego et al. 2012; Eggers 2015).

In addition to voters, candidates and parties may respond to mergers and this could have a feedback effect on turnout. This may happen through increased campaigning

efforts and strategic candidate placement (Powell 1986; Cox 1999). This may also alter voters' incentives to vote strategically as discussed by Saarimaa and Tukiainen (2016).

This list of arguments is by no means exhaustive. The point of this section is that mergers may affect voters' and parties' incentives in a myriad of ways and the resulting overall effect may be positive or negative, and may depend on the change in the size of the municipalities or their size relative to their respective mergers. Therefore, the question of whether and how mergers affect turnout is ultimately an empirical one.

3. Finnish municipalities and mergers

The following description is based on Harjunen et al. (2017) who provide an overview on the functioning of Finnish municipalities and the merger reform.

Municipal tasks and revenue sources: Finland has a two-tier system of government consisting of the central government and municipalities. Municipalities have extensive tasks and fiscal autonomy, which makes municipal elections important from voters' perspective. In addition to local public goods and services, municipalities are responsible for providing most of social and health care services along with primary and secondary schooling. The GDP share of municipality spending is roughly 18 percent and they employ around 20 percent of the total workforce.[2] The most important sources are local taxes and operating revenues, such as fees. Regional tax base and cost disparities are offset by a central government grant system.

Municipal politics: Municipal councils are the main decision-making body. The length of the council term is four years and starts in January after the elections. The term from 2012 onwards was an exception because the subsequent elections were moved from October 2016 to April 2017. Only permanent residents of a municipality can vote or run for a council seat. Each municipality has only one electoral district (i.e. constituency) and no geographic quotas are in place, even after a merger. This implies that mergers may have large effects on political competition. The elections are held on the same day in all municipalities. Voting in advance is also possible for all voters, but in a more limited number of locations than on Election Day.

[2] Currently, there is a plan in place to introduce a new middle tier from 2020 onwards, which will be responsible for, e.g. health and social care.

Finland has a proportional representation (PR) system with eight major parties in national and municipal politics. The party lists are open and voters vote for an individual candidate. Party vote is calculated as the sum over its candidates' votes. Council seats are allocated to parties based on the party vote shares in accordance with competitive indices set by the d'Hondt method. Personal votes determine the position of the candidates within the party list.

Merger reform: In 2005, the central government initiated a plan that aimed at reforming the municipal revenue structure and more importantly making the production of statutory municipal services more efficient. The reasons behind the reform included aging-related expected increases in municipal expenditures and disparities in municipal revenue bases and demographics.

In 2006, there were 431 municipalities in total. Following the central government plan, 14 mergers took place in 2007, 1 in 2008 and 32 in 2009. This reduced the number of municipalities to 348. The number of municipalities involved in a given merger ranged from 2 to 10 municipalities. We concentrate on the mergers that took place in 2009.[3] The development of the overall number of municipalities and the map highlighting the 2009 mergers are presented in Fig. 1.

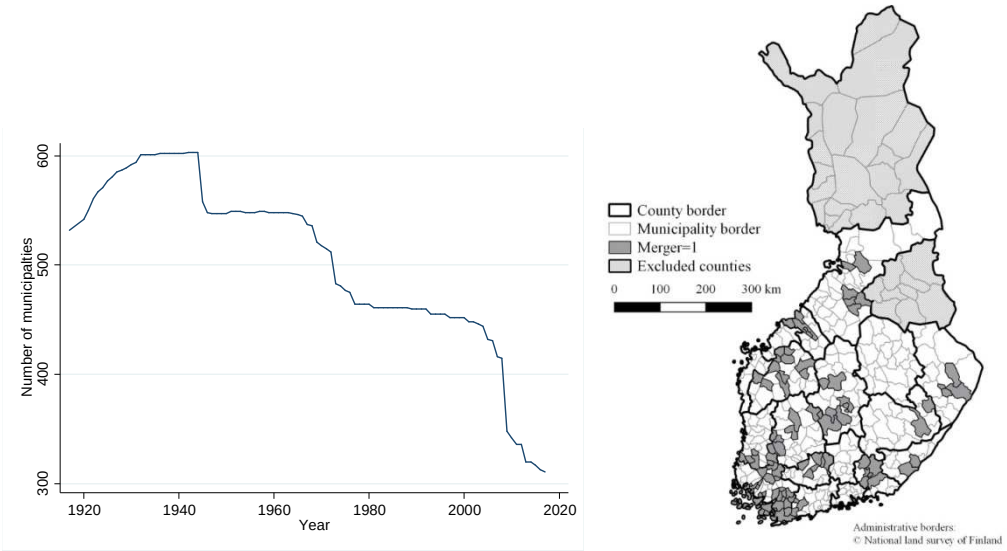

Fig. 1. Number of municipalities in Finland 1917–2017 and the 2009 mergers.

[3] The 2007 mergers happened in the middle the council term. The 2008 elections are therefore different for these municipalities than for those in the 2009 mergers, because the earlier ones have already experienced some of the effects of the merger on service quality and taxes. Including the 2007 mergers would therefore make the interpretation of the effects difficult.

4. Data and research design

4.1 Data

Our main data source is the election database of the Finnish Ministry of Justice obtained through Statistics Finland. The data include the results of municipal elections held in 2000, 2004, 2008, 2012, and 2017. For the municipalities in the 2009 merger wave, the October 2008 municipal elections were already held using the merged municipalities as constituencies. This means that we have two pre-treatment and three post-treatment elections.

To re-construct voting outcomes at the level of pre-merger municipalities, we use voting data at the level of polling districts, sub-municipal geographical units where voters are assigned to vote and at which votes are counted. Polling districts are mostly the same in 2008 as in 2004, allowing us to identify each polling district with a pre-merger municipality. For subsequent elections, polling districts are modified, but usually identifiable through their names or from geographical designations.[4] In cases where polling districts become unidentifiable in later years, we drop these municipalities and corresponding mergers from the sample. In the end, we are left with 61 merged municipalities for which we have turnout data for all the municipal elections.[5]

In addition to voter turnout, we also investigate the connection between mergers and political efficacy: citizens' feeling that they can impact the political process (see Campbell et al. 1954).[6] Efficacy may be an important driver of turnout. To measure this concept, we turn to survey data collected by Pekola-Sjöblom (2014) on a subset of municipalities in 2008 (before the mergers took effect) and 2011 (after the mergers).[7] In merging municipalities, the survey is conducted at the pre-merger municipality level in both years, and asks questions about the degree to which respondents feel like they can

[4] For example, polling districts in 2012 and later might take the name of the pre-merger municipality. In those cases, we assume that they correspond to the pre-merger municipality.

[5] The dropped municipalities are somewhat larger in terms of population and have more polling districts than the ones we were able to match across years. However, as we show later, we have enough data that the assumptions for difference-in-differences still hold in our context.

[6] Some studies separate between internal and external efficacy (Lassen and Serritzlew 2011). We do not have data to do so.

[7] Pekola-Sjöblom (2014) reports that the sample of the municipalities in the study were chosen so that they would be representative of all the municipalities in Finland. The number of individual respondents per municipality ranged from 13 to 388. We have checked that our results hold when using only the municipalities with at least a 100 respondents.

take part in and have an impact on local politics. The answers to that survey are coded on a scale of 1 to 5, larger value referring to higher efficacy. We use municipality level averages as our measure of efficacy.

4.2 Research design

Ideally, we would want to compare voter turnout in merged municipalities to voter turnout in these same municipalities had they not experienced the merger. Here we run into the fundamental problem of causal inference which is that we never observe more than one realized outcome for a single municipality. The challenge is then to construct a credible counterfactual that serves as the baseline when estimating the causal effect. The Finnish mergers were voluntarily decided by the local municipality councils, and thus, the merged municipalities may be different from the municipalities that did not merge in ways that are unobservable to us, and which may lead to selection bias. To address the non-random assignment issue, we follow Harjunen et al. (2017) and combine nearest-neighbour matching algorithm with DID methods.

In the first step, we construct a control group by simulating all possible mergers involving up to ten municipalities that could have taken place according to the pre-merger municipality map.[8] We constrain these hypothetical mergers in the following ways: First, before we simulate the hypothetical mergers, we extract all the municipalities that actually underwent a merger in the period 2005–2016 from the municipal map. This ensures that the control group is not contaminated by municipalities that actually underwent a merger during our analysis period. Second, we only allow the simulated mergers to take place between adjacent municipalities so that the hypothetical new municipality is geographically contiguous. Finally, we allow the simulated mergers to take place only within county borders as was the case with the actual mergers (see Fig. 1). This procedure gives us a total of 7,295 hypothetical mergers that did not actually take place.

In the second step, we use nonparametric nearest-neighbour matching based on merger level characteristic from the pre-merger period to find suitable controls for the actual mergers from the group of hypothetical mergers.[9] In our case, matching on pre-

[8] See Saarimaa and Tukiainen (2014) and Harjunen et al. (2017) for further details on the procedure.

[9] Following Harjunen et al. (2017), we use exact matching with respect to number of municipalities in the merger. The matching was based on the following covariates: total population of the merger, median distance of the citizens to the business center of the largest municipality in the merger, indicator for whether

treatment variables is the only way to control for systematic differences in observables, because we cannot measure most of these variables at the pre-merger municipality level after merging as the old municipalities cease to exist as statistical units.

Using the actual and hypothetical mergers, we can calculate treatment intensity for the individual municipalities in *both* the treatment and control groups. That is, we can calculate, for example, the relative size of a municipality with respect to the merger, actual or hypothetical. This allows us to study the heterogeneity in the merger effects.

We use two treatment intensity measures. The first measure is the municipality's relative share of the total merger electorate. For a municipality *i* in merger *j*, this measure can be written as

$$\text{Share of electorate}_{ij} = \left(\frac{\#\text{eligible voters in municipality } i}{\#\text{eligible voters in merger } j} \right) * 100. \quad (1)$$

Our second measure is the relative increase in the size of the electorate. Again, for a municipality *i* in merger *j*, this measure can be written as

$$\text{Relative increase in electorate}_{ij} = \left(\frac{\left(\#\text{eligible voters in merger } j - \#\text{eligible voters in municipality } i\right)}{\#\text{eligible voters in municipality } i} \right) * 100. \quad (2)$$

Both of these measures are based on the pre-merger electorate sizes and they stay constant throughout the analysis period.[10]

In the analysis, we will divide the municipalities into groups based these two measures of treatment intensity. For both measures, we find the 33rd and 66th percentiles among the merging municipalities, and use these values as thresholds. For the municipality's relative share of the total merger electorate (first measure), all municipalities below the 33rd percentile are included in the strong treatment intensity

all the partners belong to the same health care cooperation unit, and within-merger heterogeneity in per capita taxable income, expenditures and deficit.

[10] We have selected these measures based on previous work by Lassen and Serritzlew (2011) and Koch and Rochat (2017). In our data, these measures are highly correlated (-0.61), but we use both of them in order to maintain comparability with previous literature.

group. Those municipalities make up a relatively small share of their respective merger. Those above the 66th percentile are included in the weak treatment intensity group, while those between the two values are included in the medium intensity group. For the relative increase in the size of the electorate, all municipalities above the 66th percentile are included in the strong treatment intensity group. These municipalities experienced a large increase in the size of their electorate (relative to the initial level). Those below the 33rd percentile are included in the weak treatment intensity group, while those between the two values are included in the medium intensity group.

Table 1 presents descriptive statistics on turnout and the number of eligible voters across these treatment intensity groups and across mergers and non-mergers, in 2004 (the last pre-merger election). Panel A splits the sample according to the municipality's relative share of the total merger electorate. In both mergers and non-mergers, the number of eligible voters is larger in the weak treatment intensity groups, and turnout is higher among municipalities with a strong treatment intensity. Note that since the thresholds are based on the merging municipalities, the control group municipalities are not distributed equally across the treatment intensity groups. Panel B splits the sample according to the relative increase in the size of the electorate. We find similar patterns with this measure of treatment intensity.

Table 1. Means and standard deviations of turnout and the number of eligible voters, by merger status and treatment intensity (2004).

	Non-Mergers			Mergers		
Treatment Intensity:	Weak	Medium	Strong	Weak	Medium	Strong
Panel A: By Share of Electorate						
Turnout	61.3	63.2	65.2	61.4	64.4	68.8
	(5.3)	(4.8)	(3.6)	(4.3)	(7.2)	(7.3)
# of Eligible Voters	11 760	5 787	2 224	13 770	5 514	1 653
	(8 851)	(3 846)	(1 073)	(16 122)	(6 332)	(1 175)
N	80	144	81	20	20	21
Panel B: By Relative Increase in Electorate						
Turnout	61.6	63.0	65.2	61.1	64.9	68.9
	(5.3)	(4.9)	(3.7)	(4.4)	(6.8)	(7.4)
# of Eligible Voters	11 959	5 856	2 252	13 180	5 669	1 513
	(8 921)	(3 961)	(1 096)	(15 945)	(6 263)	(1 008)
N	76	147	82	21	20	20

Note: Standard deviations are in parentheses.

5. Results

5.1 Voter turnout

We start with a graphical representation of our main result in Fig. 2. The figure is constructed so that we have divided the merged and non-merged municipalities into groups based on the treatment measure and treatment intensity. On left panel of the figure, the municipalities are divided according to their relative share of the electorate (Eq. (1)) and on the right panel according to relative increase in the size of the electorate (Eq. (2)).

We first look at the municipalities that received a weak treatment. In the two first graphs, we see that merged and non-merged municipalities receiving a weak treatment follow similar trends in turnout both before and after treatment. Turnout increases in 2004 compared to 2000, and in 2008 compared to 2004, before decreasing again in 2012 and 2017. This is true for both definitions of treatment intensity.

The following two graphs in Fig. 2 illustrate turnout for municipalities receiving a treatment of medium intensity. Here, we see a slightly larger increase in turnout in 2008 for merged municipalities compared to non-merged ones. Moreover, there is a slightly larger decline in 2012 for the merged municipalities. However, in this group of municipalities, the pre-treatment common trend between merged and non-merged

municipalities is not as clean. In fact, we observe a slightly larger increase in turnout in 2004 for merged municipalities.

In municipalities receiving a strong treatment, usually small municipalities in their merger (Table 1), we observe rather clean pre-treatment common trends for the merged and the non-merged municipalities. In 2008, we only observe a small increase in turnout for the non-merged municipalities, but not for the merged municipalities. In 2012, however, we observe a substantially larger decline in turnout for the merged municipalities compared to the non-merged ones. The effect also persists to the 2017 elections.

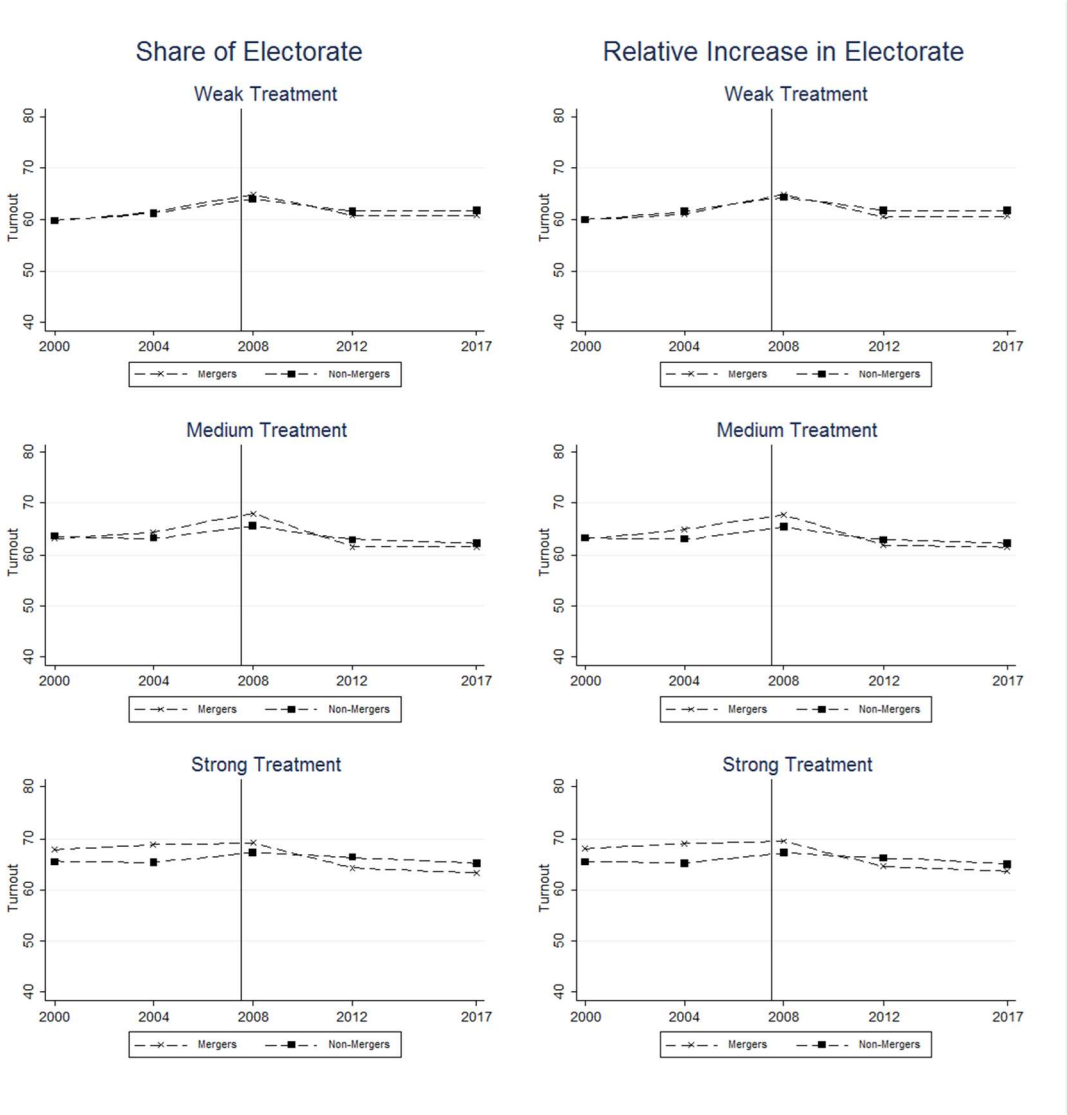

Figure 2: Trends in voter turnout by merger status and treatment intensity.

Notes: In the left-hand panel, the treatment intensity is based on the municipality's share of the merger's total electorate in 2004. In the right-hand panel, the treatment intensity is based on the relative increase in the size of the electorate.

We confirm these graphical results using econometric estimations. In particular, we estimate the following DID model:

$$turnout_{it} = \alpha + \theta_t + \beta \cdot merger_i + \sum_{k=2004}^{2017} \delta_k merger_i \cdot year_k + u_{it}, \quad (3)$$

where α is the intercept, θ_t are year dummies, *merger* is a dummy variable that equals one if municipality i merged and u_{it} is the error term. Our interest lies on the coefficients, δ_k,

on the interaction terms *merger·year*. The coefficient for the first interaction term δ_{2004} enables us to formally test the pre-treatment common trends, while the remaining interaction term coefficients provide us the election-specific causal effect of merging.

We estimate this model separately for each treatment intensity group and for each definition of treatment intensity corresponding to Fig. 2.[11] Table 2 presents the results of these estimations. First, we check the pre-treatment trends. For both the strong and weak treatment intensity groups, pre-treatment trends are similar between merged and non-merged municipalities. This is important for the causal interpretation of the results. However, as suspected in Fig. 2, merged and non-merged municipalities receiving a treatment of medium intensity already followed diverging trends in 2004, before the treatment.

Columns 3 and 6 confirm the negative effect of mergers on turnout in 2012 and 2017 in the group of municipalities receiving a treatment of strong intensity. In fact, for these municipalities, turnout decreases by about 4 percentage points compared to the control group of similar municipalities that did not merge. As the average turnout rate prior to merging in this group was around 69%, this is a substantial effect. Moreover, the difference in the average turnout between the municipalities in the weak and strong treatment intensity groups was equal to about 7 percentage points in the pre-treatment period (see Table 1). In other words, the long-term effect of merging on turnout in the municipalities receiving a strong treatment (usually smaller municipalities) is equivalent to closing more than half of the turnout gap between these municipalities and those receiving a weak treatment (usually larger municipalities).[12]

We can also test whether the merger effects differ across treatment intensity groups. The coefficients in the "strong treatment" regressions (Columns 3 and 6) are statistically different from those in the "weak treatment" (Columns 1 and 4) in 3 of 4 cases. Using the share of electorate, they are different at the 5% level in 2012 ($p = 0.033$) and the 10%

[11] We could also conduct the analysis for the three groups simultaneously by also including dummy variables for each group and their interactions. Since this pooled model would be fully saturated, i.e. would include all the group dummies and interaction terms with the merger and time dummies, the results would be exactly the same.

[12] Tables A1 and A2 in the Appendix shows results when splitting municipalities in four groups instead, using the four quartiles of treatment intensity. Our conclusions are similar: municipalities in the highest treatment intensity quartile are the ones experiencing a significant decline in turnout in 2012 and 2017.

level in 2017 (p = 0.063). Using the increase in relative size, they are different at the 10% level in 2012 (p = 0.096), but not significant in 2017 (p = 0.109).

Table 2. Effect of mergers on turnout, by year and treatment intensity.

	Share of electorate			Relative increase in electorate		
	Weak treatment	Medium treatment	Strong treatment	Weak treatment	Medium treatment	Strong treatment
	[1]	[2]	[3]	[4]	[5]	[6]
Constant	59.71***	63.60***	65.50***	59.97***	63.35***	65.48***
	[1.160]	[0.770]	[0.748]	[1.185]	[0.800]	[0.740]
Merger	0.074	-0.434	2.301	0.04	-0.249	2.54
	[1.621]	[1.664]	[1.584]	[1.618]	[1.677]	[1.626]
2004	1.586***	-0.416	-0.263	1.631***	-0.352	-0.323
	[0.424]	[0.390]	[0.623]	[0.437]	[0.381]	[0.638]
2008	4.244***	1.989***	1.860**	4.433***	2.007***	1.764*
	[0.605]	[0.542]	[0.917]	[0.572]	[0.548]	[0.944]
2012	1.964***	-0.637	0.814	1.836***	-0.471	0.745
	[0.572]	[0.534]	[0.995]	[0.549]	[0.559]	[1.002]
2017	2.012***	-1.402**	-0.422	1.803***	-1.174*	-0.482
	[0.698]	[0.553]	[0.844]	[0.658]	[0.601]	[0.851]
Merger * 2004	0.069	1.643*	1.219	-0.548	2.184***	1.242
	[0.674]	[0.939]	[0.931]	[0.874]	[0.716]	[0.966]
Merger * 2008	0.862	2.924***	-0.628	0.509	2.742***	-0.391
	[0.898]	[0.941]	[1.368]	[0.868]	[0.986]	[1.417]
Merger * 2012	-0.846	-0.977	-4.382***	-1.304	-0.819	-4.255***
	[0.933]	[1.107]	[1.457]	[1.065]	[1.018]	[1.500]
Merger * 2017	-0.945	-0.234	-4.064***	-1.12	-0.464	-3.877***
	[1.047]	[1.162]	[1.387]	[1.064]	[1.185]	[1.429]
N	500	820	510	485	835	510
R^2	0.073	0.069	0.082	0.082	0.062	0.082

Notes: The results are from OLS models. Standard errors are clustered at the municipality level and reported in brackets. ***, ** and * indicate statistical significance at 1, 5 and 10 percent level, respectively.

5.2 Political efficacy

Previous work (Lassen and Serritzlew 2011; Koch and Rochat 2017) has emphasized the role of political efficacy as a possible mediator of merger effects on political participation. Next we turn to analysing the connection between mergers and political efficacy, and the role of the latter in explaining the turnout decrease. Since the number of municipalities with data on political efficacy before and after the mergers is

rather small, we cannot divide the merged municipalities into treatment intensity groups. Instead, we estimate a simple DID model using the merger dummy as a treatment variable.

In table 3, we present results from two regression models. In the first column, we report the results from a DID regression model where we use two years of data on efficacy (2008 and 2011). The efficacy score decreased on average by 0.169 due to mergers, which corresponds to roughly two standard deviations in the score in 2008. This result is in line with prior literature, but since we cannot analyse pre-treatment trends we are reluctant to make strong causal claims regarding mergers and efficacy.

Table 3. Political efficacy and change in turnout.

	Efficacy	Change in turnout
Constant	3.075***	-3.238***
	[0.024]	[0.717]
Merger	0.042	
	[0.031]	
2011	0.025	
	[0.035]	
Merger*2011	-0.169***	
	[0.053]	
Change in efficacy		10.98***
		[2.504]
N	86	24
R^2	0.188	0.302

Notes: The results are from OLS models. The first column reports results from a DID model using data from 2008 and 2011 and the efficacy score as the dependent variable. The second column reports results from a model using only the merged municipalities. Robust standard errors are reported in brackets. ***, ** and * indicate statistical significance at 1, 5 and 10 percent level, respectively.

In the second column, we report the result from regressing the change in turnout between 2008 and 2012 on the change in efficacy between 2008 and 2011 using only the merged municipalities. The change in efficacy is strongly and positively associated with the change in turnout. In fact, back-of-the-envelope calculations combining the results from the two columns in Table 3 suggest that the decrease in efficacy in the merged municipalities is enough to explain a decrease in turnout of about 1.8 percent.

The results show that mergers have a negative effect on turnout in municipalities that are small relative to the merger as a whole and that efficacy is potentially an important mediator of the mergers' effect on turnout. However, our data on efficacy is not as extensive as our data on turnout and the efficacy scores may be correlated with other mediating mechanisms. Disentangling different mediating mechanisms is difficult as there are many of them and not all are easy or even possible to measure. Moreover, even if they were observable, learning about causal mechanisms is difficult and rests on strong assumptions (Imai et al. 2011). Therefore, we are reluctant to draw too strong conclusions with respect to the connection between political efficacy and turnout.

6. Conclusions

We study the effects of municipal mergers on voter turnout and political efficacy in a difference-in-differences framework, using data on a wave of mergers in Finland in 2009. Our main findings can be summarized as follows. First, municipal mergers (and the accompanying increase in jurisdiction size) decrease voter turnout substantially (4 percentage points) in the relatively small municipalities compared to similar small municipalities that did not merge. The long-term effect of merging on turnout in the municipalities receiving a strong treatment (usually smaller municipalities) is equivalent to closing more than half of the turnout gap between these municipalities and those receiving a weak treatment (usually larger municipalities).

We also document a negative effect of municipal mergers on political efficacy, and a positive association between efficacy and turnout. While suggesting that efficacy can have a role in explaining the effects of mergers on turnout, the evidence is not conclusive as political efficacy may be correlated with other factors that influence turnout. Even though our study does not provide us with a complete understanding of the mechanisms at work, the fact that mergers do affect turnout and efficacy is an interesting and policy-relevant result as such. These results provide further evidence that local democracy concerns are warranted in the context of merger reforms.

Given that similar findings have been reported regarding efficacy in Denmark (Lassen and Serritzlew 2011) and turnout in Switzerland (Koch and Rochat 2017), it seems that the results may generalize to other countries as well. However, all of these results are from countries that use open-list proportional representation in local elections.

It would be a fruitful avenue for future research to analyse whether the results carry over to other electoral systems.

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Appendix: Additional results

Table A1. Effect of mergers on turnout, by year and four groups of treatment intensity (using share of electorate).

	Share of electorate			
Treatment Intensity Percentiles:	[0,25[[1]	[25,50[[2]	[50,75[[3]	[75,100] [4]
Constant	61.845***	60.620***	64.928***	65.480***
	[1.686]	[0.843]	[0.878]	[0.982]
Merger	-2.224	-0.369	1.069	3.140
	[2.131]	[1.763]	[1.526]	[2.072]
2004	1.185**	0.838*	-0.751*	-0.098
	[0.474]	[0.447]	[0.393]	[0.746]
2008	3.712***	3.596***	1.257**	2.204*
	[0.793]	[0.635]	[0.500]	[1.123]
2012	1.074	0.909	-0.663	1.213
	[0.773]	[0.680]	[0.513]	[1.152]
2017	1.298	0.891	-1.912***	-0.226
	[0.824]	[0.745]	[0.453]	[1.011]
Merger * 2004	0.775	-0.928	3.455***	0.388
	[0.778]	[1.144]	[0.699]	[1.089]
Merger * 2008	1.695	1.158	2.610***	-1.450
	[1.106]	[1.134]	[0.909]	[1.760]
Merger * 2012	0.491	-1.988	-1.469*	-5.257***
	[1.140]	[1.477]	[0.857]	[1.813]
Merger * 2017	0.360	-1.640	-0.837	-4.951***
	[1.157]	[1.519]	[1.059]	[1.652]
N	210	665	610	345
R^2	0.091	0.084	0.078	0.091

Notes: The results are from OLS models. All the models include year dummies. Standard errors are clustered at the municipality level and reported in brackets. ***, ** and * indicate statistical significance at 1, 5 and 10 percent level, respectively.

Table A2. Effect of mergers on turnout, by year and four groups of treatment intensity (using increase in relative size).

	Increase in relative size			
Treatment Intensity Percentiles:	[0,25[	[25,50[	[50,75[	[75,100]
	[5]	[6]	[7]	[8]
Constant	61.799***	60.598***	64.862***	65.465***
	[1.866]	[0.894]	[0.847]	[1.006]
Merger	-2.419	0.519	0.510	3.154
	[2.316]	[1.841]	[1.504]	[2.085]
2004	1.384***	0.747*	-0.584	-0.167
	[0.497]	[0.431]	[0.403]	[0.784]
2008	3.766***	3.499***	1.494***	2.103*
	[0.886]	[0.625]	[0.514]	[1.172]
2012	0.965	0.893	-0.441	0.996
	[0.866]	[0.684]	[0.509]	[1.189]
2017	1.280	0.875	-1.679***	-0.397
	[0.887]	[0.762]	[0.475]	[1.054]
Merger * 2004	0.511	-0.433	3.098***	0.458
	[0.824]	[1.109]	[0.721]	[1.116]
Merger * 2008	1.713	1.272	2.330**	-1.349
	[1.208]	[1.076]	[0.915]	[1.792]
Merger * 2012	0.543	-2.004	-1.443*	-5.040**
	[1.246]	[1.435]	[0.853]	[1.838]
Merger * 2017	0.253	-1.595	-0.829	-4.780***
	[1.235]	[1.511]	[1.057]	[1.679]
N	185	670	635	340
R^2	0.098	0.075	0.067	0.092

Notes: The results are from OLS models. All the models include year dummies. Standard errors are clustered at the municipality level and reported in brackets. ***, ** and * indicate statistical significance at 1, 5 and 10 percent level, respectively.