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Selection into Politics & The Significance of Local Government Revenue

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Content

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Summary

This master thesis investigates selection effects in Norwegian local governments and explores the effect of increased revenue in local governments on the quality of politicians. Quality is measured by educational level, and we rely on commercial property tax per capita as an exogenous source of local government income. Great data on individual candidates and on aggregated municipal level let us exploit both the cross-sectional and the time-varying components of the datasets. A simple descriptive analysis is done on selection effects, while a more quantitatively analysis is conducted to find the relationship between revenue in local governments and the quality of politicians. To estimate the relationship, we employ a standard OLS analysis in addition to a fixed effects framework. First, we find that middle-aged men with higher education are positively selected into local governments. Second, our empirical models suggest that there is no significant relationship between increased revenue in local governments and the quality of politicians. The sensitivity analysis implies that selection effects does not differ between non-power and power municipalities. Last, an analysis with an alternative measure of quality is done. The result suggests that there is no relationship between increased revenue in local governments and income, cleaned for gender and age effects.

1 Introduction

1.1 Introduction to topic

Selection into politics is of crucial importance for the democracy. A democracy needs capable and representative politicians to represent and promote their needs and desires. Previous research states that both high participation and politically engaged individuals are crucial for the democracy, and that "strong feelings of political competence enhance the acceptance of the political system as a whole" (Vetter, 2002, p. 5). Potential drivers and motives for political selection could be of great interest for policy makers and is an important social concern. Politician quality has been found to affect voters' decision of which party to vote for (Dal Bó, Finan, Folke, Persson, & Rickne, 2017). If the supply of candidates of high quality are low, we may be left with candidates of low quality. These candidates may be unable to pursue policies for the public good or may run to serve themselves instead of serving for the public good.

Who are those who becomes politicians? In their paper on political selection in Sweden, Dal Bó et al. (2017) find that politicians are strongly positively selected for all ability measures. That is, "politicians are on average significantly smarter and better leaders than the population they represent" (Dal Bó et al., 2017, p. 1877). Furthermore, positive selection is present conditional on social and family background, which mean that individual ability matters greatly for selection. Traditional economic theory tells us that free-riding incentives and lower opportunity costs give the less competent a comparative advantage at entering the political life (Caselli & Morelli, 2004; Messner & Polborn, 2004). The American author, Arthur C. Clarke said that "because politics is the science of the possible, it only appeals to second-rate minds. The first raters only interested in the impossible". Hence, the positive selection found in Dal Bó et al. (2017) goes against the traditional economic theory, where people with higher wages and more promising career opportunities face a higher cost to enter public life.

Brollo, Nannicini, Perotti, and Tabellini (2013) study the effect of additional government revenues on political corruption and on the quality of politicians. The study is based on both theory and data, where the theory is based on a political agency model with career concerns and endogenous entry of political candidates.

The data refer to Brazil, where the model highlights several political effects of an increase in non-tax government revenues. Their results are striking, where they find that there is an effect on moral hazard in addition to a negative selection effect. They find that a larger budget size means that the incumbents have "more room to grab political rents without disappointing rational but imperfectly informed voters" (Brollo et al., 2013, p. 1760). The selection effect is that a larger budget leads to a decline in the average educational level among the candidates who run for election. This is a by-product of the moral hazard-result and the assumption that political rents are more valuable for lower quality political candidates. They refer to the counterproductive effects of additional resources as a political resource curse, which is defined as "a negative impact of windfall resources on political corruption and political selection" (Brollo et al., 2013, p. 1794).

Several studies have investigated the effects of higher revenue in municipalities. In a paper by Borge, Parmer, and Torvik (2015), the authors investigate whether high public revenue derived from natural resources have adverse effects for economic efficiency. The study relies on data from hydropower plants in Norwegian local governments and geographical characteristics as instruments. They find support for the "Paradox of Plenty", but no support for the "Rentier State" hypothesis[1]. This implies that high public revenue retard economic efficiency, but it is not stronger in municipalities with more natural resource revenue. Poor economic efficiency could imply that the quality of those who are distributing the income, the politicians in local governments, are lower. It could also imply that these politicians are running for election motivated by monetary gains, as in Brollo et al. (2013).

Another important question is how higher exogenous income affects different political outcomes. Andersen, Fiva, and Natvik (2014) investigates if higher stakes leads to higher turnouts in local elections. They state that "an election's stakes depend on how strongly the winning candidate can influence outcomes that voters care about", and that fiscal flexibility is a key determinant of a politician´s influence

[1] The "Paradox of Plenty" hypothesis states "that higher local government revenue reduces the efficiency in production of public goods". The "Rentier State" hypothesis states "that revenue derived from natural resources should harm efficiency more than revenue derived from other sources such as taxation" (Borge et al., 2015, p. 101).

(Andersen et al., 2014, p. 157). They find that when more wealth is controlled by the local government, individuals participate to a larger extent in the political process, because "higher revenue from hydropower production equips elected officials with more funds to distribute, and thus raises the stakes of the local election" (Andersen et al., 2014). Another important finding for our study is "that there is a strong and essentially linear relationship between hydropower production per capita in the 1970-1999 period and the commercial property taxation in 2007" (Andersen et al., 2014, p. 159). We rely on this in our thesis and notes that commercial property tax (*CPtax*) also includes other types of energy production, like oil and gas.

In our thesis, we address two questions. The first question concerns political selection, and whether politicians in the municipal councils are positively selected on quality, measured in years of schooling. In this part, we extend our analysis with an investigation of selection with regards to gender and age. The second question concerns how increased income to local governments from exogeneous sources could affect the selection process. There are few or no studies of how income might affect the selection of representatives. Brollo et al. (2013) find that politicians are negatively selected on quality as a result of increased government income in Brazil. However, the paper is based on data from Brazilian elections, where political agency problems are widespread at both the national level and at the municipal level (Business Anti-Corruption Portal, 2018). According to Transparency International (2017), Norway is the sixth least corrupt country in the world, while Brazil is the 79th least corrupt country, and this can hardly be generalized to our study. We aim to extend the empirical literature, by investigating the political resource curse in Norwegian municipalities. In particular, we are interested in changes in the quality of the representatives, measured in years of schooling, due to increased revenues from *CPtax*. Can we generalize the finding of Brollo et al. (2013) to Norway, or will we find the opposite; that parties are stricter in their recruitment process, that more highly educated people self-select into politics and that voters care more about politician quality?

1.2 Motivation for study

The potential effect of a windfall income on political selection is of interest for several reasons. First, the research opportunities on whether *CPtax* has a causal effect on the quality of politicians, and political selection, have great untapped potential. Several studies investigate how voter behaviour is affected by wealth, but we find few studies that have investigated how this affects the selection process. This illustrates the research potential in the field and makes our study an important contribution to the existing research frontier.

Second, we have access to rich administrative panel data in addition to economic data on local governments. This let us exploit the time variation in the introduction of property tax across municipalities. We have access to the educational level of representatives in municipal councils, the educational level among citizens in the municipalities, and the educational level in Norway. In addition to this, we have access to *CPtax* and total property tax in all the municipalities. This great individual data, combined with the aggregated data on municipalities constitute a research potential we aim to exploit. We have access to this data over time, which will be useful in the panel data analysis. The big variations in *CPtax* across municipalities, in addition to over the years, gives great research opportunities. Introduction of property tax has gradually increased in Norwegian municipalities over the years (Fiva, Halse, & Natvik, 2017). From around 200 municipalities in 1991 to 366 in 2017. This means that 86% of Norwegian municipalities have introduced property tax in some way, while the total income from property tax was over 12 million NOK in 2016 (Statistics Norway, 2017a). Important factors for municipalities to introduce property tax have been hydropower production, in addition to oil and gas production in the North Sea after the 1970s (Energifakta Norge, 2017). As revenues from *CPtax* is mainly determined by topography, we can use this as a source of independent income variation across Norwegian municipalities (Andersen et al., 2014). The most prominent example of a municipality that has recently introduced property tax is Aukra, which illustrates the interesting time-varying components of our dataset.

Third, the psychology in greediness and the study of how money affects human behaviour is particularly interesting. A study from Poland from 2016 conducted in a group of children shown that handling money leads to a decrease in pro-social

behaviour and an increase in egoistical attitudes (Gasiorowska, Chaplin, Zaleskiewicz, Wygrab, & Vohs, 2016). Social psychologist, Paul Piff, has also investigated the influence of money on human behaviour and found that rich people are less likely to share of their wealth, while their empathy level is on a decline (Nikolaou, 2015). This can be linked to the fact that several rich municipalities are reluctant when it comes to merging with other municipalities. A survey conducted by Aftenposten in 2016, uncovered that 61 of the 69 municipalities with more than 120 percent of the country's average in corrected earnings were reluctant of merging in 2015 (Gjerde, 2016).

1.3 Hypothesis and outline of study

In our thesis, we investigate *selection into politics and whether increased income from CPtax affect selection on quality.* The existing empirical literature and traditional economic theory are divided in the view of selection into politics. On the one hand, we have the theory of opportunity cost, where high quality candidates have higher market skill, which gives them higher opportunity cost of running for office (Caselli & Morelli, 2004). If this is the case, we could expect that the average quality of candidates running for office should increase when *CPtax* increase, as administrative spending is higher in municipalities with substantial income from *CPtax*[2]. On the other hand, we have a theoretical argument, presented by Besley (2004). Candidates of high quality might self-select into politics even when the stakes are low. However, when the stakes are high, these candidates could be challenged by candidates of low quality who are not interested in the public good but are self-selecting into politics for potential economic gains. With this argument, we would expect that the quality of the candidate pool would decrease when *CPtax* increases. In our thesis, we concentrate on local government politicians, who often are part-time politicians. Hence, their remunerations are often too low to serve as the main source of income. This means that we could be more likely to see selection of candidates who run to serve the public instead of themselves.

In addition to self-selection, selection into politics can arise through the parties´ list proposals and the voters´ casting list votes and personal votes for preferred

[2] Simple investigation of the relationship between *CPtax* and total administrative spending as a share of total spending.

candidates. We contribute to the literature by focusing on how higher stakes affect selection by parties and voters. When the stakes are higher, the politicians have more funds to distribute and it might be that this make it more important for voters and parties to prioritize highly educated candidates. To distinguish between selection from parties and voters, we create a counterfactual seat allocation. This gives the seat allocation if only list proposals from the parties matters for selection, as we ignore personal votes. We investigate this by finding the parties´ and voters´ preferences for quality, gender and age. After this investigation, we find that voters and parties positively select candidates on quality, measured as educational level. In addition, we find that middle-aged men are positively selected into municipal councils. When investigating the selection effect when the stakes are high, we do not find any evidence on differences in preferences for quality, gender or age between non-power and power municipalities.

The identification strategy of the analysis of *CPtax* takes the standard ordinary least squares approach, in addition to a fixed effects model. We start by a cross-section analysis, where we aim to run a standard regression as in Andersen et al. (2014), where we investigate selection into politics using educational data for individual politicians. With cross sectional data, we can learn more about the relationship among the variables by studying differences in educational level across municipalities during a single time period. We net out potential threats of omitted variable bias and problems with endogeneity by studying the difference between years of schooling for the representatives and years of schooling for the citizens in the municipality. Central municipalities tend to have higher education level on average, and by taking the difference, we net out potential centrality issues and omitted variable bias (Statistics Norway, 2018). In the rest of the thesis, the difference between years of schooling for politicians and years of schooling for citizens is called the quality difference.

For the panel data analysis, we employ the fixed effects model, controlling for both municipality and time fixed effects, while we are clustering the standard errors at the municipal level. We include both municipality and time fixed effects in order to isolate the variation in the quality difference from variation in *CPtax*. In the fixed effects model, *CPtax* will be as good as randomly assigned once we control for

constant and unobserved municipal factors and time variation within the municipalities.

We find no relationship between the quality difference and *CPtax* in the cross-section analysis, nor with the fixed effects specification. In the cross-section analysis, we obtain weakly negative but insignificant results, while the fixed effects estimates are weakly positive. However, these results are also insignificant, and we cannot conclude that there is a causal relationship between the quality difference and *CPtax*. The confidence intervals substantiate this result.

The thesis is structured in the following order: In section 2, an overview of the political system in Norway is given, in addition to an introduction to the three selection mechanisms and a justification for using the quality difference as a measure of political quality. This section also includes data and descriptive statistics. Section 3 investigates selection effects for parties and voters, with regards to preferences for educational level, gender and age. In section 4, our empirical strategies are explained and the main analysis on the quality difference and *CPtax* is done. In this section we also report and discuss our results. Some concise sensitivity analyses are done in section 5, where we use a different measure of quality. In addition, this section contains a brief investigation of differences between power and non-power municipalities. Finally, in section 6, we summarize our findings, discuss and conclude our study.

2 Institutional Setting & Data

2.1 Institutional setting:

There are three layers of government in Norway: The central government, the regional governments and the local governments. Municipalities have been given responsibility for a wide range of tasks, especially within welfare. This includes primary education, elderly care, municipal health services and social benefits. The municipal council has the taxing rights in the municipality (Hansen, 2018). In 2016 the local levels of government accounted for about 18% of mainland GDP in Norway, where 73% of the total income consists of tax revenue and block grants (frie inntekter). The remaining income to local governments comes from fees and categorical grants. In addition to this, the municipal sector employed 19% of the total workforce in 2016 (Regjeringen, 2016).

2.1.1 Political system and electoral participation in Norway:

The local governments are headed by municipal councils, and elections are run every fourth year in September. Norwegian citizens who are 18 years old by the end of the election year and have ever been registered as residents in Norway, are entitled to vote. In addition, Nordic citizens have the right to vote if they were registered as residents in Norway by June 30th in the election year. Foreign nationals who have resided in Norway for the last three years before the election day are also entitled to vote. The participation rate for the last three elections, the 2007, 2011 and 2015 elections, has been over 60% (Statistics Norway, 2017c).

The electoral system is based on the principles of direct elections and proportional representation. Direct elections mean that the electors vote directly on representatives of the electoral district by voting for a party list. Proportional representation means that divisions in an electorate are reflected proportionately in the elected body (Regjeringen, 2017). They can also cast preferential votes for particular candidates. In addition to direct elections and proportional representation, the local government level parties have the option to give some candidates an increased share of the poll, which corresponds to 25% of the total number of votes received by the party's list (Andersen et al., 2014). The calculation method used in all Norwegian elections is the modified Sainte-Laguë method, which is allocating

seats according to votes. Candidates are elected based on the votes they individually receive, where the municipal council decides the number of representatives, based on statutory minimum requirements relative to the population in the municipality. Candidates who just miss out on a council seat become their party's first deputy councillor, where each list should have as many deputy councillors as regular councillors plus three (Fiva & Røhr, 2018).

From 2017, there are nine political parties in the Parliament of Norway. These are the main parties also in the local levels of government, but there are also some independent lists. These are lists that are independent of the traditional political parties and receive substantial support in some municipalities. Aars and Ringkjøb (2005) argues that non-partisan lists are more issue-oriented than the traditional party lists. We usually divide between parties on the left and right wing, where left-wing parties often desire high taxes and fees. In return, the state shall provide welfare services. They want to equalize economic differences between groups in society. On the other side, right-wing parties desire lower taxes, where the private business can provide welfare services more efficiently than the state. They are more willing to accept economic differences between groups in society (Stortinget, 2018b).

Lundqvist (2013) found that there is no indirect monetary gain to winning a seat in a municipal assembly in Sweden. She shows that monetary returns from politics are, on average, absent. This is irrespective if one considers the period right after the election, and up to 15 years later or the period right after exiting politics. The Norwegian remuneration rates are set by the municipal councils themselves, but are usually low, and it is reasonable to assume that Lindqvist´s findings also hold for Norway. The average wage for Norwegian mayors are also higher than the average wage in Norway, as in Sweden (Dal Bó et al., 2017). Mayors are highly reputed in local communities, but public employees are often paid less than in the private sector. However, we have investigated whether administrative spending increase as a share of total expenditures with higher *CPtax* in the municipality. A simple investigation indicates that administrative spending as a share of total expenditure is higher in power municipalities, which makes it more attractive to be a mayor in these municipalities.

2.1.2 Selection mechanisms

In the Norwegian electoral system, we have three selection mechanisms. These three are the parties, the candidates themselves and the voters. In this section, we will describe how these mechanisms affects the final election results.

The main selection mechanism is from the parties. All parties submit a list proposal, which is then subject to the approval of the electoral authorities. This list proposal forms the basis of the ballot paper for each party, and must contain at least seven names, filled out in sequence. In elections for the municipal council, a number of candidates at the top of the list proposal may be given an increased share of the poll. This pre-advantage corresponds to 25% of the total number of ballot papers cast for the list at the election. This is an important tool for parties to give their preferred candidates a headstart in the election, and at the same time makes party elites have considerable control over which candidates win the elections (Fiva & Røhr, 2018). Fiva and Røhr (2018) found that 85% of candidates with pre-advantage won a seat in the municipal council. They also define what they refer to as a safe position, which is defined as "if the candidate is awarded a pre-advantage and the total number of pre-advantaged candidates on the party list does not exceed the number of seats won in the previous election" (Fiva & Røhr, 2018). Of those candidates with a safe position, 94% was elected to the municipal council.

In Norway, a nomination committee from each party often recruit candidates for the ballot. Ringkjøb and Aars (2010) divide the recruitment process in four stages: The first stage is to ask incumbents if they are interested in re-election. The second stage is to ask previous candidates for renomination. The third stage is to ask existing party members if they are interested in nomination, before the final stage is to ask sympathizers. After this, the party establish a list proposal before the final party ballot is decided at a nomination meeting. The ranking done by the parties tend to be of crucial importance for the election and the final ranking (Christensen, Midtbø, Ringkjøb, & Aars, 2008).

In Sweden, parties typically screen those individuals who self-select into politics (Dal Bó et al., 2017). One potential way of screening individuals is by observing their members compete in coming up with good arguments and policy proposals. Dal Bó et al. (2017) shows that political parties actively screen and promotes

candidates, especially in municipalities with stiffer political competition. They confirm this by comparing top-ranked politicians with lower-ranked politicians for different ability measures. These ability measures consist of cognitive score, leadership score and earnings score, and top-ranked politicians has significantly higher ability than every other rank for all these measures. Hence, we clearly see that parties prefer candidates of higher quality and positively select politicians with regards to ability. They also state that of those who self-select into political service, the positive selection translates into higher competence of elected politicians. Since Sweden is comparable to Norway in many ways, including the electoral system, it may be possible that we can generalise this study to Norway as well.

The second selection mechanism is self-selection, where we aim to investigate whether higher stakes leads to positive self-selection of high quality candidates. Dal Bó et al. (2017) discuss candidates´ material and intrinsic motives for self-selection into politics and finds that intrinsic motives to serve in politics is influencing the most. In municipalities with high remunerations for mayors and vice mayors, the competence of top politicians is higher. Also, in parties with higher probability of filling full-time political positions, the competence of top politicians is higher. Lastly, elected candidates in parties with close to zero probabilities to land full-time political jobs are considerably smarter than the average citizen in the municipality. Hence, Dal Bó et al. (2017) points out that this fact substantiate that candidates have strong intrinsic motives to serve in politics. Intrinsic motives can be a desire to influence the society, to get a larger network of contacts, social duty or strong political interest (Aars & Christensen, 2010).

The wages of politicians in Norway, and especially politicians in the Storting, has been widely discussed over the years and is important for the self-selection mechanism. Recently, parliamentary politician Michael Tetzschner argued that the wages of parliamentary politicians should increase because he believes we miss out on good candidates from the business sector. He believes that it exists examples of people who have refused a safe place on a nomination list to the Storting, on the grounds that the remunerations are not good enough (Kristiansen, 2018). Today´s wage level for parliamentary politicians is approximately 928 000 NOK, which belongs to the elite of Norwegian wages (Stortinget, 2018a). This means that if remunerations are the most important motive for becoming a politician in

Norwegian municipalities, we might miss out on top candidates because of the high opportunity cost, which is the competitive wage in business.

The last selection mechanism is the voters´ influence in local elections. Voters can both cast list votes and personal votes for individual candidates. The list votes decide the distribution of seats, while the personal votes decide the returning of members. The number of personal votes cast on other party lists is limited to a quarter of the council size, and you cannot add more than five candidates. If the voter votes in a municipality where 10 candidates are to be elected to the municipal council, one vote for party A, without personal votes, is worth 10 list votes. Lokalvalgsundersøkelsen (2007) found that 15% of the voters gave side votes (slengere) and 46% gave personal votes in the 2007 election. Furthermore, Bergh, Bjørklund, and Hellevik (2010) found that 25% of all politicians were elected into municipal councils based on personal votes in 2007. This means that voters have a significant influence on who wins a seat in the municipal councils.

How voters decide which party to vote for is an important question for us. It is a known fact that the voter turnout is higher for highly educated people than for lower educated people. In addition to this, the turnout increases with age. This tells us that experienced and educated people are more interested in influencing the governing of their municipality (Statistics Norway, 2017c). Does the educational level of the candidates matter for selection, and does it matter more when the stakes are higher? In a report from Statistics Sweden they found that issue voting, ideology and politician competence is the top three reasons for deciding which party to vote for (Statistics Sweden, 2010, p. 54). Andersen et al. (2014) found that voter turnout increased when the stakes are high, but we want to investigate if politician competence becomes more important as well. In a report from Rokkansenteret, Christensen et al. (2008) found that educational level has no effect on personal votes, despite the fact that they expected a positive relationship. On the other hand, they found that high employment in the public sector and in the primary industries were positively correlated with the number of personal votes given at the election. One of the most important reasons for not giving personal votes is that people are interested in voting for a party and not for persons.

2.1.3 Education as a measure of politician quality

For our research, it is important to clearly define how we measure the quality of politicians in municipal councils. This will be the main outcome variable of our research, and we need to find an appropriate way to measure this. Quality of politicians in itself is difficult to measure, as we lack data describing this. Brollo et al. (2013) refers to the politicians´ education as a measure for high or low quality. The most common answer in the scholarly literature of why we would expect politicians who have more formal education to be better leaders "is that people with more schooling have more human capital and tend to be more engaged in civic life" (Carnes & Lupu, 2016, p. 36). In their highly cited paper, Besley and Reynal-Querol (2011, p. 552) argues that education is a "compelling indicator of a leader´s quality", because education is strongly correlated with both earnings and civic engagement. Another paper arguing in favour of this view, by De Benedetto and De Paola (2013, p. 6), states that "Under the assumption that "political" and "market" skills are correlated, human capital should also represent a good proxy for politicians' quality". A last paper defending the use of educational attainment as a measure of political quality is Atkinson and Rogers (2012), where they argue:

> In the political realm, those with higher education have a distinct advantage in being better able to develop logical arguments, assemble and assess evidence, and make public presentations . . . university degrees signal capacity in this regard and invite the inference that education provides at least some politically relevant skills (Atkinson & Rogers, 2012, p. 6)

An opponent to this way of measuring quality is Dal Bó et al. (2017). They state that measuring quality or ability by educational level is common in the existing empirical literature, but that researchers use this because they lack "direct data on the underlying intelligence or personality of politicians" (Dal Bó et al., 2017, p. 2). Further, using education is not without its issue, as highly capable people may choose not to take higher education. Another indicator of abilities and capabilities may be individual income. We are looking into this in our sensitivity checks. However, we are confident that using educational level is the best way to measure quality of politicians, based on economic theory and previous findings. For our purpose, calculating the difference in years of schooling between politicians in the

municipal council and the citizens in the municipality will give us good measures of quality.

In contract theory, signalling is the idea that an agent credibly reveals some information about himself to a principal. In our example, politicians are the agents, while parties and voters are the principals. We can transfer Michael Spence´s job-market signalling model to politics to understand how and why we might observe positive selection into politics. Politicians send a signal about their quality to the voters and parties by acquiring education credentials. The informational value of the credential comes from the fact that the voters believes the credential is positively correlated with having higher quality and difficult for low quality politicians to obtain. Thus, the credential enables the voters and parties to reliably distinguish low quality politicians from high quality politicians (Spence, 1978). The equilibrium we want is a separating equilibrium, where high and low-quality politicians choose different levels of schooling, such that the principal easily can choose the candidate with the highest quality.

2.2 Data

For our research, we are mostly relying on two datasets on Norwegian municipalities. We combine data on economics and demographics, aggregated at municipal level, with information about the candidates at individual level. This gives us a comprehensive dataset on the last four municipal elections in Norway, with approximately 60 000 observations for each election year. With this as a starting point, we have a great basis for our research.

2.2.1 The local government dataset

The Local Government Dataset, by Fiva, Halse and Natvik in its newest edition from 2017 contains statistics on public spending, tax policy, local elections and demographics on the municipal level. The dataset covers the period from 1972 to 2016. Since the main focus for this thesis is the last three municipal elections, we are primarily exploiting the data from 2007 onwards.

Our primary interest in this dataset is the data on property tax per capita from 2007-2015, divided into commercial and residential. The commercial property tax per

capita *(CPtax)* serves as one of our main regressors in our research. In addition, we are utilizing some of the demographic variables, like the age and gender distributions of the municipalities.

2.2.2 Individual data

The dataset containing individual information on candidates running for the municipal elections from 2003 to 2015 has previously been utilized by Fiva and Røhr (2018). Here, we have data on education, income, election results, mayor-status and more on each individual candidate.

Some of these data is attributed to Christensen et al. (2008), where most of the data from 2003 and 2007 originates. This we have supplied with data collected directly from the municipals. The data on 2011 derives entirely from the municipalities, while Statistics Norway has the data from 2015. These sources of data on the candidates has been compiled together, and combined with more information on the candidates; e.g. education level, income etc. This information is attributed to Statistics Norway.

As of now we do not have complete data on the 2003 election. Without this, we have restricted use of the 2003 observations. We are therefore relying on data from 2007 and onwards.

2.2.3 Adjustments & compilation

We restrict our observations to municipalities existing for the whole period between 1990 and 2015 with the same municipal code (Fiva et al., 2017). This leaves us with 418 municipalities per year.

The individual dataset is of high quality. However, there exist inconsistencies between the collected and the Statistics Norway data. In order not to reduce our source data in a sustainable way and lose multiple power municipalities, we found it sufficient to remove only list with inconsistencies. This leaves us with approximately 60 000 observations per election year, in total 180 000 observations.

One of the primary interest in the individual data is the 6-digit education code (Barrabés & Østli, 2016). This states the level and area of study for each candidate. In this code, the first digit is representing the level of schooling the individual has reached. We use this digit to compute the years of schooling the candidate has completed, making it possible for us to create the average years of schooling and the share of higher educated among the candidates and the elected.

Combining the years of schooling for the candidates with corresponding data for the population, we are able to compare the two groups. We have used the conversion table presented in table A.1 in the appendix to compute the years of schooling in the same format for the two data sources. The years used for computation are presented in the column "YoS Corrected".

2.3 Descriptive statistics

2.3.1 Data aggregated at municipal level

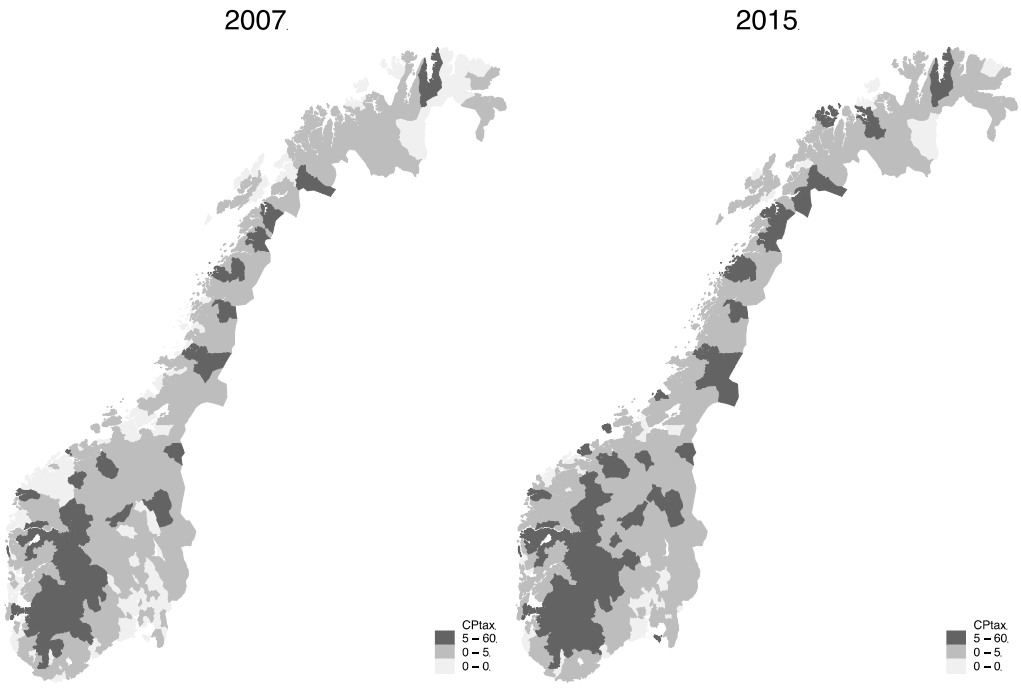
In A.2 in the appendix we present descriptive statistics for the municipal level data. These values are aggregated at municipal level, and as such, the averages are over municipalities. We have split the descriptive statistics in the three election years from 2007-2015, before we assemble them in the last section of the table. The table illustrate the time variation in *CPtax* where we observe a considerable increase over the three election years. In 2007, the mean was 2,41, growing to 2,62 in 2015.

Using the observations of *CPtax*, we define power municipalities as municipalities with *CPtax* above 0. In addition to this, we split between low and high-power municipalities, where high corresponds to municipalities with *CPtax* above 5000 NOK per capita and low corresponds to municipalities with *CPtax* between 0 and 5000 NOK per capita[3]. Table A.3 in the appendix illustrates the increase in number of power municipalities. As we see, the largest increase is in the number of low-power municipalities, which increases from 217 to 275 between 2007 and 2015. The increase in high-power municipalities is 10, from 49 in 2007 to 59 in 2015. The increase in the number of power municipalities is visualized in figure 1, illustrating where the different municipality types are located. We see that most of the high-

[3] This division is utilized in the analysis in section 5.

power municipalities are located near the centre of the southern part of Norway, where high mountains and waterfalls are present, making these municipalities well-endowed for hydropower production. High-power municipalities like Bykle and Modalen are located in this area, illustrated with a dark shade in figure 1. The municipality with the highest *CPtax* was Modalen in 2007 with 57 000 NOK per capita.

Figure 1



The figure shows the distribution of power municipalities in the election years of 2007 and 2011. Darker shade implies higher power income.

When it comes to years of schooling, it increases from year to year for elected candidates, for those who would have been elected by the party[4] and for the population as a whole. This indicates the trend in today's society, where the importance of education increases. The highest educated municipal council was Oslo in 2015, with an average of 17,28 years of schooling. The least educated municipal council was Røst in 2011, with an average of 12,27 years of schooling.

[4] To find those who *would have been elected by the party* we create a counterfactual seat allocation, ignoring personal votes. More on this in section 3.

Throughout the thesis, we investigate whether there is a quality difference between the municipal council and the population. This corresponds to the difference in years of schooling between the municipal council and the population. From table A.2, we see that this is around 2 in all election years, meaning that the average politician in the council have 2 years of additional schooling compared to the average citizen. This result is interesting and not documented to a large degree in Norway. In the next section, we discuss the quality difference deeper and show it graphically. The highest quality difference is observed in Sel in 2015, with a difference of 3,78. In Utsira in 2015 we actually observe a negative quality difference, which means that the citizens are higher educated than the municipal council on average.

When we investigate the difference in the voter´s selection effect between power and non-power municipalities, our dependent variable is rank improvement for highly educated candidates. In 2007 and 2011 this is low. The average rank improvement, which is the difference between the candidates' position prior to the election and after the election, is 0,05 in 2007 and 0,04 in 2011. Surprisingly, this increases drastically in 2015, to 0,15. This might be a fluke, but we are not able to find any signs of this in the data. However, it might be a trend we miss out on, as there are some data missing in 2011, but we cannot conclude on this. The next four variables in the table are age and gender distributions and is somewhat stable over the election years. That is also the case for the unemployment rate, being low and stable for all years.

2.3.2 Individual data

Table 1 describes descriptive statistics on individual data from local elections between 2007 and 2015. We have individual data on almost 180 000 candidates for the three local elections held in this period. Firstly, we see that the average years of schooling for elected candidates is 14,58, corresponding to a few years of higher education. The second variable, the difference in years of schooling, has a mean of 1,52. This means that elected individuals on average have 1,5 years of additional schooling compared to the average in their municipality. We see that the highest quality difference observed is 7,38 years. Important to note here is that this is the difference between the candidate's individual education level, and the population

mean. When it comes to the age distribution, we see that the average politician is approximately 49 years old. Furthermore, the share of women in the party lists are 0,42. This tells us that on average the parties are following the requirement of at least 40% representation from each gender.

Table 1

Individual data

Variable	N	Mean	Std. Dev.	Min	Max
Years of Schooling	176293	14,58	2,69	10,00	19,00
Difference in YoS*	176147	1,52	2,63	-4,94	7,38
Age	179648	49,09	14,59	17,00	101,00
Share of women**	179648	0,42	0,49	0,00	1,00
Share elected**	179648	0,18	0,38	0,00	1,00
N	179648				

Notes:

*Difference between elected individual and the municipal population average

** Dummy for women/elected

This table reports descriptive statistics on individual candidates, running for election in 2007, 2011 and/or 2015, and reports the average years of schooling, average difference in years of schooling from the population and the average age of the candidates. It also reports the share of women running for the elections, in addition to the share of candidates elected into council.

3 Selection into Politics

Which types of candidates are preferred by the voters and the parties? In this section we study selection into politics with regards to education, gender and age. Politicians are strongly positively selected for all ability measures in Sweden, despite facing higher opportunity costs (Dal Bó et al., 2017). This selection effect is not investigated to a large degree in the empirical literature in Norway, and we aim to fill this gap. We investigate the selection mechanism from the parties and from the voters. Particularly, we are interested in whether the parties and the voters are positively selecting politicians on quality. To investigate the differences between the selection mechanisms from the parties and the voters, we create a counterfactual seat allocation. This approach ignores personal votes and gives the seat allocation if only list proposals from the parties mattered for election of candidates.

3.1 Selection mechanism from the parties

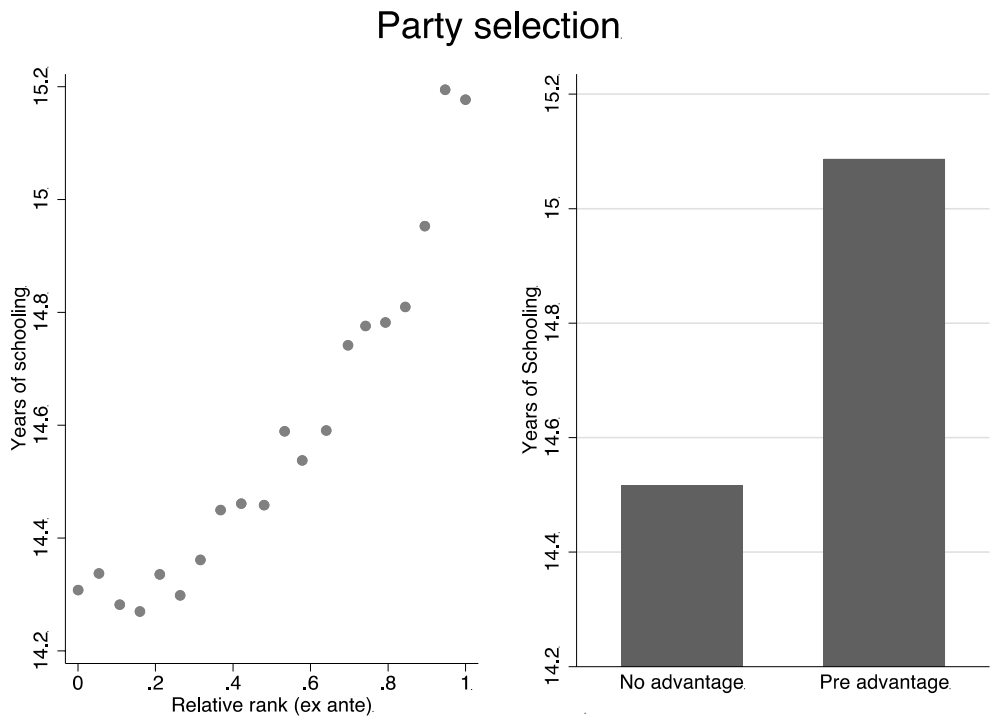
After determining the quality difference in section 2 and showing that there is a positive selection with regards to education into municipal councils, we aim to determine where this selection comes from. More specifically, we want to investigate whether parties and voters prefers politicians of higher quality, and whether it is the parties or the voters that pull the selection. To investigate parties´ behaviour, we want to see if there are any relationship between years of schooling for the candidates and the parties´ ranking of candidates. In addition, we document the relationship between years of schooling for the candidates and the allocation of pre-advantages to top candidates.

Figure 2 demonstrates that parties positively select top candidates with regards to education. The left-hand panel in figure 2 indicates that parties rank candidates with higher education at a higher level. This is illustrated as candidates at a higher relative rank prior to the election have more years of schooling than candidates at a lower relative rank. We use the relative rank because list size varies to a large extent across municipalities, and to be able to analyse the actual relationship. Ballot position is standardized in the same way as in Fiva and Røhr (2018)[5]. Rank 0

[5] Relative rank is standardized using the formula: $Relative\ Rank = 1 - \frac{Rank-1}{List\ Size-1}$

implies the lowest ranked candidate, while rank 1 implies the highest ranked candidate. We see that top candidates on average have about 15,2 years of schooling, compared to 14,3 years of schooling for candidates in the bottom ranks. It is rational to believe that parties´ give preference to candidates they believe in and that have support from their voters. Regjeringen (2017, p. 1) writes that "the party/group behind the list proposal can give an increased share of the poll to a limited number of candidates in order to have some possibility of influencing who is elected". The right-hand panel implies that candidates with a pre-advantage on average have approximately 15,1 years of schooling, while the candidates without a pre-advantage on average have approximately 14,5 years of schooling. This corresponds to a difference of 0,6 additional years of schooling for those with a pre-advantage. Hence, figure 2 illustrates that parties positively select candidates to the municipal council with regards to quality, measured in years of schooling.

Figure 2



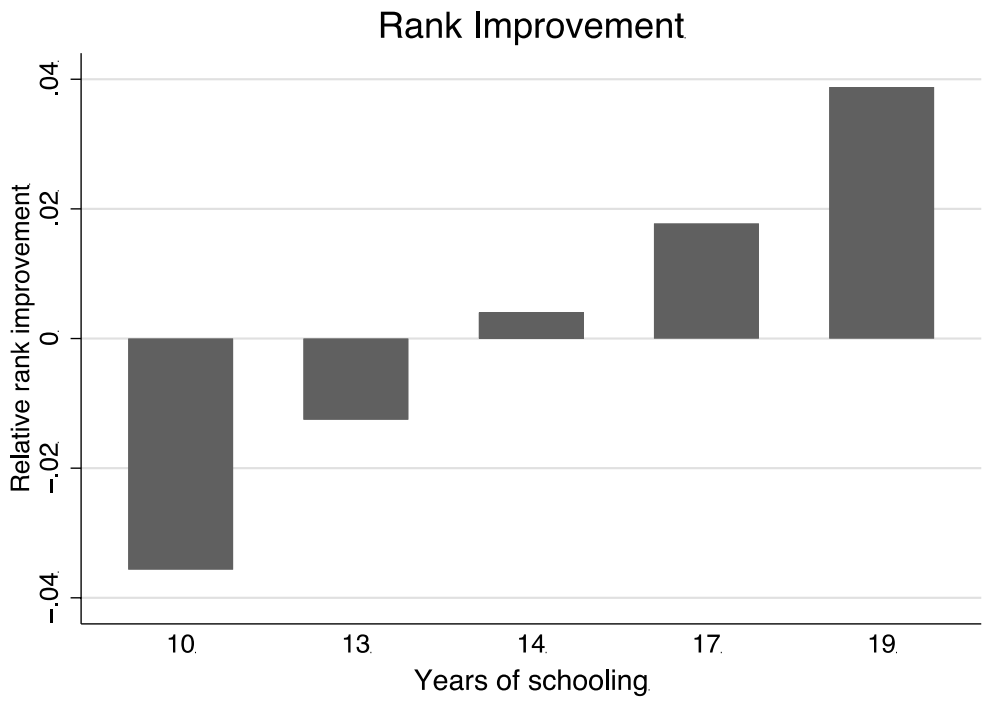
The panel to the left reports the relationship between the candidates´ relative rank (ex ante) and years of schooling. The panel to the right illustrates the difference in years of schooling of the candidates receiving pre-advantage and not. Note: All election years between 2007-2015 are included in the figure.

3.2 Selection mechanism from the voters

What effect do the voters have on the selection of politicians? We want to see if there are any positive selection effect from the voters in the municipalities on average. To be able to draw a conclusion on this, we are linking educational level of the municipal council to the candidates´ *relative rank improvement*. *Relative rank improvement* denotes the difference in the relative rank from the original rank ex ante to the election results ex post. This difference can be interpreted as the candidate´s climb or drop in the ranks due to voter preferences. Baskaran and Hessami (2017) argues that "the extent to which the final rank of a candidate differs from her initial rank is a first-order proxy for how much voters prefer a candidate". We follow this approach in determining the selection mechanism from the voters.

In figure 3, we illustrate the relation between years of schooling for the candidates and *relative rank improvement*. Here we find a positive relationship between *relative rank improvement* and years of schooling for candidates in the municipal council. Figure 3 illustrates that higher educated candidates are preferred by the voters and will thereby climb the ranks to a higher degree than lower educated candidates. We see that those with 19 years of schooling climb the ranks with around four percentage points, from the counterfactual ranking to the actual ranking. In the other end, we see that those with 10 years of schooling falls in the ranks with around four percentage points. This illustrates that candidates with higher education are favoured by the voters. This finding imply that voters prefer candidates of higher quality, measured in years of schooling, and that they amplify the selection effect from the parties. The analysis illustrates that both voters and parties positively select politicians on quality.

Figure 3



The figure illustrates the relative rank movement of candidates with different years of schooling. Note: only candidates on list with complete data on rank ex ante and ex post included. All election years between 2007-2015 are included in the figure.

3.3 Voters vs. Parties

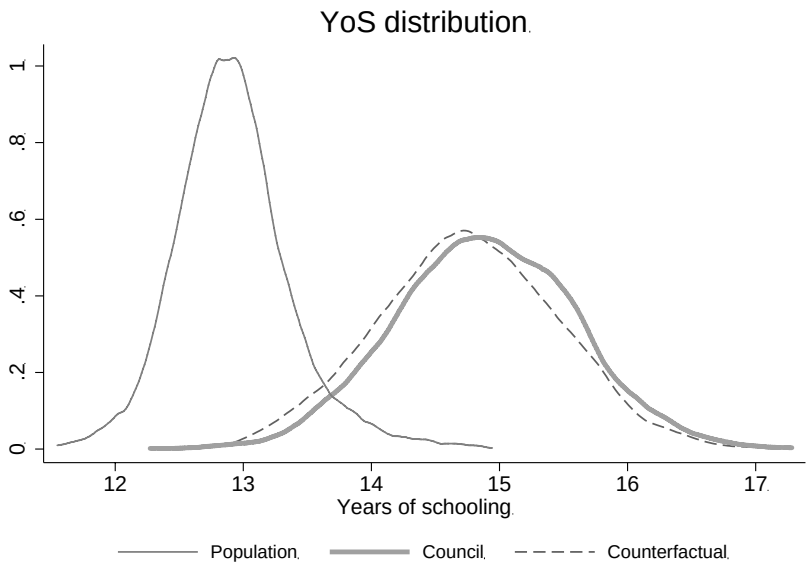
3.3.1 Years of Schooling

In section 2.3.1 we documented a positive quality difference, meaning that the average years of schooling for the politicians in the municipal councils are higher than the average years of schooling for citizens in the municipality. Figure 4 illustrates this graphically, where it shows the distribution of years of schooling in the Norwegian population above 16 years of age and the distribution of years of schooling in the municipal councils. The solid line corresponds to the former, and the thin line corresponds to the latter. This illustration clearly shows a positive quality difference; the average years of schooling in municipal councils are considerably higher than the average years of schooling in the population. This is in line with Dal Bó et al. (2017), where they found that politicians are positively selected for all ability measures. The average years of schooling in the population is 12,9, while the average years of schooling in the municipal council is 14,9. This corresponds to a quality difference of 2 years of additional education for the councils compared to the population.

By now, we have documented positive selection for both voters and parties, and that there indeed is a positive quality difference between the politicians and the citizens. Which of these effects is of greatest importance for the quality difference? To separate the selection effects between voters and parties, we are relying on the counterfactual seat allocation. In addition to years of schooling for the population and the municipal council, we plot the density of years of schooling for the candidates who *would have been selected into the municipal council if only the party list proposal mattered*. That is, the density of years of schooling for candidates in the counterfactual ranking which is ignoring personal votes, corresponding to the number of seats that the party wins in the election. From figure 4, we see that the positive selection of candidates in the municipalities mostly come from the parties´ positive selection and their preference for candidates of high quality. This may be due to the fact that parties anticipate voters. As the mean of the dashed line is just below the mean of the solid line, we can conclude that the positive selection mainly comes from parties. However, as we have shown, voters positively select candidates with higher quality and contribute to amplify the selection effect. The difference between the dashed and the solid line implies that voters positively select candidates with regards to quality, measured in years of schooling[6].

[6] As an alternative to years of schooling, we have used the income of the candidates, cleaned for age and gender effects. This measure of quality is explained and investigated further in section 5.2. Using cleaned income reveals no differences between the actual and the counterfactual councils. This implies that the parties are driving this selection. See figure A.4 in the appendix.

Figure 4



The figure illustrates the distribution of years of schooling of the population, the elected council and the counterfactual council. Note: the counterfactual council is the candidates who would have been elected if we exclude all personal votes. In this case, only party ranking matters. All election years between 2007-2015 are included in the distribution.

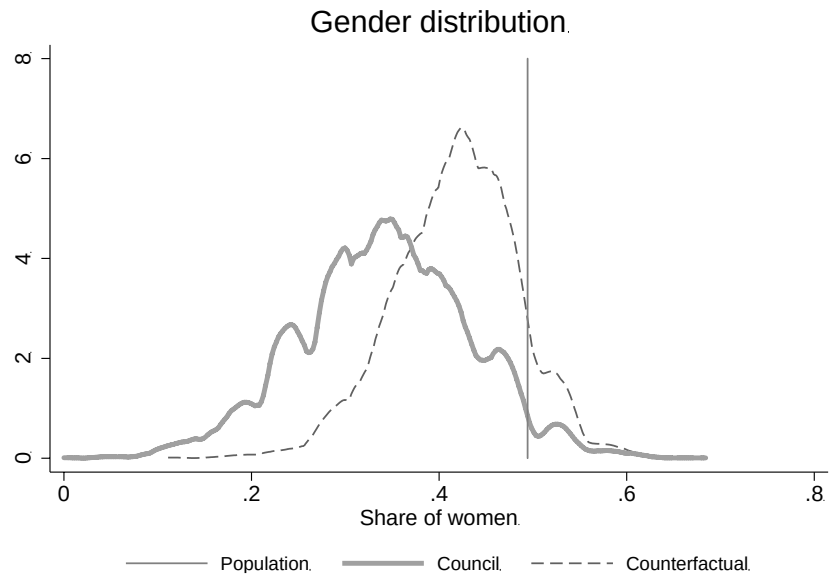
3.3.2 Gender and age selection

Selection into politics might not be limited to quality, but also other factors. Can we see any sign of selection effects with regards to gender and age? It is stated in the Local Government Act of 1993, §36, that each gender should be represented by at least 40 percent in the municipal council. Hence, we would expect that the least represented gender would have a share of at least 40 percent in the counterfactual ranking as parties are expected to comply with laws and regulations. It is a known fact that the female representation in leading positions have been considerable low over the years. In 2017, 38 percent of all leaders in Norway were female, stating their underrepresentation (Statistics Norway, 2017b). Esteve-Volart and Bagues (2012, p. 394) found that "the fact that female candidates are nominated to worse positions in Spanish legislative elections cannot be explained by male candidates' greater popularity among voters". From figure 5, we see that the gender distribution shows an overrepresentation of men both in the counterfactual council and the actual council. As expected, the female share is approximately 42 percent if only the parties where to decide, but the voters amplify the gender difference. The municipal councils ex post has a female share of around 38 percent, considerably lower than the counterfactual. In the overall population, the men and women are equally distributed. This suggest that both parties and voters contribute to the

gender imbalance in Norwegian local politics contribute to the gender imbalance in Norwegian local politics.

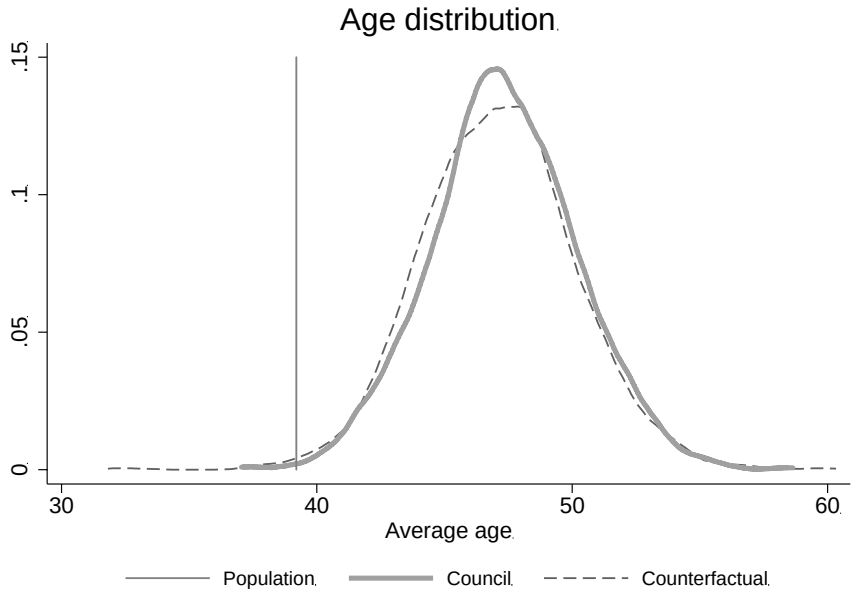
From figure 6, we observe that the average age distribution of municipal council members are around 47 years old both in the counterfactual ranking and in the actual result. The average age in the Norwegian population in election years between 2007-2015 were around 39 years, and the graph indicates that both voters and parties positively select relatively older candidates. The age difference between the population and the elected candidates indicates that voters and parties prefer older and more experienced candidates, and/or that these candidates are more interested in participating in politics. Overall, it appears that middle-aged men with higher education tend to be positively selected into municipal council.

Figure 5



The figure illustrates gender distribution of the elected council and the counterfactual council, in addition to the ratio of the population. Note: the counterfactual council is the candidates who would have been elected if we exclude all personal votes. In this case, only party ranking matters. All election years between 2007-2015 are included in the distribution.

Figure 6



The figure illustrates the age distribution of the elected council and the counterfactual council, in addition to the ratio of the population. Note: the counterfactual council is the candidates who would have been elected if we exclude all personal votes. In this case, only party ranking matters. All election years between 2007-2015 are included in the distribution.

4 Municipality Revenue & Selection

The previous section illustrates that there exists positive selection on quality into municipal councils. Is this effect amplified in municipalities with substantial income from *CPtax*? We know that higher stakes at the local election leads to higher voter turnout (Andersen et al., 2014), but our analysis focus on how higher stakes could affect the selection into politics. More specifically, we investigate the relationship between *CPtax* and the quality difference. First, we do a cross sectional analysis. Second, we take advantage of the time-varying data by employing a fixed effects model, where we control for time and municipality fixed effects. Third, we investigate whether candidates of higher quality have a higher rank improvement in municipalities with substantial income from property tax. This is done in order to separate the selection effect between the voters and the parties.

4.1 Cross sectional analysis

4.1.1 Empirical strategy

The empirical strategy of the cross-sectional analysis addresses the hypothesis of whether commercial property tax per capita (*CPtax*) has a significant impact on politicians' quality. As before, politician quality is measured by educational level and is defined by the difference between years of schooling for politicians in the municipal council and years of schooling for citizens in the municipality.

Changes in political quality may be influenced by several factors, and one of the empirical challenges of our thesis is to isolate the effect of local government income on the quality difference. One would ideally conduct an experiment to identify the isolated effect of *CPtax* on the quality difference, in which *CPtax* would have been allocated randomly. It is not possible to allocate *CPtax* to municipalities, nor prevent municipalities from utilize their natural resources. However, by employing a quasi-experimental variation generated by the introduction of *CPtax* in Norwegian municipalities, we are able to simulate the ideal experiment (Angrist & Pischke, 2009). As a starting point, we consider estimating β in the following equation, linking quality of the municipal council in municipal i in year t, denoted as Y_{itPol}, to *CPtax* in municipality i in year t:

(1) $$Y_{itPol} = \mu + \beta CPtax_{it} + \varepsilon_{it}$$

With this specification, the coefficient β isolate how income alters politician quality if there are no omitted variables correlated with both $CPtax_{it}$ and Y_{itPol}. Coefficients in the regression will be biased if *CPtax* correlates with variables that determine individuals´ choice of schooling (Angrist & Pischke, 2009). It might be that municipalities rich in power income happen to have a highly educated municipal council irrespective of what is actually at stake in any specific election. More central municipalities tend to have a higher educational level on average, and it is often the less central municipalities that are rich on *CPtax*. The latter is in line with Borge et al. (2015, p. 107), where they find that "local governments with high hydropower revenue typically are small and sparsely populated". Hence, to deal with this endogeneity problem, we redirect attention to the quality difference. Andersen et al. (2014, p. 158) states that "by focusing on the difference between participation in the local and regional elections... we obtain estimates that are unlikely to be biased by (unobserved) population characteristics". By taking the difference between years of schooling for the representatives in the municipal council and years of schooling for the citizens in the municipality, we net out the issues with omitted variables described above. When setting up the new equation, our estimate of β will be contaminated only if there are further unobserved variables, that both are correlated with *CPtax* and have a differential impact on the quality of politicians (Andersen et al., 2014). We estimate the following equation:

$$(2) \qquad Y_{itPol} - Y_{itPop} = \mu + \beta CPtax_{it} + \varepsilon_{it}$$

The idea with this regression is to find a line as close as possible to the observed data, where we minimize the squared difference between actual and predicted values of the quality difference. This specification cleans out any influence from factors that are common to both politicians and the citizens, such as centrality. $Y_{itPol} - Y_{itPop}$ denotes the quality difference in municipality i in year t. $CPtax_{it}$ can be interpreted as before, that is commercial property tax per capita. The error term, ε_{it}, captures any measurement error and all variation in $Y_{itPol} - Y_{itPop}$ that is not explained by *CPtax*. We can interpret β as the effect of an increase in *CPtax* on the quality difference. If β is positive, it means that when *CPtax* increase, the average years of schooling of the municipal council will increase relative to the average years of schooling for the population. We choose to base our inference on equation (2), due to the considerations discussed above.

For the estimation results to be unbiased and consistent, our specification must satisfy the underlying assumptions of OLS. Especially, the conditional mean zero assumption, that *CPtax* and the error term are uncorrelated, will be important for this approach. If $E(\varepsilon_{it}|CPtax_{it}) = 0$, it means that *CPtax* is exogenous. By netting out differences in quality between municipalities, we have filtered out the potential bias. Hence, *CPtax* and the error term will be uncorrelated. The reason is that *CPtax* is as good as exogenously given, only determined by the municipalities geographical location (Andersen et al., 2014). However, each municipality decides whether or not to levy *CPtax* and they can choose a tax rate below the maximum level. Andersen et al. (2014) found that the average tax rate among all the municipalities with *CPtax* was 0.62. This might constitute an endogeneity problem, as municipalities with some *CPtax* choose not to set the highest tax rate. However, all local governments with substantial hydropower income have set the tax rate at the maximum level, which is 0.7[7], and let us treat *CPtax* as exogenously given.

4.1.2 Results

In this section, we present the estimated results for equation (1) and (2) and a graphical illustration of the relationship between *CPtax* and the difference in years of schooling. Table 2 shows the regression results, where the dependent variable is years of schooling for elected candidates and the quality difference, whereas the independent variable is *CPtax*. We choose to take all three election years between 2007 and 2015 into account in the regression, and control for time fixed effects to capture the influence of possible aggregate trends. The estimates are standardized, and the interpretation will be the number of standard deviation units the quality difference changes due to a standard deviation increase of one in *CPtax*. As seen by the table, the relationship between the defined variables is as good as neutral. We see a small and negative, but insignificant relationship between *CPtax* and the quality difference. The standardized decrease in the quality difference measured in years of schooling due to a standard deviation increase of one in *CPtax* is -0,00485 in the election years between 2007 and 2015. We cannot conclude on this result, as the estimates are insignificant. Similar neutral and insignificant results occur when

[7] "For the 93 local governments with an income above NOK 2000 per capita, all have a tax rate of 0,7" (Andersen et al., 2014, p. 159).

we measure the quality difference as the difference between the share of highly educated politicians in the municipal council and the share of highly educated citizens in the population[8]. When running the regression on the three election years separately, we get neutral and insignificant results. The confidence interval varies from -0,07 to 0,06. This narrow confidence interval implies good precision of the estimates, that there is no effect of higher *CPtax* on the quality difference.

Table 2

Regression results

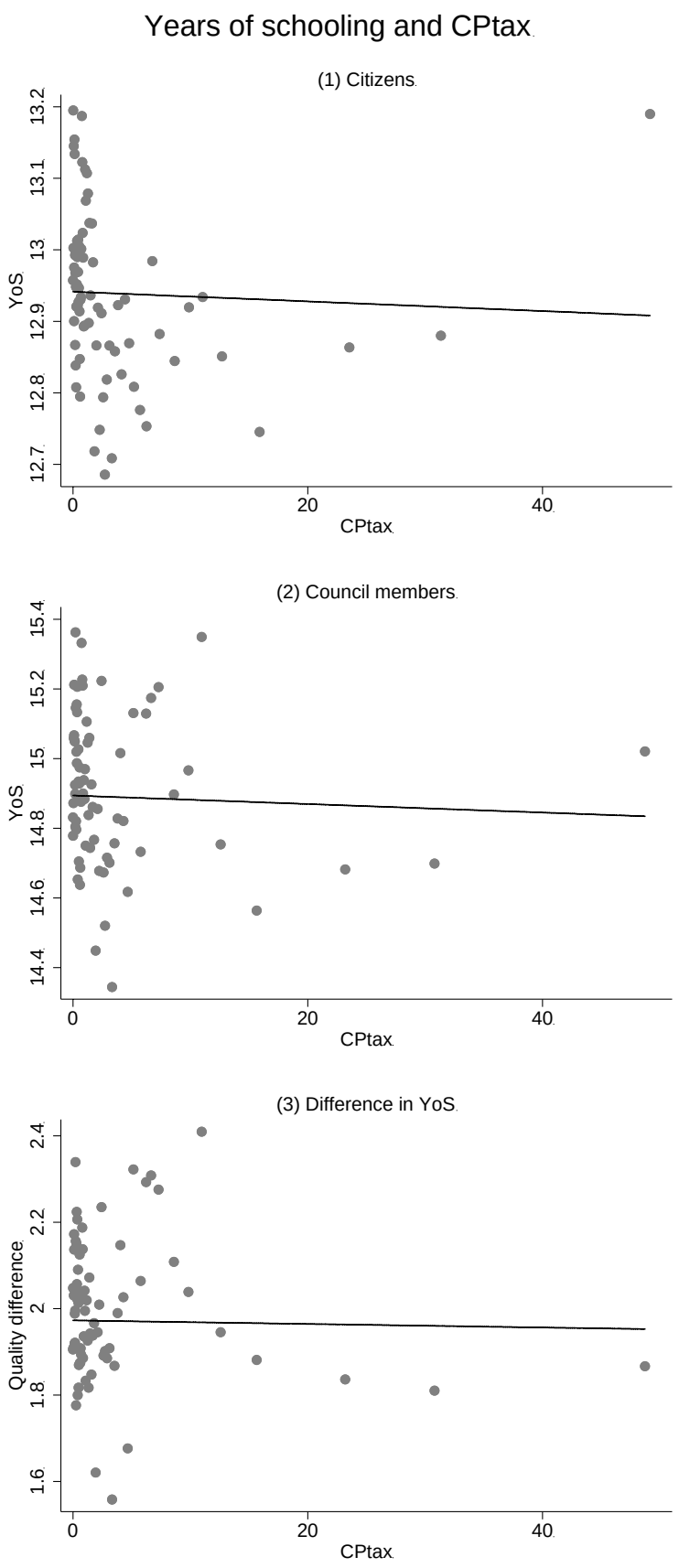
	(1)	(2)
VARIABLES	YoS Elected	YoS Difference
CPtax	-0.0179	-0.00485
	(0.0340)	(0.0339)
Constant	21.31***	3.500***
	(0.0543)	(0.0519)
Observations	1,250	1,250
R-squared	0.045	0.001
Year FE	YES	YES

All variables standardized on their standard error
Standard errors clustred on municipality level in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The first panel in figure 7 illustrates the relationship between *CPtax* and years of schooling for the population in the municipalities. This illustrate a weak and negative relationship, as one could expect. This is based on the discussion on centrality and the location of municipalities with higher income from *CPtax*. The second panel in figure 7 describes the relationship between *CPtax* and years of schooling for the candidates in the municipal councils, described by equation (1). This graphical illustration shows a neutral relationship between the variables but is most likely contaminated by various omitted variables. If we shift our focus to the third panel in figure 7, this issue is dealt with, where this panel corresponds to the specification in equation (2). As represented from the regression results, the relationship is small and negative, but insignificant, and we conclude that there is no relationship between *CPtax* and the quality difference by employing this simple empirical strategy.

[8] Higher education is defined as 16 years of schooling or above. The estimated results are weakly positive, but insignificant. When including controls, the relationship becomes more positive, but is still insignificant. As for the model in section 4.1, we conclude that there is no relationship between the variables. Regression results are reported in table A.5.

Figure 7



The figure illustrates the relationship between CPtax and years of schooling. Panel 1 demonstrates this for the population, panel 2 demonstrates this for the elected council, while panel 3 illustrates the relationship for the difference in years of schooling between the council and the population. All election years between 2007-2015 are included in the figure.

4.2 Fixed effects analysis

4.2.1 The Aukra case

After the discovery of the "Ormen Lange" gas field on the west coast of Norway in 1997, it was decided that Aukra should be the place for onshore facilities to process the gas before exportation to Easington in England (Bergem, Bremnes, Hervik, & Opdal, 2013). This gave them the opportunity to claim taxation rights on the field, and the municipality introduced commercial property tax (*CPtax*) from 2003. In 2004 it was decided that the onshore facilities should be located at Nyhamna in Aukra, and the production started in the autumn of 2007. From figure A.6 in the appendix we see that the increase in revenues from property tax is massive, from nothing in 2003 to over 40 000 NOK per capita in 2009. This illustrates the great potential of the time variation in *CPtax*.

We have done a simple analysis of Aukra, to investigate our hypothesis that the quality of politicians will increase with *CPtax*. We find no conclusive evidence for this in our brief investigation (see table A.7 in the appendix), but we are fascinated by the variation of *CPtax* seen in Aukra. As pointed out in section 2.3.1, several municipalities have introduced *CPtax* between 2007 and 2015. We aim to utilize the time variation in *CPtax*, exemplified by Aukra, by employing the fixed effects model to further investigate our hypothesis.

4.2.2 Empirical Strategy

A suitable method to investigate the relationship between *CPtax* and the quality of politicians in the municipal council is to estimate a fixed effects model. In order to utilize the time-varying components of our panel dataset, the fixed effects model is a reasonable model to employ. The fixed effects model we aim to employ, include both time and municipality fixed effects.

Let Y_{itPol} - Y_{itPop} equal the difference in years of schooling between the municipal council of municipal *i* in year *t* and years of schooling for the citizens in municipal *i* in year *t*, that is the quality difference. $CPtax_{it}$ denote commercial property tax per capita. In addition, we include a set of controls. The included controls are age distributions, female share and unemployment rates. This set of controls are socioeconomic in their nature and is included because of their importance in

existing literature. They have been demonstrated to have significance for political participation (Andersen et al., 2014; Campbell, Converse, Miller, & Stokes, 1980; Geys, 2006).

An important assumption is that potential unobserved factors should be time-invariant and within each cross-sectional unit for the fixed effects model to be valid. "By time-invariant values, we mean that the value of the variable does not change over time" (Williams, 2015, p. 1). Wooldridge (2010) describes unobserved factors as specific features of a cross-sectional unit that are not observed. These confounders can be political interest in the population, motivation and cognitive ability. What Wooldridge (2010) mention as cross-sectional units refers to the municipalities in our case, while the unobserved factors are aggregated at municipal level. We assume that the unobserved factors will stay constant over time, such that the fixed effects model is more reasonable to employ than the random effects model, in which the unobservable factors are allowed to be time-variant. This is based on that we find it highly unlikely that changes in the municipalities´ population composition would lead to changes in unobservable factors. Once constant and unobserved municipality factors are controlled for, *CPtax* is as good as randomly assigned. In order to estimate the fixed effects model, we build on OLS by adding α_i and λ_t which captures the municipality fixed effects and the time fixed effects. The equation estimating the fixed effects model will be an extension of equation (2):

$$(4)\ Y_{itPol} - Y_{itPop} = \alpha_i + \lambda_t + \beta CPtax_{it} + \varepsilon_{it}$$

In equation (4), β denotes the causal effect of interest, how *CPtax* affects the quality difference. As before, $CPtax_{it}$ explains the municipalities´ income from commercial property tax in municipality i in year t. The parameter of interest, β, captures the effect of *CPtax* on the quality of politicians in the municipal council, holding all other variables constant. Given panel data, the causal effect of *CPtax* on the quality of politicians can be estimated treating α_i and λ_t, the fixed effect and the time effect, as parameters to be estimated. The unobserved individual effects are coefficients on dummies for each municipality, while the year effects are coefficients on time dummies (Angrist & Pischke, 2009). α_i captures all municipal factors that do not vary over time, such as ability, motivation and political interest of the population.

However, municipalities may have aggregate trends that should be taken into account, and we therefore include time fixed effects, λ_t to control for this variation. This filters out potential trends across municipalities and let us compare the different election years. The error term, ε_{it}, captures all variation and measurement error in the explained variable, Y_{itPol} - Y_{itPop}, that is not explained by the other variables. Lastly, we cluster the standard errors at municipal level to take intra-municipality correlation into account.

According to Angrist and Pischke (2009, p. 223), "treating the individual effects as parameters to be estimated is algebraically the same as estimation in deviations from means". As α_i is unobservable, it cannot be directly controlled for. However, in the fixed effects model, we eliminate α_i by demeaning the variables using the within transformation. Our panel data consists of observations of the same municipalities over time, and we therefore calculate the difference between equation (4) and the average of the municipalities. Now, we are left with within-municipality variation over time, as the deviations from means eliminate the unobserved municipality effects (Angrist & Pischke, 2009). By this specification, we take the advantage of observing variation in the years of schooling for the municipal council in a certain municipality over several election years. This could potentially help us in avoiding sources to bias that would otherwise affect the estimated results.

As discussed above, local governments decide the tax rate, but as we have seen, substantial income from *CPtax* means that the local government set the tax rate at the maximum level. Municipalities with high *CPtax* may be negatively correlated with educational level for both the population and the politicians, due to the centrality issue. We assume that by using the fixed effects model both the treated and non-treated municipalities are equivalent in the remaining characteristics. Hence, the difference in the outcome variable, that is years of schooling for the municipal council, between power municipalities and non-power municipalities can be attributed to the fact of having *CPtax*. As stated earlier, we rely on the conditional mean independence assumption to isolate the causal effect and believe that once we control for constant and unobserved municipal factors (α_i) and time variation within the municipalities (λ_t), then $CPtax_{it}$ is as good as randomly assigned. Aukra is geographically located near the "Ormen Lange" gas field, and

because of this they accidentally received the taxation rights from the gas field. If the assumption of random assignment holds, $\hat{\beta}_1$ has a causal interpretation.

4.2.3 Results

This section presents the regression results from the fixed effects model. The model controls for both time and municipality fixed effects and are clustering the standard errors. First in table 3 we report the OLS estimates, corresponding to the estimates in table 2, but without time fixed effects. We have also included controls in this estimate, as seen from the second column in table 3. The estimated results are higher, implying that equation (2) might have some omitted variable bias. However, the estimates are insignificant. Furthermore, we report estimates from the fixed effects model including both time and municipality fixed effects, in addition to some observable control variables. As in the cross-sectional analysis, we standardize the variables. When employing the fixed effects model, we see that the relation between *CPtax* and the quality difference is estimated to be 0,267, as reported in table 3. That is, an increase of one standard deviation in *CPtax* results, on average, in an increase of 0,267 standard deviations in the difference in years of schooling between the municipal council and the population. However, as for the simple model above, the estimation results are not significant at any significant level, with a p-value of 0,375. As for the cross-section analysis, we estimate the relationship between *CPtax* and the quality difference, measured as the difference in the share of highly educated politicians and the share of highly educated citizens. The results are positive and insignificant, but lower than the results in table 2, implying no relationship between the variables[9].

We observe that the reported standard error from the model is 0,3. The large standard error makes the regression results statistically insignificant. The confidence interval on the 95% confidence level ranges from -0,32 to 0,86, a relatively wide interval. This wide confidence interval indicates that the estimates are imprecise, and one should have little confidence in the estimated relationship. This may be a sign of small variation in *CPtax* in the municipalities, where there are only a few municipalities driving the variation. The estimates when including

[9] The fixed effects model includes both municipality and time fixed effects, and the standard errors are clustered at the municipality level. The regression results are reported in table A.5.

both time and municipality fixed effects, in addition to observable controls, does not differ significantly from the model with only municipality fixed effects nor the model with both municipality and time fixed effects. Compared to the cross-sectional analysis, the estimated coefficients are positive and larger in the fixed effects model, which may indicate negative selection bias in the cross-section estimates. However, we find no evidence of any effects in the OLS model, nor in the fixed effects model. As we have seen, the precision of the estimates seems to be much better with the OLS model than in the fixed effects model, as the confidence interval is narrower with this approach.

Table 3

Regression results: YoS difference

	(1)	(2)	(3)	(4)	(5)
VARIABLES	OLS	OLS	Fixed effects	Fixed effects	Fixed effects
CPtax	-0.00475	0.000272	0.249	0.263	0.267
	(0.0338)	(0.0351)	(0.302)	(0.316)	(0.300)
Children		-0.0176			-0.0233
		(0.0574)			(0.0885)
Young		-0.0740			-0.0487
		(0.0828)			(0.150)
Elderly		0.0338			-0.0881
		(0.0653)			(0.207)
Women		0.0778*			0.144
		(0.0461)			(0.110)
Unemployment		0.0384			-0.0845
		(0.0460)			(0.0679)
Constant	3.454***	0.0338	1.346	1.275	-4.907
	(0.0389)	(2.417)	(2.573)	(2.693)	(6.206)
Observations	1,250	1,250	1,250	1,250	1,250
R-squared	0.000	0.015	0.561	0.563	0.566
Municipality FE	NO	NO	YES	YES	YES
Year FE	NO	YES	NO	YES	YES

All variables standardized on their standard error
Standard errors clustred on municipality level in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.2.4 Rank improvement

Figure 3 in section 3.2 demonstrates that voters seems to favour higher educated candidates, moving them up the ranks. This result is general for the whole of Norway. Do higher educated candidates have a larger relative rank improvement in power municipalities than in non-power municipalities? This investigation is based

on a comparison of the movement of highly educated candidates up the ranks from the counterfactual lists to the final lists, between high and low-power municipalities[10]. If higher *CPtax* have a positive, and significant relationship with relative rank improvement of higher educated it would imply that voters in municipalities with more income from *CPtax* tend to care more about electing candidates of high quality into the municipal council. The two first columns in table 4 report the estimated OLS results. We observe a small and positive, but insignificant result when controls are not included. When we include controls, the estimated result become negative, but is still insignificant.

The next part of the analysis takes the fixed effect approach, including both time and municipality fixed effects, and are clustering the standard errors on the municipal level. We include both because we want to eliminate all variation other than the movement effect. The estimation results when only including municipality fixed effects is positive and significant at the 5% level, implying that the rank improvement of higher educated candidates would increase in municipalities with more income from *CPtax*. The increase in the quality difference due to a standard deviation increase of one in *CPtax* is estimated to be 1,7 standard deviations. However, we find it rational to include both time and municipality fixed effects as the rank improvement of highly educated candidates can be a trend that should be controlled for. We know that education have become more and more important and it might be the case that voters have become increasingly concerned about voting for highly educated candidates over the years. When estimating the model with both time and municipality fixed effects, we see that the time effect eliminates the effect. From table 4 we observe that the estimated standardized relationship between *CPtax* and rank improvement of higher educated candidates is 0,0395 and insignificant at all levels. The confidence interval range between -0,5 to 0,58, implying that the precision of the estimated result is poor. When including controls, we get similar and insignificant results as well. Hence, it seems that the selection effect from the voters is not amplified in municipalities with higher income from *CPtax*.

[10] Higher education corresponds to 16 years of schooling or more. The counterfactual list corresponds to candidates that would have been elected if we ignore personal votes.

Table 4

Regression results: Rank improvement for higher educated

	(1)	(2)	(3)	(4)	(5)
VARIABLES	OLS	OLS	Fixed effects	Fixed effects	Fixed effects
CPtax	0.0183	-0.0342	1.698**	0.0395	0.0419
	(0.0242)	(0.0241)	(0.838)	(0.276)	(0.269)
Children		-0.0959**			0.0410
		(0.0471)			(0.120)
Young		0.0736			0.169
		(0.0527)			(0.131)
Elderly		0.0733			0.291
		(0.0506)			(0.238)
Women		-0.0294			-0.148
		(0.0274)			(0.114)
Unemployment		-0.0338			0.0106
		(0.0319)			(0.0864)
Constant	1.135***	3.265**	-14.14*	-0.495	5.201
	(0.0281)	(1.543)	(7.223)	(2.367)	(5.304)
Observations	1,062	1,062	1,062	1,062	1,062
R-squared	0.000	0.468	0.334	0.715	0.720
Municipality FE	NO	NO	YES	YES	YES
Year FE	NO	YES	NO	YES	YES

All variables standardized on their standard error

Standard errors clustred on municipality level in parentheses

*** p<0.01, ** p<0.05, * p<0.1

5 Sensitivity Analysis

In this section, we implement some sensitivity analyses[11]. The first part of the sensitivity analysis goes towards dividing our sample and provides information on the differences in selection between municipality types. This analysis extends the descriptive analysis in section 3 and gives a direct visual indication of sensitivity. In the last part, we extend the analysis in section 4 by exploring an alternative dependent variable. We use a variable we call cleaned income as a measure of politician quality as the regressor. This measure of quality is based on existing empirical literature from Besley and Reynal-Querol (2011) and provides an increased understanding of the relationship between the input and output variables in our analysis.

5.1 Selection in non-power vs. power municipalities

In order to illustrate the differences in selection effects between power and non-power municipalities, we have extended the figures from section 3. We divide the sample into non-power, low-power and high-power municipalities as in section 2.3.1[12]. Figure A.8 illustrates that the positive selection on quality mostly comes from the parties in non-power and low-power municipalities, and that the voters amplify the effect by voting for highly educated candidates. This is in line with figure 4, where all municipalities are included. When investigating the last panel of figure A.8, it seems like it is more important for voters in high-power municipalities to vote for candidates with more years of schooling. This is illustrated by the distance between the dashed line and the solid line, which is larger in high-power municipalities. However, we cannot conclude on this finding, as it is almost negligible[13]. Section 4.2.4 investigates this more quantitatively, where we find that voters in power municipalities do not select higher educated candidates to a greater degree than in non-power municipalities.

[11] "The parameter values and assumptions of any model are subject to change and error. Sensitivity analysis, broadly defined, is the investigation of these potential changes and errors and their impacts on conclusions to be drawn from the model" (Pannel, 1997, p. 1).

[12] Non-power municipalities have no income from *CPtax*. Low-power municipalities have income between 0 to 5000 NOK from *CPtax*. High-power municipalities have income above 5000 NOK from *CPtax*.

[13] Changing the cutoff of high-power municipalities to 10 000 NOK, we see no change in the selection on quality. When using cleaned income as an alternative measure of quality we find no signs of differences between non-power and power municipalities. See figure A.9.

Figure A.10 and A.11 presents the gender and age selection in a corresponding figure. These illustrate that there are no significant differences between voters and parties in age and gender preferences in the three municipality types[14]. All panels are in line with the distribution over all municipalities, seen in figure 5 and 6.

5.2 Cleaned income as a measure of quality

So far, we have been relying on educational level as a proxy for politician quality. However, Dal Bó et al. (2017) debates this way of measuring quality and argues that "absent direct data on the underlying intelligence or personality of politicians, the existing empirical literature has relied on education or pre-office income" (Dal Bó et al., 2017, p. 1879). Furthermore, they state that "if ability is priced in the market, it shows up in earnings", but earnings may also reflect a number of other personal characteristics (Dal Bó et al., 2017, p. 1888). Therefore, we are following Besley and Reynal-Querol (2011) approach in constructing what we call cleaned income that preferably works as a good proxy for competence for politics. Besley and Reynal-Querol (2011) show that the earnings score is correlated with cognitive and leadership ability as well as various measures of political and policy success.

We calculate the cleaned income as a function controlling for gender and age. As we know, female wages are on average lower than male wages, and that wages increase with age. Hence, when residualizing the income variable we are netting out these two effects, which makes it more suitable as regressor in our model. After residualizing the income variable, we use the fixed effects approach to estimate the effect of *CPtax* on cleaned income for elected candidates. We then have an alternative variable to measure politicians' quality, which can strengthen our investigation. This analysis provides evidence of the association between *CPtax* and the quality of the municipal council.

When including municipality fixed effects, we obtain results that are significant at the 90% level, implying that an increase of one standard deviation in *CPtax* leads to an increase of 1,1 standard deviations in the cleaned income for council members. However, we must control for time fixed effects, as municipalities might have

[14] Changing the cutoff of high-power municipalities to 10 000 NOK, we see no change in the age and gender distributions.

trends in the cleaned income variable that should be taken into account in the estimation. When adding both time fixed effects and municipality fixed effects, we obtain negative, but insignificant results. The estimated results imply that the cleaned income for council members decrease with 0,165 standard deviations with an increase of one standard deviation in *CPtax*. The regression results can be seen in table 5. This is in line with our baseline analysis, where we revealed that there is no relationship between *CPtax* and the quality difference. When using cleaned income as a measure of quality, it does not seem that higher *CPtax* leads to higher quality of the municipal council.

Table 5

Regression results: Cleaned income

	(1)	(2)	(3)	(4)	(5)
VARIABLES	OLS	OLS	Fixed Effects	Fixed Effects	Fixed Effects
CPtax	-0.0327	-0.0263	1.102*	-0.167	-0.165
	(0.0234)	(0.0210)	(0.572)	(0.138)	(0.143)
Children		0.104***			-0.0367
		(0.0396)			(0.0692)
Young		0.0580			0.0223
		(0.0796)			(0.110)
Elderly		-0.213***			-0.0395
		(0.0518)			(0.128)
Women		0.0710**			-0.0287
		(0.0274)			(0.0563)
Unemployment		0.0212			0.0146
		(0.0284)			(0.0482)
Constant	0.644***	-3.481**	0.870***	-0.233***	1.334
	(0.0362)	(1.535)	(0.0893)	(0.0510)	(2.572)
Observations	1,250	1,250	1,250	1,250	1,250
R-squared	0.001	0.389	0.463	0.726	0.726
Municipality FE	NO	NO	YES	YES	YES
Year FE	NO	YES	NO	YES	YES

All variables standardized on their standard error

Standard errors clustred on municipality level in parentheses

*** p<0.01, ** p<0.05, * p<0.1

6 Conclusion

In this thesis, we investigate selection into politics and whether municipality revenue affect the selection of politicians into municipal councils. Our main focus is on the selection with regards to quality of politicians, but we are investigating selection with regards to age and gender as well. Quality of politicians, that is the quality difference, is defined as the difference between years of schooling for the municipal council and years of schooling for the citizens in the municipality. The validity of using this way of measuring political quality is well documented by existing literature, and we are therefore confident on this approach. The reason for using the difference is related to omitted variables and the systematic differences in the average educational level across municipalities, due to the geographical locations. We are mostly using two datasets, containing both individual data and data aggregated at the municipal level. The time variation and the detailed data on individual candidates in local elections gives us great opportunities for investigating our hypothesis in an area with little empirical research.

First, we analyse selection into politics, where we find that politicians are positively selected on quality, which is in line with the findings from Sweden, presented by Dal Bó et al. (2017). This means that the municipal council have more years of schooling compared to the municipality they govern on average. Both parties and voters positively select candidates with regards to educational level. For instance, higher educated candidates have a higher probability of getting a pre-advantage from the party, while they also have higher probability of improving their ranks. Our next analysis investigates if the selection effect mainly comes from the parties or the voters. The positive selection on quality comes mainly from the parties, but also the voters contribute to amplify the positive selection. When it comes to age preferences, middle-aged candidates are positively selected. We find that the parties are driving this selection effect. Lastly, we investigate the selection based on gender preferences. We find that the female share of the counterfactual municipal council is 42%. This means that if only the parties decide, ignoring personal votes, this would be the result. However, after influence from the voters, the female share drops to 37%, implying that voters prefer men over women to govern their municipality. In conclusion, middle-aged men with higher education are positively selected into municipal councils in Norway.

In the cross-section analysis, we find no relationship between the quality difference, measured in years of schooling, and commercial property tax per capita. We expected to find a positive relationship, as higher stakes in local elections may increase the importance of having higher quality candidates in the council, both for the parties and the voters. The relationship is quantified by a decrease in years of schooling by 0,00485 standard deviations when a municipality increases commercial property tax per capita by one standard deviation, but the estimated relationship is insignificant. The confidence interval is narrow, implying good precision of the estimate. When employing the fixed effects model, we obtain results that are positive, but insignificant. In this model we have included both municipality and time fixed effects, in order to control for unobserved, time-invariant factors and potential time trends in the municipalities. An increase of one standard deviation in commercial property tax per capita leads to an increase in years of schooling by 0,267 standard deviations. As for the cross-sectional analysis, this is also statistically insignificant. The confidence interval in the model is wide and implies that the estimated relationship is imprecise. Based on the two approaches, we find no conclusive evidence of additional positive selection on quality when the stakes are higher. The results imply that the findings in Brollo et al. (2013) cannot be generalized to Norway.

To isolate the selection effect from the voters, we investigated the relationship between the *relative rank improvement* of higher quality candidates and commercial property tax per capita. Employing the fixed effects model with only municipality fixed effects, we get a positive and statistically significant result. When including time fixed effects, the effect dies out, and we cannot conclude that there is a relationship between *relative rank improvement* and commercial property tax per capita.

The sensitivity analyses strengthen our results, both when investigating selection effects in power and non-power municipalities and when using a different dependent variable in the cross-section analysis and the fixed effects model. The sensitivity checks reinforce our conclusion that municipality revenue does not affects selection of politicians into municipal councils, with regards to quality, gender or age preferences.

For further research it would be interesting to dig deeper into municipalities with large and sudden changes in power income, like Aukra. As we lack data on educational level on individuals in local governments before 2007, we are not able to utilize the time variation in commercial property tax to its full potential. We believe that the effect of a windfall gain in power income may be temporary, and our models do not account for this effect. One possible empirical strategy to investigate the relation between the quality of the municipal council and commercial property tax is to employ the synthetic control method. One could potentially construct a synthetic municipal and estimate the difference in the quality of the municipal council between the actual and the synthetic municipal council after an increase in commercial property tax. By this method, we are able to investigate the actual and counterfactual development of Aukra, both if they get this windfall gain and if not. However, because of lack of data, we have not been able to apply this method.

Reference list

Andersen, J. J., Fiva, J. H., & Natvik, G. J. (2014). Voting when the stakes are high. *Journal of Public Economics, 110*, 157-166.

Angrist, J. D., & Pischke, J.-S. (2009). *Mostly harmless econometrics: An empiricist's companion*. New Jersey: Princeton university press.

Atkinson, M. M., & Rogers, D. (2012). *Better Politicians: If We Pay, Will They Come?* Paper presented at the Annual Meeting of the CPSA, Edmonton.

Barrabés, N., & Østli, G. K. (2016). Norsk standard for utdanningsgruppering 2016. Revidert 2000 Dokumentasjon Oppdatert 2016.

Baskaran, T., & Hessami, Z. (2017). Does the election of a female leader clear the way for more women in politics? *American Economic Journal: Economic Policy*.

Bergem, B. G., Bremnes, H., Hervik, A., & Opdal, Ø. (2013). *Konsekvenser for Aukra kommune som følge av utbyggingen av Ormen Lange*. Retrieved from http://www.moreforsk.no/publikasjoner/rapporter/naringsokonomi/1304-konsekvenser-for-aukra-kommune-som-folge-av-utbyggingen-av-ormen-lange--en-oppsummering-av-analyser-gjort-av-moreforsking-molde/1077/1536/

Bergh, J., Bjørklund, T., & Hellevik, O. (2010). Personutvelgingen i norske valg. *Norsk statsvitenskapelig tidsskrift, 26*(02), 105-131.

Besley, T. (2004). Paying politicians: theory and evidence. *Journal of the European Economic Association, 2*(2-3), 193-215.

Besley, T., & Reynal-Querol, M. (2011). Do democracies select more educated leaders? *American political science review, 105*(3), 552-566.

Borge, L.-E., Parmer, P., & Torvik, R. (2015). Local natural resource curse? *Journal of Public Economics, 131*, 101-114.

Brollo, F., Nannicini, T., Perotti, R., & Tabellini, G. (2013). The political resource curse. *The American Economic Review, 103*(5), 1759-1796.

Business Anti-Corruption Portal. (2018). Brazil Corruption Report. Retrieved from http://www.business-anti-corruption.com/country-profiles/brazil

Campbell, A., Converse, P. E., Miller, W. E., & Stokes, D. E. (1980). *The american voter*: University of Chicago Press.

Carnes, N., & Lupu, N. (2016). What good is a college degree? education and leader quality reconsidered. *The Journal of Politics, 78*(1), 35-49.

Caselli, F., & Morelli, M. (2004). Bad politicians. *Journal of Public Economics, 88*(3-4), 759-782.

Christensen, D. A., Midtbø, T., Ringkjøb, H.-E., & Aars, J. (2008). To valg med ny personvalgordning. Kontinuitet eller endring. *Bergen: Rokkansenteret, rapport, 9*, 2008.

Dal Bó, E., Finan, F., Folke, O., Persson, T., & Rickne, J. (2017). Who Becomes a Politician? *The Quarterly Journal of Economics*, *132*(4), 1877-1914.

De Benedetto, M. A., & De Paola, M. (2013). Candidates' Quality and Electoral Participation: Evidence from Italian Municipal Elections.

Energifakta Norge. (2017). KRAFTPRODUKSJON. Retrieved from https://energifaktanorge.no/norsk-energiforsyning/kraftforsyningen/

Esteve-Volart, B., & Bagues, M. (2012). Are women pawns in the political game? Evidence from elections to the Spanish Senate. *Journal of Public Economics*, *96*(3-4), 387-399.

Fiva, J. H., Halse, A., & Natvik, G. J. (2017). *Local government dataset*. Retrieved from: www.jon.fiva.no/data.htm

Fiva, J. H., & Røhr, H. L. (2018). Climbing the ranks: Incumbency effects in party-list systems. *European Economic Review, 101*, 142-156.

Gasiorowska, A., Chaplin, L. N., Zaleskiewicz, T., Wygrab, S., & Vohs, K. D. (2016). Money cues increase agency and decrease prosociality among children: Early signs of market-mode behaviors. *Psychological science*, *27*(3), 331-344.

Geys, B. (2006). Explaining voter turnout: A review of aggregate-level research. *Electoral studies*, *25*(4), 637-663.

Gjerde, R. (2016). Norges rikeste kommuner sier nei til Regjeringens kommunereform. *Aftenposten*. Retrieved from https://www.aftenposten.no/norge/politikk/i/m2KP4/Norges-rikeste-kommuner-sier-nei-til-Regjeringens-kommunereform

Hansen, T. (2018). Kommunestyre. Retrieved from https://snl.no/kommunestyre

Kristiansen, B. (2018). Dagens lønnsnivå på Stortinget er 928.000 kroner: – Jeg synes det med fordel kunne vært justert noe. *Dagsavisen*. Retrieved from https://www.dagsavisen.no/helg-nye-inntrykk/ettertanke/dagens-lonnsniva-pa-stortinget-er-928-000-kroner-jeg-synes-det-med-fordel-kunne-vert-justert-noe-1.1108891?paywall=true

Lagerstrøm, B. O. (2007). *Lokaldemokratiundersøkelsen 2007*. Retrieved from https://www.ssb.no/a/publikasjoner/pdf/notat_200945/notat_200945.pdf

Lundqvist, H. (2013). Is it worth it? On the returns to holding political office.

Messner, M., & Polborn, M. K. (2004). Paying politicians. *Journal of Public Economics*, *88*(12), 2423-2445.

Lov om kommuner og fylkeskommuner (kommuneloven), (1993).

Nikolaou, A. (2015). HOW THE POWER OF MONEY AFFECTS HUMAN BEHAVIOUR. Retrieved from http://www.tedxvienna.at/blog/how-the-power-of-money-affects-human-behaviour-and-why-owning-a-lot-of-it-might-make-you-a-mean-person/

Regjeringen. (2016). Fakta om kommunene og fylkeskommunene. Retrieved from https://www.regjeringen.no/no/tema/kommuner-og-regioner/kommunalrett-og-kommunal-inndeling/forholdet-kommune-stat/fakta-om-kommunene-og-fylkeskommunene/id548623/

Regjeringen. (2017). The main features of the Norwegian electoral system. Retrieved from https://www.regjeringen.no/en/topics/elections-and-democracy/den-norske-valgordningen/the-norwegian-electoral-system/id456636/

Ringkjøb, H.-E., & Aars, J. (2010). Nominering og konstituering i norske kommunar.

Spence, M. (1978). Job market signaling. In *Uncertainty in Economics* (pp. 281-306): Elsevier.

Statistics Norway. (2017a). Eiendomsskatt, 2017. Retrieved from https://www.ssb.no/offentlig-sektor/statistikker/eiendomsskatt/aar/2017-06-19

Statistics Norway. (2017b). *Fordelingen av økonomiske ressurser mellom kvinner og menn og kjønnsforskjeller i helse*. Retrieved from https://www.ssb.no/befolkning/artikler-og-publikasjoner/_attachment/325496?_ts=15f0ac51cb8

Statistics Norway. (2017c). Kommunestyre- og fylkestingsvalget. Retrieved from https://www.ssb.no/kommvalg

Statistics Norway. (2018). Befolkningens utdanningsnivå. Retrieved from https://www.ssb.no/utniv/

Statistics Sweden. (2010). *Åttapartivalet 2010*. Retrieved from http://www.scb.se/statistik/_publikationer/me0106_2010a01_br_me05br1101.pdf

Stortinget. (2018a). Lønn og andre godtgjørelser. Retrieved from https://www.stortinget.no/no/Stortinget-og-demokratiet/Representantene/Okonomiske-rettigheter/

Stortinget. (2018b). Politiske partier. Retrieved from https://www.stortinget.no/no/Stortinget-og-demokratiet/stortinget-undervisning/videregaende-skole/politiske-partier/

Transparency International. (2017). Corruption Perception Index 2016. Retrieved from https://www.transparency.org/news/feature/corruption_perceptions_index_2016

Vetter, A. (2002). Local Political Competence in Europe: A Resource of Legitimacy for Higher Levels of Government? *International Journal of Public Opinion Research, 14*(1), 3-18.

Williams, R. (2015). Panel data 4: Fixed effects vs random effects models. *University of Notre Dame.* Retrieved from https://www3.nd.edu/~rwilliam/stats3/Panel04-FixedVsRandom.pdf

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*: MIT press.

Aars, J., & Christensen, D. A. (2010). Hvis bare flere kunne stille! Politisk motivasjon blant kvinner og menn.

Aars, J., & Ringkjøb, H. E. (2005). Party politicisation reversed? Non-partisan alternatives in Norwegian local politics. *Scandinavian Political Studies, 28*(2), 161-181.

Appendix

A. 1

Class level	Candidate education (NUS2000)		Population education		Year of Schooling	
	1st digit	Candidate level NUS2000	Population level		YoS	YoS Corrected
	0	No education and pre-school education	Unknown or no completed education		0	0
1st - 7th	1	Primary education	Below upper secondary education		7	10
8th - 10th	2	Lower secondary education			10	10
11th - 12th	3	Upper secondary, basic	Upper secondary education		12	13
13th	4	Upper secondary, final year			13	13
14th	5	Post-secondary not higher education	Tertiary vocational education		14	14
14th - 17th	6	First stage of higher education, undergraduate level	Higher education, short		17	17
18th - 19th	7	First stage of higher education, graduate level	Higher education, long		19	19
20th +	8	Second stage of higher education (postgraduate education)			20	19
	9	Unspecified			-	-

The table denotes the levels of schooling used in NUS2000 report and for the population. YoS corrected displays the years of schooling we have standardized each level of schooling to.

A. 2

Municipal level data

Variable	N	Mean	Std. Dev.	Min	Max
2007					
CPtax	417	2,41	6,37	0,00	57,26
YoS elected	416	14,70	0,62	12,71	16,53
YoS elected b.p.*	416	14,55	0,62	12,93	16,42
YoS population	417	12,75	0,43	11,55	14,59
Difference in YoS**	416	1,95	0,52	0,31	3,66
Rank Improvement HE***	415	0,05	0,05	-0,10	0,27
Share of children	418	0,07	0,01	0,04	0,10
Share of young	418	0,14	0,01	0,10	0,18
Share of elderly	418	0,16	0,03	0,08	0,26
Share of women	418	0,50	0,01	0,45	0,52
Unemployment share	418	0,01	0,01	0,00	0,06
2011					
CPtax	417	2,54	6,22	0,00	54,74
YoS elected	418	14,91	0,74	12,27	17,18
YoS elected b.p.*	417	14,76	0,76	12,80	17,00
YoS population	418	12,91	0,43	11,59	14,74
Difference in YoS**	418	2,00	0,60	0,35	3,68
Rank Improvement HE***	230	0,04	0,04	-0,13	0,19
Share of children	418	0,07	0,01	0,03	0,10
Share of young	418	0,13	0,01	0,09	0,17
Share of elderly	418	0,17	0,03	0,08	0,27
Share of women	418	0,49	0,01	0,45	0,53
Unemployment share	418	0,02	0,01	0,00	0,06
2015					
CPtax	418	2,91	6,88	0,00	56,33
YoS elected	418	15,06	0,68	13,00	17,28
YoS elected b.p.*	418	14,94	0,66	13,16	16,59
YoS population	418	13,09	0,42	11,98	14,94
Difference in YoS**	418	1,97	0,59	-0,19	3,78
Rank Improvement HE***	418	0,15	0,07	-0,02	0,49
Share of children	418	0,07	0,01	0,03	0,10
Share of young	418	0,10	0,01	0,07	0,15
Share of elderly	418	0,18	0,04	0,09	0,29
Share of women	418	0,49	0,01	0,44	0,51
Unemployment share	418	0,02	0,01	0,01	0,05
Total					
CPtax	1252	2,62	6,49	0,00	57,26
YoS elected	1252	14,89	0,70	12,27	17,28
YoS elected b.p.*	1251	14,75	0,70	12,80	17,00
YoS population	1253	12,92	0,45	11,55	14,94
Difference in YoS**	1252	1,97	0,57	-0,19	3,78
Rank Improvement HE***	1063	0,08	0,07	-0,13	0,49
Share of children	1254	0,07	0,01	0,03	0,10
Share of young	1254	0,12	0,02	0,07	0,18
Share of elderly	1254	0,17	0,04	0,08	0,29
Share of women	1254	0,49	0,01	0,44	0,53
Unemployment share	1254	0,02	0,01	0,00	0,06
N	1254				

Notes:

YoS: Years of Schooling, computed with NUS 2000 codes

*Elected by party: If rank ex ante places the person in the council

**Difference between the municipal council and the municipal population

*** Relative rank movement for candidates with higher education

The table describes averages and shares for key variables in the municipal level dataset (based on the Local Government Dataset) for each election year, 2007, 2011 and 2015, in addition to total levels.

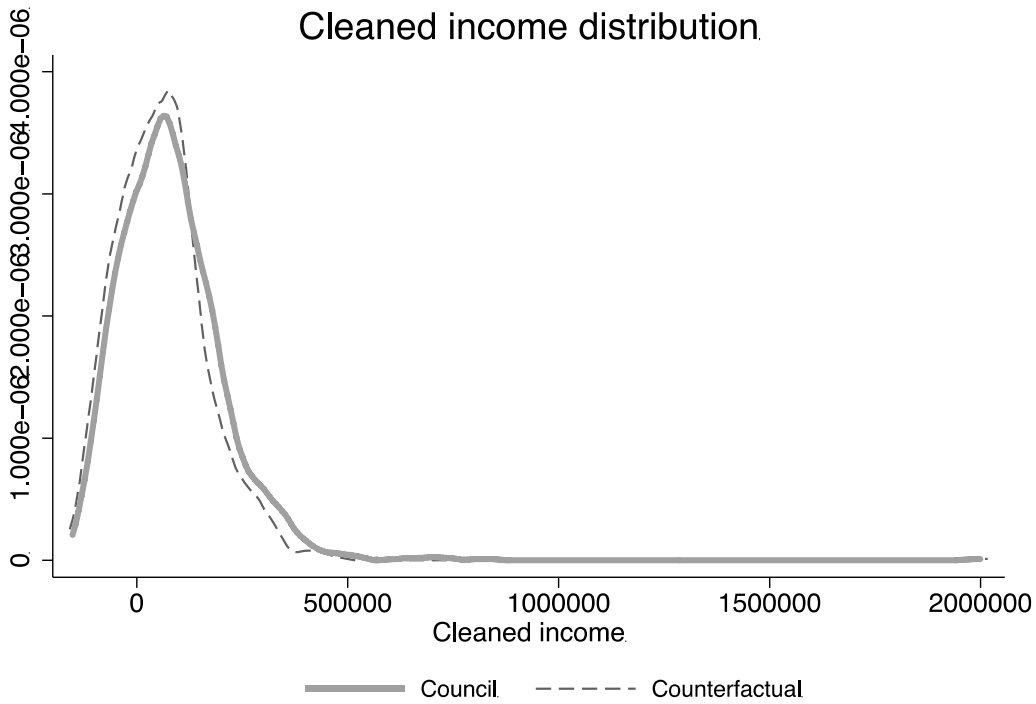
A. 3

# of power municipalities

	0	<5	>5	Total
2007	152	217	49	418
2011	115	252	51	418
2015	84	275	59	418
Total	351	744	159	1254

This table denotes the number of power municipalities (municipalities with income from commercial property tax) in each election year. <5 denotes the municipals whit income over 0, but below 5000 NOK per inhabitant. >5 denotes the municipalities with 5000 NOK or more per inhabitant.

A. 4



The figure illustrates the cleaned income distribution of the elected council and the counterfactual council. Note: the counterfactual council is the candidates who would have been elected if we exclude all personal votes. In this case, only party ranking matters. The population distribution is not possible to compute and is as such not included. Cleaned income is income controlled for age and gender effects. All election years between 2007-2015 are included in the distribution.

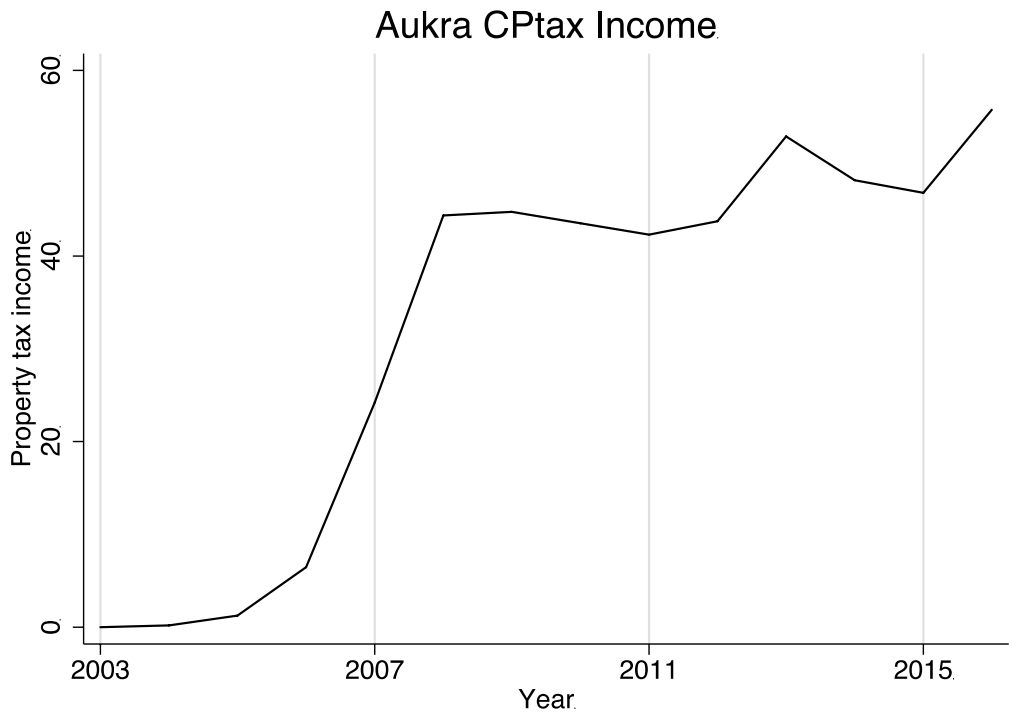
A. 5

Regression results: Share of higher educated

	(1)	(2)	(3)	(4)	(5)
VARIABLES	OLS	OLS	Fixed Effects	Fixed Effects	Fixed Effects
CPtax	0.00714	0.00862	0.721*	0.403	0.395
	(0.0443)	(0.0462)	(0.379)	(0.329)	(0.308)
Children		-0.0775			-0.0502
		(0.0582)			(0.0902)
Young		-0.121			-0.0659
		(0.0798)			(0.135)
Elderly		-0.119*			-0.142
		(0.0658)			(0.186)
Women		0.103**			0.108
		(0.0412)			(0.0986)
Unemployment		-0.0112			-0.104*
		(0.0438)			(0.0609)
Constant	2.331***	-1.102	-4.109	-1.505	-5.708
	(0.0399)	(2.215)	(2.955)	(2.572)	(5.568)
Observations	1,215	1,215	1,215	1,215	1,215
R-squared	0.000	0.055	0.570	0.604	0.607
Municipality FE	NO	NO	YES	YES	YES
Year FE	NO	YES	NO	YES	YES

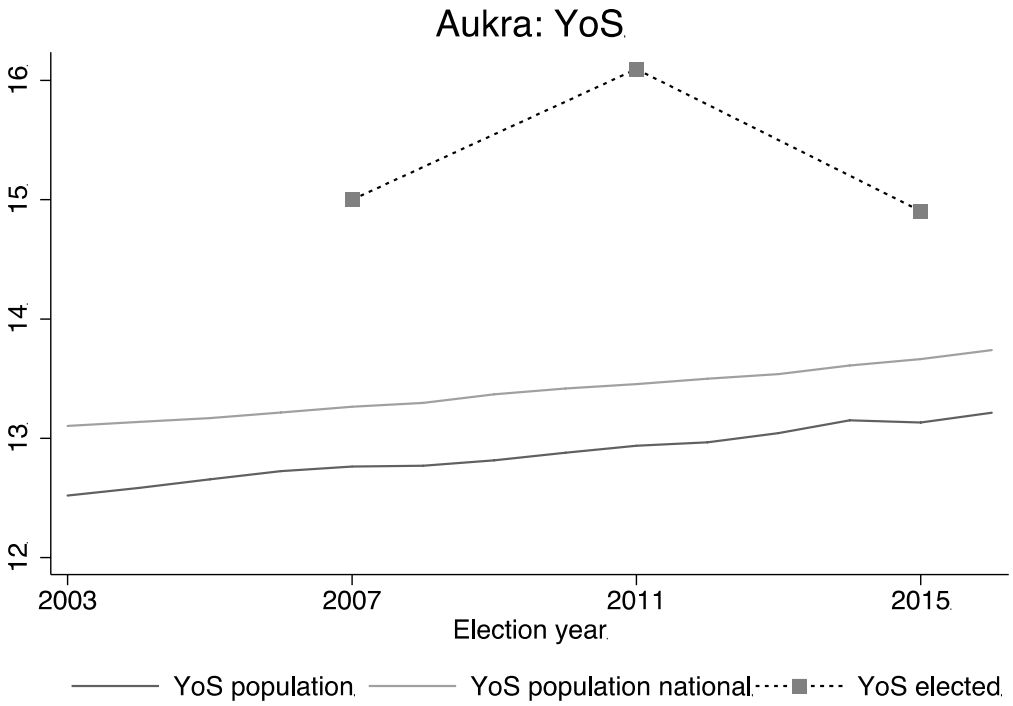
All variables standardized on their standard error
Standard errors clustred on municipality level in parentheses
*** p<0.01, ** p<0.05, * p<0.1

A. 6



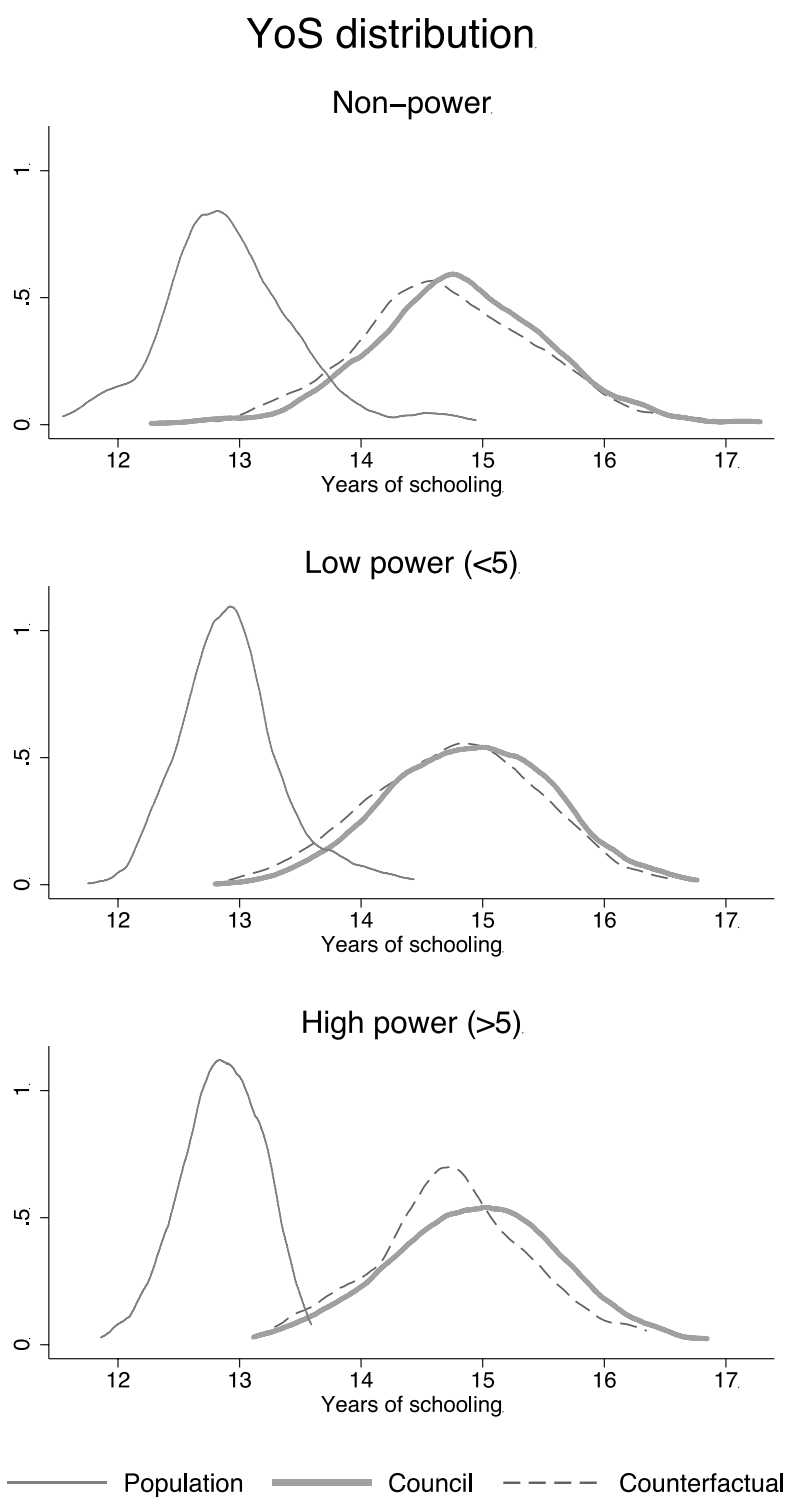
The figure illustrates the development of income from commercial property tax in the municipality of Aukra from 2003 to 2016.

A. 7



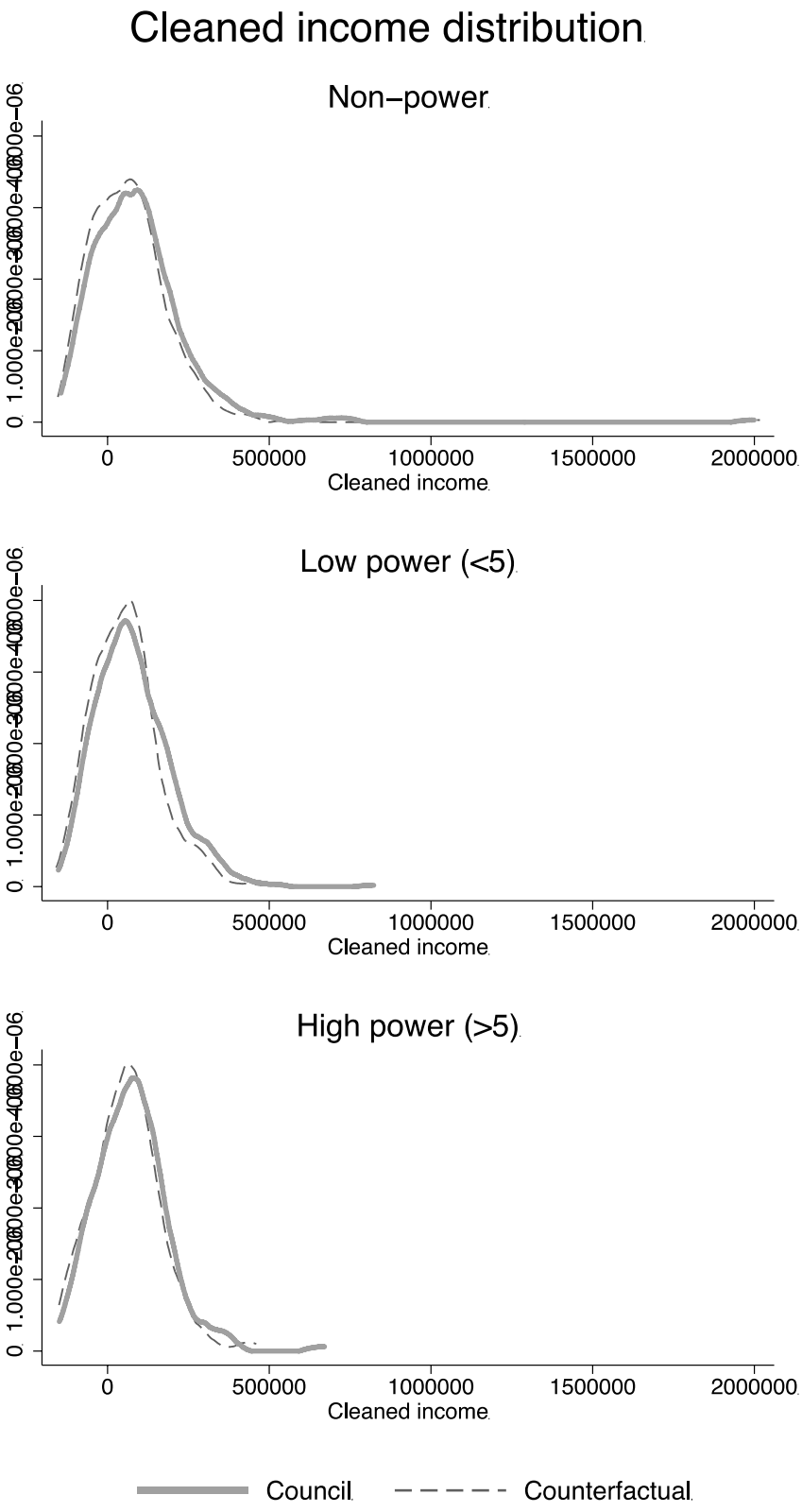
The figure shows the development of the average years of schooling of the population; both nationally and in Aukra. Also included is the average years of schooling of the elected council of Aukra in the last three municipal elections.

A. 8



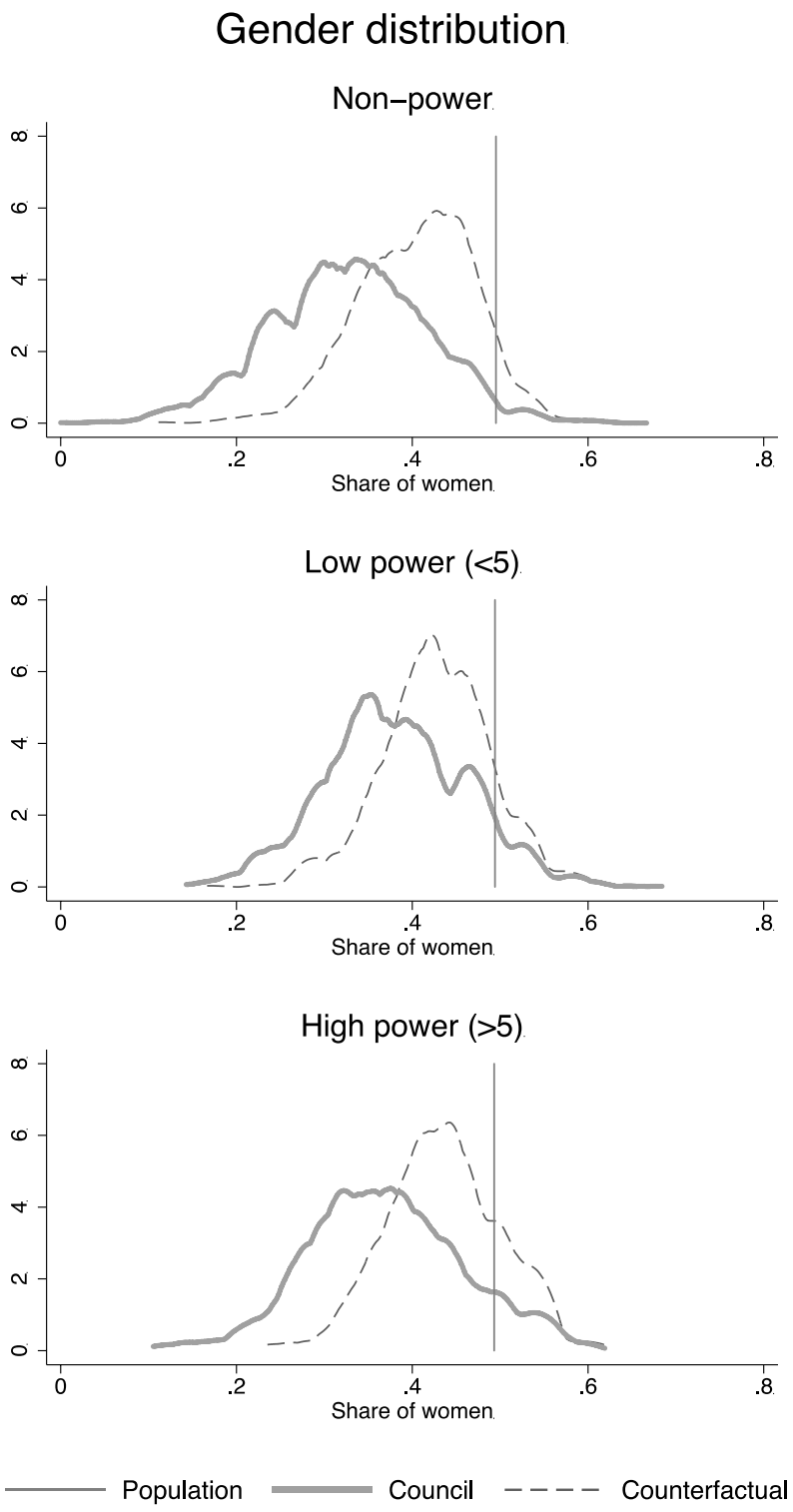
The figure illustrates the distribution of years of schooling of the population, the elected council and the counterfactual council, divided CPtax. Non-power shows the distribution for municipals without CPtax income, Low power for municipals with less than 5000 NOK CPtax income and High power for municipals with more than 5000 NOK CPtax income. Note: the counterfactual council is the candidates who would have been elected if we exclude all personal votes. In this case, only party ranking matters. All election years between 2007-2015 are included in the distributions.

A. 9



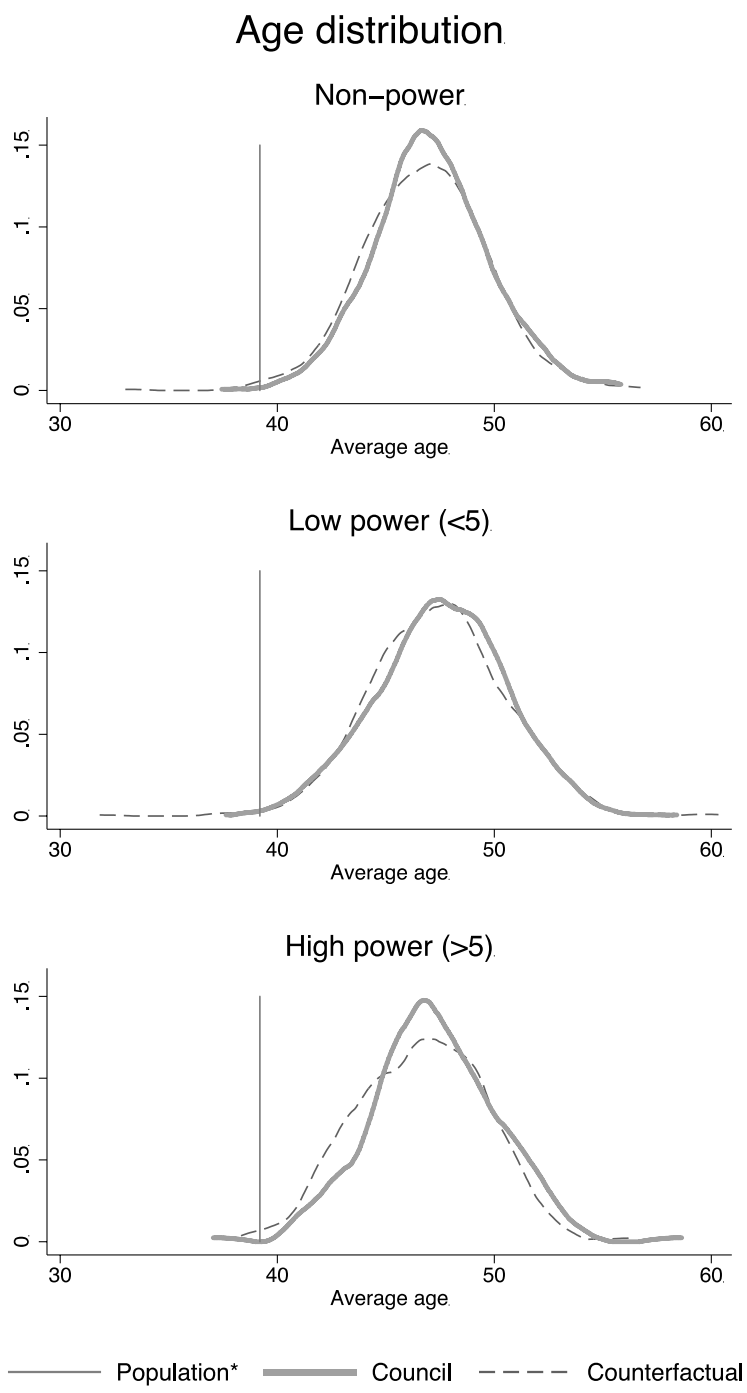
The figure illustrates the cleaned income distribution of the elected council and the counterfactual council, divided CPtax. Non-power shows the distribution for municipals without CPtax income, Low power for municipals with less than 5000 NOK CPtax income and High power for municipals with more than 5000 NOK CPtax income. Note: the counterfactual council is the candidates who would have been elected if we exclude all personal votes. In this case, only party ranking matters. The population distribution is not possible to compute and is as such not included. Cleaned income is income controlled for age and gender effects. All election years between 2007-2015 are included in the distributions.

A. 10



The figure illustrates gender distribution of the elected council and the counterfactual council, in addition to the ratio of the population, divided CPtax. Non-power shows the distribution for municipals without CPtax income, Low power for municipals with less than 5000 NOK CPtax income and High power for municipals with more than 5000 NOK CPtax income. Note: the counterfactual council is the candidates who would have been elected if we exclude all personal votes. In this case, only party ranking matters. All election years between 2007-2015 are included in the distributions.

A. 11



The figure illustrates the age distribution of the elected council and the counterfactual council, in addition to the ratio of the population, divided CPtax. Non-power shows the distribution for municipals without CPtax income, Low power for municipals with less than 5000 NOK CPtax income and High power for municipals with more than 5000 NOK CPtax income. Note: the counterfactual council is the candidates who would have been elected if we exclude all personal votes. In this case, only party ranking matters. All election years between 2007-2015 are included in the distributions.