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Getting Your Money's Worth: Municipality Wealth and the Quality of Politicians

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Getting Your Money's Worth:
Municipality Wealth and the Quality of Politicians

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Content

Preliminary

Introduction

In Norway, there exist municipalities that could be characterized as wealthy. We want to investigate if this wealth means that the municipal council consists of "higher quality" representatives compared to less fortunate municipalities. In addition to this, we want to see if a positive, exogenous shock to wealth affects the quality. As quality as such is hard to measure, we have used education as a signal of quality. Specifically, we look at the share of highly educated within the council. Education and investment in human capital has become increasingly important in the last century, and the importance will continue to increase in the future. Nationwide, the share of the population with education from university or college has increased from 7% in 1970 to 32% in 2016 (Statistics Norway, 2014).

To measure wealth, we have looked at the hydropower income of the municipalities. Norway is a big producer, and have been a big producer of hydropower for a long time, and account for 96,3% of the total electricity production in Norway in 2017 (Statistics Norway, 2017b). The many waterfalls and rivers makes the country well suited for production of electricity. Andersen, Fiva, and Natvik (2014) found a strong and linear relationship between hydropower production per capita in the 1970-1999 period and the commercial property taxation in 2007. Hydropower production and production of oil and gas in the North Sea have been an important factor for Norwegian municipalities to introduce property tax, especially commercial property tax. In 2017, around 86% of Norwegian municipalities have introduced property tax according to Statistics Norway (2017a) and this number is expected to grow further the coming years if we follow the path from the last 10 years.

Aukra, a relatively small municipality in Møre og Romsdal, gain most of their income from taxation on the "Ormen Lange" gas field. The production started in 2007, and the taxation covers 89% of their operating expenses, which is the highest in Norway (Bjerknes, 2017). On the other hand, we have Bykle in Aust-Agder, which is a power municipality. The hydropower income contributes to the fact that Bykle had the highest gross operating income per capita in Norway in 2016 (Statistics Norway, 2018b). We will use these and similar municipalities to measure

the effect of increased municipality wealth on the quality of the politicians in the municipal council.

In Norway, local governments are governed by municipal councils, which is elected by the inhabitants every fourth year. Dal Bó, Finan, Folke, Persson, and Rickne (2017) found that politicians on average are significantly smarter than the people they represent in Sweden. We want to investigate the same relationship in Norwegian municipalities. An interesting perspective on the topic is to investigate the relation between income variation and education.

In the following we will, firstly, present our research topic and research question. Secondly, we will present and discuss some of the related literature. Thirdly, we will describe our data´s and the empirical strategy we aim to use. Lastly, we will present some descriptive statistics and preliminary results.

Topic and research question

Getting your money's worth: Municipality wealth and the quality of politicians

"How does municipality wealth affect the selection of politicians into municipal councils?"

Our main objective of the master thesis is to study how income variation in different municipalities affect the quality of the politicians in the municipal council. By 2018, there are 422 municipalities in Norway. Hydropower income and commercial property tax is appropriate to study because it is independent of municipality size. Central municipalities tend to have higher education level on average, with Oslo, Bergen, Trondheim and Stavanger among the highest educated municipalities in 2016 (Statistics Norway, 2018a). This issue is something we have to control for in our model. Higher municipality income may incentivize higher quality people to self-selecting into politics, by becoming candidates for the municipal councils. Hence, we would like to investigate if a municipality with high hydropower or oil and gas income leads to a municipal council with a higher share of highly educated politicians than a municipality with low hydropower or oil and gas income.

Related literature/theory

In this section, we present some of the relevant literature on the topic. There are several research papers that have been written both on voter preferences, political candidates, and effects of high hydropower income or property taxation. The papers presented below are papers we find inspiring and relevant for our research, both in terms of theory and methods used.

Andersen et al. (2014):

Andersen et al. (2014) finds that more people vote in the local election rather than in the regional election, when windfall gains from hydropower production equip the municipal council with extra funds to distribute. They state that "when more wealth is controlled by the local government, the elected officials have greater flexibility to pursue targeted spending programs" (Andersen et al., 2014, p. 166). This again leads to stronger incentives to participate in the political process for individuals. We want to see if these higher election stakes, leads to more competent politicians in the municipality.

Brollo, Nannicini, Perotti, and Tabellini (2013):

Brollo et al. (2013) investigates if a windfall of resources could deteriorate the quality of the political process. They have focused on the effects of additional resources on political corruption and on the incentives to participate in politics. In the paper, they found that higher exogenous revenues induce more corruption, because incumbents have more rooms to grab rents. Furthermore, they found that individuals of lower quality are attracted into politics, because they have lower outside options than individuals of higher quality. In other words, "because his opponents are now of lower quality, an incumbent can afford to grab more rents while at the same time increasing his reelection chances" (Brollo et al., 2013, p. 1794).

Dal Bó et al. (2017):

An interesting and important question is who becomes a politician? In their paper on political selection in Sweden Dal Bó et al. (2017) find that democracy can promote leadership, which stems from inclusive meritocracy. They found 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.

Borge, Parmer, and Torvik (2015):

Borge et al. (2015) suggests that the large income variation among Norwegian municipalities can partly be explained by hydropower income. In their paper, they state that there is no support for the Rentier State hypothesis in Norway. "The rentier state hypothesis asserts that when resource abundance makes public revenue less dependent on taxation, citizens monitoring of politicians becomes weaker, and policies worse" (Borge et al., 2015, p. 2). However, they found support for the Paradox of Plenty; that higher local government revenue reduces the efficiency in production of public goods, but the effect is not stronger in municipalities with more natural resource revenue.

Finseraas (2017):

The paper by Finseraas (2017), uses i.a. synthetic control method on the natural experiment created by the municipal election of 1995 in Flå to estimate the partisan representation effect on public welfare spending. We find this paper compelling due to its use of synthetic control method on Norwegian municipalities, something we will use as inspiration for our work.

Institutional setting and description of data

Political system and political selection

The municipal council is a municipality's highest governing body. These councils are elected through direct elections every fourth year. Candidates for the council are elected based on individual votes (Hansen, 2018). There are seven main political parties, and some local lists. Andersen et al. (2014) has shown that higher hydropower income leads to higher voter turnout. We want to take a closer look at the candidates for the election, and see if there are any selection effects of higher hydropower or gas and oil income. Our hypothesis is that a higher share of highly educated candidates is elected into politics as the municipality get higher hydropower or oil and gas income.

Brollo et al. (2013) argues that higher government transfers lead to lower average educational level among the candidates who run for election. 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). For example, a 10 percent increase in actual transfers leads to a 6 percent drop in college. 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). Hence, increased income creates more room for corruption by politicians, and may be an additional incentive for people to select into politics. According to Transparency International (2017), Norway is the sixth least corrupt country in the world, while Brazil is the 79th least corrupt country, and the study can hardly be generalized to Norway. The paper also emphasizes the fact that highly educated candidates have higher opportunity costs of entering politics than lowly educated candidates. Caselli and Morelli (2004) and Besley (2004), cited in Brollo et al. (2013) finds a positive correlation between market skills and political competence. Do we obtain that additional resources, such as increased hydropower income, leads to higher educational level among the politicians and the candidates who run for election?

Description of data

For our thesis, we are mostly using previously constructed datasets on the Norwegian municipalities. Our main dataset is the Local government dataset, by Fiva, Halse and Natvik in its newest edition from 2017. This has, for example, been used by in the paper "Voting when the stakes are high" by Andersen et al. (2014). This dataset extends back to 1972, and contains data on elections, demographics and economy for the Norwegian municipalities. Within this, we have data on property tax per capita, from 2007 divided into commercial and residential. Here, the commercial property tax income mainly originates from taxation on hydropower plants and gas plants. This we have used as an indicator for the wealth of the municipality, as hydropower production is mainly exogenous, being determined by typography (Andersen et al., 2014).

This is supplied with data on specific information of each candidate in the municipal elections, collected by i.a. us as research assistants, for use by the Department of Economics at BI, combined with confidential information from Statistics Norway, on education level, income and more. This dataset has also been used by Fiva and Røhr (2018). With the use of this data, we have been able to compute the share of highly educated representatives in the municipal councils.

Finally, we have collected and will collect data from Statistics Norway and the NSD "Kommunedatabase". Here, we have found the share of highly educated above the age of 16 in the population of the municipalities, together with average income etc for the population. In addition, we have also gathered the centrality index from Statistics Norway, as used by Finseraas (2017).

We are still missing some information on education of the representatives for the elections in -03, -11 and -15, but we are expecting this data to be available soon. In addition, we are lacking the distinction between commercial and residential property tax for the years before 2007. Here, we only have the total property tax income. This might constitute a problem for us when investigating how the quality difference develops with hydropower income/ commercial property tax for the 2003 election, and thus make it hard to compare this result to the other election years. We are evaluating our options to whether we can compute the hydropower income, or find it in any different ways. Should this not be successful, we need to find other indicators for wealth. Still, it should not be a problem for creating a synthetic Aukra, as we know they didn't have any property tax in this year.

We have found some inconsistencies in the data, where some information on education is given for only some representatives, and parts of list are missing. Therefore, we will also have to investigate the datasets closer, to exclude potential errors and misspecifications that can affect the results.

Definition of the dependent variable - The quality difference

For our research, it is important to clearly define how we measure the quality of politicians in municipal councils. This will be the 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. For our purpose, we believe that measuring the share of highly educated politicians in the municipal council, relative to the share of highly educated citizens in the municipality will give us good measures of quality in each municipality. Hereafter called the quality difference. We define highly educated as people with education from university or college, or above. Hence, the share of highly educated politicians in the municipal council is the share of politicians with education from university or college, or above.

Dal Bó et al. (2017) states that measuring quality or ability by educational level is common in the existing empirical literature. However, researchers use this because they lack "direct data on the underlying intelligence or personality of politicians" (Dal Bó et al., 2017, p. 2). Furthermore, they state that education is positively correlated with ability, as it is likely to reflect luck and social class. They conclude that politicians on average are significantly smarter and better leaders than the population they represent.

Educational attainment of individuals in Norway are collected by Statistics Norway, called NUS2000 (Barrabés & Østli, 2016). The education code from Statistics Norway is given by a six-digit number. We are interested in the first digit, which refers to education level, on a scale from 1-8. 1 is no education and 8 is doctorate education. 9 is used when the education level is unknown. We translate these categories into lowly educated and highly educated. The education code from Statistics Norway let us divide by type of education, but for simplicity, we choose to only care about the two defined categories above.

As discussed above, we define the quality of politicians by dividing between those who are highly educated and those who are lowly educated. Those with education from university or college or above are defined as highly educated, and those with education lower than university or college as lowly educated. 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". We believe that by taking the difference between the share of highly educated in the municipal council and the share of

highly educated in the municipality will filter out the centrality issue described above.

Definition of the independent variable - Hydropower income/property tax

We aim to explain the variation in the quality of politicians by an exogenous income shock, or by comparing rich municipalities with poor municipalities. According to Borge et al. (2015), increased hydropower income should not have more adverse effects than alternative revenue. Hence, it seems like property taxation, hydropower income or oil and gas income is a convenient way to generate variation in income among municipalities. Andersen et al. (2014) also use hydropower income to generate income variation. X_i represents the hydropower income or the property tax in municipality i.

Methods

Ordinary Least Squares

For our preliminary, we do a regression on the difference of the average share of highly educated politicians and the average share of highly educated citizens in the municipality on hydropower income. We can use Ordinary Least Squares (OLS) to estimate the equations of interest. The first equation does not include any control variables, and the second equations include a vector of controls, given by $\mathbf{C}_i$. As we still discuss which controls to add, we have run the regression without additional control variables, assuming that the least squares assumptions hold (Stock & Watson, 2015). However, we believe that assumption 1, that the error term, e_i, is uncorrelated with X_i is violated. That is, $E(\varepsilon_i \mid X_i) \neq 0$. We will discuss this issue later.

Equations of interest

Equation (1): $$Q_i^{Pol} - Q_i^{Pop} = \mu + \beta X_i + \varepsilon_i$$

Equation (2): $$Q_i^{Pol} - Q_i^{Pop} = \mu + \beta X_i + \alpha \mathbf{C}_i + \varepsilon_i$$

Equation (3): $$\frac{Y_i^{diff} - y}{SD_Y} = \mu + \beta \frac{X_i - x}{SD_X} + \varepsilon_i$$

In equation (1) we aim to estimate β, which can be interpreted as the effect of hydropower income on the quality difference. This will be the true equation if we explain that there are no omitted variables, after filtering out the centrality issue by differencing the quality shares. Q_i^{Pol} represents the share of highly educated politicians in municipality i, while Q_i^{Pop} represents the share of highly educated in municipality i. Q_i^{Pol} - Q_i^{Pop} denotes the difference in the share of highly educated between the politicians and the municipality population, i. e. the quality difference.

Even when focusing on the quality difference, there might be omitted variables that affects our estimates. In equation (2), we also want to estimate β, but the estimate is conditional on a vector of controls, given by $\boldsymbol{C}_i$.

In equation (3), we estimate the OLS with standardized coefficients. Y_i^{diff} represents Q_i^{Pol} - Q_i^{Pop} and y denotes the mean of the quality difference. x denotes the mean of hydropower income. SD_Y and SD_X gives the standard deviations of the quality difference and hydropower income, respectively. In this case, we interpret β as the effect of one standard deviation increase in hydropower income on the quality difference.

Omitted variable bias and including of controls

When running regressions to measure causal effects, omitted variable bias is a common mistake. Coefficients in the regression will be biased if hydropower income or oil and gas income correlates with variables that determine individuals' choice of schooling (Angrist & Pischke, 2009). To solve this problem, we can include a set of controls. The controls included should not vary over time and should not be dependent variables. When controls are added, this leads to the conditional independence assumption, also called selection on observables (Goldberger, 1972 and Barnow, Cain and Goldberger, 1981 cited in Angrist & Pischke, 2009). When setting up a new equation, our estimate of β will be contaminated only if there are further unobserved variables, not included in the set of controls, that both are correlated with hydropower income and have a differential impact on the quality of politicians (Andersen et al., 2014).

If there exist variables that are positively (negatively) correlated with the independent variable, hydropower income, and positively (negatively) correlated with the dependent variable, quality of politicians, we say that the estimate of β is upward biased. In this case, the estimate, β^{est}, is higher than the true parameter, β^{true}, such that $\beta^{true} < \beta^{est}$. Conversely, if there exist variables that are negatively (positively) correlated with hydropower income, and positively (negatively) correlated with the quality of politicians, we say that the estimate of β is downward biased. Now, the estimate is lower than the true parameter, such that $\beta^{true} > \beta^{est}$. It is reasonable to believe that there are omitted variables that covariates with hydropower income and the quality difference, as centrality. This could potentially affect the quality difference. One solution to omitted variable bias if data on adequate control variables are not available is to use panel data, which we are using (Stock & Watson, 2015). In the coming weeks, we will investigate which variables to include as controls to avoid the problem with potential omitted variables. We will use existing data, like Andersen et al. (2014) and Finseraas (2017) to find sophisticated controls in our regression.

Andersen et al. (2014) control for various municipality-specific characteristics and various institutional characteristics. Finseraas (2017) is a paper using the synthetic control method on Norwegian municipalities. He is controlling for voter preferences, in addition to four controls for population size and age composition. Brollo et al. (2013) also include controls for population size. We will use time to analyse what's the most appropriate set of controls for our thesis. Although, we already believe that we must control for centrality and population size. Central municipalities tend to have higher education on average, which we believe will bias our estimates (Statistics Norway, 2018a). As we believe that highly educated people will be attracted by more central municipalities, because of more job possibilities, this is a way to isolate the effect we are trying to measure. However, instead of using Statistics Norway´s index of centrality, we have controlled for this by looking at the quality difference in each municipality.

Synthetic control method

An idea taken from Borjas (2015) is to use a synthetic control method to estimate the effect of increased municipality wealth on quality of politicians. The synthetic

control method is a weighted average of the available control units, and will therefore show the relative contribution of each control unit to the counterfactual of interest, and the similarities between the treatment group and the synthetic control group (Abadie, Diamond, & Hainmueller, 2010). Furthermore, Abadie, Diamond, and Hainmueller (2015, p. 497) states that "it is important to restrict the donor pool to units with similar pre-period characteristics as for the unit representing the case of interest". Finseraas (2017) restrict the donor pool to municipalities that are characterized as "least central" in Statistics Norway´s index of centrality, which is similar to the treated unit. Hence, we conclude that we must carefully choose the donor pool when using the synthetic control method.

Outline of research plan

In our work on the thesis, we intend to use different methods to investigate our topic; how municipal wealth affects the quality of its representatives. Here, we discussed the best option on how to get valid results. Initially, we discussed controlling the municipalities for centrality, since we believe this to be highly relevant for the average level of education in municipalities. Rather than this, we decided to look at the difference in the share of highly educated between those elected to the municipal council, and that of the population of the municipality. With this, we gain a result that is comparable across municipalities, without the need of testing for centrality. We get a value that demonstrates how much more the share of highly educated representatives are compared to the share of highly educated in the population. Using this data together with municipalities hydropower income, we are able to see a positive relationship between the quality difference and increased hydropower income. We later present some results to demonstrate this.

Currently, we have educational data for the 2007 election, while we are still waiting for the data for the 03, 11 and 15 elections. When we get this, we want to do a difference in difference analysis, where we plan to investigate how an income shock would affect the quality difference. Further, if we are able to gather relevant data from earlier elections, we want to use a synthetic control method, and create a synthetic municipality to explore the same effect. Here, we preferably would like to use the municipality of Aukra, where we know there was an income shock

between the 2003 and 2007 election, due to the "Ormen Lange" gas pipeline construction. Our idea is to create a synthetic version of Aukra, which did not receive this income shock, and compare it to the actual development.

Preliminary results

We have investigated the distribution of the share of highly educated politicians. In Figure A, we have plotted the distribution the share of highly educated politicians, the share of highly educated in the population, and the difference between these two, in all municipalities. Included is also a curve showing the normal distribution. From the first panel in Figure A, we observe a considerable variation in the quality of the council members across municipalities. In the last panel, the difference in quality is illustrated, showing that in almost all municipalities, the council members are positively selected with regards to education. This is consistent with Dal Bó et al. (2017) .

In Table 1, we have included some descriptive statistics. The table includes the mean, standard deviation, minimum and maximum values and median of four different variables. We see that the mean hydropower income among Norwegian municipalities is 2 405 NOK per capita. The municipality with the highest hydropower income is Modalen, with around 57 260 NOK per capita. We also observe that the quality difference is quite big, with a mean difference of 23 percentage points. This means that the share of highly educated council members is higher than the share of highly educated citizens on average. The municipality with the highest share of highly educated council members is Oslo, where 76,3% of the municipal council are highly educated. Conversely, Iveland is the municipality with the lowest share of highly educated council members, with 5,9% highly educated. Hence, we believe that controlling for centrality is useful to filter out the population size effects. Lastly, we observe that Krødsherad is the municipality with the biggest quality difference, with a difference of around 59 percentage points.

Furthermore, we have plotted the share of highly educated citizens in the municipalities against hydropower income, seen in Figure B. In the first panel, we have plotted the share of highly educated citizens, giving us a weakly negative

relationship. Secondly, we have plotted the share of highly educated council members, where we get no relationship with hydropower income. In the final panel, we have used the difference of shares among the citizens and the elected, the quality difference, to find the relationship of interest to us. As noticeable, we see that the slope of the fitted line in this graph is positive, but minor. As we expected to see, we got a positive relationship between the quality difference and increased hydropower income, but anticipated it to be of greater size. In Table 2, we present the standardized size of the relationship between the quality difference and hydropower income. We have calculated this to be 0,0278 – the increase in quality difference due to a standard deviation increase of one in hydropower income. This is not a considerable increase, and shows that there might not be a causal relationship between these variables. Still, we do not believe this simple regression paints the full picture of the relationship between the quality of the representatives and municipality wealth. We hope that when controlling for more municipality-specific characteristics, as Andersen et al. (2014), we will evade a potential omitted variable bias we might have incurred here, and get a more sizable relationship. In addition, we want to do more analyses in the type of difference in difference and synthetic control method before concluding.

Table 1: Descriptive Statistics

Hydro power income and share of higher educated

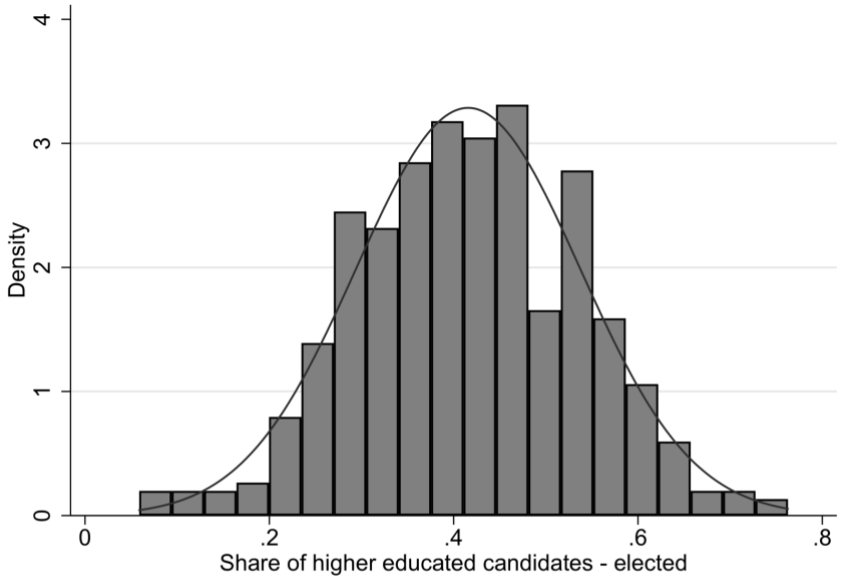
Variable	Mean	StdDev	Min	Max	Median
Hydropower income	2,405	6,314	0,000	57,260	0,328
Share of higher educated council members	0,416	0,121	0,059	0,763	0,412
Share of higher educated citizens	0,188	0,054	0,093	0,457	0,179
Quality difference	0,228	0,104	-0,072	0,588	0,226

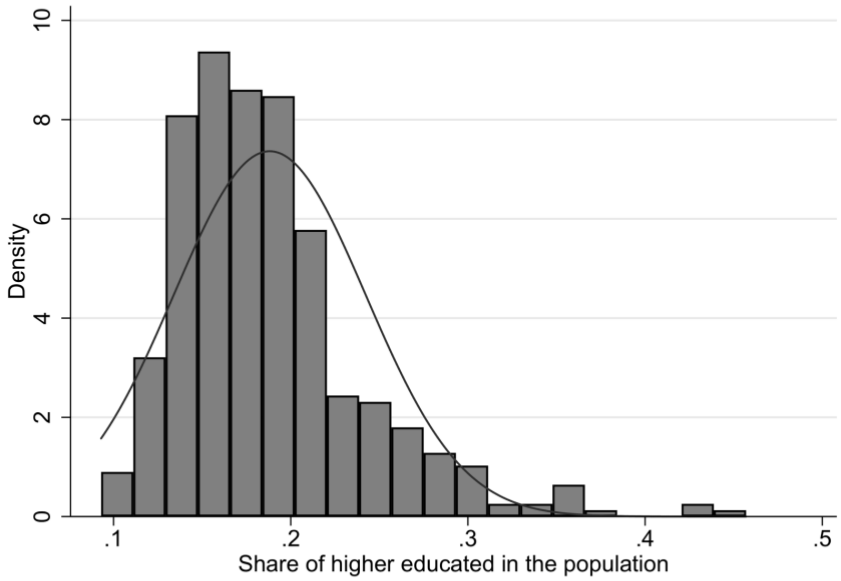
Table 2:

The relationship between hydropower income and the quality difference (standarized)

Variable		StdErr	P value
Hydropower income	0,0278293	0,0484110	0,566

Figure A: *Higher education histograms*





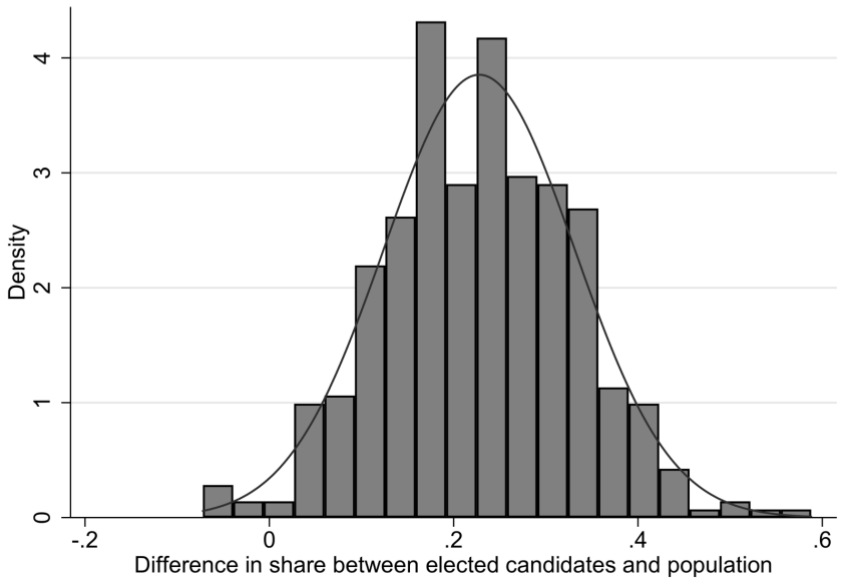
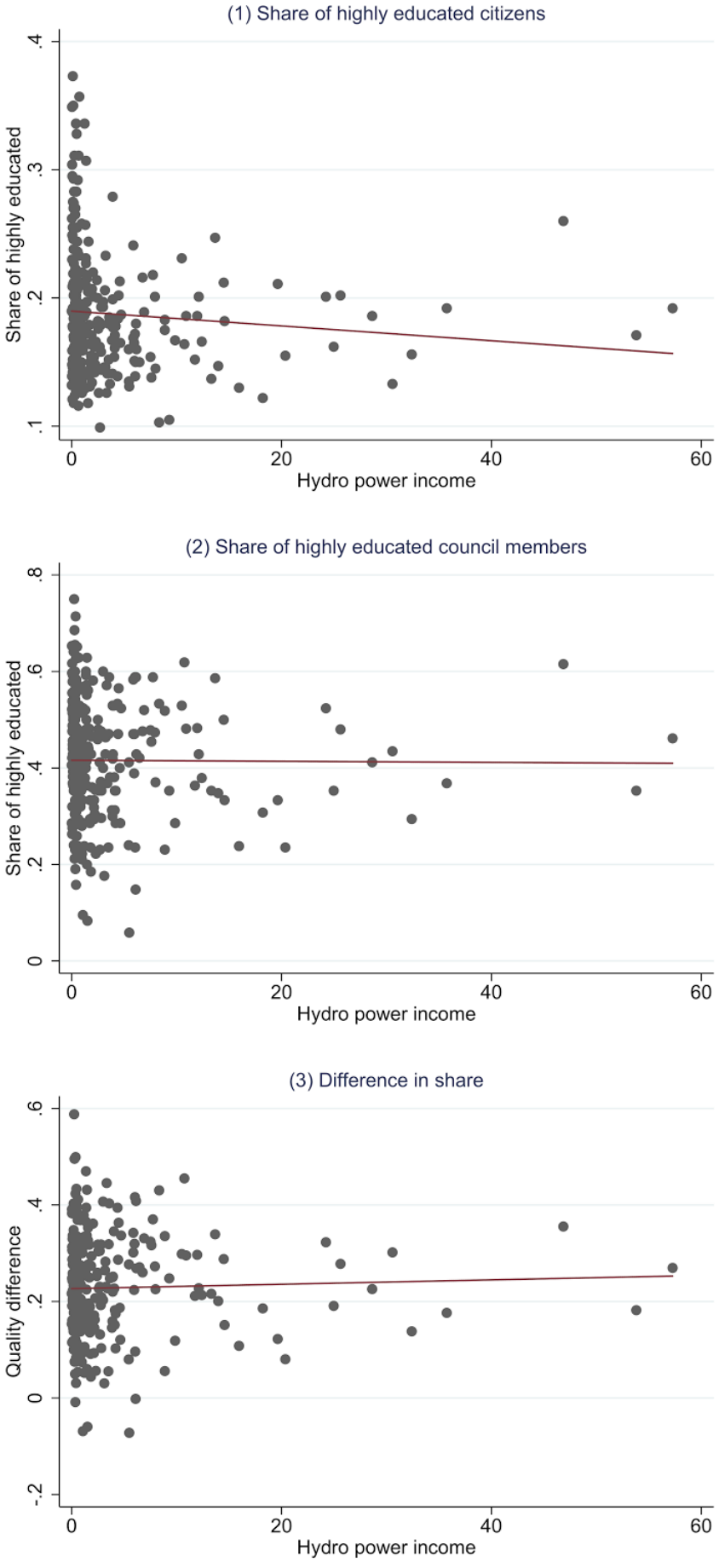


Figure B: *Higher education and hydro power income*



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