Online Appendix to "Voting When the Stakes Are High"*

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October 14, 2013

Abstract

This note provides supplementary material to "Voting when the Stakes are High". First, a formal discussion of how municipality income relates to election stakes is provided. Thereafter, a simple framework is constructed and utilized to illuminate the empirical challenges that arise when estimating the effect of municipality income on electoral participation. The framework is also used to explain how the empirical strategy in the paper deals with these challenges. Finally, we provide additional descriptive statistics and empirical analysis.

*This paper is part of the research activities at the center of Equality, Social Organization, and Performance (ESOP) at the department of economics at the University of Oslo, and at the Centre for Applied Macro and Petroleum economics (CAMP) at the Norwegian Business School. ESOP and CAMP are supported by the Research Council of Norway and CAMP receives additional funding from Statoil. The views expressed in this paper are those of the authors and cannot be attributed to Norges Bank or anyone else.

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1 Hydropower Income and Election Stakes

We here give a simple formalization of how a municipality's income may affect the election stakes for a citizen.

We assume that a local government may use its income I to provide core welfare services to its citizens and to finance targeted spending ("pork"). Candidates differ by which composition of core services they will provide, and which composition of targeted spending they will choose, if elected. Denote by $G_{j,i}$ the basket of core services provided by candidate j, normalized by the preferences of voter i. Hence, if voter i prefers the composition of general goods provided by candidate j over the composition provided by candidate k, and both candidates spend equally much on core public goods, then $G_{j,i} > G_{k,i}$. Denote by $T_{j,i}$ the targeted spending provided by candidate j to voter i. Voters' preferences over spending are given by $U\left(G_{j,i}, T_{j,i}\right)$, which is separable, increasing and concave in each argument: $U_1 > 0$, $U_{11} < 0, U_2 > 0$, $U_{22} < 0$, $U_{12} = 0$. We assume that candidate j will target spending at individual i, whereas other candidates will not. Hence, $T_{j,i} > 0$ and $T_{-j,i} = 0$. Finally, we assume that that the candidate who targets individual i with pork also is the candidate who offers the basket of core services that i prefers the most: $G_{j,i} > G_{-j,i}$.

Denote by B_i individual i's utility from having his most preferred candidate, j, in office rather than someone else. We may express this benefit as

$$B_i = U\left(G_{j,i}, T_{j,i}\right) - U\left(G_{-j,i}, T_{-j,i}\right).$$

Differentiating with respect to income, I, we obtain

$$\frac{dB_i}{dI} = \frac{\partial U}{\partial T_{j,i}} \frac{\partial T_{j,i}}{\partial I} + \frac{\partial U}{\partial G_{j,i}} \frac{\partial G_{j,i}}{\partial I} - \frac{\partial U}{\partial G_{-j,i}} \frac{\partial G_{-j,i}}{\partial I}.$$

From this expression we see that higher hydropower income is likely to have two opposing effects on the election stakes (B_i). First, if $\frac{\partial T_{j,i}}{\partial I} > 0$ higher income raises the election

stakes by facilitating more non-core spending. On the other hand, if both $\frac{\partial G_{j,i}}{\partial I} > 0$ and $\frac{\partial G_{-j,i}}{\partial I} > 0$, then higher income may reduce B_i, since concavity of U implies that $\frac{\partial U}{\partial G_{j,i}} < \frac{\partial U}{\partial G_{-j,i}}$. It follows that higher income is more likely to raise the election stakes, the more strongly higher income tends to be spent on pork rather than on core welfare services.

The argument above relates to the traditional way of viewing pivotalness (i.e., "outcome pivotalness"). An alternative type of pivotalness that has been forwarded in the literature is "prize pivotalness" (Smith and Bueno De Mesquita (2012)). If parties are able to observe group-level voting, they can make targeted spending decisions contingent on the voting pattern and thus motivate voters to turn out even when they individually are highly unlikely to affect who wins the election. Note that both of these two types of pivotalness requires spending to be targeted, in the sense that it benefits some voters, but not others. Furthermore, in our discussion we have implicitly assumed that voters are certain about what candidates will do once in office. Schwartz (1987) discusses the role of targeted spending versus "global public benefits" when the credibility of campaign promises is an issue, and argues that targeted spending will stimulate the instrumental incentive to vote more strongly than will non-targeted spending.

2 Research Design

In this section we construct and utilize a simple framework to account for how hydropower income may affect electoral participation. Our objective is to illuminate the empirical challenges we face and how our empirical strategy deals with them.

2.1 An Accounting Framework for Electoral Participation

We first lay out a framework to account for voter participation in a simple way. Our framework builds on the conventional "calculus of voting" model introduced by Downs (1957), generalized somewhat to encompass the many alternative forces behind electoral

participation that have been emphasized in the literature.

We consider eligible voters indexed by i living in municipalities indexed by l, at elections $J = \{L, R\}$, where L is the local election and R is the county election. The two elections are held simultaneously. An individual will participate at an election if the utility of voting exceeds her costs of turning up, denoted by $C_{l,i}$. $C_{l,i}$ includes any general or individual-specific costs associated with turning up to vote, such as the local weather conditions on the election day, voter i's travel distance to the polling station, or personal costs of leaving home.

Voting might give utility for a multitude of reasons.[1] For our purposes, it is useful to separate between all benefits that are obtained by the act of voting at any election, $V_{l,i}$, and sources of utility that are election-specific, $U^J_{l,i}$. Hence, $V_{l,i}$ captures all factors that are insensitive to the characteristics of an election, such as the personal sense of fulfilling one's civic duty. As in Degan and Merlo (2011), we could think of such moral obligations to vote as individual-specific and invariant across elections. Regarding $U^J_{l,i}$, one component might for instance be the traditional Downsian instrumental motive to vote, namely citizen i's probability of being decisive, multiplied by her value of influencing the election outcome.[2] Another component could be the voter's information about local politics, as stressed by the rational abstention literature where individuals are more likely to vote when they are better informed (Feddersen and Pesendorfer (1996), Matsusaka

[1]The literature has proposed a host of factors behind individual's utility of voting. Example are: demographic variables such as age (Strate, Parrish, Elder, and Ford (1989)), gender (Schlozman, Burns, Verba, and Donahue (1995)), marital status (Stoker and Jennings (1995)), education (Leighley and Nagler (1992a)), income (Leighley and Nagler (1992b)); attitudinal and behavioral factors such as general political knowledge (Galston (2001)), strength of partisanship (Huckfeldt and Sprague (1992)), feelings of civic duty (Blais and Young (1999)), political trust (Hetherington (1999)), church attendance (Cassel (1999)); social variables such as social pressure (Funk (2010)), group consciousness (Miller, Gurin, and Gurin (1981)), political disagreement (Mutz (2002)), and social capital (Lake and Huckfeldt (1998)); and institutional variables such as closeness of the election (Schachar and Nalebuff (1999)), party loyalty (Schuessler (2000)), contact from political organizations (Wielhouwer and Lockerbie (1994)), campaigns (Ansolabehere, Lyengar, Simon, and Valentino (1994)), and barriers to registration (Rosenstone and Wolfinger (1978)); and, finally, genes (Fowler and Dawes (2008)). See Dhillon and Peralta (2002), Geys (2006) and Degan and Merlo (2011) for more comprehensive reviews of the literature.

[2]The probability of being pivotal can be interpreted in the traditional way, where voters may be pivotal in terms of altering political representation. Alternatively, voters may be pivotal by influencing which group(s) within the community will receive patronage rewards or local public benefits (Schwartz (1987); Smith and Bueno De Mesquita (2012)). When pork barrel politics dominate the local political agenda, this interpretation may be particularly relevant.

(1995)).[3] Importantly, information theories imply that $U^J_{l,i}$ might well be negative, as voters could suffer disutility if they vote for the wrong candidate.

Consider now the decision to participate at the local election. In general, there are two types of voters who are motivated to participate here. First, a voter may perceive the local election as so important that she participates in it irrespective of how important she perceives the regional election to be. This occurs if $U^L_{l,i} + V_{l,i} \geq C_{l,i}$. Second, because there are two simultaneous elections, an individual who has $U^L_{l,i} + V_{l,i} < C_{l,i}$ may still choose to vote for the local election because the joint surplus of voting at both elections exceeds the cost of turning out. This occurs if a citizen has both $0 \leq U^L_{l,i} + V_{l,i} < C_{l,i}$ and $U^L_{l,i} + U^R_{l,i} + 2V_{l,i} \geq C_{l,i}$. A general characterization of local election participation is therefore somewhat cumbersome, as it requires that one accounts for both possible voter types. To simplify our exposition, we therefore ignore the second possible voter type, which naturally is a small part of the population anyhow. Formally, we assume $U^L_{l,i} \geq U^R_{l,i} + C_{l,i}$ for all i, so that any individual with $U^L_{l,i} + U^R_{l,i} + 2V_{l,i} \geq C_{l,i}$ necessarily also has $U^L_{l,i} + V_{l,i} \geq C_{l,i}$.[4] In the appendix, we relax this assumption, and show that it plays no substantive role beyond allowing a tractable presentation.

Naturally, $C_{l,i}$ and $V_{l,i}$ may differ across individuals. Hence, the difference $C_{l,i} - V_{l,i}$, hereafter referred to as the "net voting costs", is distributed within the population of each local government l. The cumulative distribution of the net voting costs we denote by $F(e; \mathbf{Y}_l)$, and it represents the fraction of eligible voters with $C_{l,i} - V_{l,i} \leq e$ where $\mathbf{Y}_l$ is a vector of local government specific characteristics that influence the distribution of net voting costs. For expositional convenience, we assume that $U^L_{l,i}$ does not differ across individuals in district l, $U^L_{l,i} = U^L_l$. The share of l's potential voters who decide to vote

[3] Theory has highlighted two main mechanisms that cause rational abstention. In "uncertain voter" models, such as those proposed by Matsusaka (1995), Degan and Merlo (2011), voters are assumed to suffer a direct utility loss from making "voting mistakes", and therefore rationally abstain when they are uninformed about different alternatives. The alternative mechanism is that less informed voters may optimally delegate the voting activity to citizens that are better informed than themselves, as emphasized by Feddersen and Pesendorfer (1996).

[4] This simplification seems a relatively innocuous approximation for the setting we are studying, as the survey evidence in Figure 1 indicates that citizens view the local election as considerable more important than the regional election, and the same survey revealed that less than 1% of citizens voted at the regional election only.

in the local election, "local participation" hereafter, is then conveniently represented by $F\left(U_l^L; \mathbf{Y}_l\right)$.[5]

We now move to the decision to vote in the regional government election (indexed by R), held at the same time and place as the local election. Because we assume that $U_{l,i}^L \geq U_{l,i}^R + C_{l,i}$, the necessary and sufficient condition for a citizen to vote in the regional election is simply $U_{l,i}^R + V_{l,i} \geq 0$. Analogously to the local election, we may then conveniently formulate the share of voters in l who participate in the regional election, "regional turnout" hereafter, as $G\left(U_l^R; \mathbf{Y}_l\right)$, where G is the cumulative distribution function for $-V_{l,i}$ and we have imposed that $U_{l,i}^R = U_l^R$.

2.2 The Effect of Local Government Income on Electoral Participation

Within the model laid out above, local government income, I_l, affects participation in the local election in l as follows:

$$\frac{dF\left(U_l^L; \mathbf{Y}_l\right)}{dI_l} = f\left(U_l^L; \mathbf{Y}_l\right) \partial U_l^L / \partial I_l + \tag{1}$$
$$d\mathbf{Y}_l / dI_l \left[f\left(U_l^L; \mathbf{Y}_l\right) \nabla \overline{U_{\mathbf{Y}}^L} + \nabla F_{\mathbf{Y}_l}\left(U_l^L; \mathbf{Y}_l\right) \right],$$

where $\nabla \overline{U_{\mathbf{Y}}^L}$and $\nabla F_{\mathbf{Y}_l}\left(U_l^L; \mathbf{Y}_l\right)$ are the gradients of U_l^L and $F\left(U_l^L; \mathbf{Y}_l\right)$ with respect to $\mathbf{Y}_l$, and $d\mathbf{Y}_l/dI_l$ is a vector of how each characteristic in $\mathbf{Y}_l$ is affected by I_l.[6] Furthermore, $f\left(U_l^L; \mathbf{Y}_l\right) \equiv F_1\left(U_l^L; \mathbf{Y}_l\right)$ is the mass of eligible voters who are "on the margin" in the sense that they are indifferent between voting and abstaining from participation in the local election. In the first term of (1), this mass is multiplied by the effect of hydropower income on the election-specific benefit from voting, U_l^L. The product thus captures how

[5]Rather than assuming that individuals have the same U_l^L, we could let them be heterogenous in this respect too. In this case turnout could be represented by $H\left(0; \mathbf{Y}_l\right)$ denoting the mass of voters with $C_{l,i} - V_{l,i} - U_{l,i}^L < 0$. This formulation generates a less transparent representation of how local income affects local participation. We therefore simplify the analysis by assuming that individuals have the same U_l^L.

[6]Hence, e.g. $\nabla F_{\mathbf{Y}_l}\left(U_l^L; \mathbf{Y}_l\right)$ is a vector of the derivatives of F with respect to each component of $\mathbf{Y}_l$.

strongly a marginal increase in income affects local election turnout via the election-specific benefit from voting.

The second term in (1) captures how I_l may influence participation in the local election through an association with local characteristics, hereafter referred to as the "selection effect". This effect depends on how strongly hydropower income relates to each characteristic in $\mathbf{Y}_l$, $\frac{d\mathbf{Y}_l}{dI_l}$, and how strongly each characteristic in $\mathbf{Y}_l$ relates to a voter's election-specific utility ($\nabla\overline{U^L_{\mathbf{Y}}}$) and the distribution of net voting costs in local community l ($\nabla F_{\mathbf{Y}}$). An intuitive example of this last effect would be if local governments with high I_l attract citizens with a strong conviction that voting per se is important, and who therefore have relatively high $V_{l,i}$.

A similar expression to (1) applies for the effect of local government income on the local participation in the regional election. Hence, income will affect the difference in participation rates at the two elections, the "*participation difference*", as follows:

$$\frac{d\left[F_l - G_l\right]}{dI_l} = f_l \partial U_l^L/\partial I_l - g_l \partial U_l^R/\partial I_l + \frac{d\mathbf{Y}_l}{dI_l}\nabla s_{\mathbf{Y}_l}, \tag{2}$$

where

$$\nabla s_{\mathbf{Y}_l} = f_l \nabla\overline{U^L_{\mathbf{Y}}} + \nabla F_{\mathbf{Y}_l} - g_l \nabla\overline{U^R_{\mathbf{Y}}} - \nabla G_{\mathbf{Y}_l}.$$

Here we have used the compressed notation $F_l = F\left(U_l^L; \mathbf{Y}_l\right)$, $f_l \equiv f\left(U_l^L; \mathbf{Y}_l\right)$, and so on, while $g_l \equiv g\left(U_l^R; \mathbf{Y}_l\right)$ is the mass of voters in l who are on the margin at the regional election, and $\nabla G_{\mathbf{Y}_l}$ is the gradient containing all the derivatives of G with respect to $\mathbf{Y}_l$.

As in the expression for turnout in the local election (1), we see two channels through which income potentially affects the participation difference. First, local income may directly affect the election-specific utility of voting in the local and regional elections, U_l^L and U_l^R, differently. This is likely to be the case since higher income at the local level raises the financial flexibility under which the local government operates, but does not affect the financial situation of the regional government.

Next, there is an effect of selection, as the relationship between income and char-

acteristics, $d\mathbf{Y}_l/dI_l$, now is multiplied by $\nabla s_{\mathbf{Y}_l}$, hereafter referred to as the "selection difference". Because the election-invariant benefits of voting, $V_{l,i}$, are the same for the two elections, $\nabla F_{\mathbf{Y}_l}$ and $\nabla G_{\mathbf{Y}_l}$ have the same sign for the two elections and at least partly cancel each other out. Hence, the selection difference is likely to be quantitatively smaller than the selection effect in (1). Importantly, equation (2) clarifies that selection can influence the participation difference only if income is related to local characteristics ($d\mathbf{Y}_l/dI_l \neq \mathbf{0}$) and these characteristics influence individuals' propensity to vote at the regional election differently from their propensity to vote in the local election ($\nabla s_{\mathbf{Y}_l} \neq \mathbf{0}$).

2.3 Empirical Strategy

From (1) we know that when regressing local participation, P_l^L, on local income, I_l,

$$P_l^L = \mu^L + \beta^L I_l + \varepsilon_l^L,$$

the coefficient β^L does not isolate how income alters electoral participation through election-specific stakes, but it will also be influenced by the selection effect. Since our primary interest is in estimating the causal effect of election stakes, we therefore consider the difference between participation rates in the local and the regional elections in each municipality, and estimate an equation of the type

$$P_l^L - P_l^R = \mu^{LR} + \beta^{LR} I_l + \varepsilon_l^{LR}, \tag{3}$$

where LR denotes that we are studying the difference between local and regional elections. From (2) and the ensuing discussion, it follows that specification (3) will identify how hydropower income affects participation via the election-specific incentives to vote if the selection difference is (on average) zero.[7]

[7]Degan and Merlo (2011) also utilize simultaneous elections to investigate the determinants of voter participation. As part of their empirical strategy they assume that individuals' sense of civic duty is the same for the US Presidential and Congressional elections. However, they do not consider election stakes in their investigation.

However, if the selection difference is non-zero, we may suffer from the selection problem even with specification (3). We therefore want to infer the severity of this potential problem. To this end, we partition the vector of municipality-specific covariates $\mathbf{Y}_l$ into observables, $\mathbf{X}_l$, and unobservables, $\mathbf{Z}_l$. The selection effect in (2) will then consist of two parts:

$$\frac{d\mathbf{Y}_l}{dI_l}\nabla s_{\mathbf{Y}_l} = \frac{d\mathbf{X}_l}{dI_l}\nabla s_{\mathbf{X}_l} + \frac{d\mathbf{Z}_l}{dI_l}\nabla s_{\mathbf{Z}_l},$$

where the two right-hand side terms are the selection differences for $\mathbf{X}_l$ and $\mathbf{Z}_l$, respectively. Hence, if we regress the participation difference on I_l and $\mathbf{X}_l$,

$$P_l^L - P_l^R = \mu + \beta^{LR} I_l + \mathbf{X}_l\alpha + \varepsilon_l^{LR}, \tag{4}$$

our estimate of β^{LR} will be contaminated by a selection effect only through $\nabla s_{\mathbf{Z}_l}$. The severity of the potential selection bias can further be assessed by comparing the estimates of β^{LR} from specifications 3 and 4, which reveals the importance of selection on observables (Altonji, Elder, and Taber (2005)). If we have included variables which we a priori expect to be important for voter behavior, and find that controlling for these variables leaves β^{LR} basically unaltered, then it is unlikely that unobservable variables bias β^{LR}.

2.4 Generalization of Electoral Participation

This section relaxes the assumption that $U_{l,i}^L \geq U_{l,i}^R + C_{l,i}$ for all i, and thereby gives a more general characterization of how municipality specific income I_l affects the participation difference than in the main text.

Participation at the local election is characterized by

$$F\left(U_l^L; \mathbf{Y}_l\right) + H\left(U_l^L, U_l^R; \mathbf{Y}_l\right)$$

where $F\left(U_l^L; \mathbf{Y}_l\right)$ is the mass of voters with $U_{l,i}^L + V_{l,i} \geq C_{l,i}$ as in the main text, and $H\left(U_l^L, U_l^R; \mathbf{Y}_l\right)$ is the mass of voters with both $0 \leq U_l^L + V_{l,i} < C_{l,i}$ and $U_l^L + U_l^R + 2V_{l,i} \geq$

$C_{l,i}$. Hence, H consists of citizens who vote at both elections, and who would not have voted locally had it not been for the simultaneously held regional election.

Symmetrically, participation at the regional election is

$$G\left(U_l^R; \mathbf{Y}_l\right) - J\left(U_l^L, U_l^R; \mathbf{Y}_l\right)$$

where $G\left(U_l^R; \mathbf{Y}_l\right)$ is the mass of voters with $U_{l,i}^R + V_{l,i} \geq 0$ as in the main text, while $J\left(U_l^L, U_l^R; \mathbf{Y}_l\right)$ is the mass of voters with $0 \leq U_l^R + V_{l,i} < C_{l,i}$ and $U_l^L + U_l^R + 2V_{l,i} < C_{l,i}$. That is, J consists of citizens who do not vote at any election even though they have (marginally) positive utility of voting at the regional election.

It follows that the impact of municipality-specific income on the participation difference, denoted Δ^p, is given by

$$\frac{d\Delta^p}{dI_l} = \frac{d\left[F_l - G_l\right]}{dI_l} + \left(J_{l1} + H_{l1}\right)\partial U_l^L/\partial I_l + \left(J_{l2} + H_{l2}\right)\partial U_l^R/\partial I_l + \frac{d\mathbf{Y}_l}{dI_l}\nabla\widetilde{s}_{\mathbf{Y}_l},$$

where J_{l1}, J_{l2}, H_{l1} and H_{l2} are partial derivatives with respect to U_l^L and U_l^R, respectively, while

$$\nabla\widetilde{s}_{\mathbf{Y}_l} = \left(J_{l1} + H_{l1}\right)\nabla\overline{U_{\mathbf{Y}}^L} + \left(J_{l2} + H_{l2}\right)\nabla\overline{U_{\mathbf{Y}}^R} + \nabla J_{\mathbf{Y}_l} + \nabla H_{\mathbf{Y}_l}.$$

Notably, we see that the effect of local income on the participation difference has the exact same form as expression (2) in the main text. The only discrepancy from (2) is that the generalized expression contains three extra components in addition to $d\left(F_l - G_l\right)/dI_l$.

First, there is $\left(J_{l1} + H_{l1}\right)\partial U_l^L/\partial I_l$. Note that from the definition of $J\left(U_l^L, U_l^R; \mathbf{Y}_l\right)$, $-J_{l1}$ describes how higher stakes at the local election raises participation at the regional election by motivating citizens who otherwise would have stayed at home to sink the cost of turning out at the voting station and once they are there vote at both elections. Necessarily, $J_{l1} \leq 0$. The term H_{l1} reflects how higher U_l^L raises the mass of voters who do not view the local election as significantly important in itself to warrant turnout, but who are motivated by the joint surplus. By the definition of $H\left(U_l^L, U_l^R; \mathbf{Y}_l\right)$, H_{l1} could be

either positive or negative. It follows that in general, the total term $(J_{l1} + H_{l1})\,\partial U_l^L/\partial I_l$ has an ambigous sign, but is likely to be negative as higher local election stakes bring citizens to the polling station who therefore drop a vote for the regional election as well as the local election (J_{l1} dominates H_{l1}). This force brings the participation difference down relative to the expression in the main text.

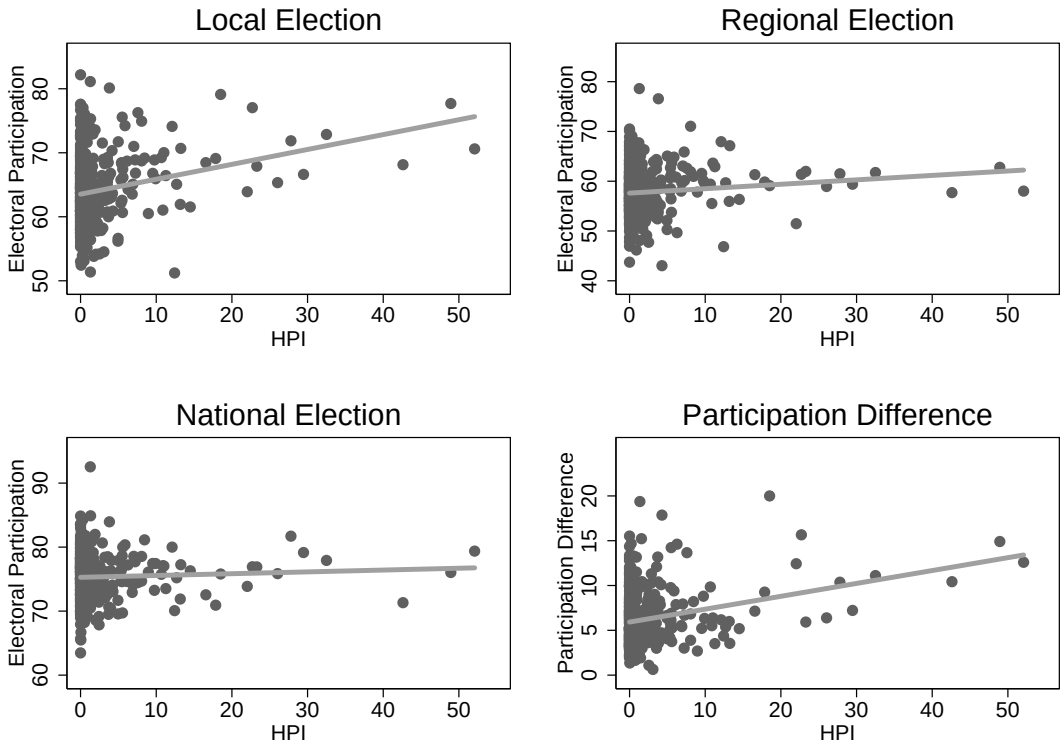
The second term, $(J_{l2} + H_{l2})\,\partial U_l^R/\partial I_l$, also has an ambiguous sign, as the definition of $H\left(U_l^L, U_l^R; \mathbf{Y}_l\right)$ implies $H_{l2} \geq 0$ while the definition of $J\left(U_l^L, U_l^R; \mathbf{Y}_l\right)$ implies that J_{l2} can be either positive or negative. However, as we in our paper we look at at an income change for which there is no reason why $\partial U_l^R/\partial I_l$ should differ from zero, this second term is of little interest.

The term $\frac{d\mathbf{Y}_l}{dI_l}\nabla\widetilde{s}_{\mathbf{Y}_l}$ reflects that there may be further selection effects than we considered in the main text. However, all these selection effects are similar to those emphasized before: There may be selection as higher income associates with municipality specific characteristics, $\mathbf{Y}_l$, that raise or reduce U_l^L, there may be selection through an association between $\mathbf{Y}_l$ and U_l^R, and there may be selection through an association between $\mathbf{Y}_l$ and the joint distribution of $C_{i,l}$ and $V_{i,l}$ as reflected by $\nabla J_{\mathbf{Y}_l}$ and $\nabla H_{\mathbf{Y}_l}$.

Intuitively, it would seem that the main effect ignored by the exposition in the main text is the one captured by $J_{l1} \leq 0$: When higher local income raises U_l^L and thereby motivates citizens to turn out for the local election, some of these individuals might also have $0 \leq U_l^R + V_{l,i}$ and therefore become motivated to vote for the regional election too. In isolation, this mechanism implies that by studying the participation difference one underestimates the effect of election stakes on electoral participation.

3 Supplementary Tables and Figures

Figure B.1: Electoral Participation and Hydropower Income



Note: The scatterplots shows the relations between local electoral participation and hydropower income (top left), regional electoral participation and hydropower income (top right), national electoral participation and hydropower income (bottom left), and the participation difference between the local and the regional elections and hydropower income (bottom right). The data are from local and regional elections held September 9–10, 2007, and the national election held at September 13–14, 2009.

Table B.1: The Relationship Between Hydropower Income and Electoral Participation

	(1) LOCAL	(2) LOCAL	(3) LOCAL	(4) REGIONAL	(5) REGIONAL	(6) REGIONAL
HydroPowerIncome	0.23***	-0.02	-0.02	0.09***	-0.13***	-0.15***
	(0.04)	(0.05)	(0.06)	(0.03)	(0.03)	(0.05)
LogVotingPopulation		-3.61***	-2.79***		-2.35***	-1.26**
		(0.27)	(0.53)		(0.31)	(0.50)
ShareInRuralAreas			2.58			2.89
			(1.73)			(1.77)
RecentImmigrants			-39.29*			-20.12
			(23.44)			(22.79)
ShareVotersAged18to37			-30.39			-34.80
			(31.78)			(35.40)
ShareVotersAged38to57			-37.62			-21.57
			(33.32)			(35.59)
ShareVotersAged58to77			-25.10			-29.09
			(31.17)			(35.89)
ShareWomen			-57.88**			-55.60*
			(28.54)			(29.74)
ShareUnMarried			-40.46*			-40.46*
			(20.95)			(21.08)
ShareWidow			-23.77			-21.70
			(48.43)			(51.21)
ShareDivorced			-37.60			-38.98
			(31.89)			(28.52)
ShareLowerSecondary			-22.22**			-28.50***
			(9.11)			(8.09)
ShareUpperSecondary			-28.90***			-29.06***
			(10.61)			(10.72)
CharityDonations			0.03			0.05*
			(0.03)			(0.02)
ChurchServiceAttendance			0.54			1.07**
			(0.49)			(0.54)
GrossWageMen			-0.05			0.24
			(1.26)			(1.20)
GrossWageWomen			6.49*			6.03**
			(3.28)			(2.83)
DirectElectionMayor			-1.34*			-1.38**
			(0.68)			(0.62)
TwoVotingDays			-0.31			-0.22
			(0.62)			(0.52)
PartyFragmentation			1.02			-1.17
			(2.79)			(3.01)
PartyIndepLists			0.45			-0.32
			(0.49)			(0.48)
N	426	426	420	426	426	420
adj. R^2	0.057	0.536	0.628	0.008	0.427	0.559
Labor Market Fixed Effects	No	Yes	Yes	No	Yes	Yes

Note: The dependent variable in columns (1), (2) and (3) is the participation rate at the local election. The dependent variable in columns (4), (5) and (6) is the participation rate at the regional election. The data are from elections held in 2007. Standard errors clustered at the labor market region level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B.2: The Relationship Between Hydropower Income and Electoral Participation: Testing for Non-linearities in HPI

	(1)	(2)	(3)	(4)	(5)	(6)
HydroPowerIncome	0.124***	0.115		0.134***	0.046	0.152**
	(0.032)	(0.088)		(0.037)	(0.073)	(0.069)
HydroPowerIncome2		0.000				
		(0.002)				
logHydroPowerIncome			0.136			
			(0.172)			
N	420	420	269	269	397	413
adj. R^2	0.541	0.539	0.493	0.540	0.522	0.524
Labor Market Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Population Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Institutional Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
ExcludedObservations	None	None	HPI= 0	HPI= 0	HPI> 10	HPI> 25

Note: Standard errors clustered at the labor market region level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B.3: The Relationship Between Hydropower Income and Electoral Participation: Alternative Controls for Electorate Size

	(1)	(2)	(3)	(4)	(5)
HydroPowerIncome	0.12***	0.13***	0.12***	0.12***	0.13***
	(0.03)	(0.04)	(0.03)	(0.03)	(0.04)
LogVotingPopulation	-1.53***	-1.68**			
	(0.38)	(0.66)			
VotingPopulation			-0.12***	-0.42***	-0.61
			(0.04)	(0.11)	(3.16)
VotingPopulation2			0.00***	0.01***	-0.51
			(0.00)	(0.00)	(1.47)
VotingPopulation3				-0.00***	0.15
				(0.00)	(0.27)
VotingPopulation4				0.00**	-0.01
				(0.00)	(0.02)
N	420	320	420	420	320
adj. R^2	0.541	0.438	0.514	0.529	0.438
Labor Market Fixed Effects	Yes	Yes	Yes	Yes	Yes
Population Characteristics	Yes	Yes	Yes	Yes	Yes
Institutional Characteristics	Yes	Yes	Yes	Yes	Yes
ExcludedObservations	None	Pop$> 10,000$	None	None	Pop$> 10,000$
EstimationMethod	OLS	OLS	OLS	OLS	OLS

Note: Standard errors clustered at the labor market region level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B.4: The Relationship Between Public Spending (in 1,000 NOK per capita) and Hydropower Income

	(1) School	(2) Elderly	(3) Child	(4) Social	(5) Health	(6) Infra	(7) Admin	(8) Fire	(9) Planning	(10) Roads	(11) Culture	(12) Industry
HydroPowerIncome	0.19***	0.27***	0.28***	0.17***	0.09***	0.13***	0.26***	0.03***	0.11***	0.17***	0.37***	0.28***
	(0.03)	(0.05)	(0.10)	(0.05)	(0.01)	(0.03)	(0.03)	(0.01)	(0.02)	(0.04)	(0.11)	(0.08)
Population	-0.03**	-0.04**	0.02***	0.01**	-0.02**	-0.01**	-0.03**	-0.00**	0.00*	-0.01**	-0.01	-0.01**
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)
ShareInRuralAreas	2.86***	6.30***	-0.24	0.36	1.42***	-0.37	3.85***	0.17	0.57***	0.00	-0.34	1.08**
	(0.89)	(0.97)	(0.43)	(0.46)	(0.31)	(0.40)	(0.78)	(0.13)	(0.20)	(0.43)	(0.78)	(0.49)
_cons	13.36***	13.92***	4.82***	4.00***	2.04***	3.55***	3.80***	0.79***	0.58***	1.73***	2.93***	0.85***
	(0.53)	(0.65)	(0.34)	(0.24)	(0.20)	(0.25)	(0.45)	(0.08)	(0.10)	(0.27)	(0.58)	(0.27)
N	426	426	426	426	426	426	426	426	426	426	426	426
adj. R^2	0.159	0.297	0.346	0.166	0.331	0.148	0.410	0.078	0.439	0.289	0.252	0.458

Note: Robust standard errors in parentheses. HydroPowerIncome is measured in NOK 1000 per capita. Population is the number of inhabitants in 1000s.

Table B.5: Survey Evidence

Dependent variable	Local	Regional	National
(i) In your opinion, will the result of the upcoming election be of high importance	0.0036**	0.0004	
for the development of the municipality [county] over the next four years?	(0.0015)	(0.0010)	
('High importance'=1, 'Don't know', 'Little or no importance' and 'Some importance'=0)	[0.23]	[0.10]	
(ii) In the last 12 months: have you tried to gather information about	0.006***		-0.000
local government [national] issues you care about? ('Yes'=1, 'No'=0)	(0.001)		(0.001)
	[0.38]		[0.12]
(iii) In the last 12 months: did you have contact with a local [national]	0.0024		0.0015**
politician concerning issues that you care about? ('Yes'=1, 'No'=0)	(0.0014)		(0.0006)
	[0.21]		[0.06]

Notes: Each cell represents marginal effects from probit regressions relating answers to survey questions (given in the first column) to hydropower income (in NOK 1000 per capita). Included in all regressions are control variables for population size and settlement pattern (ShareInRuralAreas). Standard errors clustered at the municipal level in parentheses. The mean of the dependent variable in square brackets. Data for question (i) are from the Local Election Survey (Lokalvalgsundersøkelsen) 2003 and 2007 (n=4701). Data for questions (ii) and (iii) are from a national survey conducted in 2009 by the Agency for Public Management and eGovernment (Innbyggerundersøkelsen), n=10469). $p < 0.10$,** $p < 0.05$,*** $p < 0.01$.*

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