

Strengthen governability rather than deepen democracy: why local governments introduce participatory governance

Supplemental Material for the online appendix

Robustness checks: model diagnostics

To assess the robustness of the logistic regression models used in the analysis, we reproduce and discuss the results of model diagnostics in the following.

Collinearity

As is shown by Table S1, rather high correlations (above 0.3 or below -0.3) exist mainly between three variables: the fragmentation of the party system, municipal population size and

Table S1: Pearson correlations between predictors

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1) Average turnout in national elections (1999-2011)	1	0.10	-0.07	0.05	-0.27	-0.09	-0.16	0.10	0.02	-0.16	-0.03	0.19
2) Social inequality: Gini Index taxable income (2009)	0.10	1	0.10	0.17	-0.02	0.21	0.02	0.03	-0.07	0.26	0.09	0.41
3) No municipal assembly tradition (dummy = 1)	-0.07	0.10	1	0.00	0.25	0.19	0.23	0.01	-0.25	0.42	0.03	0.00
4) Population growth (2000-2010)	0.05	0.17	0.00	1	0.04	0.24	0.08	-0.1	0.23	0.24	0.14	0.39
5) Unemployment rate (2010)	-0.27	-0.02	0.25	0.04	1	0.26	0.34	0.07	0.04	0.28	0.04	0.03
6) Fragment. party system (2011) (Effective number of parties)	-0.09	0.21	0.19	0.24	0.26	1	0.58	-0.06	0.29	0.37	0.13	0.43
7) Share of the vote for green and left parties in national elections	-0.16	0.02	0.23	0.08	0.34	0.58	1	0.07	0.25	0.24	0.04	0.32
8) Volatility of national councillor elections (1999-2011)	0.10	0.03	0.01	-0.1	0.07	-0.06	0.07	1	-0.15	-0.30	-0.15	-0.13
9) Percentage of out-commuters in municipalities	0.02	-0.07	-0.25	0.23	0.04	0.29	0.25	-0.15	1	-0.01	0.11	0.54
10) Municipal population (average 2000-2010)	-0.16	0.26	0.42	0.24	0.28	0.37	0.24	-0.30	-0.01	1	0.21	0.32
11) Mini-publics in neighboring municipalities	-0.03	0.09	0.03	0.14	0.04	0.13	0.04	-0.15	0.11	0.21	1	0.16
12) Municipal resources in terms of median taxable income (2009)	0.19	0.41	0.00	0.39	0.03	0.43	0.32	-0.13	0.54	0.32	0.16	1

municipal resources. Otherwise, correlations between the predictors are rather small (mostly between [-0.2; 0.2]).

Collinearity does not seem to be a major issue in models 1 to 5 (Table S2). In model 6 (the full model), Variance Inflation Factors are higher, but still acceptable. However, Variance Inflation Factors larger than 3 would result from including population size in the full model (data not shown).

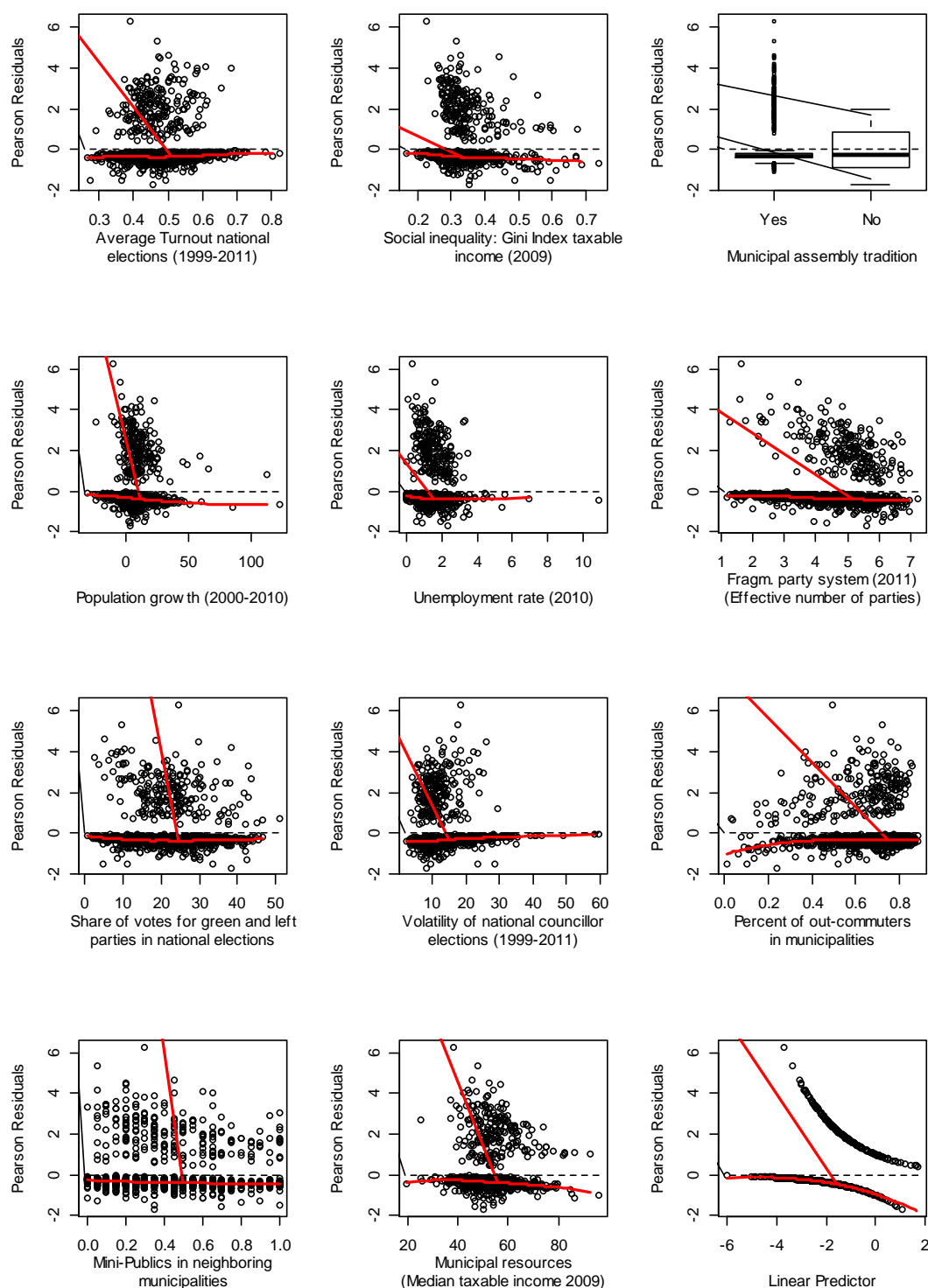
Table S2: Variance Inflation Factors (VIF) of models 1 to 6

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
1) Average turnout in national elections (1999-2011)	1.100					1.259
2) Social inequality: Gini Index taxable income (2009)	1.248					1.633
3) No municipal assembly tradition (dummy = 1)	1.016					1.356
4) Population growth (2000-2010)		1.116				1.131
5) Unemployment rate (2010)		1.004				1.323
6) Fragment. party system (2011) (Effective number of parties)			1.183			1.899
7) Share of the vote for green and left parties in national elections				1.127		2.001
8) Volatility of national councillor elections (1999-2011)				1.078		1.085
9) Percentage of out-commuters in municipalities				1.556		2.024
10) Municipal population (average 2000-2010)					1.071	
11) Mini-publics in neighboring municipalities					1.032	1.046
12) Municipal resources in terms of median of taxable income (2009)	1.310	1.119	1.183	1.499	1.072	2.629

Residual diagnostics, full model

Figure S1 plots the Pearson residuals of the full model (model 6) against all predictors and against the predicted values. The Loess lines are not perfectly horizontal, but they do not show a clear trend that would lead to a reshape of the model. The fact that the Loess lines are below the zero line is due to the unbalanced sample at hand.

Figure S1 : Pearson residuals vs. predictors and predicted values



To confirm the visual inspection, we calculate a curvature test, meaning that a quadratic term for each predictor is added to the model (Table S3). The test does not show significant

results. There is no need for quadratic predictors. We therefore assume an overall correctly specified linear model.

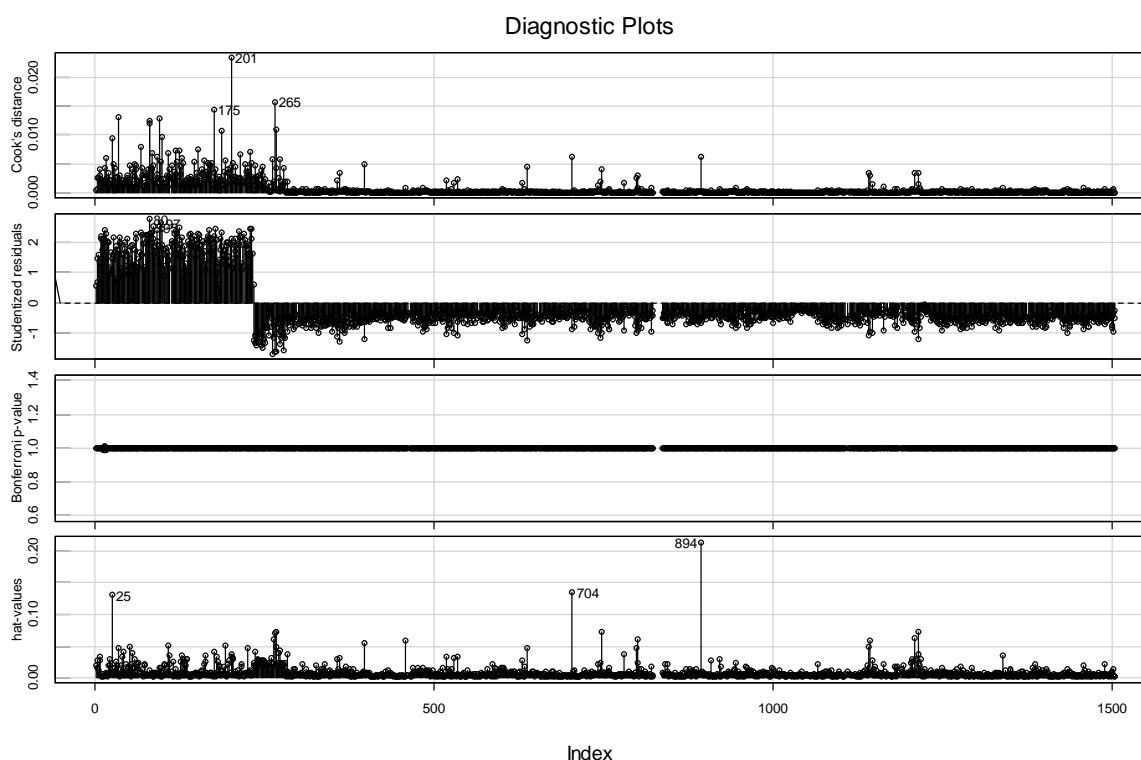
Table S3: Curvature test

Variables	Test statistics	Pr(> t)
Average turnout in national elections (1999-2011)	1.354	0.245
Social inequality: Gini Index taxable income (2009)	1.903	0.168
No municipal assembly tradition (dummy = 1)	NA	NA
Population growth (2000-2010)	0.125	0.724
Unemployment rate (2010)	1.663	0.197
Fragment. party system (2011) (Effective number of parties)	1.693	0.193
Share of the vote for green and left parties in national elections	0.730	0.393
Volatility of national councillor elections (1999-2011)	2.402	0.121
Percentage of out-commuters in municipalities	2.450	0.118
Municipal population (average 2000-2010)	0.829	0.363
Mini-publics in neighboring municipalities	0.094	0.759

Leverage, influence, outliers

Standardized residuals are used to detect potential outliers. As Figure S2 shows, there are no big outliers. The visual inspection is confirmed by the Bonferroni Outlier Test, which does not detect any significant outliers (see also, all Bonferroni p-values are around 1).

Figure S2 : Diagnostic plots



The fourth graph of figure S2 plots the hat values to detect observations with high leverage. Three cases seem to have a rather high leverage. However, their effect is rather marginal (see Table S4). Finally, three observations have rather high influence (measured in Cook's Distance). Their effect is marginal (see Table S4). Overall, we cannot identify cases that have a significant impact on model building.

Table S4: Logistic regressions, reduced models

	Model 6 <i>Full model</i>	Model 6a <i>Remove cases with highest leverage (hat values > 0.1)</i>	Model 6b <i>Remove cases with biggest influence (Cook's D > 0.01)</i>	Model 6c <i>Remove cases with highest leverage and/or biggest influence</i>
Average turnout in national elections (1999-2011)	-2.246 (1.286)	-2.227 (1.287)	-2.173 (1.300)	-2.154 (1.301)
Social inequality: Gini Index taxable income (2009)	0.818 (1.424)	0.933 (1.427)	0.679 (1.446)	0.792 (1.450)
No municipal assembly tradition (dummy = 1)	0.975** (0.289)	0.980** (0.289)	0.966** (0.293)	0.972** (0.294)
Population growth (2000-2010)	0.017* (0.007)	0.017* (0.007)	0.018** (0.007)	0.018* (0.007)
Unemployment rate (2010)	0.128 (0.123)	0.124 (0.124)	0.109 (0.127)	0.105 (0.128)
Fragment. party system (2011) (Effective number of parties)	0.326** (0.107)	0.329** (0.107)	0.305** (0.108)	0.307** (0.108)
Share of the vote for green and left parties in national elections	-0.011 (0.014)	-0.011 (0.014)	-0.007 (0.014)	-0.008 (0.014)
Volatility of national councillor elections (1999-2011)	-0.061** (0.016)	-0.061** (0.017)	-0.062** (0.017)	-0.062** (0.017)
Percentage of out-commuters in municipalities	-3.969** (0.683)	-3.940** (0.684)	-4.126** (0.693)	-4.098*** (0.694)
Municipal population (average 2000-2010)	0.729* (0.308)	0.698* (0.310)	0.773* (0.313)	0.741* (0.315)
Mini-publics in neighboring municipalities	0.047** (0.015)	0.047** (0.015)	0.047** (0.015)	0.047** (0.015)
Constant	-2.058* (0.806)	-2.109** (0.808)	-1.999* (0.815)	-2.049* (0.817)
Number of observations	1420	1417	1411	1408
AIC	1091.6	1088.0	1065.6	1061.9

*SE in parentheses, * $p < 0.05$, ** $p < 0.01$*

Further analyses

Testing for confounding effects of the urban / rural distinction

Our analysis shows that the introduction of mini-publics at the municipal level is associated with a number of factors that, one could argue, are associated with the urban / rural distinction. Indeed, rural municipalities in general have less inhabitants, are politically, economically and socially less fragmented, left and green parties are weaker, and they more

often have a local assembly tradition. And Table 3 in the main text shows that mini-publics are much less frequent in rural areas (10 percent), than in the other types of municipalities.

In order to assess the potential confounding effects of the urban / rural distinction, we performed a two-step matching procedure. First, we perform a 1:n exact matching based on the assembly tradition dichotomous variable. Second, we perform a 1:1 nearest-neighbor-matching. Distance is measured by propensity scores, which are calculated by using the three variables that are believed to have the biggest influence on confounding: fragmentation of the party system, municipal population size and municipal resources. Additionally, we included a dichotomous urbanization dummy based on Table 3 in the main text (0 = [rural municipalities], 1 = [core cities, suburbs, isolated cities]). Matching is done without replacement. Table S5 shows the result of the matching procedure. After matching, no significant differences between municipalities with and without MPs exist.

Table S5 :Matching

	Before Matching			After Matching		
	Municipalities without MPs	Municipalities with MPs	Test statistics	Municipalities without MPs	Municipalities with MPs	Test statistics
Log(Mean Population size), mean	7.15	8.32	$t=-13.3$ $p=2.2*10^{-16}$	8.19	8.32	$t=-1.2$ $p=0.22$
Fragmentation, mean	4.42	4.88	$t=-6.0$ $p=7.0*10^{-9}$	4.90	4.88	$t=-0.2$ $p=0.87$
Municipal resources, mean	52.20	54.48	$t=-3.5$ $p=6*10^{-4}$	54.04	54.48	$t=-0.5$ $p=0.58$
Rural municipalities, N	805	84	$X^2=63.8$ $p=1.4*10^{-15}$	90	84	$X^2=0.24$ $p=0.63$
Urban municipalities, N	396	135		129	135	
Assembly municipalities, N	1157	178	$X^2=72.0$ $p=2.2*10^{-16}$	178	178	$X^2=0$ $p=1$
Parliament municipalities, N	44	41		41	41	
N	1201	219	..	219	219	..

The predictors of the full model – without the matching variables – are included in a logistic regression analysis (Table S6). Although we now control for confounding, the effects of population growth, electoral volatility and the percent of out-commuters remain significant. Moreover, average turnout in national elections, social inequality, unemployment and the share of votes for green and left parties still do not have a significant effect on the decision to introduce mini-publics. These results from the analysis with matched data thus confirm the robustness of our full model with the complete data.

Compared to our full model with the complete data, the presence of mini-publics in the nearest municipalities does not show a significant effect after matching. This is no surprise. We argue that the introduction of mini-publics is not random but depends on several circumstances. If we perform nearest neighbour matching based on these circumstances – fragmentation, population size, urban/rural distinction, municipal resources and assembly tradition –, we exclude municipalities with completely different patterns.

Table S6: Logistic Regression of introduction of mini-publics in municipalities (data of matched cases)

	Full model (without matching variables)	Variance Inflation Factors
Average turnout in national elections	0.014 (1.663)	1.294
Social inequality: Gini Index taxable income	-0.048 (1.463)	1.136
Population growth	0.024* (0.011)	1.129
Unemployment rate	-0.228 (0.176)	1.528
Share of votes for green and left parties	0.006 (0.014)	1.421
Volatility of national councillor elections	-0.053* (0.021)	1.119
Percentage of out-commuters	-1.991** (0.670)	1.196
Mini-Publics neighbouring municipalities	0.596 (0.404)	1.061
Constant	1.654 (1.025)	
Number of observations	438	
AIC	601.72	
Nagelkerke R2	0.070	

*Table entries are logistic regression coefficients, SE in parentheses, * $p < 0.05$, ** $p < 0.01$*

Validity check: analyses with data from an alternative source

For the analyses in this article, data on the introduction of mini-publics in the 1505 municipalities was collected via a survey of professional providers. While non-response was no major issue in our survey, we cannot completely exclude that, due to missing data, we miscategorised municipalities that actually had experienced a mini-public exercise in the study period. In order to check the validity of our findings, we performed additional analyses with data from the 2009 survey of Swiss municipal secretaries (Ladner et al., 2013). Using the answers to question 25b on alternative forms of citizen participation, we built a dichotomous variable to express whether any of these had been implemented in a given municipality or not.

No specification is possible, however, as to whether experiences with alternative forms of citizen participation involved an external provider. Moreover, the municipal secretary survey includes only 804 (57 percent) of the municipalities under scrutiny in our study, and appears to be biased with respect to some of the predictors of interest. More precisely, large and fast growing municipalities are overrepresented, municipalities with high electoral volatility are overrepresented, and municipalities with low median income are underrepresented. Nevertheless, it allows an approximation of the dependent variable through an alternative source of data.

Table S7: Logistic regressions of the implementation of mini-publics in Swiss municipalities (data from the municipal secretary survey)

Variables	Logistic regressions (coefficients, SE in parentheses)					
	Model 1 (Hyp 1)	Model 2 (Hyp 2)	Model 3 (Hyp 3)	Model 4 (Hyp 4)	Model 5 (Hyp 5)	Model 6 full
Average turnout in national elections (1999-2011)	-0.795 (1.116)					0.022 (1.278)
Social inequality: Gini Index taxable income (2009)	-0.199 (1.423)					-3.029 (1.709)
No municipal assembly tradition (dummy = 1)	3.266** (1.014)					2.471* (1.031)
Population growth (2000-2010)		0.009 (0.008)				0.006 (0.008)
Unemployment rate (2010)		0.534** (0.137)				0.493** (0.167)
Fragment. party system (2011) (Effective number of parties)			0.179* (0.074)			0.133 (0.099)
Share of the vote for green and left parties in national elections				0.024* (0.011)		-0.011 (0.014)
Volatility of national councillor elections (1999-2011)				-0.002 (0.016)		-0.001 (0.017)
Percentage of out-commuters in municipalities				-3.094** (0.742)		-2.941** (0.864)
Municipal population (average 2000-2010)					0.482** (0.076)	-
Mini-publics in neighboring municipalities					-0.499 (0.314)	-0.377 (0.324)
Municipal resources in terms of median of taxable income (2009)	0.036** (0.011)	0.021 (0.011)	0.020 (0.011)	0.053** (0.013)	0.010 (0.011)	0.060** (0.018)
Constant	-0.607 (0.707)	-9.23 (0.569)	-0.894** (0.537)	-0.314 (0.608)	-2.927** (0.649)	-0.276 (0.837)
Nagelkerke R square	0.072	0.048	0.026	0.057	0.090	0.115
AIC	950.6	969.4	988.7	956.7	953.9	925.8
Number of observations	821	828	835	816	838	809

Significance levels: * $p < 0.05$, ** $p < 0.01$

Table S7 shows the estimates of the regression models with this alternative data. While not all variables turn out to have exactly the same influence, the overall results are very similar to the ones obtained using our own survey. Indeed, the analysis with the alternative data also finds predictors of a democratic deficit (the absence of a municipal assembly tradition), problem pressure beyond government control (unemployment), need to create public support (party system fragmentation), as well as population size to be associated with the introduction of alternative forms of citizen participation at the municipal level, and does not support the electoral benefit calculation hypothesis (the share of left and green parties together with weak – rather than strong - community ties plays a role). The significance of the control variable measuring municipal resources is also the same in most of the models. It thus appears that the conclusions from our study have a rather high external validity, as the main findings are supported even when using alternative data sources.