

Supplementary Materials for: Incumbent Tenure Crowds Out Economic Voting

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S1: A Formalisation of the Bayesian Learning Model

In this model we examine a set of voters who have to decide whether to re-elect an incumbent. We assume that the voters are more likely to re-elect the incumbent if they believe the incumbent is more competent. Therefore, voters' goal is to construct a set of rational beliefs about the incumbent's competence given the available evidence.

Imagine an incumbent I which was elected at $t = 0$, and who is now up for re-election at $t = 1$. We denote the incumbent's competence as C_I . Based on the voters' prior experiences with other incumbents, they start off with a normally distributed prior belief about C_I , which we standardise to have a mean of 0 with and a variance of 1.

Since voters are interested in the incumbent's competence, C_I , they try to infer how competent the politician is based on the economic situation, y , which is affected by C_I . The economy is also affected by a non-competence related shock ϵ , which is independently and identically drawn in each period from a normal distribution with mean zero and variance σ_ϵ^2 . The economic situation at $t = 1$ can be defined as:

$$y_1 = C_I + \epsilon_1 \quad (1)$$

In this equation, voters only observe y_1 , but they do know the distribution the non-competence related shock is drawn from. As such, voters face a signal extraction problem, which can be solved by using the Bayes rule to update their prior beliefs about C_I using y_1 . This leaves voters with the following posterior beliefs about C_I :

$$C_I|y_1 \sim N\left(\frac{1}{\sigma_\epsilon^2 + 1}y_1; \frac{\sigma_\epsilon^2}{\sigma_\epsilon^2 + 1}\right) \quad (2)$$

Equation 2 tells us that voters' beliefs about the incumbent's expected competence are improving in y_1 . That is, a better economic situation leads the voter to infer that the incumbent is more competent. Specifically, the effect of a one unit increase in y_1 on expected competence is $\frac{1}{\sigma_\epsilon^2 + 1}$.

From this, we can also see that the effect of the economic situation on beliefs about competence becomes smaller as σ_ϵ^2 becomes larger. That is, as the variation in non-competence related shocks to the economy increases, it becomes more likely that any variation in the economic situation is due to non-competence related shocks, and accordingly the economy becomes a more noisy signal of the incumbent's competence. In effect, σ_ϵ^2 can be thought of as being a (reverse) indicator of clarity of responsibility. If σ_ϵ^2 is large, the incumbent is probably not responsible for changes in economic conditions, if σ_ϵ^2 is small the incumbent is probably responsible for changes in economic conditions.¹

Imagine the incumbent is re-elected in $t = 1$. In period $t = 2$, the voters have to decide once again whether to vote for the incumbent. However, now the voters' prior beliefs about the incumbent incorporate the information obtained about C_I at $t = 1$. That is, voters' prior beliefs now have a mean of $\frac{1}{1 + \sigma_\epsilon^2}y_1$ and a variance of $\frac{\sigma_\epsilon^2}{\sigma_\epsilon^2 + 1}$. (Note that the variance of the new prior is smaller than the original prior, since $1 > \frac{\sigma_\epsilon^2}{\sigma_\epsilon^2 + 1}$).

Voters update their prior beliefs using Bayes rule, based on the economic situation in $t = 2$, y_2 , which is equal to:

$$y_2 = C_I + \epsilon_2 \quad (3)$$

¹This conclusion closely mirrors the one found by Duch and Stevenson (2008). Using a slightly more complicated set-up, they show that as control of economic conditions becomes more independent of elected officials (i.e. the variance of non-competence related shocks increase), voters' beliefs about the incumbent's competence become more independent of economic conditions.

This leaves the voter with the following posterior beliefs about the incumbent's competence.

$$C_I|y_2, y_1 \sim N\left(\frac{1}{\sigma_\epsilon^2 + 2}y_1 + \frac{1}{\sigma_\epsilon^2 + 2}y_2; \frac{\sigma_\epsilon^2}{\sigma_\epsilon^2 + 2}\right) \quad (4)$$

A better economic situation in period 2, y_2 , is used to infer that incumbent competence is higher and σ_ϵ^2 attenuates the degree to which voters can use the economic situation to make inferences about C_I . However, there is one key difference from period 1. The effect of the economic situation on voters' beliefs about the incumbent's competence has become smaller.

In period 1 the effect of a one unit increase in y_1 was $\frac{1}{1+\sigma_\epsilon^2}$. In period 2 the effect of a one unit increase in y_2 is $\frac{1}{2+\sigma_\epsilon^2}$. This is a key result from the model, which underlines the assertion made in the theoretical discussion of the main article: as voters' information about the incumbent accumulate, their priors harden and recent economic situation comes to play a smaller role in shaping voters' beliefs about the incumbent.

Increasing Clarity of Responsibility Versus Bayesian Learning

In the model presented above, we assumed that the economic situation in period 1 and the economic situation in period 2 was a result of the same mix of competence and non-competence related shocks. Some previous literature on the relationship between economic voting and time in office makes a different assumption (e.g., Nadeau and Lewis-Beck 2001). In particular, these researchers assume that the incumbent becomes more responsible for the economic conditions as their time in office increases. In the terminology of our model, they think incumbent competence becomes more important relative to non-competence related shocks at $t = 2$. What happens if we incorporate this alternative assumption into our model?

We introduce the assumption by letting non-competence related shocks, σ_ϵ^2 , decrease with time in office. In particular, we assume that the variance decreases from σ_ϵ^2 at $t = 1$ to $\tilde{\sigma}_\epsilon^2$ at $t = 2$, where $\tilde{\sigma}_\epsilon^2 < \sigma_\epsilon^2$. We denote the rate at which the variance decreases as α , where $\alpha = \tilde{\sigma}_\epsilon^2/\sigma_\epsilon^2$. If α is close to 1, there is only a small decrease in the variation of the error term, signifying that incumbents become only slightly more responsible for the economic situation in the second period. If α is close to 0 there is a marked decrease in the variation of the error term, signifying that incumbents become a lot more responsible for the economic situation.

How does introducing this assumption affect voters' beliefs about incumbent competence? In the first period, nothing changes, as the variance of the non-competence related shocks remain the same. However, in the second period, voters take into account that the variance in ϵ has decreased to $\tilde{\sigma}_\epsilon^2$, and consequently rely more on the competence signal relayed by the economic situation y_2 . In particular, after updating their priors using Bayes rule, voters' posterior beliefs about incumbent competence can be described as follows:

$$C_I|y_2, y_1 \sim N\left(\frac{1}{\frac{1}{\alpha} + \sigma_\epsilon^2 + 1}y_1 + \frac{1}{1 + (\sigma_\epsilon^2 + 1)\alpha}y_2; \frac{\tilde{\sigma}_\epsilon^2\sigma_\epsilon^2}{\tilde{\sigma}_\epsilon^2\sigma_\epsilon^2 + \tilde{\sigma}_\epsilon^2 + \sigma_\epsilon^2}\right) \quad (5)$$

Note that in Equation 5, the extent to which voters rely on y_2 depends negatively on α (the rate at which the variance in the non-competence related shocks decreases from $t = 1$ to $t = 2$). This makes intuitive sense, because a large decrease in variance corresponds to a large increase in the clarity of political responsibility. As such, if clarity of responsibility increases a lot with time in office, then α is low and voters rely more on y_2 .

We can compare the extent of economic voting across time in office by comparing the effect of a one unit increase in y_2 on $E(C_I)$ at $t = 2$ (see Equation 5) with the effect of a one unit

increase in y_1 on $E(C_I)$ at $t = 1$ (see Equation 2). If the effect in the earlier period is larger, then economic voting decreases over time. This inequality can be written as

$$\frac{\delta E(C_I)}{\delta y_2} < \frac{\delta E(C_I)}{\delta y_1} \iff \frac{1}{1 + (\sigma_\epsilon^2 + 1)\alpha} < \frac{1}{1 + \sigma_\epsilon^2}, \quad (6)$$

which can be simplified to

$$\sigma_\epsilon^2 \left(\frac{1}{\alpha} - 1 \right) < 1. \quad (7)$$

If the inequality in Equation 7 is satisfied, economic voting decreases with time in office. When will this inequality be satisfied? All else equal, it is more likely to be satisfied if the increase in clarity of responsibility over time is low (if α close to 1), and if the overall role placed by non-competence related shocks is low (σ_ϵ^2 is small). Note that if α is 1, signifying no increase in clarity of responsibility over time, the condition in equation 7 will always be satisfied, and incumbent tenure will always crowd out economic voting.

In conclusion, it is not possible to form unambiguous theoretical expectations for how incumbent tenure and economic voting are related based on this augmented model. Instead, the answer has to be that ‘it depends’. In particular, it depends on the exact beliefs voters hold about α and σ_ϵ^2 .

S2: Overview of the Countries, Elections and Election Surveys Included in the Analysis

An overview of the data used in the country-level and individual-level analyses are presented in Tables S.1 and S.2.

Table S.1: Elections Included in the Country-level Analysis

	Minimum	Maximum	Number of Elections
Argentina	1985	2001	12
Australia	1961	2007	19
Austria	1971	2008	12
Belgium	1961	2007	15
Bolivia	1989	2002	8
Brazil	1990	2002	7
Bulgaria	1991	2001	6
Canada	1962	2008	16
Chile	1993	2001	5
Colombia	1982	2002	12
Costa Rica	1982	2002	12
Denmark	1964	2007	18
Dominican Republic	1990	2002	6
Ecuador	1984	1998	11
El Salvador	1985	2000	9
Finland	1962	2007	17
France	1968	2007	14
Germany	1972	2009	11
Greece	1981	2009	9
Honduras	1989	2001	8
Iceland	1963	2007	13
India	1980	1998	6
Ireland	1973	2007	10
Israel	1969	2006	12
Italy	1972	2008	10
Luxembourg	1979	2009	7
Madagascar	1996	2001	2
Netherlands	1963	2006	14
New Zealand	1978	2008	11
Norway	1969	2009	11
Papua New Guinea	1987	2002	4
Peru	1990	2001	6
Poland	1993	2001	3
Portugal	1980	2009	10
Spain	1979	2008	9
Sweden	1976	2006	10
Switzerland	1983	1999	5
Trinidad and Tobago	1991	2000	3
Turkey	1987	2002	5
United Kingdom	1964	2010	12
United States	1978	2002	19
Total	1961	2010	409

Table S.2: Observations Included in the Individual-level Analysis

	1989	1994	1999	2004	2009	2014	Total
Denmark	832	1642	759	999	867	1058	6157
France	749	1321	363	1034	513	1049	5029
Germany	875	1333	777	381	691	1610	5667
Greece	525	1236	320	373	689	1080	4223
Ireland	752	1351	370	892	762	1074	5201
Italy	673	960	2446	1151	561	1063	6854
Netherlands	871	1610	804	1260	802	1087	6434
Portugal	521	1154	259	605	623	1020	4182
Spain	618	1216	581	887	680	1097	5079
United Kingdom	856	1603	711	1104	690	1378	6342
Total	7272	13426	7390	8686	6878	11516	55168

S3: Variable Descriptions and Descriptive Statistics

Descriptive statistics for the country-level data are presented in Table S.3.

Table S.3: Descriptive Statistics, Country-level Data

	Mean	SD	Min	Max	n
Electoral support for incumbent party	33.63	12.26	0.00	59.20	433
Lagged Support	37.99	12.61	0.00	67.30	433
Change in support for incumbent party	-4.36	8.03	-42.80	20.70	433
Economic growth	2.91	3.14	-11.70	13.85	433
Economic growth - 2 years	3.08	2.65	-8.78	14.90	428
Tenure	6.02	4.25	1.00	30.00	409
Executive election	0.14	0.35	0.00	1.00	433
Effective number of parties	3.87	1.63	1.18	10.49	415
Coalition partners	1.53	1.28	0.00	3.00	433
Government has majority in legislature	0.71	0.46	0.00	1.00	348
Number of elections	12.60	4.01	5.00	19.00	431
Years pr. term	2.34	1.03	0.00	4.67	433
Fixed term	0.15	0.36	0.00	1.00	433
Mismatch tenure (person v. party)	0.35	0.48	0.00	1.00	433

The question wording for the different questions used in the individual-level analysis are as follows.

- Executive party vote: “If there were a general election tomorrow, which party would you vote for?” Executive parties are coded 1, others are coded 0.
- Executive party vote (last election): “Which party did you vote for at the General Election of [Year]?” Executive parties are coded 1, others are coded 0.
- Ideology: “In political matters people talk about ‘the left’ and ‘the right.’ What is your position? Please indicate your views using any number on a 10-point scale. On this scale, where 1 means ‘left’ and 10 means ‘right’, which number best describes your position?”
- Class: “If you were asked to choose one of these five names for your social class, which would you say you belong to — the working class, the lower middle class, the middle class, the upper middle class, or the upper class?”
- Religiosity: “How often do you attend religious services: several times a week, once a week, a few times a year, once a year or less, or never?”
- National economic perceptions (NEP): In 1989, 1994, 2004, 2009 and 2014: “What do you think about the economy? Compared to 12 months ago, do you think that the general economic situation in this country is: a lot better, a little better, stayed the same, a little worse, or a lot worse?” In 1999: “How about the state of [country’s] economy? Very satisfied, somewhat satisfied, somewhat dissatisfied, very dissatisfied?”

Descriptive statistics for the individual-level data are presented in Table S.4.

Descriptive statistics for the subnational data are presented in Table S.5.

Table S.4: Descriptive Statistics, Individual-level Data

	Mean	SD	Min	Max	n
Executive party vote	0.29	0.46	0.00	1.00	55168
Executive party vote (last time)	0.34	0.47	0.00	1.00	49250
National economic perceptions	0.43	0.28	0.00	1.00	55168
Prospective NEP	0.50	0.25	0.00	1.00	39142
Time in office (years)	5.46	4.24	1.00	17.00	55168
Class	0.45	0.30	0.00	1.00	52597
Religiosity	0.51	0.31	0.00	1.00	48672
Ideology	0.50	0.26	0.00	1.00	51018
Economic growth	1.85	2.96	-5.64	10.76	48826
Inflation	2.24	2.82	-4.48	13.70	47951
Unemployment rate	10.16	5.25	3.40	26.30	48826
Coalition government	0.63	0.48	0.00	1.00	55168

Table S.5: Descriptive Statistics, Subnational Data

	Mean	SD	Min	Max	n
Change in Support for Mayoral Party	-2.85	15.67	-45.20	78.15	1823
New incumbent	0.44	0.50	0.00	1.00	1823
Unemployment 07	2.31	0.86	1.00	8.70	1823
Unemployment 09	4.51	0.81	2.30	8.30	1823
Increase in unemployment rate	2.20	0.67	-0.40	4.10	1823
Turnout	0.69	0.06	0.37	0.89	1823
Right wing mayor	0.43	0.50	0.00	1.00	1823
Log of eligible voters	7.24	1.10	1.84	10.36	1823
Municipality amalgamated	0.80	0.40	0.00	1.00	1823
Proportion of votes for right wing parties	0.48	0.14	0.10	0.88	1823

S4: Alternative Measure of Growth

In Table S.6, we re-estimate the models from Table 1 using an alternative measure of economic growth: economic growth across the past two years, rather than just the past year. The interaction effect becomes slightly larger, remains negative and statistically significant.

Table S.6: Alternative Measure of Economic Growth

	(1)	(2)	(3)	(4)
Economic growth - 2 years	0.95*	1.16*	1.25*	1.31*
	(0.27)	(0.34)	(0.35)	(0.32)
Tenure	0.06	0.11	-0.03	-0.12
	(0.11)	(0.10)	(0.13)	(0.17)
Economic growth - 2 years \times Tenure	-0.07*	-0.09*	-0.09*	-0.08*
	(0.03)	(0.03)	(0.03)	(0.03)
Lagged Support	-0.23*	-0.24*	-0.40*	-0.39*
	(0.05)	(0.05)	(0.06)	(0.11)
Executive election	-1.06	-0.11	1.99	0.22
	(1.61)	(1.41)	(1.61)	(0.79)
Year FE		✓	✓	
Country FE			✓	✓
Leader FE				✓
Observations	406	406	406	406

Standard errors clustered by country in parentheses.

S5: Using Controls in the Country-Level Data

In this section we add some controls to the models estimated on the country-level dataset of elections. This means dropping around 80 observations that do not have data coverage for the control variables. In order to make the estimates with and without controls more comparable, we start by estimating the same models as in Table 1 on the smaller sample of elections for which we have controls. This is done in columns one through four of Table S.7. The results are fairly similar to those found using the full sample. The main difference is that the interaction effects become slightly smaller, and the standard errors become slightly larger, leaving the interaction terms insignificant.

Next, we introduce the controls. The controls we use are number of government coalition partners, including a dummy for one, two and three or more partners; majority government, including a dummy for whether the government has more than 50 percent of the seats in parliament; and effective number of parties in parliament, a linear index measuring the size-adjusted number of parties in parliament. All these variables have been taken from the database of political institutions (Beck et al. 2001). They have been chosen with the following considerations in mind: we know that government composition affects economic voting (e.g., Fisher and Hobolt 2010), depressing the clarity of responsibility for economic policy, and it seems plausible that the effective number of parties can do the same—the more parties, the more political actors are to blame for economic conditions. It also seems likely that government and parliamentary composition can influence the tenure of the executive party, making it a good candidate for a confounder. Finally, unlike most other institutional factors, government and parliamentary composition are not already controlled for using the year, country and leader fixed effects. The controls are introduced in columns five through eight of Table S.7. This leaves the interaction effects practically unchanged.

In sum, while the interaction estimates remain substantially unchanged, the statistical significance of the interaction coefficients drop when introducing the controls. However, this is because we analyze a smaller sample of elections. As such, there is no evidence to suggest that the controls introduced in any way confound the negative relationship between economic voting and time in office.

Table S.7: Including Control Variables in the Country-level Data

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Executive election	-1.14 (1.63)	0.10 (1.48)	1.77 (1.73)	-2.23 ⁺ (1.26)	-1.35 (1.53)	0.06 (1.41)	1.43 (1.71)	-1.76 (1.51)
Economic growth	0.69* (0.25)	0.78* (0.29)	0.71* (0.27)	1.07* (0.29)	0.69* (0.23)	0.80* (0.27)	0.73* (0.25)	1.10* (0.27)
Tenure	-0.01 (0.12)	0.06 (0.11)	-0.18 (0.16)	-0.21 (0.20)	0.02 (0.11)	0.09 (0.10)	-0.19 (0.15)	-0.20 (0.21)
Economic growth × Tenure	-0.04 (0.03)	-0.04 (0.03)	-0.04 (0.04)	-0.06 (0.04)	-0.04 (0.03)	-0.04 (0.03)	-0.05 (0.03)	-0.06 (0.04)
Lagged Support	-0.22* (0.06)	-0.23* (0.06)	-0.39* (0.07)	-0.39* (0.12)	-0.30* (0.07)	-0.31* (0.08)	-0.41* (0.09)	-0.32* (0.12)
Government has majority in legislature					-1.05 (0.97)	-1.28 (1.13)	-1.26 (1.29)	-3.12* (1.47)
One coalition partner					0.99 (1.24)	0.73 (1.34)	0.32 (1.63)	0.20 (2.68)
Two coalition partners					-1.74 (2.00)	-1.82 (1.81)	-0.46 (1.58)	-0.09 (2.28)
More than two coalition partners					0.08 (1.27)	-0.58 (1.37)	-0.37 (1.61)	2.27 (2.12)
Effective number of parties					-0.85 (0.52)	-0.88 (0.54)	-0.66 (0.74)	0.07 (0.68)
Time FE		✓	✓			✓	✓	
Country FE			✓	✓			✓	✓
Leader FE				✓				✓
Observations	330	330	330	330	330	330	330	330

Standard errors clustered by country in parentheses.

S6: Sensitivity to Outliers

Are the interaction effects presented above based on broad patterns in voting behavior or idiosyncrasies related to just one country? This is always an important question when dealing with time-series cross-sectional data. In order to investigate whether this was the case in the present analyses, we re-estimated the key models in the country-level, individual-level and subnational datasets, looking for evidence of instability in the effect-sizes which stem from the exclusion of one important set of cases.

For the country-level data, we re-estimate the models from Table 1 excluding one country at a time. The resulting 41×4 regression coefficients attached to the interaction between economic conditions and incumbent tenure are plotted for each model in the top left panel of Figure S.1. As can be seen from this figure, the interaction coefficients in models 1 and 2 seem rather stable; however, in models 3 and 4 one of the estimated coefficients deviates substantially from the rest. An inspection of the underlying data, reveals that the omitted country in this case is Luxembourg. There are two reasons why this is not that disconcerting. First, the interaction coefficient remains negative. Second, Luxembourg is not one of the countries included in the individual-level dataset, and therefore the negative relationship between economic voting and tenure cannot be attributed to Luxembourg alone.

For the individual-level data, we re-estimate the models from Table 2 excluding one survey at a time. The resulting 60×3 logistic regression coefficients attached to the interaction between economic perceptions and incumbent tenure are plotted for in the top right panel of Figure S.1. As can be seen from this figure, the interaction coefficients are relatively stable across all models.

For the subnational data, we re-estimate the models from Table 3 excluding one municipality at a time. The resulting 66×3 regression coefficients attached to the interaction between local unemployment and new incumbent are plotted for each model in the bottom panel of Figure S.1. As can be seen from this figure, the interaction coefficients are relatively stable across all models.

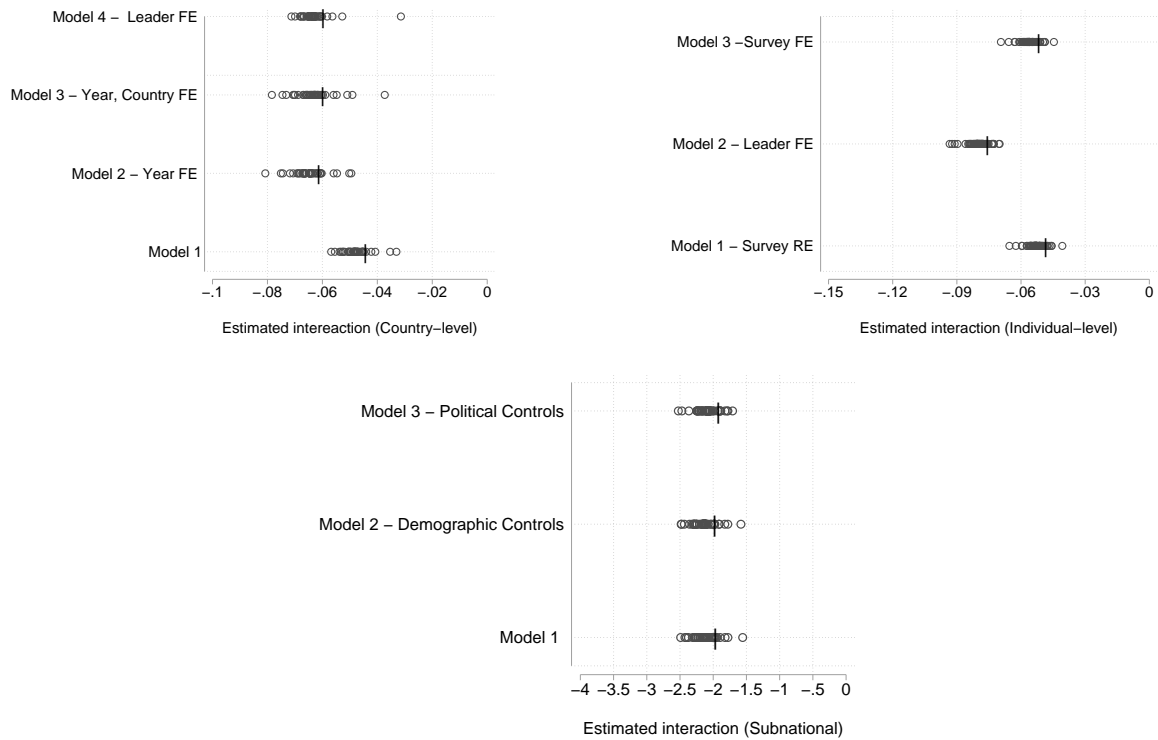


Figure S.1: Lines represent the interaction coefficients from linear and logit models in Tables 1, 2 and 3. Each dot in the top left panel represents an interaction coefficient from one of the four country-level models estimated with one of the 41 countries omitted. Each dot in the top right panel represents an interaction coefficient from one of the three individual-level logit models estimated with one of the 60 surveys omitted. Each dot in the bottom panel represents an interaction coefficient from the three subnational models estimated with one of the 66 municipalities omitted.

S7: Further Checks of the Interaction Terms

In a recent paper Hainmueller, Mummolo and Xu (2016) suggest three diagnostics to run when encountering a multiplicative interaction term. Below, we look at each of these in turn for the interactions estimated in the country-level, individual-level and subnational data.

The first diagnostic is examining whether the L-kurtosis of the interaction variable is below 0.16. If the L-kurtosis is above 0.16, then much of the variation in the interaction variable is based on just a few observations. The L-kurtosis for the time in office variable in the country-level dataset is 0.2. This means that the interaction effect in the country-level data potentially relies on just a few observations, making the interaction term less reliable. The L-kurtosis for the time in office variable in the individual-level dataset is 0.075. In the subnational data, the L-kurtosis for the unemployment variable is 0.14. This is below the cut-off, and accordingly, we probably do not need to be concerned with the reliability of the interaction variable in the individual-level or the subnational data.

The second diagnostic looks for monotonicity in the average marginal effects. That is, we should expect average marginal effects to move monotonically with the interaction variable. To test this we trichotomised our interaction variables for all three datasets based on the variables' terciles. For the linear interaction models we then estimate the average marginal effect at the median of each tercile using a binning estimator (see Equation 4 in Hainmueller, Mummolo and Xu 2016). For the non-linear model which analyze the individual-level data we cannot use the binning estimator. Instead, we estimate a model using the trichotomised interaction variable as a set of dummy-interactions instead of the linear interaction, deriving the average marginal effects for the bottom, middle and top tercile. For the country-level, individual-level, and subnational data, we find that the average marginal effects monotonically decrease across the three terciles.

The final diagnostic is examining the linearity of the interaction. To do this, we plot the average marginal effects from the trichotomised interaction terms, along with the average marginal effects derived from simple linear interaction terms in Figure S.2. The trichotomised interaction terms are plotted at the median within each tercile. While the average marginal effects from the trichotomised interaction terms do not match the average marginal effect from the linear interaction terms perfectly, they do not deviate substantially either.

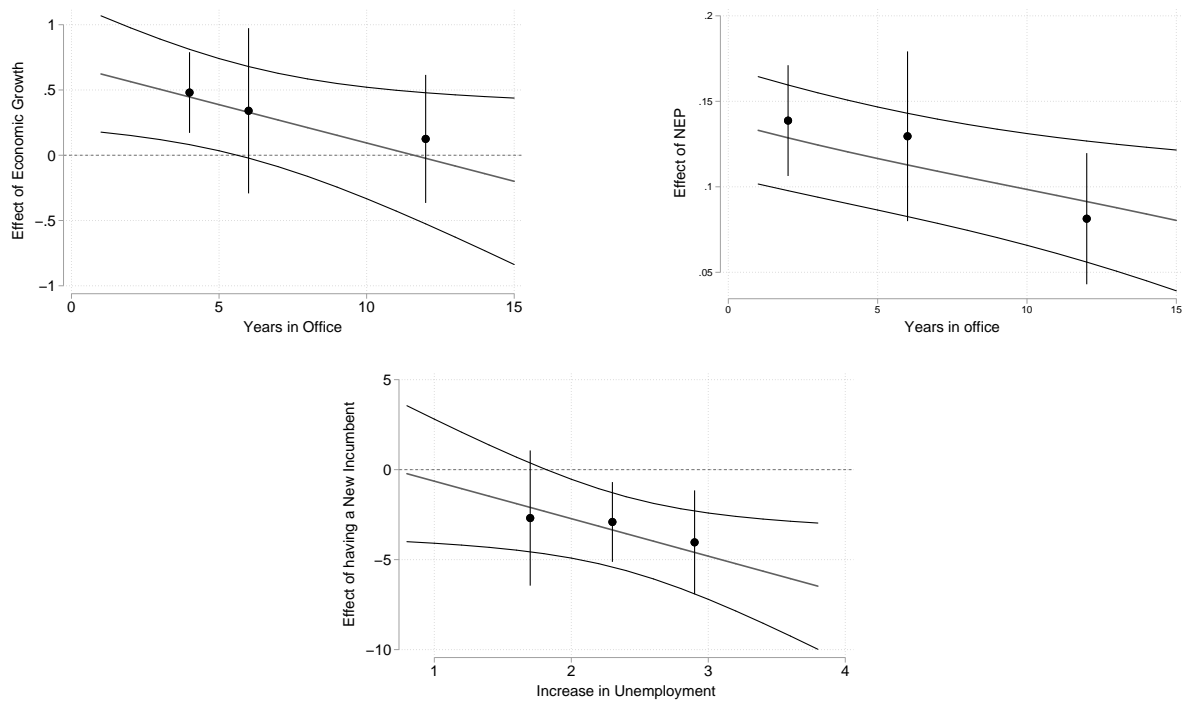


Figure S.2: The lines represent the average marginal effects of economic growth, national economic perceptions and having a new incumbent across the interaction variables tenure and local unemployment. Derived from column one of Table 1, column three of Table 2 and column one of Table 3. Dots represent the average marginal effects from binning estimators, which include a trichotomised interaction. All the average marginal effects are plotted with 95 pct. confidence intervals.

S8: Strategic Election Timing

To probe the plausibility of the strategic election timing explanation, we augment our country-level analysis in two different ways.

First, we introduce a control variable which measures how often an incumbent calls for an election (i.e. years served divided by elections called). By introducing this variable we hold constant the incumbents' inclination to call early elections. We add this variable as a control to the set of models already estimated in Table 1, and report estimates of these extended models in the first four columns of Table S.8. As can be seen from Table S.8, the interaction remains negative, it has the same size and is statistically significant ($p < 0.1$).

Table S.8: Controlling for Election Timing

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Economic growth	0.68*	0.85*	0.76*	0.89*	0.91*	0.44	0.49*	0.87 ⁺
	(0.22)	(0.26)	(0.24)	(0.27)	(0.45)	(0.33)	(0.16)	(0.52)
Tenure	-0.00	0.05	-0.11	-0.18	0.25*	-0.03	-0.53*	0.11
	(0.11)	(0.10)	(0.12)	(0.17)	(0.05)	(0.06)	(0.27)	(0.08)
Economic growth × Tenure	-0.05 ⁺	-0.07*	-0.06*	-0.06*	-0.09*	0.01	-0.13*	-0.10*
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.05)	(0.04)
Lagged Support	-0.23*	-0.24*	-0.38*	-0.38*	-0.04	0.01	-0.82*	-0.34*
	(0.05)	(0.05)	(0.07)	(0.11)	(0.08)	(0.07)	(0.16)	(0.15)
Executive election	-0.96	0.08	1.68	12.30*	-2.63	-1.81	2.32	
	(1.68)	(1.46)	(1.68)	(1.69)	(3.99)	(2.37)	(1.56)	
Time FE		✓	✓			✓	✓	
Country FE			✓	✓			✓	✓
Leader FE				✓				✓
Observations	409	409	409	409	60	60	60	60

Standard errors clustered by country in parentheses.

Executive election dummy omitted in column eight due to perfect collinearity with Leader FE.

Second, we disentangle election-timing and tenure by restricting the sample of elections to the five countries in our dataset where terms are fixed. This leaves 60 of the original 409 elections. In these countries, the executive cannot time the election, and accordingly, any relationship found between time in office and the importance of the economy cannot be attributed to election timing. Using this restricted sample, we re-estimate the models from Table 1. The key estimates from these models are reported in the four rightmost columns of Table S.8. As can be seen from Table S.8, the interaction effect remains negative and statistically significant in the most demanding model, which includes the leader fixed effects.

Across both types of control for election timing the interaction thus remains negative and substantially unchanged in the most demanding model specification (see columns four and eight of table S.8).

S9: Coalition and Single-party Governments

Table S.9 re-estimates the models from Table 1 subsetting on single-party governments (columns one through four) and on coalition governments (columns five through eight).² The estimated interaction coefficients are consistently negative, however, there are some differences across the two sets of models. In the models with no controls and the model with leader fixed effects, the negative interaction seems to be smaller for single-party governments. In the models with year and country fixed effects, the interaction seem to be smaller for multi-party governments. As such, there are no consistent differences in the size of the estimated interaction across the two groups.

This suggests that the negative interaction term identified in the country-level data cannot be explained in terms of differences in how voters judge coalition and single-party governments over time. If this was the case, we would expect to see no interaction between time in office and economic voting for single-party governments, and a very strong and statistically significant interaction among coalition governments. This is not what we find.

Table S.9: Differences Between Single-Party and Multi-Party Governments in the Country-level Data

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Economic growth	0.69*	0.88 ⁺	0.61	0.89	0.46*	0.64*	0.75*	0.21
	(0.33)	(0.48)	(0.49)	(0.58)	(0.22)	(0.26)	(0.20)	(0.27)
Tenure	-0.27	-0.03	-0.27	-0.62*	0.06	0.02	-0.09	-0.18
	(0.17)	(0.31)	(0.27)	(0.30)	(0.12)	(0.12)	(0.13)	(0.16)
Economic growth × Tenure	-0.02	-0.05	-0.06	-0.01	-0.05 ⁺	-0.05	-0.07*	-0.04
	(0.04)	(0.08)	(0.07)	(0.09)	(0.03)	(0.03)	(0.03)	(0.03)
Lagged Support	-0.30*	-0.29*	-0.47*	-0.45 ⁺	-0.21*	-0.21*	-0.27*	-0.24*
	(0.13)	(0.14)	(0.14)	(0.25)	(0.04)	(0.04)	(0.05)	(0.07)
Time FE		✓	✓			✓	✓	
Country FE			✓	✓			✓	✓
Leader FE				✓				✓
Observations	113	113	113	113	239	239	239	239

Standard errors clustered by country in parentheses.

Table S.10 re-estimates the models from Table 2 only for single-party governments (columns one through three) and only for multi-party governments (columns three through six). There are no substantial differences across the two sets of models. In line with the findings above, this suggests that any differences in economic voting across time in office *cannot* be explained by differences in how voters hold single-party and coalition governments electorally accountable for the economy.

²We exclude all presidential elections from this analysis because these *always* feature single party government.

Table S.10: Differences Between Single-Party and Multi-Party Governments in the Individual-level Data

	(1)	(2)	(3)	(4)	(5)	(6)
Executive party vote						
National Economic Perceptions	2.56*	2.55*	2.44*	1.51*	1.50*	1.58*
	(0.25)	(0.26)	(0.27)	(0.20)	(0.19)	(0.22)
Tenure	0.04	-0.01		0.06 ⁺	-0.05	
	(0.04)	(0.04)		(0.03)	(0.04)	
National Economic Perceptions × Tenure	-0.07*	-0.07 ⁺	-0.06	-0.06*	-0.06*	-0.07*
	(0.03)	(0.04)	(0.04)	(0.02)	(0.02)	(0.02)
Lagged executive party vote	4.52*	4.51*	4.52*	4.32*	4.32*	4.30*
	(0.45)	(0.45)	(0.45)	(0.18)	(0.18)	(0.19)
Ideology	2.20*	2.20*	2.21*	2.40*	2.38*	2.41*
	(0.29)	(0.30)	(0.29)	(0.33)	(0.33)	(0.34)
Religiosity	-0.05	-0.04	-0.04	0.24	0.25 ⁺	0.25 ⁺
	(0.19)	(0.19)	(0.19)	(0.15)	(0.15)	(0.15)
Class	0.44 ⁺	0.46 ⁺	0.45 ⁺	0.29 ⁺	0.28 ⁺	0.27 ⁺
	(0.23)	(0.24)	(0.24)	(0.16)	(0.16)	(0.16)
Observations	14,165	14,165	14,165	25,048	25,048	25,048

Standard errors clustered by country in parentheses.

Tenure omitted in model (3) and (6) due to collinearity with Survey FE.

S10: Mismatch in Tenure

Table S.11 re-estimates the models from Table 1 including a control for whether the tenure of the executive officer (i.e., president or prime minister) is different from that of the executive party. We include this control by itself and interact it with economic growth. This control is, obviously, highly correlated with time in office (because the longer a party is in power the more likely it is that they will replace the executive officer). Adding these controls shift the estimates and standard errors slightly, leaving the interaction estimates significant at the 10 percent level (rather than at the five percent level) in columns one, two and three.

Table S.11: Controlling for Mismatch between Party and Personal Tenure

	(1)	(2)	(3)	(4)
Mismatch tenure (person v. party)	-2.53 (1.73)	-2.09 (1.94)	-0.94 (2.15)	-2.65 (2.13)
Economic growth	0.69* (0.21)	0.84* (0.26)	0.74* (0.25)	0.88* (0.27)
Tenure	0.05 (0.21)	0.12 (0.21)	-0.02 (0.20)	-0.21 (0.27)
Mismatch tenure (person v. party) × Tenure	0.09 (0.22)	0.04 (0.23)	-0.03 (0.28)	0.19 (0.28)
Economic growth × Tenure	-0.04 ⁺ (0.03)	-0.06 ⁺ (0.03)	-0.06 ⁺ (0.03)	-0.06* (0.03)
Executive election	-0.94 (1.57)	0.12 (1.38)	1.92 (1.64)	-1.89 (1.33)
Lagged Support	-0.23* (0.05)	-0.24* (0.05)	-0.38* (0.06)	-0.37* (0.12)
Year FE		✓	✓	
Country FE			✓	✓
Leader FE				✓
Observations	409	409	409	409

Standard errors clustered by country in parentheses.

S11: Two-step Models of Individual-level data

Another way to examine whether there is an interaction between time in office and national economic perceptions is to estimate a multilevel model which allows for a random slope with respect to national economic perceptions across the different surveys, and then examine whether the size of the survey-specific slopes are related to the tenure of the incumbent party at the time of the survey.

To do this, we estimate a set of multi-level logit models of the probability of voting for the executive party with the full set of individual-level controls, omitting time in office and allowing the effect of national economic perceptions to vary across the surveys (i.e., estimate a random slope model). Using this method, we obtain 60 different logit coefficients, which represent the effect of national economic perception in the individual surveys. Figure S.3 plots these logit coefficients against incumbent tenure at the time of the surveys.

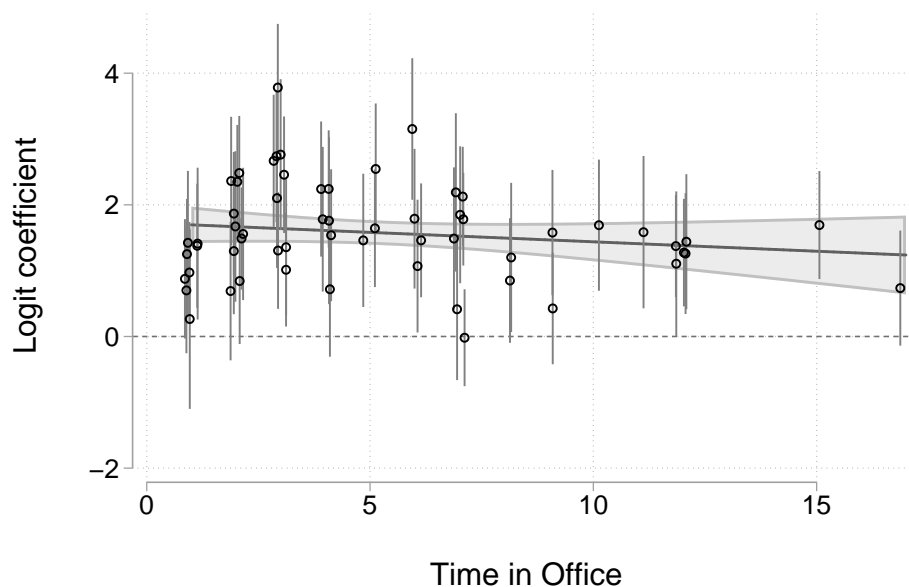


Figure S.3: Random slope of NEP plotted with 95 pct. confidence intervals. Uniformly distributed random noise added to the horizontal placement of the dots. Figure includes a linear fit with 95 pct. confidence intervals.

There is a negative relationship between time in office and the size of the logit coefficients. A linear regression of time in office on the logit coefficients reveal that the negative relationship is statistically significant ($p < 0.05$ using country-clustered standard errors). This alternative way of estimating the effect of time in office on the economic vote therefore gives us the same basic result as the one we found in the multi-level analysis.

S12: The Role of Prospective Economic Conditions

Table S.12 re-estimates the models presented in Table 2 excluding the economic perceptions variable used so far, but including a measure of prospective national economic perceptions and an interaction between these perceptions and time in office.

In particular, we use the following item from the EES: “Over the next 12 months, how do you think the general economic situation in this country will be: a lot better, a little better, stay the same, a little worse, or a lot worse?”. We rescale this variable to go from zero (a lot worse) to one (a lot better). This question was not asked in the ’89 and the ’99 EES, and we therefore omit these years when estimating the models with prospective economic perceptions.

There is a statistically significant negative interaction between prospective economic perceptions and time in office. As such, there is no evidence that incumbents time in office lead voters to shift their focus from one type of economic percepts to another. Voters simply become less reliant on their perceptions of the economy, regardless of whether these perceptions are prospective or retrospective, as incumbents’ time in office increases.

Table S.12: Prospective Economic Perceptions and Support for the Executive Party

	(1)	(2)	(3)
Prospective NEP	2.06*	2.07*	2.08*
	(0.28)	(0.29)	(0.28)
Tenure	0.08 ⁺	0.05	
	(0.04)	(0.06)	
Prospective NEP × Tenure	-0.07*	-0.07*	-0.07*
	(0.03)	(0.03)	(0.03)
Lagged executive party vote	4.28*	4.29*	4.29*
	(0.16)	(0.16)	(0.16)
Ideology	2.41*	2.42*	2.42*
	(0.33)	(0.33)	(0.33)
Religiosity	0.11	0.10	0.11
	(0.15)	(0.16)	(0.16)
Class	0.33*	0.31*	0.32*
	(0.14)	(0.14)	(0.15)
Observations	28,557	28,557	28,557

Standard errors clustered by country in parentheses.

Tenure omitted in model (3) due to collinearity with Survey FE.

S13: Endogeneity in National Economic Perceptions

We found higher levels of economic voting across levels of tenure in the individual-level analysis than we did in the country-level analysis. This might be because the endogeneity of national economic perceptions is leading us to overestimate the level of economic voting in the individual-level data. To investigate whether this is the case, we re-analyze the individual-level data in two different ways, both of which might allow us to sieve out (some of) this endogeneity.

First, we exclude those who voted for the incumbent at the last election, because these are more likely to be incumbent partisans and therefore more likely to be engaged in the type of “wishful thinking” that drives part of the correlation between economic perceptions and electoral support for the incumbent.³ In the first three columns of Table S.13, we present the results of this analysis with model specifications similar to those used in the main analysis.⁴ Figure S.4 plots the average marginal effects of national economic percepts across tenure for the censored sample based on the model presented in column three of Table S.13. As can be seen from this figure, the pattern identified in this censored sample matches up more closely with what we found in the country-level data—that is, when we leave out incumbent “partisans” incumbent tenure tends to completely crowd out economic voting.

Table S.13: Addressing Endogeneity Problems in the Individual-level Data

	(1)	(2)	(3)	(4)
main				
National Economic Perceptions	2.37*	2.49*	2.46*	0.39*
	(0.31)	(0.31)	(0.31)	(0.04)
Tenure	0.05	-0.00		0.01*
	(0.03)	(0.04)		(0.00)
National Economic Perceptions × Tenure	-0.13*	-0.17*	-0.14*	-0.02*
	(0.05)	(0.05)	(0.05)	(0.01)
Ideology	3.00*	3.03*	3.01*	
	(0.29)	(0.29)	(0.29)	
Religiosity	-0.15	-0.16	-0.13	
	(0.13)	(0.14)	(0.14)	
Class	0.30 ⁺	0.35*	0.33 ⁺	
	(0.17)	(0.18)	(0.19)	
Observations	24,996.00	24,996.00	24,996.00	47,951.00

Standard errors clustered in parentheses. Clustered at the country-level for columns one, two and three. Tenure omitted in model (3) due to collinearity with Survey FE.

Second, we use aggregate objective economic conditions to instrument national economic perceptions. This approach sidesteps problems with endogeneity by only examining the differences in national economic perceptions which are caused by changes in objective economic conditions (for the details of this method see Nadeau, Lewis-Beck and Bélanger 2013). This means sieving out variation in national economic perceptions which is caused by factors such as partisanship.

In measuring objective economic conditions we include election year inflation, unemployment and economic growth at the country-level. All these variables were taken from the World Banks database. The reason we do not simply use economic growth, as we did in the analysis

³A more standard measure of party identification would be preferable, however, no such measure is included in the EES.

⁴To more effectively estimate the multi-level model, we do not estimate random slopes for national economic perceptions in this analysis.

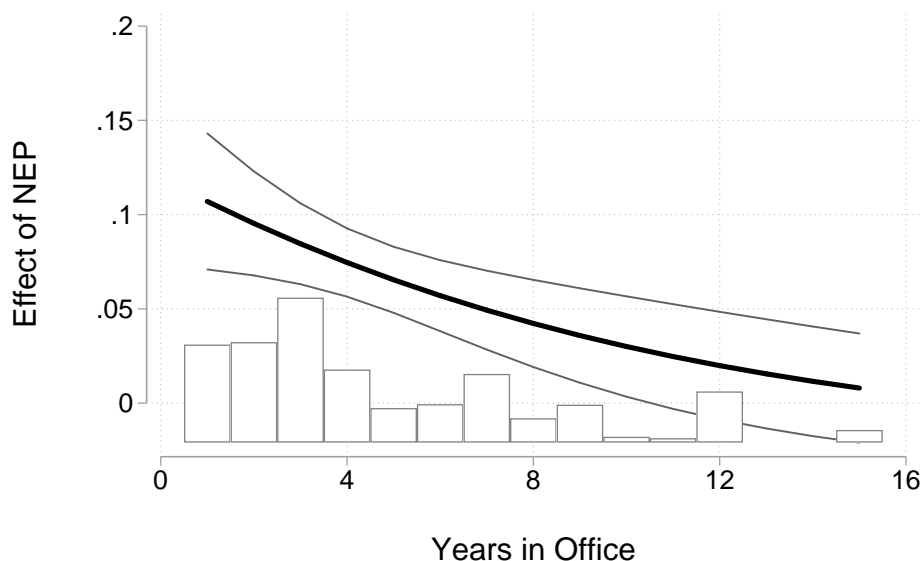


Figure S.4: Average marginal effects of national economic perceptions on the probability of voting for the executive party across levels of tenure with 95 pct. confidence intervals. Estimated based on the model presented in column three of Table S.13. The bar plot shows the density of the variable years in office.

of the country-level data, is that it is possible to get estimates for unemployment and inflation for the time period covered by the EES. This is not possible for all elections used in the country-level data. Turning to estimation, we instrument national economic perceptions and the interaction between these percepts and time in office using growth, unemployment and inflation, as well as an interaction between these three variables and time in office. We omit the individual-level controls, since these are potentially endogenous as well. We also drop survey and leader fixed effects as these would be perfect or near-perfectly collinear with the aggregate level economic indicators. Finally, we link the instrumented economic perceptions and incumbent support using a linear probability model rather than a logit model to make the estimation less computationally complex.

The estimates produced using this instrumental variables approach are presented in the fourth column of Table S.13. As can be seen from this model, we still see a statistically significant negative interaction between tenure and the now-instrumented national economic perceptions. Figure S.5 plots marginal effects across tenure based on the instrumental variables regression. Here we see that after taking potential problems with endogeneity into account, the level of economic voting becomes statistically indistinguishable from zero after roughly 15 years in office. This trajectory is roughly similar to what we find in the country-level data, where the effect of economic voting also becomes statistically indistinguishable from zero as time in office increases (although this already happens after eight years, see Figure 1).

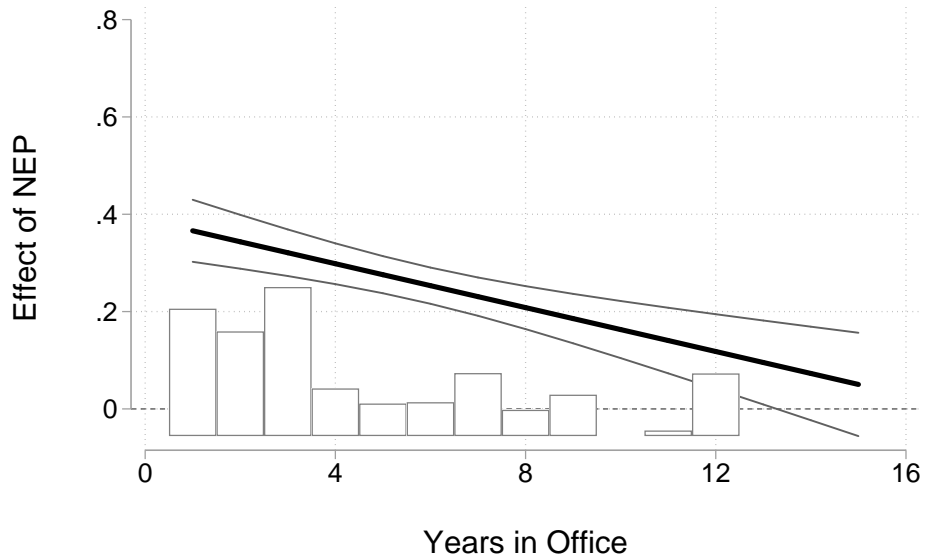


Figure S.5: Average marginal effects of national economic perceptions on the probability of voting for the executive party across levels of tenure with 95 pct. confidence intervals. Derived from the instrumental variables estimation (see column four of Table S.13). The bar plot shows the density of the variable years in office.

S14: Balance Test for the Subnational Data

Were there any systematic differences between precincts that got a new incumbent following the jurisdictional reform and precincts that did not (i.e., the main treatment variable)? To find out, we first run a regression of getting a new incumbent on the pre-reform unemployment rate (i.e., 2007 unemployment rate), clustering standard errors at the municipal level. As can be seen from Table S.14 there was a small insignificant difference corresponding to one tenth of a percentage point. Next, we ran a set of regressions of getting a new incumbent on right-wing support, logged number of eligible voters and turnout. In each of these regressions we include municipality fixed effects to take into account that we look at within municipality differences of getting a new incumbent in our main analysis. Number of right-wing voters and turnout seems balanced across precincts that got a new incumbent and precincts that did not. However, there is a difference in logged number of voters—precincts that got a new incumbents were roughly 20 percent smaller than those who did not. The difference is statistically significant at the ten percent level.

Table S.14: Effect of Different variables on the Probability of Having a New Incumbent.

	(1)	(2)	(3)	(4)
	Unemployment	Right-wing	Log(votes)	Turnout
New incumbent	0.13	0.02	-0.19 ⁺	0.00
	(0.13)	(0.02)	(0.10)	(0.00)
Municipality FE		✓	✓	✓
Observations	1,465	1,465	1,465	1,465

Standard errors clustered by municipality in parentheses.

References

- Beck, Thorsten, George Clarke, Alberto Groff, Philip Keefer and Patrick Walsh. 2001. “New tools in comparative political economy: The Database of Political Institutions.” *The World Bank Economic Review* 15(1):165–176.
- Duch, R.M. and R.T. Stevenson. 2008. *The Economic Vote: How Political and Economic Institutions Condition Election Results*. Cambridge University Press.
- Fisher, Stephen D and Sara B Hobolt. 2010. “Coalition government and electoral accountability.” *Electoral studies* 29(3):358–369.
- Hainmueller, Jens, Jonathan Mummolo and Yiqing Xu. 2016. “How Much Should We Trust Estimates from Multiplicative Interaction Models? Simple Tools to Improve Empirical Practice.” <http://web.stanford.edu/~jhain/research.htm>. Accessed: 2016-05-23.
- Nadeau, Richard and Michael S Lewis-Beck. 2001. “National economic voting in US presidential elections.” *Journal of Politics* 63(1):159–181.
- Nadeau, Richard, Michael S Lewis-Beck and Éric Bélanger. 2013. “Economics and elections revisited.” *Comparative Political Studies* 46(5):551–573.