Looking back or looking out?

A reevaluation of economic voting

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Abstract

Economic voting theory explains electoral outcomes with economic performance during the rule of an incumbent. Voters are assumed to evaluate politicians based on Bayesian calculations about the quality of the politician. In this paper we enrich this framework with the possibility of inter-country comparison. From a simple model of information externality, we derive that voters in fact find it useful to use such comparisons. The predictions of the model are tested using panel on data elections in 16 European countries from 1950 to 2007. Our results support the hypothesis that inter-country comparisons were relevant factors in at least our sample of electoral outcomes.
1. Introduction

Economic voting theory is a widespread approach in political science which claims that economic performance can be a key determinant of electoral outcomes. The relevance of this view has been underlined by both formal political economy models (Barro, 1973, Ferejohn 1986) and large body of statistical evidence (Kramer 1971, Fiorina 1981). Formal models of economic voting are often based on the assumption that political processes are set in an environment characterized by asymmetric information between politicians and the electorate. In such a setup welfare is both influenced by some exogenous factors (often referred to as the “state of the world”) and by the policies implemented by the government. The electorate, being unable to distinguish between these effects is assumed to follow some retrospective rule to evaluate the quality of the incumbent based on Bayesian calculation. Good economic performance during the rule of a given government is a helpful if noisy signal that the quality of the incumbent was good and this in turn increases the chances of reelection.

Building on these theories a body of empirical research (e.g. Kramer 1971, Fiorina 1981) have been conducted to assess the significance and scale of economic voting. In fact most of them found that economic variables had affected the vote share of incumbents to some extent. However, these studies were concerned about analyzing the behavior of a given country (mostly the US and the UK) and as such, the do not offer evidence for retrospective voting as a general phenomenon. Surprisingly, the studies including several countries (Storm and Lipset 1984, Lewis Beck and Mitchell 1990 and Duch and Stevenson 2006) failed to confirm the significance of economic voting or at least did so at only a restricted domain. Closest to the direction followed by this paper, Powell and Whitten (1993) suggested that the negative evidence brought by previous research might be the consequences of methodological flaws. In particular, they suggested that contextual differences should be taken into considerations. They added ideological and institutional factors in their analysis and indeed found some encouraging result (e.g. the effect of unemployment on popularity differs systematically among leftist and conservative parties).

In this paper we follow the suggestion of Powell and Whitten (1993) who proposed also that instead of absolute, relative economic performance should be used. In their paper this is an ad hoc strategy so we will try to give some theoretical foundadion to this approach. In particular, we present a simple model in which the electorate in fact uses relative economic performance to evaluate the quality of government and so creates an environment of “yardstick competition” (as proposed in a different context by Shleifer 1985).
Our model is based on the insight that the economic performance of countries is jointly determined by economic policy formation and the economic environment. In the era of globalization countries cannot remain untouched by trends and shocks of the world economy: policy making is only one of the many determinants of economic performance. To get a picture of the quality of the government, the electorate wants to “screen out” the shocks and trends that affect the observed economic outcomes. We argue that if these exogenous shocks have a common (or at least similar) impact on various countries, then inter-country comparisons offer a possibility of such screening. In fact, in our model this sort of comparison is an outcome of optimization of expected welfare after the election (retrospective voting) and the pattern is also found when data on elections is analyzed. The remainder of the paper is organized as follows: Section 2 lays out the model and derives the hypotheses to be tested. Section 3 provides a description of the data used and addresses measurement issues. Section 4 sets up the econometric model and addresses problems of estimation strategy. Section 5 presents our results, and Section 6 concludes.

2. A simple model of economic voting based on inter-country comparison

Our model is a simplified version of the one by Besley and Case (1995). As we are focusing on the behavior of the electorate we assume away from problems arising from agency issues. Also, the fact that we do not consider conflicting interests among voters, allows us to think of the electorate as a representative agent. As a consequence, coordination problems are not concerned here. In this simplified setup, the quality of the policy implemented (and in turn the welfare of the electorate) is solely a function of the incumbent’s type and not their effort. This also means that there is no conflict of interest between the incumbent and the electorate. The information asymmetry concerns the quality of the politician in power but no signals can be conveyed about that. This is, the type of the incumbent can only be inferred to from the welfare, which is in turn determined by the economic policy implemented and the environment (state of the world) which is also unobserved by the electorate.

Baseline model

The welfare of an electorate is determined by the following equation: \( w = p + s \) where \( p \) is the quality of the policy implemented (which coincides with the quality of the politician) and \( s \) is
the state of the world economy. Both $s$ and $p$ are random variables which are not observed by
the electorate which only gets to know $w$. However the distribution of $s$ and $p$ is known:

$$p \in \{0,1\}, \ P(p = 1) = \alpha \ and \ s \in \{0,1\}, \ P(s = 1) = \beta, \ p \perp s$$

The electorate can chose between to actions: either to reelect or to dismiss the incumbent. Of
course, the voters want to reelect the good quality politicians and to dismiss the bad. Although
we present no underlying utility functions here, one can think of this decision as the
following.

There are two periods, with an election in between them. The electorate wants to
maximize the welfare in the second period using information about the quality of the
incumbent based on the its performance in the first period. As they cannot affect the state of
the world this maximization is equivalent to maximizing the probability of electing a good
type. In case of dismissal this probability is $\alpha$, (the a priori probability of good quality).
However, the electorate can update its beliefs about the type of the incumbent on the basis of
observed economic performance. This is, the probability that the incumbent is good is
$P(p = 1|w)$. The retrospecting rule is the following: the incumbent is reelected if the
following condition holds:

$$\alpha < P(p = 1|w).$$

That is, the incumbents is reelected if the probability of him being of good quality given the
observed value of welfare is greater than the a priori probability of electing a good politician.
To get optimal reelection rule we have to look at the possible values of $w$ and look at how
beliefs are updated.

**Proposition 1**: Assume $\beta < 0.5$. The optimal reelection rule is the following: incumbent is
reelected if $w \in \{1,2\}$ and is dismissed only if $w = 0$. See Appendix for Proof.

Note, that the probability of reelection increases with welfare. This is, a politician is more
likely to be reelected the greater the welfare is under her rule.
Model with information externality

In this section we enrich our simplistic model with a form of informational externality. In particular, we let our electorate observe welfare levels in some neighboring country. This information is helpful if we assume that there are some common factors affecting various economies while the qualities of policy varies among them. Based on this assumption we show that this additional information helps to update beliefs about the incumbent with a better efficiency.

For simplicity, assume that there is one representative “other” electorate (one can think of it as the average of all other electorates) the welfare of which is determined by \( w_2 = p_2 + s \).\(^1\) Note that the state of the world is the same for the two countries thus creating a possibility of acquiring some additional information about the quality of the incumbent. To see how this additional information can be used, let us denote \( d = w_1 - w_2 \) which is the difference of the welfare of the two polities. As \( w_i = p_i + s \) for \( i \in \{1,2\} \) we have the following:

\[
d = w_1 - w_2 = (p_1 + s) - (p_2 + s) = p_1 - p_2
\]

\[p_i \in \{0,1\} \Rightarrow d \in \{-1,0,1\}\]

The electorate now uses the observed value of \( d \) and \( w_2 \)\(^2\) to infer to the quality of the incumbent. Thus, the retrospecting rule is modified to the following. The incumbent is reelected if the following condition holds:

\[
\alpha < P(p = 1 | w_2, d).
\]

That is, the incumbents is reelected if the probability of him being of good quality given the observed value of welfare in the other country and the difference of welfares is greater than the a priory probability of electing a good politician. To get optimal reelection rule we have to look at the possible values of \( w_2 \) and \( d \).

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\(^1\) \( p_2 \) and \( p_1 \) are independent and identically distributed

\(^2\) Note that it’s equivalent to use \( (d, w_2) \) or \( (d, w) \). Our choice of \( W_2 \) serves empirical purposes which will be explained in time.
Proposition 2: Assume $\beta < 0.5$ and $\alpha > 0.5$. The optimal reelection rule is the following: the incumbent is reelected if $d = 1$ and is dismissed if $d = 2$. For $d = 0$, the incumbent is reelected if $w_2 \in \{1, 2\}$ and dismissed if $w_2 = 0$. See Appendix for Proof.

Note, that the probability of reelection increases with the difference of welfare levels. This is, a politician is more likely to be reelected if under her rule the county does better than others. Also note, that when there is observable difference between the welfare of the countries, there is no need to think about absolute performance. Conversely, when the difference between welfare is zero welfare levels are to be used to predict incumbent type.

Hypotheses

Based on the arguments above we can formulate our hypotheses to be tested. These hypotheses claim the importance of relative performance in evaluating and potentially dismissing politicians. We also claim that when relative performance is known, absolute information is rarely informative about the quality of politicians.

To connect these findings with data on electoral outcomes we have to assess the effect of relative and absolute performance on reelection of incumbents. As we only model a marginal part of the causes which determine elections it is useful to think of them as probabilistic events. This way, the findings of our model are to be translated to these probabilistic world$^3$.

Hypothesis 1: $\frac{dE(\text{reelection} \mid \text{relative performance})}{d \text{ relative performance}} > 0$. This is, the probability of reelection increases in relative performance (d in our model).

$^3$ Note that determinacy of our model is the consequence of simplification. For example, if the type of states and politicians were to be modeled by uniform distributions instead of Bernoulli we would get probabilistic results.
Hypothesis 2: $\frac{\partial E(\text{reelection} | \text{relative performance, mean performance})}{\partial \text{relative performance}} > 0$. This is, holding mean performance of other countries, the probability of reelection still increases in relative performance.

Hypothesis 3: $\frac{\partial E(\text{reelection} | \text{relative performance, mean performance})}{\partial \text{mean performance}} \approx 0$. This is, holding relative performance constant, mean performance doesn’t affect the probability of reelection. This hypothesis is less straightforward: it follows from the result that absolute performance is only informative if the performance of a country is very similar to its environment.

3. **Data and measurement**

We collected data on elections taking place in 16 countries from 1951 to 2007. The election data is then paired with measures of economic performance.

**Election data**

In contrast to existing literature we characterize election results with a single dummy variable which takes the value of 1 if the incumbent’s party was reelected. We build this variable the following way. Reelection was coded whenever the chief executive of the country after the election was supported or was a member of the same party as the one that was in power before the election. The list of Prime Ministers and Presidents as well as the timing of elections was downloaded from various governmental websites (check the list in the references).

**Economic performance**

As a proxy for economic performance, annual GDP growth was used. The date was downloaded from the Penn Tables (2009). Other studies of economic voting has used growth as well as inflation and unemployment. We confined ourselves to use GDP only because of

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4 There are two semi-presidential countries in the sample: France and Finland. In the case of Finland we used Prime Minister as chief executive and President for France.
the ambiguity of the latter two. As Powell and Whitten (1993) put it “left wing governments have traditionally been more concerned with such goals as fighting unemployment… while their right wing counterparts have been more concerned with fighting inflation… if voters are assessing governments retrospectively… they might well hold right wing governments to a higher standard on inflation and be less concerned about unemployment. Vice versa for left wing government.” (p. 404).

We want to proxy economic performance which was surely affected by the incumbent as well as to account for lagged effects. Thus we chose to use the two years growth rate before the election. We didn’t include previous growth rates as in some cases the time between two consecutive elections was not much more than two years. On the other hand, voters may not be expected to discern the effects of governments on their welfare if we consider almost overlapping periods.

As demanded by our estimation strategy we separated the economic performance into two elements. One was “mean of other countries’ growth” which was calculated for each country in each year as the mean of the past two years’ growth rate of the other countries in the sample. The other element, “deviation from others” was calculated as the difference between a two years’ growth rate and the mean of the other countries. More formally,

\[
two\ years'\ growth_{ij} = \frac{GDP_{ij} - GDP_{i,j-1}}{GDP_{ij-1}} + \frac{GDP_{i,j-1} - GDP_{i,j-2}}{GDP_{i,j-2}}
\]

\[
other's\ mean_{ij} = \frac{1}{J-1} \sum_{j \neq i} two\ years'\ growth_{ij}
\]

\[
development_{ij} = growth_{ij} - other's\ mean_{ij}
\]

For simplicity in what follows the variables described above will be referred to a growth, mean growth and deviation respectively. See the descriptive statistics of the key variables below in Table 1 and Table 2.

<table>
<thead>
<tr>
<th>Table 2: Description of economic variables</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variable</strong></td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td>Growth</td>
</tr>
<tr>
<td>Mean growth</td>
</tr>
<tr>
<td>Deviation</td>
</tr>
</tbody>
</table>
To assess our three hypotheses empirically, we make two specifications to be tested. First, to make sure that our data supports the idea of the basic economic voting model (the “baseline model”), we estimate the following equation.

\[ \text{reelection}_{i,t} = \alpha_i + \beta \text{growth}_{i,t} + u_{i,t} \]
If economic voting is relevant in our sample – which is sort of a baseline hypothesis, we expect a significant positive value for $\beta$ (i.e. growth rate has a positive effect on reelection).

Second, to assess the relevance of international comparisons (this is, to test our three hypotheses) we try to separate the two variables that we specified in our theoretical model. We make use of the fact, that by construction, $\text{growth}_i \equiv \text{mean}_i + \text{deviation}_i$. This enables us to restate (1) as the following:

\begin{equation}
\text{reelection}_i = \alpha_i + \gamma \text{mean growth}_i + \delta \text{deviation}_i + u_{i,i}
\end{equation}

With this equation we can test our last two hypotheses. Our first hypothesis that deviation from mean growth has a positive effect is supported by the data if $\delta > 0$ when mean growth is not added. The second hypothesis is reinforced if the same holds but including mean growth in the regression. Finally, our third hypothesis demands $\gamma \approx 0$.

**Econometric issues**

The panel structure of the data allows for controlling for unobserved characteristics of each countries which do not change by time. This can be achieved by estimating fixed-effects regression. Also, we estimate robust standard errors clustered by countries. This is, the error terms are allowed to be correlated within countries.

Stationarity of our variables is not a serious concern. First, GDP is entering the regressions in a first differenced form; which is usually assumed to be stationary in the literature. On the other hand, in the case of election outcomes it’s harder to make such assumptions. Ratio of votes received by a party certainly depends on the share of vote received in the previous elections. On the other hand, the probability of a governing party being reelected can be assumed to be independent of the result of the previous elections. To make sure, we plotted the re-election patterns of each country in Figure (Appendix). As far as we are concerned there is no distinguishable pattern in the figures which would cast doubt on our assumption of stationarity.

As we have a binary left hand side variable we could choose among a number of ways of estimating the effects of interest. We use linear probability models in each case for two reasons. First, we want to avoid complications of interpreting marginal effects (in the case of logit or probit specifications). Second, our interest are primarily qualitative: we want to check
the sign and significance our coefficients and we suppose that those do not change dramatically with the value of our independent variables.

5. Results

In this section we present the result of our econometric analysis. We estimated three specification: we regressed reelection on growth (column 1), on deviation from mean growth (column 2) and finally on mean growth and deviation (column 3). Each are shown in Table 4 below.

<table>
<thead>
<tr>
<th>Dependent variable: Reelec</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth</td>
<td>0.026</td>
<td>0.029</td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td>(4.44)***</td>
<td>(3.26)***</td>
<td>(3.54)***</td>
</tr>
<tr>
<td>Deviation</td>
<td>0.019</td>
<td>0.019</td>
<td>0.019</td>
</tr>
<tr>
<td></td>
<td>(1.11)</td>
<td>(1.11)</td>
<td>(1.11)</td>
</tr>
<tr>
<td>Mean</td>
<td>0.575</td>
<td>0.655</td>
<td>0.598</td>
</tr>
<tr>
<td></td>
<td>(34.08)***</td>
<td>(363.12)***</td>
<td>(11.37)***</td>
</tr>
<tr>
<td>Constant</td>
<td>214</td>
<td>214</td>
<td>214</td>
</tr>
<tr>
<td>Observations</td>
<td>16</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Number of countries</td>
<td>16</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.028</td>
<td>0.024</td>
<td>0.029</td>
</tr>
</tbody>
</table>

Table 4 : The effect of absolute and relative performance to reelection

Robust t statistics in parentheses, *** denotes significant at 1%. Country fixed effects are used in each specification, standard errors are clustered around countries

The estimates of Column 1 support the theoretical findings of economic voting. A one percent increase in growth is expected to raise the probability of reelection by 2.6%. The R-squared of the model is small which suggests that even if economic voting actually works, it explains only a small fraction of the causal mechanisms underlying elections.

Column 2 shows that the coefficient of deviation from mean has virtually the same size as growth in the previous equation with a somewhat smaller (but still significant) t-statistic. This already suggests that the effect of growth on the probability of reelection should work as a channel for inter-country comparison. Note also, that the “predictive power” of the model – though small – remains almost unchanged.
Finally in Column 3 we are able to check our last two hypothesis. The coefficient of deviation from mean remains virtually unchanged both in size and significance when mean growth is added. However, the coefficient of mean growth is not statistically significant. These to results reinforce our theoretical findings summarized by Hypotheses 2 and 3.

A main concern is the robustness of our results. We utilized three ways of checking how sensitive the estimates are to specification and to the countries added. First, we repeated our regressions adding country specific year trends as explanatory variables (Table 5). This could perturb our results if there is some systematic differences among countries in the patter of government changes (which is apparently the case on the basis of Figure 1). We find that though size and significance of each coefficient is reduced, the results do not change qualitatively.

| Table 5 : The effect of absolute and relative performance to re-election (test for robustness) |
|-----------------------------------------------|----------------|-------|-------|
| Dependent variable:                           | 1              | 2     | 3     |
| Reelection                                    | 0.019          | 0.022 | 0.022 |
| Growth                                        | (2.98)***      |       |       |
| Deviation                                     |                | 0.022 | 0.022 |
| Mean                                          |                |       |       |
| Mean                                          | (2.13)*        | (2.20)**|       |
| Mean                                          | 0.015          |       |       |
| Mean                                          | -0.71          |       |       |
| Constant                                      | 10.356         | 11.609| 10.637|
| Constant                                      | (21.08)***     | (116.86)***| (8.12)***|
| Observations                                  | 214            | 214   | 214   |
| Number of countries                           | 16             | 16    | 16    |
| R-squared                                     | 0.15           | 0.14  | 0.15  |

Robust t statistics in parentheses, *** denotes significant at 1%
Country fixed effects are used in each specification, standard errors are clustered to countries, Country specific time trends are added

Second, we run a series of regressions in which one of the countries were left out. Again, coefficients and significance levels remained more or less the same. Finally, we rerun each equation with a logistic regression specification. Results remained unaffected. These results are not shown here but can be asked for from the authors.
6. Conclusion

In the paper we tried to dig a bit deeper in the theory of retrospective (economic) voting. We argued for the importance of international comparison in the evaluation of politicians in office and hence in elections. The importance of this claim is twofold: on one hand, this approach offers an explanation to cases which have been contrary to what economic voting would have predicted. Countries that have done relatively well in an economic environment characterized by sharp decline of economies might have reasonably chosen not to dismiss their governing parties. On the other hand, this simple theory offers a handy test for the rationality of voting behavior: it’s not self evident that voters pay attention for the economy. So, it still less likely that they look at the performance of other countries. However, our empirical results support the claim of inter-country comparison as a relevant force in voting.

Both of the theoretical and the empirical part of our paper might seem to be overly simplified. Our model assumes away from a number of factors that in fact could be expected to shape election results (eg. moral hazard, conflict of interest between members of the electorate, media and other institutions etc.). However, we think that the inclusion of these factors would not change our results dramatically (see for example Besley and Case 1995, with a similar model with moral hazard). Also, our empirical inquiry lacks a number of fine-tuning. In contrast with existing literature we used a binary description of electoral outcomes as opposed to vote shares, a probably richer variable to work with. On the other hand, we ignored a number of contextual factors (like institutional differences or the role of party ideology). We hope though, that those omitted factors will not cast doubt on our results, but instead give a starting point for further research.

7. References

Journal articles


The sources of electoral and economic data

www.statemaster.com (Lists of Heads of Governments)

www.parties-and-elections.de (Election results)

http://pwt.econ.upenn.edu (Economic growth)

5 The data was downloaded between 20th-25th of March 2010
6 Penn World Table 6.3 (A. Heston, R. Summers and B. Aten, CICPIP at the University of Pennsylvania, August 2009.)
8. Appendix

Proofs

**Proposition 1**: Assume $\beta < 0.5$. The optimal reelection rule is the following: incumbent is reelected if $w \in \{1,2\}$ and is dismissed only if $w = 0$.

**Proof**: Suppose that $w = 0$. Then $p$ couldn’t have been 1 as $w = p + s$. Similarly, if $w = 2$ then $p$ couldn’t have been 0. Finally, if $w = 1$,

$$P(p = 1 | w = 1) = \frac{(1-\beta)\alpha}{\beta(1-\alpha) + (1-\beta)\alpha}.$$ 

This is calculated using Bayesian logic. $w = 1$ is possible either if the state of the world was bad ($s = 0$) and the incumbent was good ($p = 1$) or vice versa. The sum of the probability of these events is the denominator. The numerator is the probability of the case where $w = 1$ and $p = 1$. To check optimal reelection rule we have to solve the following inequality:

$$\alpha < \frac{(1-\beta)\alpha}{\beta(1-\alpha) + (1-\beta)\alpha}$$

Solving for parameters that satisfy this inequality, we get

$$0 < \alpha < 1$$
$$0 < \beta < 0.5$$

This is just what we assumed.
Proposition 2: Assume $\beta < 0.5$ and $\alpha > 0.5$. The optimal reelection rule is the following: the incumbent is reelected if $d = 1$ and is dismissed if $d = 2$. For $d = 0$, the incumbent is reelected if $w_2 \in \{1, 2\}$ and dismissed if $w_2 = 0$.

Proof: We go through each cases.

i. $d = 1$ implies $p_1 = 1$ and $p_2 = 0$ as $d = (p_1 + s) - (p_2 + s) = (p_1 - p_2)$ and $p_i \in \{0.1\}$

ii. $d = -1$ implies $p_1 = 0$ and $p_2 = 1$ as $d = (p_1 + s) - (p_2 + s) = (p_1 - p_2)$ and $p_i \in \{0.1\}$

If $d = 0$, voters are to use additional information specifically $w_i = w_2$.

iii. $w_1 = 2$ implies $p_1 = 1$ (the same argument as in the proof of Proposition 1)

iv. $w_1 = 0$ implies $p_1 = 0$ (the same argument as in the proof of Proposition 1)

v. $w_1 = 1$ leaves voters in uncertainty. However, Bayesian calculation is used:

$$P(d = 0 \mid w = 1) = \frac{(1-\beta)\alpha^2}{\beta(1-\alpha)^2 + (1-\beta)\alpha^2}$$

The interpretation is similar to the one with Proposition 1. If $d = 0$ because the state of the world is the same, the quality of incumbents must have been the same as well. $w_1 = w_2 = 1$ is possible in two cases. First, if both incumbent is good, but the state of the world is bad, the probability of which is $(1-\beta)\alpha^2$. Second, if both incumbent was bad but the state of the world was good, this happens with probability $\beta(1-\alpha)^2$. The conditional probability of the incumbent being good is calculated using the Bayes-rule.

Reelection is preferred if this probability is greater than the a priori probability of electing a good politician.

$$\alpha < \frac{(1-\beta)\alpha^2}{\beta(1-\alpha)^2 + (1-\beta)\alpha^2}$$

Solving for the parameters for which this condition holds, we get $0 < \beta < \alpha < 1$ which is exactly our initial assumption.
**Figures**

Figure 1: Reelection patterns in the sample

Graphs by country