

# Business cycle and political election outcomes: Evidence from the Chilean democracy

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**Abstract** This paper explores the influence of economic variables in Chilean presidential elections. We use a panel where the dependent variable corresponds to the share of the vote obtained by the incumbent at a municipal level in the presidential elections of 1989, 1993 and 1999. We focus on the unemployment rate and the output gap and find that both have a significant influence on the vote. We also find that if the mayor is from the same coalition as the incumbent, people will further punish the incumbent when regional unemployment is above national unemployment.

**Keywords** Political elections · Business cycle · Unemployment

**JEL classification:** C33, E32

## 1 Introduction

The purpose of this paper is to analyze how macroeconomic performance has influenced the presidential elections in Chile since the return of democracy in 1989. Since the 1988 plebiscite in which the people voted against Pinochet staying in power for another eight years, the coalition currently in power (the “Concertación”) has won all presidential elections. However, the margin of victory seems to be related to macroeconomic conditions. The most contested election, in 1999, when there was a second round, took place while the country was in its first recession in sixteen years. In that year, the GDP fell 0.8% and the unemployment rate climbed from 6.2% in 1998 to 9.7% in 1999.

In an influential paper on this subject, Kramer (1971) concluded that election outcomes depend on economic changes in the year of the election. In particular, he showed that economic fluctuations are important influences on congressional elections where economic upturns will help the candidate of the incumbent party and economic declines will benefit the opposition. Stigler (1973) argues that voters know that the government cannot push the economy

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permanently off its long-term path, hence they neither reward nor punish short-term deviations from this path. In his view, the economic variables that affect voting relate more to income distribution aspects rather than to short-term macroeconomic fluctuations.

Fair (1978, 1996) uses a model in which each voter considers his/her expected utility under the two possible scenarios: what it will be if the Republican candidate wins and what it will be if the Democratic candidate wins. The expectations are related to what the government did while it was in power. He uses the time-series information for the presidential elections in the USA between 1916 and 1976 and economic variables for the period 1889–1976. His basic conclusion is that the voters use mostly economic information from the year of the election. The two most important economic variables that affect the results of the elections are unemployment and economic growth.

Peltzman (1990) uses a principal agent model to evaluate the use of information in the “political market.” Using state-level election returns for presidential, senatorial and gubernatorial elections from 1950–1988, he finds that the market is efficient in the sense that it uses information efficiently. It differentiates, for instance, between permanent and transitory income, expected and unexpected inflation, and does not discard relevant information. In Peltzman (1992), the view is challenged that voters favor the incumbents who increase public spending before elections. He finds – using the same data set as in his 1990 paper – that voters penalize federal and state spending growth.

There have been at least a couple of studies on elections and macroeconomic performance in Chile. Engel and Araos (1989) estimated the effect of the unemployment rate on the results of the 1988 plebiscite. They use data for the 28 largest cities and conclude that the unemployment rate, plus the historical vote, explain half of the difference in voting among cities. Villena (2003) uses a panel with the results by municipality of the elections in 1993, 1997 and 2001 for the lower house of congress. He finds that the business cycle is not key, although the unemployment rate helps to explain the results to some degree. According to his estimations, the level of income is the key variable, with the poor voting for the center-left coalition. This implies the somewhat uneasy conclusion that as the country becomes richer, the likelihood of the center-left coalition being elected declines. Nor is it consistent with the evidence of some polls<sup>1</sup> that indicates that, with the exception of the very rich, income seems to be unrelated to voting behavior in Chile.

The paper is organized as follows. In the Section 2 we present some preliminary evidence. Section 3 contains a description and an analysis of the data and the methodology. The results are analyzed in Section 4. Section 5 concludes.

## 2 Preliminary evidence

Our dependent variable is the incumbent’s vote as a percentage of total vote. The data are obtained from the Chilean electoral service. We use a panel with three periods (the elections in 1989, 1993 and 1999) and 228 municipalities. To look more carefully at our question of interest, we decided to analyze presidential elections at the Chilean municipal level. We decided to do so because there is large variation in electoral performance throughout the country, thus we would obtain a great variation in our data set by including the cross-sectional dimension of the data. In fact, from Table 1, which shows descriptive statistics of electoral performance by regions, we can conclude that there is large variation in the data between and

<sup>1</sup> Centro de Estudios Públicos (2004).

**Table 1** Vote for the incumbent by region (%)

Region	Year	Observations	Mean	Std. Dev.	Min.	Max.
I	1989	10	48.86	12.47	30.22	66.46
	1993	10	46.00	10.59	25.80	58.98
	1999	10	38.89	12.66	15.33	51.41
II	1989	9	27.89	6.36	21.47	39.53
	1993	9	56.94	5.97	47.79	66.87
	1999	9	59.13	4.68	53.48	65.22
III	1989	9	31.69	6.86	19.95	46.86
	1993	9	59.61	3.44	53.03	63.33
	1999	9	60.90	4.86	53.24	70.68
IV	1989	15	31.74	9.63	21.14	54.04
	1993	15	62.56	4.68	54.82	71.86
	1999	15	62.11	9.50	47.60	78.29
V	1989	37	31.91	9.02	19.52	61.92
	1993	37	59.63	6.72	46.22	71.09
	1999	38 <sup>a</sup>	48.64	7.67	34.70	62.72
VI	1989	33	31.35	5.15	20.75	42.31
	1993	33	64.48	3.94	55.22	71.14
	1999	33	51.76	4.56	42.94	62.51
VII	1989	29	30.47	5.28	21.50	42.89
	1993	29	60.64	6.17	42.85	71.26
	1999	30 <sup>b</sup>	50.55	7.41	37.44	62.21
VIII	1989	49	30.02	10.05	10.69	54.72
	1993	49	61.57	6.36	48.17	74.80
	1999	52 <sup>c</sup>	51.11	11.14	26.71	73.04
IX	1989	30	31.50	9.07	19.54	59.75
	1993	30	54.08	7.88	37.08	67.54
	1999	31 <sup>d</sup>	40.68	8.01	23.35	56.84
X	1989	42	33.69	8.57	19.12	56.74
	1993	42	54.48	6.75	35.49	65.39
	1999	42	44.38	8.42	24.45	60.05
XI	1989	10	44.10	15.24	25.09	76.43
	1993	10	52.09	3.77	46.17	55.51
	1999	10	40.97	9.17	22.95	54.31
XII	1989	11	46.77	19.28	27.55	86.67
	1993	11	55.64	13.42	31.43	67.16
	1999	11	44.93	14.97	13.33	59.73
XIII	1989	51	32.07	8.78	20.12	63.38
	1993	51	58.68	8.25	29.40	69.66
	1999	52 <sup>e</sup>	50.48	8.23	24.10	61.66

Source: Chilean Electoral Service

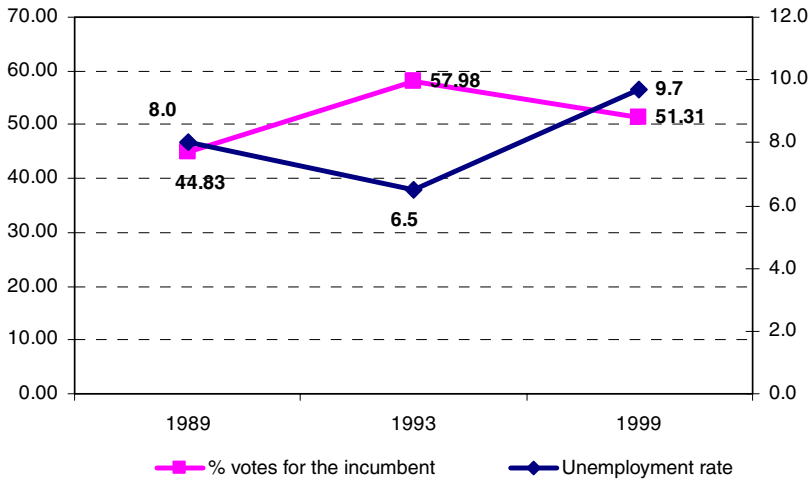
<sup>a</sup>It includes “Con Con”

<sup>b</sup>It includes “San Rafael”

<sup>c</sup>It includes the following counties: “Chiguayante”, “Chillan Viejo” & “Sn. Pedro de la Paz”

<sup>d</sup>It includes “Padre Las Casas”

<sup>e</sup>It includes “Padre Hurtado”



**Fig. 1** Vote (%) for the incumbent and the unemployment rate. Presidential elections

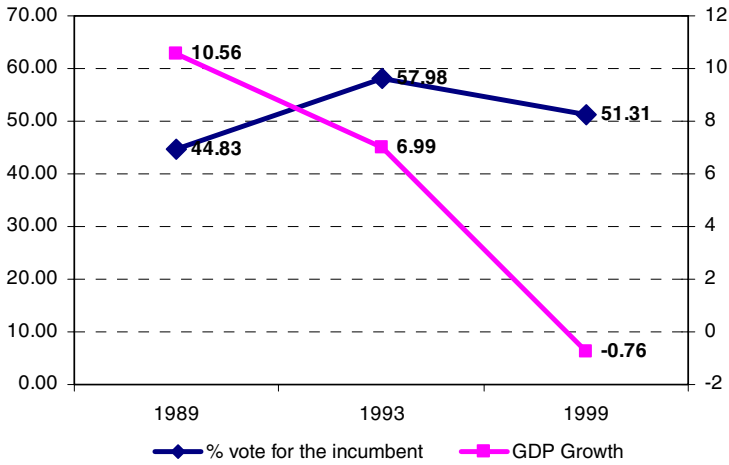
within regions and over time in a given region. In addition, we decided to focus on presidential elections rather than elections of congressional representatives or mayors because those representatives do not have the same power as the president to determine economic policies. Thus, it is more likely that people evaluate economic policies in presidential elections.

Figure 1 shows the unemployment rate and the incumbent's vote. For the 1999 election, the numbers are for the second round of the presidential election. It is seen that the increase in the vote of the incumbent in 1993 and the decline in 1999 coincide with movements of the unemployment rate in the opposite direction. GDP growth and the incumbent's vote are depicted in Figure 2. The decline in the rate of growth in 1999 also matches a decline in the vote obtained by the incumbent. In Figure 3, we have constructed a variable, which is the difference between the actual and trend GDP (the output gap). A positive number implies that the economy is in the upper part of the business cycle and a negative number that it is in the lower part of the business cycle. It is apparent that the recession of 1999 is somewhat related to the decline in the vote for the incumbent's candidate.

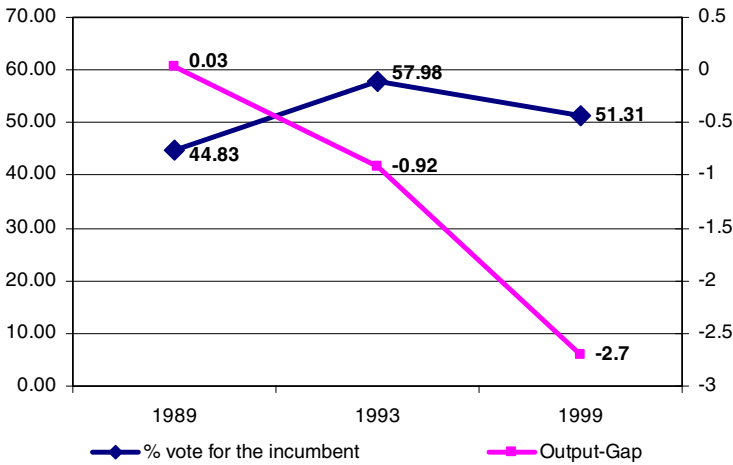
### 3 Methodology and estimations

The question to answer in this paper is how variables such as the unemployment rate and the output gap affect the vote of the governing coalition in presidential elections. We use a panel with the data for the vote in the presidential elections of 1989, 1993 and 1999 by municipality. We use the unemployment rate and the output gap as the principal macroeconomic variables. Since there are no inflation data in Chile either by municipality or by region, we could not include inflation in our estimations. We also control by variables such as the crime rate, poverty, whether the mayor belongs to the government's coalition, historical performance of the coalition in power, fixed effects by Chilean regions and by other demographic variables.

As mentioned above, we have data on presidential elections by municipality. We also obtained economic and demographic data by municipality from the 1990, 1992 and 1998 Survey of Socioeconomic Characteristics of the Chilean Population (CASEN). These data correspond to a representative survey of the Chilean population. The survey is taken among



**Fig. 2** Vote (%) for the incumbent and GDP Growth. Presidential elections



**Fig. 3** Vote (%) for the incumbent and output gap. Presidential elections

approximately 200,000 individuals per year. It allows us to obtain data related to demographics, such as the average age of voters and the fraction of female voters; the fraction of the population considered to be poor (who are below the poverty line); and the unemployment rate. We do not have data on the GDP by county, hence we use the information by region. The variable used is the output gap, defined as the deviation of GDP from its trend (the trend measured by means of the Hodrick Prescott filter).

Macroeconomic variables, such as the output gap and the unemployment rate, are included since the population may punish incumbents—by decreasing the likelihood of voting for them—when there is a poor economic performance that might indicate a set of bad economic policies. Nonetheless, it could be argued that in a small open economy like Chile, in which a significant part of the variability in the economic variables depends on external shocks rather than on an incumbent’s economic decisions, voters do not penalize the incumbent if the

economy is performing badly since they understand that the macroeconomic performance depends only marginally on economic policies. In that case, the vote of the incumbent is not affected by business cycle variables but by other variables, such as demographics (average age of the population in the county and the fraction of female voters in each county), historical preferences (which undoubtedly influences individual preferences) and/or other political variables (such as the political party of the mayor in that municipality). But in this case, the vote could also be determined by regional variables. For instance, in a region where unemployment is above the national level, the incumbent might be punished not only because of the increase in countrywide unemployment but also because the deviation of the unemployment in that region from the countrywide level.

The preliminary evidence presented in the previous section seems to support the view that economic variables do affect the vote in political elections. Cerda and Vergara (2005) look at the same evidence for Chile, but in reference to congressional and municipal data, and they confirm a relationship between the incumbent's vote and economic variables.

To proceed with the econometric analysis, we hypothesize the following relationship:

$$Elect_{it} = \alpha_0 + X'_{it}\beta + Z'_{it}\gamma + P'_i\lambda + \mu_i + v_{it} \quad (1)$$

where the subscripts indicate the  $i$ th municipality and the  $t$ th year. The variable  $Elect_{it}$  is the incumbent's electoral performance while  $X_{it}$  is a set of economic variables and  $Z_{it}$  is the set of other non-economic variables determining  $Elect_{it}$ . In  $Z_{it}$ , we include demographics, plus other political variables that might influence people's vote. The set of variables in  $P_i$  are non-time varying variables that might influence electoral performance, such as geographical locations – regions – or historical performance of the coalition in power. These are non-time varying variables that are usually incorporated into the fixed effect. Nonetheless, as these are observable variables, we separate them from the fixed effect in order to know their individual effect. Finally,  $\mu_i$  is a municipality-fixed effect (related to the unobservable non-time varying variables) and  $v_{it}$  is a well-behaved error term distributed as  $iid(0, \sigma_v^2)$ .

The CASEN survey does not contain other economic variables of interest at the municipal level, such as GDP growth rate or the inflation rate. To deal with this problem, we obtained data on GDP by Chilean region from the National Accounts. However, there are no data on inflation rates, even by region. Thus, the variables we included that measure economic performance were the unemployment rate at the municipal level and a measure of the output gap at the regional level. Finally, to control other political considerations, we obtained from the Chilean electoral service the political party of the mayor in office. We also use a proxy for the historical performance of the coalition in power by computing its performance in the 1989 presidential elections. Finally, we include dummies by region<sup>2</sup> as a measure of geographic location effects.

One of the two economic variables in which we are interested is the unemployment rate. As seen in Table 2, the dispersion of unemployment rates throughout the years in the municipalities considered is significant. The next step is to extrapolate the effect of this variable and the output gap, controlling by the other variables that may affect the political vote.

We initially estimated our panel data using a random-effect GLS method. However, the Hausman test indicated that the random effect estimation should be rejected, denoting a rejection of the hypothesis of orthogonality between the municipality-fixed effect and the

<sup>2</sup> There are 13 regions in Chile. The median number of counties per region is 30.

**Table 2** Unemployment rates by region (%)

Region	Year <sup>a</sup>	Observations	Mean	Std. Dev.	Min.	Max.
I	1989	2	7.94	3.15	5.71	10.16
	1993	2	3.47	0.43	3.17	3.77
	1999	10	4.40	2.73	0.26	9.61
II	1989	2	9.96	2.75	8.01	11.91
	1993	7	6.88	2.67	4.19	11.79
	1999	6	9.02	3.41	5.36	13.83
III	1989	1	6.90	–	6.90	6.90
	1993	9	6.74	3.94	2.00	11.92
	1999	9	11.14	4.89	4.68	20.08
IV	1989	3	14.13	4.98	8.79	18.63
	1993	3	5.18	0.24	5.01	5.45
	1999	15	10.00	3.37	5.25	16.19
V	1989	2	13.58	4.84	10.16	17.00
	1993	6	5.63	2.74	1.99	8.45
	1999	35	9.35	3.16	3.54	18.28
VI	1989	3	9.66	0.91	8.79	10.60
	1993	3	3.85	1.68	2.59	5.75
	1999	13	8.89	2.44	4.29	14.07
VII	1989	1	15.54	–	15.54	15.54
	1993	1	7.46	–	7.46	7.46
	1999	10	9.51	2.67	4.83	12.43
VIII	1989	3	12.56	0.48	12.00	12.84
	1993	49	7.33	3.93	1.10	20.57
	1999	22	15.28	4.69	8.60	27.95
IX	1989	1	6.68	–	6.68	6.68
	1993	1	4.47	–	4.47	4.47
	1999	16	10.14	3.88	3.39	14.71
X	1989	3	10.67	3.81	8.17	15.05
	1993	3	5.77	0.44	5.27	6.10
	1999	4	10.29	2.41	8.39	13.81
XI	1989	2	6.18	0.05	6.14	6.21
	1993	2	5.36	0.40	5.08	5.65
	1999	2	4.61	2.46	2.88	6.35
XII	1989	1	6.48	–	6.48	6.48
	1993	1	3.03	–	3.03	3.03
	1999	3	7.66	2.15	5.56	9.85
XIII	1989	25	9.26	3.02	2.97	13.09
	1993	51	4.95	1.87	1.20	8.81
	1999	52	9.37	3.33	2.22	18.18

<sup>a</sup>Data on 1989 was obtained from the 1990 CASEN, data on 1992 was obtained from the 1992 CASEN and data on 1999 was obtained from the 2000 CASEN

explanatory variables, thus invalidating the random-effects GLS estimation. Therefore, we report the fixed effect estimation. In our regression model, we included the unemployment rate and the square of the unemployment rate to capture a potential non-linear effect of this variable. There might be a non-linearity because when unemployment is low, a one percentage point increase in unemployment rate is proportionally much more important than the same increase when unemployment is high. In that sense, individuals might strongly punish the

**Table 3** Fixed effect estimation

	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5
Unemployment	-1.711** (0.282)	-1.204** (0.259)	-0.284* (0.167)	-0.057 (0.146)	-0.059 (0.147)
Crime rate	-	-	-0.002 (0.001)	-0.001 (0.001)	0.000 (0.001)
Output-gap	-	-	-	0.698** (0.118)	0.694** (0.119)
Poverty	-	-	-	0.363** (0.107)	0.362** (0.107)
Mayor	-	-	-	-	0.571 (1.451)
Demographics	No	Yes	Yes	Yes	Yes
$R^2$ within	0.1919	0.5020	0.4005	0.5793	0.58
Observations	384	384	335	335	335
Groups	228	228	228	228	228

SE in parenthesis.\*10% significance, \*\*5% significance

incumbent for the increase in the unemployment rate when unemployment is low. Hence, we expect the overall impact of the unemployment rate to be negative, but possibly the squared term might be positive so as to capture the non-linear effect.

We start by estimating our model (Tables 3 and 4), excluding the non-time varying variables ( $P_i$ ). The unemployment rate was included at a county level. As can be seen in Table 3, the coefficient is negative, but as we introduced the other explanatory variables, it became statistically insignificant. In Table 4, we also included the square of the unemployment rate at the county level to capture the potential non-linear effect of this variable. As we can see from the results of these estimations, the coefficient of unemployment is negative and that of the square of unemployment positive, and both are statistically significant in all the regressions. Although the square of unemployment is statistically significant, for the range of the unemployment rates of our sample, its effect on the vote is small.<sup>3</sup> In this estimation, after introducing some variables, the coefficient of unemployment and the unemployment rate squared stabilize. The output gap is positive and statistically significant, as expected.

Next, we introduce the non-time varying variables (regional effects and historical performance of the incumbent). Note that it is possible to provide estimates of the impact of the non-time varying variables by means of the procedure of Hausman and Taylor (see Baltagi, 2001). Furthermore, note that in our set of non-time varying variables, the regional dummies are exogenous, as they correspond to location variables, while the historical performance of the coalition in power could be correlated with the error term in the electoral performance equation, and, therefore, could be considered an endogenous variable. In addition, note that this procedure, when there is correlation between the fixed effect and the explicative variables as indicated by the Hausman test reported in Table 3, it is consistent, but more efficient than the fixed effect estimates. This procedure is a two-stage error component procedure in which the set of instruments is composed of the within variation of exogenous and endogenous explicative variables (in relation to the fixed-effect component), plus the between variation of the exogenous explicative variables. Those instruments are orthogonal to the error term in

<sup>3</sup> 80% of the unemployment rates in this sample are below 11%. Using the coefficient of Equation (6), an increase in the unemployment rate from 7% to 8% reduces the vote for the incumbent by 0.4 percentage points.



**Table 4** Fixed effect estimation

	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6
Unemployment	-4.035** (0.816)	-2.912** (0.676)	-1.751** (0.353)	-1.529** (0.314)	-1.258** (0.331)	-1.259** (0.334)
Unemployment, squared	0.113** (0.037)	0.082** (0.030)	0.068** (0.015)	0.063** (0.013)	0.054** (0.013)	0.054** (0.014)
Crime rate	–	–	-0.001 (0.001)	-0.002 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Output-gap	–	–	–	0.611** (0.112)	0.648** (0.111)	0.648** (0.112)
Poverty	–	–	–	–	0.232** (0.105)	0.232** (0.106)
Mayor	–	–	–	–	–	-0.032 (1.363)
Demographics	No	Yes	Yes	Yes	Yes	Yes
R <sup>2</sup> within	0.2372	0.5256	0.5055	0.6198	0.6378	0.6378
Observations	384	384	335	335	335	335
Groups	228	228	228	228	228	228

SE in parenthesis. \* 10% significance, \*\* 5% significance

Equation (1) because the within variation of endogenous variables is, by definition, orthogonal to the fixed-effect component. Those instruments are used in a two-stage least-square regression of the random-effect GLS panel method.

Tables 5 and 6 show the results when the Hausman and Taylor procedure is used. As seen in Table 5, the coefficients of all the variables remain quite constant after introducing output gap. The Hausman test run in these models confirms that the problem of no orthogonality between the fixed effect and the explanatory variables is corrected. Both the unemployment rate and the square of the unemployment rate are statistically significant, with the expected signs.<sup>4</sup> The “output gap” variable and the “historical performance” variable are highly significant, with the expected signs. The coefficient on poverty is statistically significant and negative, indicating that as poverty increases, the vote for the incumbent decreases.

To further explore the impact of the unemployment rate on the incumbent’s vote, in Table 6, we separated the unemployment variable into three different variables: the county unemployment rate and the regional unemployment rate (both as deviations from the countrywide unemployment rate), and in addition the countrywide unemployment rate. The idea is to see whether people punish the incumbent for countrywide unemployment and/or regional and county deviations. We also included an interaction term between the regional unemployment rate and the political affiliation of the mayor to see whether the incumbent president gets punished for relatively bad performance of the region when his party is locally in power.

The coefficients of countrywide unemployment and of the interaction term between regional unemployment and political affiliation of the mayor are negative and statistically significant while the coefficient of county and regional unemployment are negative, but statistically not significant. This result suggests that people punish the incumbent not only for the countrywide unemployment, but also for the regional unemployment when it is above

<sup>4</sup> Like in the previous case, the coefficient of the square of the unemployment rate is small enough so as to not have a major impact on the effects on unemployment for the unemployment levels of our data.

**Table 5** Hausman – Taylor estimation baseline model

	Equation 1	Equation 2	Equation 3	Equation 4
Unemployment	−1.533** (0.247)	−1.430** (0.250)	−1.245** (0.219)	−1.107** (0.229)
Unemployment, squared	0.054** (0.011)	0.052** (0.011)	0.051** (0.009)	0.0478** (0.009)
Mayor	2.046* (1.212)	1.966 (1.219)	1.188 (1.035)	1.344 (1.009)
Crime rate	–	−0.001 (0.001)	−0.002** (0.001)	−0.002** (0.001)
Output-gap	–	–	0.608** (0.084)	0.626** (0.083)
Poverty	–	–	–	−0.149** (0.064)
Incumbent's historical performance	0.706** (0.158)	0.661** (0.154)	0.484** (0.126)	0.474** (0.124)
Demographics	Yes	Yes	Yes	Yes
Regional Dummies	Yes	Yes	Yes	Yes
Wald Chi2	231.18	243.00	351.82	358.83
Prob	0	0	0	0
Observations	335	335	335	335
Groups	228	228	228	228
Hausman Test	8.9	9.77	9.05	10.85
Prob	(0.2597)	(0.2819)	(0.4329)	(0.3696)

SE in parenthesis. \*10% significance, \*\*5% significance

the countrywide unemployment and the mayor belongs to the incumbent's coalition. When we introduce these new measures of unemployment, the square of the unemployment rate becomes statistically insignificant, suggesting that the non-linear effect found above was measuring other effects associated with deviations in regional unemployment vis-à-vis the national unemployment.

The coefficient of the mayor variable is positive and statistically significant, indicating that, in addition to the interaction term just mentioned, the political coalition of the mayor has an influence on the vote: if the mayor is of the same coalition as the incumbent, then there a positive effect on the incumbent's vote.

The output gap is also statistically significant and with the expected sign. The coefficients on poverty and the incumbent's historical performance remain with the expected sign and are statistically significant.

#### 4 Analysis of the results

The results in Table 6 indicate that the coefficient of the unemployment rate is negative and statistically significant. This means that the higher the national rate of unemployment, the lower the vote for the incumbent. The vote also depends on the interaction between deviations in regional unemployment rates from national unemployment rates and the political party of the mayor. If the mayor is from the same coalition as the incumbent presidential candidate, people will also punish the incumbent for regional unemployment when it is above the national unemployment rate. By the same token, if regional unemployment is lower than national

**Table 6** Hausman–Taylor estimation: New measures of unemployment

	Equation 1	Equation 2	Equation 3	Equation 4
County unemployment/National unemployment	−0.612 (2.860)	−0.564 (2.899)	0.537 (2.662)	1.378 (2.720)
County unemployment/National unemployment, squared	−0.375 (1.113)	−0.417 (1.133)	−0.209 (1.034)	−0.407 (1.032)
Regional unemployment/National unemployment	−5.354** (2.367)	−5.469** (2.394)	−1.094 (2.381)	−2.311 (2.374)
Regional unemployment/National unemployment * Mayor	−4.743* (2.681)	−4.701** (2.697)	−5.277 (2.463)	−5.060** (2.434)
National unemployment	−1.484** (0.194)	−1.517** (0.215)	−1.324** (0.202)	−1.282** (0.204)
Mayor	1.917* (1.101)	1.887* (1.102)	1.860* (1.000)	1.956** (0.980)
Crime rate		0.0003 (0.0007)	−0.0001 0.0006	0.00002 (0.0006)
Output-gap			0.451** (0.099)	0.428** (0.098)
Poverty				−0.142** (0.063)
Incumbent's historical performance	0.693** (0.135)	0.710** (0.136)	0.496** (0.109)	0.527** (0.110)
Demographics	Yes	Yes	Yes	Yes
Wald Chi2	343.86	340.88	420.09	426.89
Prob	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Observations	335	335	335	332
Groups	228	228	228	227
Hausman Test	6.92	6.72	9.45	10.55
Prob	(0.7332)	(0.8216)	(0.6638)	(0.6486)

SE in parenthesis. \*10% significance, \*\*5% significance

unemployment and the mayor is from the same coalition as the incumbent presidential candidate, there will be a positive effect on the vote for the incumbent.

Our results predict that if the national unemployment rate increases by one percentage point, the incumbent's vote in presidential elections will decline by 1.3 percentage points. If the mayor belongs to the political coalition of the incumbent, then the incumbent will be even further punished for the unemployment in that particular region.

Our results regarding the output gap suggest that for each percentage point that the GDP is above its trend, the vote for the incumbent will increase by 0.42 percentage points. It has been estimated<sup>5</sup> that in 1993, the GDP was 4.7% above the GDP trend while in 1999, it was 2% below the trend. This factor alone explains a decrease of about three percentage points in the vote for the incumbent in the presidential election in 1999 as compared to the presidential election in 1993.

<sup>5</sup> Ministry of Finance (2004).

The political party of the mayor, on the other hand, appears to have an effect on the vote in presidential elections. If the mayor belongs to the coalition of the incumbent, then there is a positive effect on the vote for the candidate of the government coalition in that municipality. Poverty negatively affects the vote for the incumbent. Finally, our results also suggest that history matters in the sense that the historical vote of the coalitions appears with a positive sign and it is statistically significant.

## 5 Conclusions

The purpose of this paper has been to investigate whether, and to what extent, economic variables affect political elections. Our results indicate that the unemployment rate and the output gap have a significant effect on the votes obtained by the incumbent. More specifically, an increase of 1% in the national unemployment rate has an effect of about 1.3 percentage points on the vote of the incumbent. On the other hand, for each percentage point that the economy is above its trend, the vote for the incumbent will increase by 0.4 percentage points. These results indicate that the worsening of the economic conditions between the presidential elections of 1993 and 1999 reduced the vote for the incumbent by a significant amount.

Our estimations also indicate that variables such as the poverty rate, the political coalition of the mayor and the history in each municipality have an influence on the vote.

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## References

- Baltagi, B. (2001). *Econometric analysis of panel data* (2nd ed). England: John Wiley & Sons.
- Centro de Estudios Públicos (2004). Encuesta Nacional de Opinión Pública, Junio-Julio 2004, at [www.cepchile.cl](http://www.cepchile.cl).
- Cerda, R., & Vergara, R. (2005). Government Subsidies and Political Elections: Evidence for Chile. Working Paper No. 294, Universidad Católica de Chile.
- Engel, E., & Araos, M.R. (1989). Desempleo, Votación Histórica y el Plebiscito de 1988. *Colección de Estudios CIEPLAN* No. 27, December, pp. 5–17.
- Fair, R.C. (1978). The effect of economic events on votes for president. *The Review of Economics and Statistics*, *LX*(2), 159–173.
- Fair, R.C. (1996). The econometrics of presidential elections. *Journal of Economic Perspectives*, *10*(3), 89–102.
- Kramer, G.H. (1971). Short term fluctuations in U.S. voting behavior, 1896–1964. *The American Political Science Review*, *65*, 131–143.
- Ministerio de Hacienda, Chile (2004). Resultados del Comité Consultivo del PIB Potencial. Santiago, August (at [www.minhda.cl](http://www.minhda.cl)).
- Peltzman, S. (1990). How efficient is the voting market. *Journal of Law and Economics*, *XXXIII*, 27–63.
- Peltzman, S. (1992). Voters as fiscal conservatives. *Quarterly Journal of Economics*, *CVII*(2), 327–361.
- Stigler, G. (1973). General economic conditions and national elections. *American Economic Review*, *63*(2), 160–167.
- Villena, B. (2003). De qué Dependen los Resultados Electorales en Chile? Un Análisis Empírico de las Elecciones de Diputados de 1993–2001. Unpublished Manuscript, May.