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

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 plebiscite of 1988, in which the people voted against Pinochet staying in power for another eight years, there have been three presidential elections in Chile. All of them have been won by the coalition currently in power (the “Concertación”), but the margin of the victory seems to be related to macroeconomic conditions. The most contested election, the one in 1999 in which there was a second round, took place while the country was in its first recession in sixteen years. In that year, 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 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 election 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 1950-88, 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 that voters favor the incumbents who increase public spending before the elections is challenged. 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 & Araos (1989) estimate the effect of the unemployment rate on the results of the plebiscite of 1988. 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 becoming elected declines. Nor is it consistent with the evidence of some polls¹ that indicate 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 second section we present some preliminary evidence. Section three contains a description and an analysis of the data and the methodology. The results are analyzed in section four. Section five 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

¹ Centro de Estudios Públicos (2004).

shows descriptive statistics of electoral performance by regions, we can conclude that there is large variation in the data between and 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 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.

Table 1. Vote of 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 a/	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 b/	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 c/	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 d/	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 e/	50.48	8.23	24.10	61.66

a/ It includes "Con Con"

b/ It includes "San Rafael"

c/ It includes the following counties: "Chiguayante", "Chillan Viejo" & "Sn. Pedro de la Paz"

d/ It includes "Padre Las Casas"

e/ It includes "Padre Hurtado"

Source: Chilean Electoral Service

FIGURE 1: % VOTE FOR THE INCUMBENT AND THE UNEMPLOYMENT RATE
PRESIDENTIAL ELECTIONS

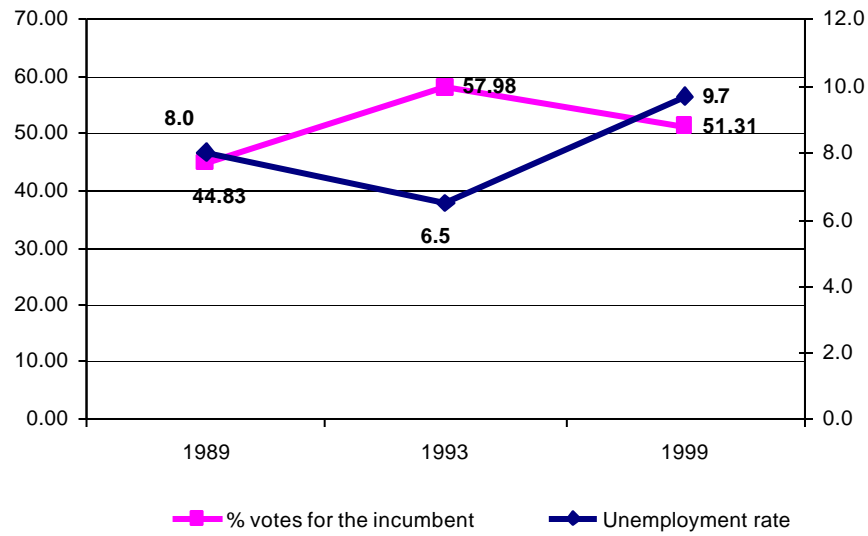


FIGURE 2: % VOTE FOR THE INCUMBENT AND GDP GROWTH
PRESIDENTIAL ELECTIONS

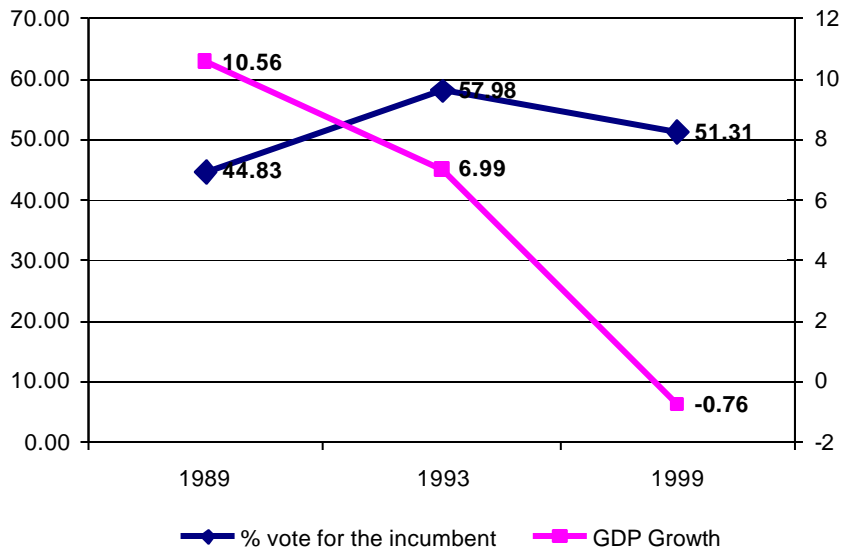
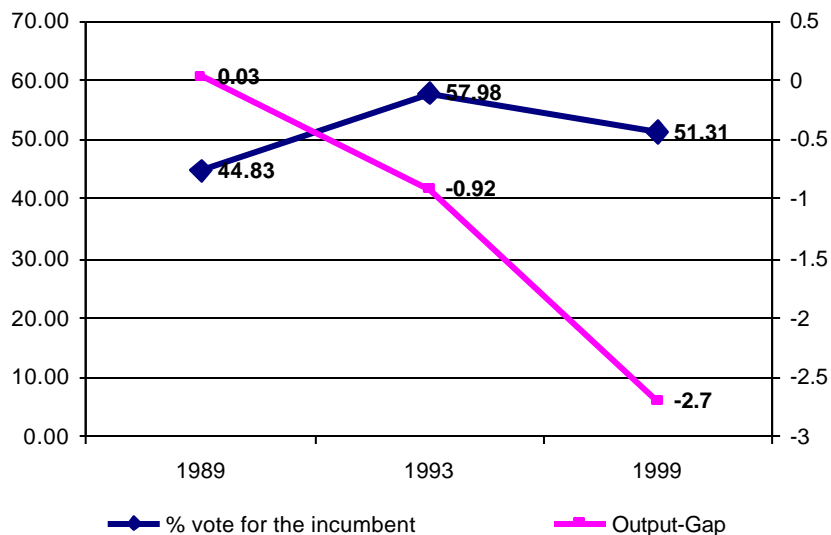


FIGURE 3: % VOTE FOR THE INCUMBENT AND OUTPUT GAP
PRESIDENTIAL ELECTIONS



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. As there have been only three elections in Chile since the return to democracy, we have to use a panel with the data for the vote in each election by municipality. We use the unemployment rate and the output gap as the principal macroeconomic variables. As in Chile there are no inflation data 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 and by other demographic variables.

As mentioned above, we have data on presidential elections by county. We also obtained economic and demographic data by county 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 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 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 refer to aspects such as family background, which undoubtedly influences individual preferences and which, in a fixed-effect estimation, is captured precisely by the fixed effect at a municipal level) and/or other political variables (such as the political party of the mayor in that municipality).

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 referring 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:

$$(1) \quad Elect_{it} = \mathbf{a}_0 + X'_{it} \mathbf{b} + Z'_{it} \mathbf{g} + \mathbf{m} + n_{it}$$

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. Finally,

μ_i is a municipality-fixed effect and ϵ_{it} is a well-behaved error term distributed as $iid(0, \sigma_\epsilon^2)$.

The CASEN survey does not contain other economic variables of interest at the county level, such as GDP growth rate or the inflation rate. To deal with this problem, we obtained data on GDP by Chilean regions from the National Accounts. However, there are no data on inflation rates, even by regions. Thus, as variables measuring economic performance, we include the unemployment rate at the municipal level and a measure of output in 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.

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 political vote.

Table 2. Unemployment rates by region.

Region	Year a/	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

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

We initially estimated our panel data using a random-effect GLS method. 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. We expect the overall impact of the unemployment rate to be negative, but possibly the squared term might be positive to capture the non-linear effect. Column 1 of table 3 shows the result when we do not control by other variables. Columns 2 to 6 provide the sensitivity analysis as we introduce other variables. Even though the results in this table are consistent with the effects we expected for each of the variables included, there is a pattern that concerns us: the magnitude of the parameters of both unemployment and the unemployment square decreases as we introduce new variables in our model. Furthermore, the Hausman test is rejected in all the specifications, denoting a rejection of the hypothesis of orthogonality between the municipality fixed effect and the explanatory variables, thus invalidating the random-effects GLS estimation. In economic terms, we can interpret this as confirming that history is important in explaining the vote in presidential elections. Said otherwise, there are counties that are historically more inclined to vote for a given political party. In fact, this would be perfectly consistent with public opinion feelings, such as that the north is more leftist while certain parts of the south are more conservative.

To deal with the orthogonality problem, we next estimated a fixed-effect model (Table 4). As this model excludes the fixed effect component, any potential endogeneity between explanatory variables and the fixed effect is eliminated. In this estimation, after introducing some variables, the coefficient of unemployment and the unemployment rate squared stabilize. The same occurs in the case of the crime rate, output gap and poverty. The signs of all variables are correct (except that of the mayor), yet some of them are not significant.

Table 3: Random effect GLS estimation
Dependent variable: electoral votes, %, by county

Variable	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6
Unemployment	-1.3042 (-2.53)**	-1.7099 (-3.63)**	-1.1019 (-3.59)**	-0.9342 (-3.26)**	-0.7627 (-2.53)**	-0.7075 (-2.36)**
Unemployment, squared	0.0599 (2.47)**	0.0692 (3.19)**	0.0453 (3.28)**	0.0412 (3.25)**	0.0387 (3.03)**	0.0354 (2.78)**
Demographics	NO	YES	YES	YES	YES	YES
Crime rate			-0.0031 (-3.28)**	-0.0032 (-4.03)**	-0.0032 (-4.13)**	-0.0030 (-3.85)**
Output-Gap				0.5649 (5.04)**	0.5764 (5.15)**	0.5401 (4.80)**
Poverty					-0.1315 (-1.93)*	-0.1254 (-1.88)*
Mayor						4.6908 (4.60)**
R2 Overall	0.0166	0.2796	0.1609	0.1637	0.1693	0.2604
Within	0.0803	0.3773	0.3616	0.4844	0.4846	0.4538
Between	0.0009	0.103	0.0885	0.0753	0.0886	0.1862
Observations	384	384	335	335	332	332
Groups	228	228	228	228	227	227
Hausman test		77.6 Prob 0.00	70.89 Prob 0.00	90.93 Prob 0.00	93.15 Prob 0.00	82.78 Prob 0.00

Demographics include average age, average schooling, average schooling squared, fraction of females. T statistics in parenthesis. ** 5% significance, * 10% significance.

Table 4: Fixed effect estimation
Dependent variable: electoral votes, %, by county

Variable	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6
Unemployment	-4.0349 (-4.95)**	-2.9120 (-4.31)**	-1.7509 (-4.96)**	-1.5293 (-4.87)**	-1.5242 (-4.56)**	-1.5262 (-4.53)**
Unemployment, squared	0.1132 (3.03)**	0.0824 (2.73)**	0.0681 (4.61)**	0.0630 (4.82)**	0.0634 (4.78)**	0.0635 (4.74)**
Demographics	NO	YES	YES	YES	YES	YES
Crime rate			-0.0013 (-1.12)	-0.0015 (-1.52)	-0.0014 (-1.39)	-0.0014 (-1.38)
Output-Gap				0.6111 (5.46)**	0.6324 (5.61)**	0.6331 (5.57)**
Poverty					-0.0568 (-0.59)	-0.0569 (-0.59)
Mayor						-0.1062 (-0.08)
R2 Within	0.2372	0.5256	0.5055	0.6198	0.6243	0.6243
Observations	384	384	335	335	332	332
Groups	228	228	228	228	227	227

Demographics includes average age, average schooling, average schooling squared, fraction of females. ** 5% significance, * 10% significance.

A more consistent procedure when there is correlation between the fixed effect and the explicative variables are the Hausman and Taylor estimators. This procedure is a

two-stage error component procedure in which the set of instruments is composed by 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 equation (1) because the within variation of endogenous variables by definition is orthogonal to the fixed-effect component. Those instruments are used in a two-stage least-square regression of the random-effect GLS panel method. This procedure is consistent and more efficient than the Fixed Effect estimator.

Table 5 shows the results when the Hausman and Taylor procedure is used. As in the within estimation, the coefficient of all the variables remains quite constant after introducing output gap. In addition, now the “crime rate” and “mayor” variables are significant (with correct signs) while poverty is marginally significant. Finally, the Hausman test run in those models confirms that the problem of no orthogonality between the fixed effect and the explanatory variables is corrected.

Table 5: Hausman Taylor estimation
Dependent variable: electoral votes, %, by county

Variable	Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6
Unemployment	-4.0135 (-4.47)**	-3.2279 (-6.91)**	-1.7805 (-8.89)**	-1.5548 (-8.55)**	-1.5442 (-7.05)**	-1.3820 (-5.92)**
Unemployment, squared	0.1158 (2.85)**	0.0873 (4.13)**	0.0684 (8.10)**	0.0631 (8.37)**	0.0622 (7.10)**	0.0573 (6.08)**
Demographics	NO	YES	YES	YES	YES	YES
Delinquency rate			-0.0013 (-1.91)*	-0.0015 (-2.62)**	-0.0015 (-2.23)**	-0.0016 (-2.32)**
Output-Gap				0.6094 (9.43)**	0.6157 (8.33)**	0.6032 (7.58)**
Poverty					-0.0663 (-1.04)	-0.1030 (-1.55)
Mayor						1.7216 (1.92)*
R2 Overall	0.0062	0.149	0.0097	0.004	0.0067	0.0312
Within	0.2371	0.5098	0.5049	0.619	0.6164	0.6027
Between	0.0328	0.0098	0.0003	0.0005	0.0001	0.003
Observations	384	384	335	335	335	332
Groups	228	228	228	228	228	227
Hausman test	0.56 Prob 0.99	6.84 Prob 0.335	0.21 Prob 0.99	0.33 Prob 0.99	3.41 Prob 0.94	8.27 Prob 0.60

Demographics include average age, average schooling, average schooling squared, fraction of females. ** 5% significance, * 10% significance.

4. ANALYSIS OF THE RESULTS

The results in Table 5 indicate that the coefficient of the unemployment rate is negative and significant and the coefficient of the square of the unemployment rate is positive and significant. This means that the higher the rate of unemployment, the lower the vote of the incumbent. The relationship is not linear since the effect declines as the unemployment rate increases. The average unemployment rate in the Chilean economy in 1989-2003 was 8%. Our results predict that if the unemployment rate increases from 8% to 9%, the incumbent's vote in a presidential elections will decline by 0.4 percentage points. On the other hand, if the unemployment rate decreases from 8% to 7%, the vote for the incumbent will increase by 0.53 percentage points. In 1999, the unemployment rate in Chile was 9.8% while in 1993 it was 6.5%. This factor alone explains a decline of 1.5 percentage points in the vote for the incumbent.

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 0.6 percentage points. It has been estimated² 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 another decrease of four percentage points in the vote for the incumbent in the presidential election in 1999 as compared to the presidential election in 1993. The unemployment rate and the output gap together add up to a decline in the vote of 5.5 percentage points for the incumbent between the presidential election in 1993 and the presidential election in 1999.

It is interesting to note that the rest of the variables are significant and have the expected sign. The higher the crime rate and the poverty rate, the lower the vote for the incumbent. 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.

We tested several lags for the different variables but they were not significant. This supports the idea that the economic events that influence political elections are the current events rather than the lagged events.

² Ministry of Finance (2004).

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 unemployment rate has an effect of about 0.5 percentage points on the vote of the incumbent (a non-linear effect). On the other hand, for each percentage point that the economy is above its trend, the vote for the incumbent will increase by 0.6 percentage points. These results allow us to estimate that the worsening of the economic conditions between the presidential elections of 1993 and 1999 reduced the vote for the incumbent by 5.5 percentage points.

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

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