The Influence of Local and National Economic Conditions on French Legislative Elections

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Abstract. This article's aim consists in building and estimating a model which explains and forecasts the outcomes of the French legislative elections by department. This model, which constitutes the first attempt for such a geographical level, emphasises the role of the economic and political factors in the explanation of the legislative vote. The model seems to be very accurate in forecasting the elections of the past at the local and national level. Furthermore, its behaviour for the 2002 election was very satisfactory. This model is therefore a reliable alternative to the vote intention polls as an electoral forecasting instrument.

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1. Introduction

Since the beginning of the 1970s and Kramer (1971)'s pioneer study for the United States, numerous studies put in evidence the influence of economic conditions on elections outcomes[1]. The earlier econometric vote models explain the election results of the past by using time series analysis methods applied to data aggregated at the national level. This kind of models offers forecasts which are not always accurate due to the instability of the estimated vote-functions. This instability which can result from a badly adapted modelling and/or from statistical problems like the weak number of observations. Two ways have been explored to remedy this patent instability.

Abrams (1980), Budge and Farlie (1983), Rosenstone (1983) and Abrams and Butkiewitz (1995) analysed the influence of the economic and political factors on the vote *by state* for some American presidential elections by using cross sectional data. This method is very useful to study the national and local context of a particular election but fails to catch the difference from an election to another one since the time dimension is missing.

The second way is the building of econometric vote models which use pooled data (see e.g. Holbrook, 1991, Campbell, 1992). These models allow to explain and to forecast the results at the local and national level for several American presidential elections. This method uses at the same time cross sectional analysis and time series analysis. Compared to national model, the number of degrees of freedom is larger and a greater number of independent variables can be introduced into the vote-function[2].

In France, models using pooled data have been developed since the beginning of the 1990's and Jérôme *et al.* (1993)'s pioneer study[3]. This paper covers four legislative elections between 1978 and 1988 and uses regional data[4]. The dependent variable which is the vote for the right-

wing parties at the first round is explained by the preceding elections' results, the change in the President's popularity, and the change in the regional unemployment rate. A seat-function allows to transform the vote share received in each region in seats won in each region. The sum of these local forecasts leads to a national forecast. This model was successful in announcing for the right-wing parties results in metropolitan France: 453 seats in 1993 (against 470 actual seats)[5] and 242 seats in 1997 (against 255 actual seats)[6].

Jérôme *et al.* (1999) built a vote-function which explains the vote for the ruling majority at the first round of the six legislative elections between 1978 and 1997 at the regional level. Four independent variables are used: the vote at the previous presidential elections, an "ideology" variable showing a persistence to the Right or to the Left in the orientation of the regional vote, an "instability" variable for the regions which changed several times in the orientation of their vote and the change of the regional unemployment rate during the year preceding the election year[7]. In their seat-function, the dependent variable is the percentage of seats obtained by the ruling majority and the dependent variables are the percentage of vote going to the ruling majority, the vote abstention propensity in the first round and a dummy variable which takes into account the "Front National" (the main Extreme Right party) strength[8]. This model allowed them to forecast *a posteriori* 263 seats for the right-wing parties in 1997 which obtained 238 seats.

A last model is developed by Fauvelle-Aymar *et al.* (2000). This model has the capacity to explain the results of several types of elections. The dependent variable is the first round vote going to the left-wing parties[9]. Among the independent variables, there are the difference between the left-wing parties' level of popularity and the right-wing parties' one, the votes going to the left parties for the previous elections of the same type, the rate of turnout for the previous elections of the same type (as well as the same rate when the Left is the ruling majority) and

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dummy variables to take into account the specificity of every type of elections. This model was not used to forecast the legislative elections[10].

All these three models share the same level of data, that is regional data. We think that it is better to use departmental data. Indeed, the department appears to be a more homogenous electoral entity than the region (see Bon and Cheylan, 1988: 7)[11]. This homogeneity can be explained by an historical point of view. Departments have been created in 1790 on sociological criteria (that is a structural criterion) whereas the division into regions dates back to 1960 and has been mainly motivated by national planning considerations (that is a short-term criterion). Furthermore, except the region "Alsace", there is no region totally rooted to the Right or to the Left. A good example is the region "Bretagne" which votes always in majority for the right-wing parties. On four departments which compose this region, three departments always vote in majority for the right-wing parties and one department always votes in majority for the left-wing parties. These behaviour differences may be partly explained by the fact that economic conditions vary from a department to another in the same region. For example, in December 2000, the regional unemployment rate was 13.0 % in "Languedoc-Roussillon" and within this region, the departmental rate ranged from 5.5 % in "Lozère" to 14.3 % in "Hérault"[12].

Our paper is organised as follows: we begin by describing the French political system (section 2), we present the empirical model used (section 3) and we detail the estimates' results (section 4). Finally, we study the behaviour of the model for the 2002 French legislative elections (section 5).

2. The French political system

The fifth Republic began on October 4, 1958, after the adoption of a new constitution subjected to referendum on September 28, 1958. The French political system became then a presidential system keeping the fundamental principles of a parliamentary system (we can describe it as a semi-presidential regime).

The President of the Republic is the head of State and, since the 1965 presidential election, he is elected by direct universal suffrage in a two-ballot majority poll. He appoints the Prime Minister, presides over the Council of Ministers and takes charge mainly of the Foreign Policy and the Defence. Until the 2002 presidential election, the president's term of office was seven years. Since the constitutional revision of October 2, 2000, and the 2002 presidential election, the president's term of office is five years. The President of the Republic can also dissolve the National Assembly once a year.

Since the 1986 legislative election, the National Assembly consists in 577 deputies[13] elected for five years. It votes for the laws proposed by the government or the parliamentarians. The government, led by the Prime Minister, decides on the policy of France and is responsible to the National Assembly. The National Assembly may cause the resignation of the Prime Minister by voting a *motion de censure*.

Traditionally, the President of the Republic and the Prime Minister belong to the same political side. When the opposite occurs, we speak about *cohabitation*[14]. Except in periods of cohabitation, the President of the Republic determines the nation's policy, while during the periods of cohabitation, the Prime Minister is fully the head of government.

Since the 1958 legislative election, the legislative ballot is an "unominal system"[15] in two rounds by electoral districts. If no candidate obtains the absolute majority of the expressed votes and a number of votes equal at least to the quarter of the registered voters in the first round, a second round is organised in which the candidates having obtained 12.5 % of the registered votes

are in competition. For the 1986 legislative election, a one-round proportional scheme was adopted[16] before returning then to an election with a majority basis by electoral districts in 1988.

There is a second assembly, the Senate, consisted in 321 senators[17], whom role is to discuss bills subjected by the government or the deputies. They can also make their own bills.

The National Assembly and the Senate together constitute the Parliament, in charge of certain constitutional changes.

The deputies belong generally to political parties distributed on a Left-Right political spectrum. The left-wing parties are traditionally progressive parties and the right-wing parties are conservative ones.

The right-wing parties dominated the French political life from 1958 to 1981 until the victory of the socialist candidate, François Mitterrand, at the 1981 presidential election. Over the period 1981-2002, the left-wing is formed by the PC and the PS which constitute the moderate left-wing, and the Extreme Left[18]. The ecological parties can be classified to the Left because the main ecological party, the Greens, got closer to the PS after the 1994 European elections and was a part of the Left majority from 1997 to 2002. Over this period, the Right is formed mainly by the RPR and the UDF[19] for the moderate Right, and the FN for the Extreme Right. We precise that, during the periods 1986-1988 and 1993-1997, when the Right was the majority in the National Assembly, the Extreme Right was not a part of this majority.

After the 1981 presidential election, François Mitterrand, the President of the Republic, dissolved the National Assembly and the Left won easily the 1981 legislative election, the PS obtaining even the absolute majority in seats. Several communists participated in the government (1981-1984). The 1986 legislative election was won by the moderate Right, which led, for the first time in France, to a period of cohabitation. In May 1988, François Mitterrand was reelected President of the Republic and dissolved then the National Assembly, which led to a legislative

election which the Left won with difficulty. The majority in the National Assembly was only relative because the PC did not support the government officially. The Right won then the 1993 legislative election, which led to a second period of cohabitation. In 1995, it is a Right candidate, Jacques Chirac, who is elected President of the Republic. He decided to dissolve the National Assembly in May 1997 by thinking that the Right would win the legislative election but it is the Left which obtained the majority in seats in the National Assembly. After a period of cohabitation of five years, Jacques Chirac is reelected President of the Republic in May 2002 and the Right won then the 2002 legislative election easily, the UMP obtaining the absolute majority in seats.

The table below summarises the formation and the strength of the different majorities following the six elections from 1981.

[Table 1 about here]

3. The model

Our model consists in a vote-function and in a seat-function[20].

On one hand, we have the following vote-function:

Vote = f (economic conditions, political factors)

The vote is explained by the economic conditions and the political factors. In order to build the vote-function, we suppose that voters behave accordingly to the responsibility hypothesis, that is they reward (respectively, punish) the ruling majority for good (respectively, bad)

economic performances (Key, 1966). More precisely, we suppose that voters take into account the recent and future results of the economic policy led by the government. Voters have then a retrospective and a prospective behaviour. The dependent variable is the share of vote received at the first or the second round[21] by the political parties of the ruling majority in the large sense[22] in the department i in the elections at the date t ($VOTE_{it}$).

We retained six independent variables. Two variables are used to take into account the impact of the economic conditions on the vote[23]: the rate of real growth of GDP at the national level (variable noted DGDP) and the growth rate of the number of job-seekers at the departmental level (variable noted UNEM). The first variable accounts for the national economic conditions and the second one accounts for the local economic conditions. When the economic growth increases and the number of job-seekers falls, the vote for the ruling majority is going to increase and it is going to fall otherwise. The expected signs for the coefficients are thus: $\alpha_1 > 0$ and $\alpha_2 < 0$.

The third variable is the popularity of the Prime Minister (variable noted POP). It's a political variable which allows to take into account factors like personal image, wearing effect of being in power, scandals, etc. Higher the popularity is, higher the vote for the ruling majority will be. Then, we are expecting a positive sign for this variable ($\alpha_3 > 0$).

Our fourth variable is a political variable constituted by the results of the previous elections (variable noted PREV)[24]. This variable thus translates the short-term electoral strength of the ruling majority ($\alpha_4 > 0$)[25].

The fifth variable is a partisan one which takes into account the persistence in the orientation of the vote (variable noted VPAR). Contrary to the previous variable, the VPAR variable translates the electoral medium-term strength of the ruling majority. When a department votes distinctly more for the current ruling majority in the previous legislative election, we may think

that it will vote in favour of the ruling majority in the following legislative election. We are then expecting a positive coefficient for VPAR: $\alpha_5 > 0$.

Finally, our sixth variable is supposed to take into account the influence on the vote of the electoral districts where the ruling majority is defeated after the first round (variable noted ELI). The coefficient of the variable ELI indicates that when the ruling majority is defeated in more electoral districts than the opposition, there is, obviously, a loss in vote for the ruling majority ($\alpha_6 < 0$).

On the other hand, we have the following seat-function:

$$Seats = f \text{ (vote, political factors)}$$

The number of seats is explained by the vote and political factors. More precisely, we suppose that the percentage of seats obtained by the parties of the ruling majority in the strict sense[26] in the department i in the elections at the date t ($SEATS_{it}$) is explained by two independent variables. The first variable is VOTE, as defined previously. The expected sign is positive since generally more votes lead to more seats ($\beta_1 > 0$). The second one, noted TRI, takes into account the extreme right-wing parties' power of nuisance on the moderate right-wing parties when there is a triangular contest. Indeed, we suppose that the extreme right-wing parties harm more in the moderate right-wing parties because a majority of extreme right-wing voters are closer to the moderate right-wing parties than to the left-wing ones. In a triangular contest between a left-wing candidate, a moderate right-wing candidate, and an extreme right-wing candidate, the vote for the whole Right is shared between the moderate right-wing candidate and the extreme right-wing candidate whereas when there is a classical opposition between a left-

wing candidate and a moderate right-wing candidate, a majority of extreme right-wing voters at the first round report their vote in favour of the moderate right-wing candidate at the second round. We are then expecting a negative sign for the coefficient of TRI ($\beta_2 < 0$)[27].

4. Estimation method, estimates' results and model's performances

When one wants to estimate a system of equations, one has to choose the estimation method. Since we estimate a system with an endogenous variable (VOTE in seat equation), we are inclined to move the OLS apart. Other methods are available like 2SLS, 3SLS or FIML. 3SLS provides more efficient estimates than 2SLS by taking into account the possibility of a correlation between the independent variables and the error terms. The choice between 3SLS and FIML is less clear. If FIML is efficient among all estimators, Greene (2000: 695) indicates "3SLS dominate FIML nonetheless". Due to these unclear prescriptions, we have chosen to present the estimates' results and to show the forecasting performances for the more efficient method, the FIML one.

As we estimate a pooled data model, we have to choose the correct specification between a model without effect, a model with fixed effects, or a model with random effects regarding the cross-sectional units. First of all, we have moved the random effects specification apart. As pointed out by Greene (2000: 567), random effects are appropriate in studies for which the sample is not composed of all the cross-sectional units. In our study, the set of cross-sectional units (the departments) is exhaustive. In over words, our study covers *all* the metropolitan French departments (96 units). So we can expect that a random effects specification is not necessary and that a fixed effects model or a model without effect is more appropriate. To choose between a

fixed effects model or a model without effect, we have performed a Fisher's test for each of the candidate methods we have retained (see Greene, 2000, for details on this test). The null hypothesis is, broadly speaking, "the model without effect is better". In our case, we conclude that the fixed effects model is preferable to the model without effect for the vote equation as for the seat equation[28].

The model to be estimated is then:

$$VOTE_{it} = c_i + \alpha_1 DGNP_t + \alpha_2 UNEM_{it} + \alpha_3 POP_t + \alpha_4 PREV_{it} + \alpha_5 VPAR_{it} + \alpha_6 ELI_{it} + \varepsilon_{it}$$

$$SEATS_{it} = d_i + \beta_1 VOTE_{it} + \beta_2 TRI_{it} + u_{it}$$

Our study concerns the 96 departments of metropolitan France over the period 1981-1997[29], that is five legislative elections: 1981, 1986, 1988, 1993, and 1997. The tables below show the estimated parameters of our two equations[30]:

[Table 2 about here]

[Table 3 about here]

The results of our estimation provide strong support for our model. The adjusted R-squared indicates that it accounts 93 % of the variance in the departmental vote and 66 % of the variance in the percentage of seats by department. All the coefficients have the expected sign and are significant at the 99 % confidence level[31]. Furthermore, the values of the Durbin-Watson statistics (DW) suggest that the residuals are not correlated at least for the vote equation[32].

The results of the vote estimate show that the vote in the legislative election for the ruling majority (in the large sense) depends partially on the national and local economic conditions. The coefficient of the variable DGDP suggests that if the economic growth during election year is superior by 1 point to what there was in the previous year, then the vote in the legislative election increases by 0.83 point. The coefficient of the variable UNEM indicates that if the growth rate of the job-seekers in a department decreases by 5 points then the departmental vote increases by 0.5 point. The vote in the legislative election also depends on political factors. The Prime Minister's popularity plays an important role. Indeed, an increase in the popularity ratio by 0.25 leads to an increase in the vote by 1.13 point. The outcomes of the preceding legislative elections have an influence on the current ones. The coefficient of the variable VPAR suggests that in a department with a vote 5 point higher than the national average at the previous legislative election, the gain in vote is equal to 1.55 point. The coefficient of the variable ELI indicates that when the ruling majority is defeated in 10 % of the electoral districts in a department, there is a loss in vote for the ruling majority by 2.9 points in this department.

The percentage of seats obtained by the ruling majority (in the strict sense) depends mainly on the percentage of vote obtained by the ruling majority (in the large sense). An increase by 1 point of the percentage of departmental vote leads to an increase by 1.89 point of the percentage of seats by department. The variable TRI plays also an important role: an increase by 50 % of the triangular contests with the Extreme Right in a department penalises the moderate Right by 6 points of vote in this department.

From the equations above, we can calculate, for the 96 departments of our sample, the *ex post* forecasts for the 1981, 1986, 1988, on 1993 and 1997 elections[33]. These forecasts allow to analyse the predictive capacity of the model by studying the forecasts in vote and in seats at the departmental and national levels.

The following table shows that for the departmental *ex post* forecasts in vote, the difference between the actual value and the predicted value is lower than 2 points in 60 % of departments and lower than 3 points in almost 80 % of departments[34].

[Table 4 about here]

The table is read as follows: in 1981, the model made a forecast error included between 0 and 1 point in 33 departments. We notice that, on our whole sample, the forecast error in vote is weak: 1.97 points on average for 480 forecasts[35].

For the *ex post* forecasts in seats at the local level, the mean absolute error is 0.48 seat by department[36]. The model makes a less-than-two-seats-error in near 95 % of departments.

[Table 5 about here]

In order to build forecasts at the national level, we compute the mean of the forecasts at the departmental level. Indeed, the table below shows that the figures are very close.

[Table 6 about here]

To check that the mean of the departmental vote and the national vote are not statistically different, we performed the Wijvekate's test resumed in Kanji (1993). Our conclusion is that the difference between the national vote and the mean departmental vote is not statistically significant at the 99 % confidence level. In other words, the mean of the departmental vote and the national vote are, statistically speaking, equal.

The table below gives, for 1981, 1986, 1988, 1993, and 1997, the national *ex post* forecasts in vote for the ruling majority:

[Table 7 about here]

 The errors are very low. The mean absolute error on five elections is less than 0.2 point. The national forecasts in seats are computed by summing the local forecasts in seats. The following table gives the national forecasts in seats for the five elections of our study.

[Table 8 about here]

We notice that by predicting the systematic defeat of the ruling majority, the model always gives the majority in the right way. The mean absolute error is 14.8 seats, essentially due to the strong error in 1988[37].

In 1997, before the first round, the model predicted *ex ante* 50.36 % for the whole Right and 254 or 241 seats for the moderate Right[38]. After the first round, it predicted *ex ante* 51.38 % for the whole Right and 249 seats for the moderate Right[39]. The actual figures were 51.97 % and 247 seats. The model caught a unique situation in the history of the fifth Republic: the whole Right was majority in vote but the moderate Right was minority in seats. It allows to think that the seat equation takes well into account the disruptive role of the extreme right-wing parties. The following table displays the *ex ante* forecast errors after the first round by departments (vote and seats).

[Table 9 about here]

As we can see, the mean absolute error in vote is lower than three points in more than half of departments and the mean absolute error in seats is lower than two seats in more than 80 % of departments. Even if the *ex ante* performances of the model are not as good as the *ex post* one, we can say that they are acceptable.

5. Behaviour of the model during the 2002 legislative election[40]

Before presenting the forecasts obtained from the model for the 2002 election, it is necessary to bring a precision on the variable PREV defined as the percentage of vote obtained by the ruling majority in the second round at the previous elections. The 2002 legislative election was preceded by the presidential election, election for which the ruling majority, the Left, was missing in the second round. To overcome this problem, we chose to retain the results of the first round[41].

The table below gives the forecast vote and the actual vote for the whole France (metropolitan France).

[Table 10 about here]

The table below gives the forecasts and the actual figures in seats for the whole France (metropolitan France). As for the 1997 election, to make forecasts before the first round, several scenarios were drawn concerning the presence of the Extreme Right in triangular contests in the second round. In the hypothesis 1, there are no triangular contests with the Extreme Right. In the hypothesis 2, the Extreme Right's presence is comparable to what it was in the 1997 legislative election[42]. Finally, in the hypothesis 3, the Extreme Right is present in the second round in 237

triangular contests. This scenario, built from the figures of the newspaper *Le Monde*[43], tries to redraw the ascent of the Extreme Right in the first round of the 2002 presidential election.

[Table 11 about here]

We notice that the majority in seats is clearly predicted (the moderate Right becomes sharply majority). After the first round, the model generates a perfect forecast in seats. In the evening of the first round, poll institutes gave ranges with the following average point: 154 for CSA, 155 for SOFRES, 167 for IPSOS[44]. So they quite underestimated the results of the Left whereas our model did not. Furthermore, the only other vote equation used to forecast the 2002 legislative election outcomes gave only 129 seats for the Left[45].

The following table resumes the preceding tables for the forecasts by department after the first round.

[Table 12 about here]

We notice that the model behaves *ex ante* as during the 1997 election in vote but the errors in seats are more sensitive with an error larger than one seat in about a third part of departments and a mean error of 1.31 seats by department. We are clearly in a scenario where the forecast errors by department counterbalanced to give a national forecast close to the actual value.

The tables below show the estimated parameters of our two updated equations.

[Table 13 about here]

[Table 14 about here]

The quality of the estimate is always good[46]. We can simply notice that the adjusted R-squared of the seat-function has decreased a little bit. However, the coefficients of the independent variables are rather stable. This is particularly satisfactory regarding the seat-function because of the big variability of the number of triangular contests with the Extreme Right from an election to another one[47].

The following tables show the *ex post* performances of the model in vote and seats.

[Table 15 about here]

[Table 16 about here]

As we can see, the *ex post* forecast error in vote for the 2002 legislative election is the largest of the sample (3.01 points). Similar finding applies to the *ex post* performances in seats.

6. Conclusion

The national and local economic situation plays an important role on the outcomes of the French legislative elections. In our model, the national economic conditions are taken into account by the real growth of the GDP while the departmental economic conditions are integrated in a relative way by the growth rate of the number of job-seekers (in every department). The national and local economic conditions are also included in political variables as the popularity of the Prime Minister and the outcomes of the previous elections.

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This model seems to be very accurate in forecasting *ex post* as well as *ex ante* elections' outcomes. This is particularly true for the 2002 legislative election when the model has supplanted all other forecasting instruments (other vote-functions as well as vote intention polls). This good behaviour does not prevent us from finding some improvements. Future researches may focus on the seat-function which is clearly the weak part of our model (its adjusted R-squared is not very high and the estimate leads large *ex ante* errors by department). The relationship between vote and seats is probably not linear: in an electoral district, if you obtain 51 % of the vote or 80 % of the vote, you still obtain one seat. Another track is to look more precisely at the 1986 election. For this election, we have to pay more attention to the modelling of the Extreme Right's power of nuisance. A last way is to take into account more precisely some local specificities as for example the electoral heterogeneousness within some departments.

Notes

[1] See Lewis-Beck and Stegmaier (2000) for a survey on economic determinants of electoral outcomes.

[2] And also in the seat-function for parliamentary elections.

[3] For a survey on the early vote-functions in France, see Dubois (2003) (in French).

[4] France is subdivided in regions, each of them subdivided in several departments. Each department is composed by several electoral districts. There are 22 regions, 96 departments and 555 electoral districts in metropolitan France.

[5] See Lafay (1993). We note that the actual value given here and thereafter depends on author's personal computation and then may differ in a study from each other.

[6] See Lafay (1998).

[7] The building of the ideology and instability variables raises questions because all the elections' outcomes over the period 1973-1993 are used to construct these variables for each election.

[8] We can criticise the construction of the variable taking into account the force of the "Front National" because this variable is built with electoral outcomes over the period 1986-1993. Furthermore, the authors do not make the

distinction between ruling left-wing majority and ruling right-wing one while the "Front National" harms more in the moderate Right than in the Left.

[9] This model contains another equation explaining simultaneously to the vote the rate of turnout in the elections.

[10] In this survey, we have only considered models for legislative elections (except Fauvelle-Aymar *et al.*, 2002 which include legislative elections among different types of elections).

[11] For a comparison between national, regional and departmental models, see Dubois and Fauvelle-Aymar (2003).

[12] The figures are from *Institut National de la Statistique et des Etudes Economiques*.

[13] 555 in metropolitan France and 22 for the overseas departments and territories.

[14] This political configuration, also called "dual executive", is close to the divided government one in the United States.

[15] It means that voters have to vote for a candidate and not for several candidates or for a list.

[16] It was a ballot in one round with several lists of candidates in every department.

[17] The senators are indirectly elected in every department for nine years and renewed by third every three years.

[18] See appendix 1 for the signification of the acronyms used in this section.

[19] The UDF was formed by the centrists and the liberals. Before the 2002 election, a part of centrists, the liberals, and the RPR grouped together to form a new party, the UMP.

[20] Precise definition and descriptive statistics of the variables and sources of the data are shown in appendixes 2 and 3.

[21] In the French electoral system, legislative elections take place as follows: in each electoral district, the candidate who obtains more than 50 % of vote in the first round is elected. If no candidate obtains more than 50 % of vote in the first round, there is a second round with candidates who have obtained at least 12.5 % of the registered voters in the first round. The candidate who obtains the biggest share of vote is elected. To take into account the fact that you can be elected either in the first round or in the second one, we have chosen to retain, for each department, the sum of vote in the first round in electoral districts where the representative was elected in the first round and of vote in the second round in electoral districts where the representative was elected in the second round.

[22] "Large sense" means whole Right (that is moderate right-wing parties plus extreme right-wing ones) when Right is ruling. The converse is "strict sense" that means only moderate Right when Right is ruling.

[23] Considering the definition of our dependent variable, the model partially attributes the economic assessment to the extreme right-wing parties when the whole Right is ruling while the extreme right-wing parties do not govern. A possible justification is that voters tend to vote more likely for the extreme right-wing parties when the ruling majority presents a bad assessment (and conversely) but that they remain generally closer to the moderate right-wing parties than to the left-wing ones. An estimate of the percentage of vote obtained by the ruling majority in the strict sense shows that voters grant less importance for the economic conditions.

[24] Whatever is their type: cantonal, regional, etc. Here, it is only about presidential or cantonal elections. The municipal elections were put apart because of their high specificity (important local dimension, problems of aggregation of the data).

[25] It may seem debatable in the case of the 1997 legislative election, preceded by the 1995 presidential election which holds two years previously. However we shall note that it is the only case in the five elections of our sample that the preceding elections didn't announce the future change of majority.

[26] The extreme right-wing deputies are not a part of the ruling majority formed by the parties of the moderate Right.

[27] According to the definition of this variable, the influence is negative if the moderate Right is the ruling majority and positive if the Left is the ruling majority.

[28] For the vote equation, the R-squared of the without effect model and the R-squared of the fixed effects model are respectively 0.89 and 0.93, which leads to a Fisher statistics of 1.73. For the seat equation, the R-squared of the without effect model and the R-squared of the fixed effects model are respectively 0.52 and 0.73, which leads to a Fisher statistics of 2.33. So in both cases, we can reject the null hypothesis since the critical value is 1.30 at 5 %.

[29] We have excluded overseas departments and territories because of the lack of local economic data before 1986.

[30] The 96 values of $\hat{c}_i$ and $\hat{d}_i$ are not reproduced here and are available on request. Notice that estimations with other methods (OLS, 2SLS, 3SLS) lead to very close outputs (available on request too).

[31] We checked the normality of the residuals by performing the Jarque-Bera test. The null hypothesis is: "the residuals are normally distributed". Under the null, the Jarque-Bera statistic has a Chi-square distribution with two degrees of freedom. Performed on stacked data with no panel dimension, the value of the Jarque-Bera statistics is 3.52 for the vote equation and 4.50 for the seat equation. Since the critical value is 5.99 at 5 %, the Jarque-Bera test leads to the acceptance of the null in both cases. Computed for each of our cross-sectional units, the Jarque-Bera

statistic never exceeds 1.56 for the vote equation and 1.65 for the seat equation (not reported here, available upon request). So normality is accepted in each case.

[32] For samples as ours, the lower bond (dL) is 1.76 and the upper bound (dU) is 1.94 at 5 %. So the Durbin-Watson statistics lies in an inconclusive region (between dL and dU) for the seat equation. For the vote equation, we can accept the null hypothesis of no correlation in the residuals since the statistics lies between dU and 4-dU.

[33] An *ex post* forecast is computed on the basis of the estimated coefficients for the whole sample whereas an *ex ante* forecast is computed from the estimated coefficients for a reduced sample including all the preceding elections and by using only the data available at the moment the forecast is made.

[34] In this table as in the followings, we report only the MAE because this indicator of accuracy is more tractable since it can be directly interpreted in point of vote or in seats. Moreover, when the predicted values were below 0 or up to 100, we have retained 0 and 100. This explains the difference between the MAE reported in table 2 (computed with the residuals) and the MAE reported in table 4.

[35] Estimates obtained with alternative methods (OLS, 2SLS, 3SLS) lead to similar forecasts. Same feature applies for the forecasts in seats.

[36] For the seats, we have computed the forecasts directly in seats and not in percentage of seats. Moreover, the same remarks as stated in note 34 apply.

[37] For this election, we notice that in the departments where the *ex post* forecast errors are the most important (two seats or more), the results in several electoral districts were closed in favour of the ruling majority: Loire-Atlantique, Moselle, Paris, and Hauts-de-Seine. In these departments, we can also notice that there were at least one electoral district very much in favour of the ruling majority and one electoral district very much in favour of the opposition. With a simple fictive example, it is easy to see how this configuration can lead to different outcomes. In a department where there are five electoral districts with respectively 32 %, 51.5 %, 51 %, 50.5 %, and 60 % in vote, the outcome is four seats for the incumbent majority. But, with a mean of 49 % at the departmental level, the forecast could be two seats according to the coefficients of the seat equation. There were also local agreements between the moderate Right and the National Front which could favour the moderate Right in two departments (Alpes-Maritimes, Var).

[38] Since the number of triangular contests is unknown before the first round, we draw two scenarios. In the hypothesis 1, there are no triangular contests with the Extreme Right. In the hypothesis 2, the presence of the Extreme Right is comparable to what it was in the 1993 legislative election.

[39] As a comparison, in the evening of the first round, the institute BVA forecasted, for metropolitan France, 260 seats for the right-wing parties. It was an average point and the range was 250-270.

[40] Quasi identical forecasts to those presented in this section were available before the ballot on the website www.previsions-elections.com .

[41] Were classified to the Left: O. Besancenot, J.-P. Chevènement, D. Gluckstein, R. Hue, L. Jospin, A. Laguiller, N. Mamère and C. Taubira. Were classified to the Right: F. Bayrou, C. Boutin, J. Chirac, C. Lepage, A. Madelin, B. Mégret, J. Saint-Josse and J.-M. Le Pen. This classification can be discussed, notably as regards J-P. Chevènement and J. Saint-Josse.

[42] 76 triangular contests.

[43] P. Roger: "Comment le FN peut faire chuter la droite aux législatives", in May 9th, 2002, p 8-9. Let us note that in this article, 237 corresponds to the electoral districts in which the Extreme Right could be present in the second round (triangular contests or duels).

[44] Ranges were the following ones: 135-175 for SOFRES, 141-192 for IPSOS and 127-181 for CSA. In these forecasts, it was again necessary to remove several seats because these forecasts included the overseas departments and territories.

[45] This forecast was available three weeks before the second round on the website www.lexpansion.com. See Jérôme *et al.* (2003) for a presentation of this model.

[46] Regarding the normality of the residuals, even though the Jarque-Bera statistics is still not significative when the test is performed in each of cross-sectional unit, we have to precise that it is no longer the case when the stacked data sample is used (for the vote as for the seats). We have then to be cautious by interpreting the results. The explanation lies in the presence of one large error up to ten points which increases the skewness and the kurtosis and consequently raises the Jarque-Bera statistics. This large error occurs in Haute-Corse and it may be explained by the political context in Corsica and particularly the so-called "processus de Matignon".

[47] 0 in 1981, 4 in 1988, 14 in 1993, 76 in 1997, 9 in 2002.

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Appendix 1. List of the main French political parties (1981-2002)

PS : Parti Socialiste (Socialist Party)

PC : Parti Communiste (Communist Party)

Les Verts (The Greens)

UDF : Union pour la Démocratie Française (Union for French Democracy)

RPR : Rassemblement Pour la République (Rally for the Republic)

UMP : Union pour un Mouvement Populaire (Union for a Popular Movement)

FN : Front National (National Front)

Appendix 2. Definitions of variables and sources of the data

Variable	Definition and source
VOTE	Share of vote received at the first or the second round by the political parties of the ruling majority in the large sense *Ministère de l'Intérieur*
DGNP	Difference between the rate of real growth of GDP in the election year (expected in December of the year preceding the election year) and the rate of real growth of GDP in the year preceding the election year *OECD –Economic Outlook*
UNEM	Difference between the growth rate of the number of job-seekers at the departmental level and at the national level over three months, two months before the elections *DARES – Bulletin Mensuel des Statistiques du Travail* (monthly data) Note : The miss of data published between June 1995 and November 1996 prevents the consideration of a growth over a period longer than three months
POP	Prime Minister's popularity: percentage of people relying on the Prime Minister / percentage of people not relying on the Prime Minister in the last survey published before the elections SOFRES - *Le Figaro Magazine*
PREV	Percentage of vote received by the ruling majority (in the large sense) at the elections preceding the legislative election *Ministère de l'Intérieur*
VPAR	Difference between the local vote and the national vote for the parties of the ruling majority in the large sense at the previous legislative election *Ministère de l'Intérieur*
ELI	Difference between the percentage of electoral districts where the ruling majority is defeated and the percentage of electoral districts where the opposition is defeated *Ministère de l'Intérieur*
SEATS	Percentage of seats obtained by the parties of the ruling majority in the strict sense *Ministère de l'Intérieur*
TRI	Percentage of electoral districts in every department where there is a "triangular contest" with a candidate of an extreme right-wing party multiplied by a dummy variable equal to 1 when the right-wing parties are ruling, and -1 otherwise. For the 1986 election, we chose to normalise the variable TRI with -100 % for all the departments because we can consider that the Extreme Right damaged more the moderate Right than the Left in all the departments because there was only one round. *Ministère de l'Intérieur*

Appendix 3. Descriptive statistics of variables (1981-1997)

Variable	No. obs.	Mean	Std. Dev.	Min	Max
VOTE	480	45.15	10.43	0.00	91.66
DGNP	480	0.60	0.94	-0.60	2.20
UNEM	480	-0.90	8.75	-27.04	19.21
POP	480	0.68	0.27	0.36	1.02
PREV	480	45.05	8.42	11.10	65.48
VPAR	480	0.05	8.20	-31.95	35.63
ELI	480	4.23	16.80	-88.89	100.00
SEATS	480	34.40	29.01	0.00	100.00
TRI	480	-17.75	42.61	-100.00	100.00

Table 1. Legislative elections and parties in government

Date of elections	Winning party or coalition	Seat share in National Assembly (%)
14-21 June 1981	PS + PC	67.8
16 March 1986	UDF + RPR	50.4
5-12 June 1988	PS	48.5
21-28 March 1993	UDF + RPR	83.9
25 May-1 June 1997	PS + PC + Verts	55.5
9-16 June 2002	UMP + UDF	69.2

Source: Lancelot (1998). The figures of the seats share are for the whole France.

Table 2. Estimates of VOTE (1981-1997)

Variable	Coefficient (t-statistics)
DGNP	0.83
	(3.45)***
UNEM	-0.10
	(-3.52)***
POP	4.50
	(5.18)***
PREV	0.53
	(16.27)***
VPAR	0.31
	(12.31)***
ELI	-0.29
	(-23.02)***
N	480
Adj. R²	0.93
DW	1.95
SER	2.83
RMSE	2.51
MAE	1.97
Thiel's Inequality Coef.	0.03

*** Significant at 0.01 level.
** Significant at 0.05 level.
* Significant at 0.10 level.

Table 3. Estimates of SEATS (1981-1997)

Variable	Coefficient (t-statistics)
VOTE	1.89
	(29.26)***
TRI	-0.12
	(-4.81)***
N	480
Adj. R²	0.66
DW	1.88
SER	16.90
RMSE	15.06
MAE	11.85
Thiel's Inequality Coef.	0.17

*** Significant at 0.01 level.
** Significant at 0.05 level.
* Significant at 0.10 level.

Table 4. Forecast errors in vote 1981-1997

Election	0-1 point	1-2 points	2-3 points	> 3 points	MAE
1981	33	32	15	16	1.78
1986	31	20	23	22	2.12
1988	37	29	17	13	1.60
1993	29	27	12	28	2.09
1997	27	23	19	27	2.25
Total	157	131	86	106	1.97

Table 5. Forecast errors in seats 1981-1997

Election	0 seat	1 seat	> 1 seat	MAE
1981	57	39	0	0.41
1986	53	39	4	0.49
1988	66	24	6	0.38
1993	55	35	6	0.55
1997	51	35	10	0.59
Total	282	172	26	0.48

Table 6. Mean of the departmental vote and national vote

Election	Mean of the departmental vote	National vote
1981	44.45	44.46
1986	45.38	45.30
1988	49.60	49.34
1993	34.88	35.60
1997	51.74	51.97

Table 7. National forecast in vote 1981-1997

Election	Predicted value	Actual value	Error
1981	44.41	44.46	0.05
1986	45.12	45.30	0.18
1988	49.23	49.34	0.11
1993	35.48	35.60	0.12
1997	51.57	51.97	0.40

Table 8. National forecast in seats 1981-1997

Election	Predited value	Actual value	Error
1981	162	151	11
1986	262	245	17
1988	230	262	32
1993	93	82	11
1997	244	247	3

Table 9. Ex ante forecast errors for 1997

Vote	0-1 point	1-2 points	2-3 points	> 3 points	MAE
	15	22	13	46	3.24

Seats	0 seat	1 seat	> 1 seat	MAE
	46	34	16	0.71

Table 10. Ex ante national forecast for 2002 (vote)

	Forecast	Actual	Error
Before the first round	44.04	44.15	0.11
After the first round	42.98	44.15	1.17

Table 11. Ex ante national forecast for 2002 (seats)

	Forecast	Actual	Error
before the first round			
scenario 1	183	171	12
scenario 2	191	171	20
scenario 3	211	171	40
after the first round	171	171	0

Table 12. Ex ante forecast errors for 2002

Vote	0-1 point	1-2 points	2-3 points	> 3 points	MAE
	13	20	14	49	3.74

Seats	0 seat	1 seat	> 1 seat	MAE
	25	36	35	1.31

Table 13. Estimates of VOTE (1981-2002)

Variable	Coefficient (t-statistics)
DGNP	0.63 (2.58)***
UNEM	-0.11 (-4.59)***
POP	4.12 (4.21)***
PREV	0.44 (14.85)***
VPAR	0.35 (15.45)***
ELI	-0.32 (-28.89)***
N	576
Adj. R²	0.90
DW	1.87
SER	3.23
RMSE	2.93
MAE	2.24
Thiel's Inequality Coef.	0.03

*** Significant at 0.01 level.

**   Significant at 0.05 level.

*   Significant at 0.10 level.

Table 14. Estimates of SEATS (1981-2002)

Variable	Coeffcient (t-statistics)
VOTE	1.95
	(28.32)***
TRI	-0.13
	(-4.08)***
N	576
Adj. R²	0.58
DW	1.93
SER	19.06
RMSE	17.34
MAE	13.69
Thiel's Inequality Coef.	0.20

*** Significant at 0.01 level.
** Significant at 0.05 level.
* Significant at 0.10 level.

Table 15. Ex post performances of the model in vote (1981-2002)

Election	Predited value	Actual value	Error 0-1 point	Error 1-2 points	Error 2-3 points	Error > 3 points	MAE
1981	44.74	44.46	36	24	15	21	1.94
1986	45.65	45.30	30	20	18	28	2.17
1988	48.96	49.34	39	23	13	21	1.76
1993	35.46	35.60	31	23	13	29	2.19
1997	51.58	51.97	24	30	16	26	2.31
2002	43.58	44.15	15	25	18	38	3.01

Table 16. Ex post performances of the model in seats (1981-2002)

Election	Predited value	Actual value	Error 0 seat	Error 1 seat	Error > 1 seat	MAE
1981	162	151	53	41	2	0.47
1986	258	245	61	31	4	0.41
1988	233	262	55	33	8	0.51
1993	95	82	53	37	6	0.57
1997	245	247	42	41	13	0.71
2002	177	171	38	41	17	0.85