A Simple Politico-Economic Model to Predict Vote and Growth in France

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Abstract: This paper tries to answer, at least partially, to the striking following question: why are OECD's forecasts concerning the French GDP growth so poor? I think that the origin of these weak forecasting performances lies in the omission of political factors. To test this hypothesis, I built a politico-economic model that takes into account the possibility that an alesinian partisan cycle occurs. This model consists in two main equations: a growth equation that explains the evolution of GDP since the beginning of the 80's and a vote equation that explains the vote for the incumbent majority at legislative elections since the late 50's. Simulations of the model for 2002 and 2003 show that this simple model outperforms the OECD forecasts.

Keywords: politico-economic model, partisan electoral cycle, GDP forecast, vote function.

JEL Classification: C32, C53, D72, E32, E37, N14.

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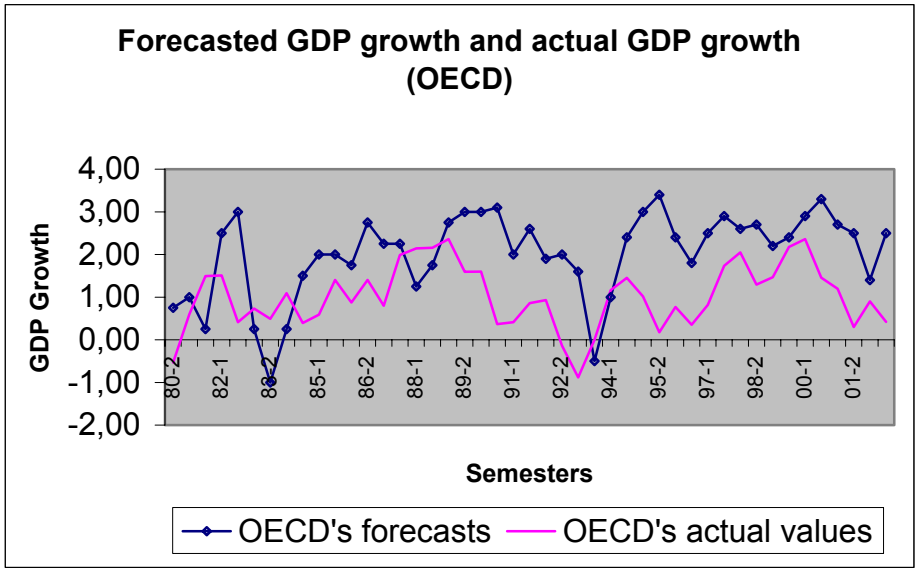
Section 1. Introduction: some stylized facts

The graph below represents the semi-annual forecasts of French GDP by the OECD and the actual figures between 1980(2) and 2002 (2)[1].



As one can see, the errors are large. The absolute mean error (AME) is 1.03 point for 45 predictions. I think that these errors can be partly explained by the negligence of political factors. In particular, one can see in the table below that something happens the year following a legislative elections year.

Table 1. GDP Growth in France and in the European Union, various years

	France	European Union	Sign of the difference	Majority
1982	2,48	0,86	+	Left
1987	2,53	2,75	-	Right
1989	4,26	3,60	+	Left
1994	1,88	2,79	-	Right
1998	3,53	2,89	+	Left

The growth differential is positive when the Left wins the elections and negative when the Right wins the elections. This feature reminds us immediately an alesinian partisan cycle. In his paper of 1989, Alberto Alesina quotes France as "particularly suggestive of the rational partisan theory"[2]. To investigate this lead, I have built a politico-economic model. The framework of this model is close to the Alesina, Londregan and Rosenthal (1993)'s one. In

[1] The OECD forecasts that I have retained are published by *Economic Outlook* the half-year before.
[2] Alesina (1989: 71). He refers to the Socialist period of 1981-1983.

this paper, they construct three equations: a growth equation that link GNP to partisan effect and military mobilization, a vote equation that link presidential vote to GNP, legislative vote, partisan dummy and military mobilization and a vote equation that link legislative vote to GNP, presidential vote, partisan dummy and military mobilization. This model was theoretically and empirically attractive but it was not very accurate in forecasting uses[3]. To improve the quality of the forecast, more attention is paid in my model on the vote equation as one will see later.

Section 2 presents the growth equation and section 3 deals with vote equation. Section 4 shows a simulation of the model on the recent past years and section 5 concludes.

Section 2. The Growth equation

2.1. Theoretical background: the alesinian framework

I chose to retain a simple version of the Alesina's model but I have improved the original model by introducing a third actor, the Central Bank. I will later explain this choice.

The model covers two periods, *t* et *t+1* ; elections hold at the beginning of the period *t*. The economy is described by the following supply function:

$$Y_t = \overline{Y} + \gamma(\pi_t - w_t) \qquad (1)$$

where Y_t is the rate of growth of GDP at time *t*, $\overline{Y}$ is the natural rate of growth (equilibrium supply level or long-term supply level) ; π_t is the inflation rate at time *t* and w_t is the rate of growth of nominal wage. γ is a positive parameter. The wages are set to maintain constant the purchasing power of the workers:

$$w_t = \pi_t^e \qquad (2)$$

where π_t^e is the expected inflation rate at the beginning of period *t*.

I suppose that there are three agents: a left-wing party (L), a right-wing party (R) and a Central Bank (CB). A loss function describes the preferences of the agents over GDP and inflation. Agent *i*'s loss function in each period is defined as follows:

$$L^i = \frac{1}{2}\left[(Y^* - Y_t)^2 + m_i \pi_t^2\right] \qquad (3)$$

[3] Alesina, Londregan and Rosenthal (1996) predict a close ballot for the 1996 elections whereas the actual vote in favour of Bill Clinton was 54.65 % of the two-party vote. However, Alesina, Londregan and Rosenthal (1996) don't use the original equations of Alesina, Londregan and Rosenthal (1993), but simpler ones.

with i = L, R, CB. Y* is the target level of GDP that can be assimilated to a full-employment supply level. I suppose:

$$a = Y^* - \overline{Y} \text{ with } a > 0 \qquad (4)$$

That is, at the equilibrium, there is natural unemployment (under-employment situation). m_i is a parameter that expresses the penalty for inflation. One has:

$$m_i > 0, \forall\, i$$

and $$m_L < m_R < m_{CB}$$

This late hypothesis tells us that the penalty for inflation is stronger for the right-wing party than for the left-wing party. The argument usually used to justify this assumption is that there are more pensioners and more capital holders among the righ-wing electorate. Then parties have not the same inflation-unemployment trade-off. Moreover, the Central Bank is supposed to be more conservative than the right-wing party.

Proportions of the voters that belong to one or the other party are random therefore one does not know the outcome of the elections before they hold. One can compute probability by using vote intentions polls. Let's take P the probability, defined before the elections, that the left-wing party wins the election at time t. $(1 - P)$ is the probability that the right-wing party wins the election at time t.

The control variable is the inflation rate. In a monetarist view, the inflation level is supposed to be linked to the money growth (see Alesina (1988), 18). Monetary policy is conducted by the Central Bank that is characterized by a independence index θ with $0 \le \theta \le 1$. For $\theta = 1$, the Central Bank is totally independent. For $\theta = 0$, the Central Bank implements without any restriction the government's policy. The newly elected party notifies the Central Bank about the inflation rate it wants. According to its independence index, the Central Bank answers favorably or not. I have introduced this innovation into the original Alesina's model to make the model consistent with the current organization of the monetary policy in the European Union.

By combining the relations (1), (2) and (4), I obtain:

$$Y^* - Y_t = a - \gamma\pi_t + \gamma\pi_t^e \qquad (5)$$

Each agent wants to minimize ist loss function (3). After using relation (5), the resolution leads to the prefered inflation rate of agent i at period t:

$$\pi_t^i = \frac{\gamma a + \gamma^2 \pi_t^e}{\gamma^2 + m_i} \qquad i = \text{L, R, CB.} \qquad (6)$$

As $m_{CB} > m_R > m_L$, one has $\pi_t^L > \pi_t^R > \pi_t^{CB}$. The prefered inflation rate of the left-wing parties is higher than the prefered inflation rate of the right-wing parties that is itself higher than the prefered inflation rate of the Central Bank.

Let's define $(\pi_t^j)^*$ the inflation rate effectively implemented by the Central Bank at time *t* when the party *j* wins the elections. I suppose:

$$(\pi_t^j)^* = \theta \pi_t^{CB} + (1-\theta)\pi_t^j \qquad j = \text{L, R.} \qquad (7)$$

where π_t^j is the wished inflation rate of the party *j* when it wins the elections.

For the elections years, expectations regarding the inflation rate are set by the agents in the following way:

$$E\left[(\pi_t^j)^*\right] = p \cdot \left[(\pi_t^L)^*\right] + (1-p) \cdot \left[(\pi_t^R)^*\right] \qquad j = \text{L, R.} \qquad (8)$$

This formula expresses the uncertainty about the elections' outcome. Expectations are rational since the agents use all the available information to form their expectations. By combining (7) and (8), one obtains the expected inflation rate:

$$E\left[(\pi_t^j)^*\right] = \theta \pi_t^{CB} + (1-\theta)\left[p \cdot \pi_t^L + (1-p) \cdot \pi_t^R\right] \qquad j = \text{L, R.} \qquad (9)$$

By introducing this expression in the supply function (1), one obtains the supply levels according to the party in office after the elections:

$$Y_t^L = \bar{Y} + \gamma\,(1-\theta)\,(1-P)\,(\pi_t^L - \pi_t^R) \qquad \text{(left-wing parties elected)} \qquad (10)$$

$$Y_t^R = \bar{Y} + \gamma\,(1-\theta)\,P\,(\pi_t^R - \pi_t^L) \qquad \text{(right-wing parties elected)} \qquad (11)$$

For $\theta = 1$, one has $Y_t^L = \bar{Y}$ if left-wing parties are in office and $Y_t^R = \bar{Y}$ if right-wing parties are in office. Then, when the Central Bank is totally independent, the alesinian partisan cycle vanishes.

For $\theta \neq 1$, one has the well-known results of Alesina (1987):

- As $\pi_t^L > \pi_t^e > \pi_t^R$, one has $Y_t^L > \bar{Y}$: when left-wing parties are elected, there is an expansion in the first period.
- As $\pi_t^L > \pi_t^e > \pi_t^R$, one has $Y_t^R < \bar{Y}$: when right-wing parties are elected, there is a recession in the first period.

For the period without elections (the second period), one has:

$$Y_{t+1}^i = \bar{Y} + \gamma\,(\pi_{t+1}^i - \pi_{t+1}^e) \qquad (12)$$

As there is no longer uncertainty about the elections outcomes (no elections in the second period), the expectations are set as follow: $\pi_{t+1}^e = \pi_{t+1}^i$. Then one obtains: $Y_{t+1}^i = \bar{Y}$. There is no longer any inflationary shock.

The main conclusion of this simple model is that only a *totally* independent Central Bank can eliminate partisan political cycles. Lossani, Natale and Tirelli (2000) lead to the same result[4].

Is the European Central Bank (ECB) totally independent? Eijffinger and De Haan (1996) have computed some independence indexes for the ECB.

Table 2. Some independence indexes for the ECB

	Independence index			
	Alesina	Grilli, Masciandaro, Tabellini	Eijffinger-Schaling	Cukierman
Maximum	4	16	5	1
ECB	4	14	5	0,94

A Central Bank is totally independent when its independence index is maximum. As one can see, according to the measure selected, the ECB can be either totally independent, or not.

To conclude this section, one have mentioned that the inflation in the Alesina's model has a monetary origin. One can think that there are other sources of inflation and that the government can drive them: budgetary deficit, public wages, minimum wage…

2.2. The empirical model

The basic idea behind the empirical model I have retained is that the French GDP growth is more or less the foreign one. "More or less" corresponds to the effects of the policies that are implemented by the French government.

The dependent variable is the rate of real growth of the French GDP [5] ($SEM\_GDP\_FR_t$). To take into account the foreign growth, I chose the European Union (15 countries) GDP growth (variable noted $SEM\_GDP\_AREA_t$). I think that it is a better measure of the international environment for France than the GDP of G7 or than the GDP of OCDE. Indeed, the economies of the countries forming this area are quite similar to the French economy[6].

The semi-annual model to be estimated is:

[4] The empirical works of Way (2000) and Maloney *et al.* (2003) lead to the conclusion that Central Bank independence reduces partisan effects.
[5] at the 1995 prices.
[6] The limit of using this kind of variables is that French GDP represents a large part of the European Union's GDP.

$$SEM\_GDP\_FR_t = \alpha_0 + \alpha_1 SEM\_GDP\_AREA_t + \alpha_2 LEFT_t + \alpha_3 RIGHT_t + \varepsilon_{1t}$$

$LEFT_t$ and $RIGHT_t$ are dummy variables that take into account partisan effects. They are built as follow:

$$LEFT_t = \begin{cases} 1 \text{ in the 2 half} - \text{years following the elections of a left} - \text{wing majority} \\ 0 \text{ otherwise} \end{cases}$$

$$RIGHT_t = \begin{cases} 1 \text{ in the 2 half} - \text{years following the elections of a right} - \text{wing majority} \\ 0 \text{ otherwise} \end{cases}$$

Since, in France, elections hold in the first or in the second quarter, I adopt the following rule:
- if the election ballot holds in the first quarter, the partisan dummy variables begins in the first half-year.
- if the election ballot holds in the second quarter, the partisan dummy variables begins in the second half-year.

Following the results of the theoretical model, one expects a positive sign for $LEFT_t$ and a negative sign for $RIGHT_t$.

Before to estimate the model, one has to check the stationarity of the data. I have performed the augmented Dickey-Fuller test. The table below summarizes the results:

Table 3. Augmented Dickey-Fuller test, SEM_GDP_FR series

Specification	ADF Test Statistic	Critical value 5%
intercept, no trend	-3,50	-2,92
trend and intercept	-3,45	-3,50
no trend, no intercept	-2,08	-1,95

One obtains somewhat mixed results but the SEM_GDP_FR series seems to be stationary at the 5 % level.

Here are the estimates on the period 1978(2)-2003(1):

$$SEM\_GDP\_FR_t = \underset{(1.34)}{0.16} + \underset{(8.61)}{0.76} SEM\_GDP\_AREA_t + \underset{(3.06)}{0.53} LEFT_t - \underset{(-2.15)}{0.38} RIGHT_t + e_{1t}$$

with an AR(1) specification for the residuals :

$$e_{1t} = 0.29 e_{1t-1} + u_{1t}$$

(2.05)

Adj. $R^2 = 0.78$, N = 49, $Q_{u1t}(47) = 29.01$, $Q_{u_{1t}^2}(47) = 36.89$.

The Chi-squared value given by the table for 47 lags is 63.72 (at the 5 % level). Hence, one cannot reject the hypothesis of non correlation of the residuals and of non correlation of the squared-residuals[7].

To see the accuracy of this model, I now examine the *ex post* and the *ex ante* forecasts[8]. The table below reports the absolute mean error for the 48 *ex post* predictions.

Table 4. Ex post forecasts: 1978(2)-2003(1)

	Politico-economic model
AME	0,30

As one can see, the AME is low: about 0.3 point for 48 predictions. The table shows values for selected recent half-years:

Table 5. Ex post forecasts: 2000(1)-2002(2)

	Forecasted values	Actual values
2000(1)	1,89	2,36
2000(2)	1,24	1,45
2001(1)	1,05	1,20
2001(2)	0,49	0,30
2002(1)	0,62	0,90
2002(2)	0,34	0,42

One can then compute annual *ex post* forecast[9]. One obtains:

Table 6. Ex post forecasts: 2000-2002

	Forecasted values	Actual values
2000	3,44	4,21
2001	1,92	2,08
2002	1,04	1,26

[7] The rejection of the late hypothesis indicates the absence of GARCH phenomenon. I will not comment these statistics in the rest of the paper unless they imply a more detailed modeling.
[8] 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.
[9] See the formula in the appendix.

Let's turn to *ex ante* predictions now. I retain the sub-sample 99(2)-03(1) because for these half-years, the predictions of the model are directly comparable with the OECD forecasts[10]. As our model makes prediction for 1 half-year ahead, I have reported the OECD forecasts made one half-year before.

Table 7. Ex ante forecasts: 1999(2)-2003(1)

Semesters	Politico-economic model	OECD 1 half-year before	Actual figures
99(2)	1,66	3,20	2,18
00(1)	1,72	3,90	2,36
00(2)	1,01	3,10	1,45
01(1)	1,05	2,60	1,20
01(2)	0,51	0,80	0,30
02(1)	0,61	1,10	0,90
02(2)	0,35	1,60	0,42
03(1)	-0,02	1,80	-0,21
AME	0,31	1,19	-

The politico-economic model's absolute mean error is about one fourth of the OECD one.

One can't compute annual *ex ante* forecasts with these figures because to predict growth for the next half-year, saying 2002(2), I supposed that the previous half-year growth is known, saying 2002(1). These are predictions one half-year ahead. To compute annual *ex ante* forecasts, I need to draw prediction three half-years ahead since three half-years growth rates are needed to compute one annual growth rates.

The table below shows annual *ex ante* forecasts for 2000, 2001, and 2002[11].

Table 8. Annual ex ante forecasts: 2000-2002

Year	Politico-economic model forecast	OECD forecast	Actual figure
2000	3,04	2,60	4,21
2001	1,60	2,90	2,08
2002	1,09	2,70	1,26
AME	0,61	1,29	-

With an AME two times less large, the model clearly outperforms the OECD's.

The limit is that *ex ante* forecasts of the model are not "pure" *ex ante* forecasts. Indeed, I have supposed that the area GDP growth rates are perfectly anticipated. In other words, I have

[10] For this period, the basis is the same (1995).

[11] The OECD's forecast is the one provided in the first issue of *Economic Outlook* published the year before the year to predict. For example, for 2000, the issue of June 1999 was used. These data are comparable with the forecasts of the politico-economic model since the prediction for 2000 is computer in the first half-year of 1999.

used the real value of the European Union GDP to make my forecasts. One solution is to model the area GDP to forecast it. A second solution is to take another forecast. Of course, if one wants to use the OECD one, one has to check that the forecasts are much more precise than for the French GDP growth.

Section 3. Vote equation

3.1. Theory of voting behavior

I suppose that the 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, I suppose that the voters take into account the recent results of the economic policy led by the government. The voters have then a retrospective behavior.

3.2. Survey on French electoral forecasting models

Contrary to Alesina, Londregan and Rosenthal (1993)'s work, I have built only one vote equation. I have chosen only to focus on legislative elections. The presidential vote equation will be added later.

As the growth equation above use data at the national level, I focus here on a vote equation that explains and forecasts electoral results at the national level[12].

Vote equations have been developed in France since the middle of the 70's. Models constructed in the first ten years (1976-1985) apply the methodology of Kramer (1971) to the French case. The weakness of these models is the heterogeneity of the electoral period. Indeed, the studied period covers elections that held under different Republics. Lewis-Beck (1985) introduces two innovations: homogeneity of the electoral period and use of a political variable (popularity of the President). The table below shortly presents the nine articles on legislative models using data at the national level in France.

[12] For models that use local data, and then essentially pooled-data estimation methods, see Auberger and Dubois (2003) for a survey and Dubois and Fauvelle-Aymar (2003) for a methodology study.

Table 9.

References	Period (number of observations)	Dependent variable	Main independent variables	R^2 or adj.R^2
Rosa and Amson (1976)	1920-1973 (31)	First round, left-wing parties	Inflation, unemployment, income per capita	$R^2 = 0.80$
Lecaillon (1980)	1928-1978 (except 1968) (12)	First round, left-wing parties	Inflation, unemployment, real income per capita	$R^2 = 0.95$
Lewis-Beck and Bellucci (1982)	1956-1978 (7)	First round, left-wing parties	Unemployment, real income per capita	$R^2 = 0.63$
Lewis-Beck (1985)	1958-1981 (7)	First round, left-wing parties	Popularity of the President, real growth of GDP	$R^2 = 0.71$
Lewis-Beck (1991), Lewis-Beck and Rice (1992)	1958-1988 (9)	First round, left-wing parties	Popularity of the President, real growth of GDP, partisan variable	$R^2_{aj} = 0.67$
Lewis-Beck (1995), Fauvelle-Aymar and Lewis-Beck (1997)	1958-1993 (10)	First round, parties opposed to the incumbent President	Popularity of the President, real growth of GDP	$R^2_{aj} = 0.65$
Jérôme, Jérôme-Speziari and Lewis-Beck (2001)	1958-1993 (9)	First round, incumbent majority	Popularity of the Prime minister, real growth of GDP or unemployment	$R^2_{aj} = 0.85/0.83$
Dubois (2001)	1958-1997 (11)	Second round, incumbent majority	Popularity of the Prime minister, previous electoral results, real income growth	$R^2_{aj} = 0.94$

Only two models are still active: Fauvelle-Aymar and Lewis-Beck (1997) and Dubois (2001). The first one succeeds in predicting before the ballot the surprising victory of the opposition parties in the 1997 elections. Unfortunately, it was not used for the 2002 elections. The model developed by Dubois (2001) gave, before the ballot, a forecast for the 2002 elections of 40.47 % for the incumbent majority that obtained finally 43.85 %.

3.3. Variables and estimates' results

For my model, one easy solution is to take the equation of Dubois (2001) that performs quite well. Two problems arise with this option. First, the model of Dubois (2001) is in terms of real disposable income, not in terms of GDP and second, this model uses the results of the previous elections whatever their type (presidential, legislative…).

I choose to explain the second ballot vote for the incumbent majority ($LVOT_t$)[13]. The studied period covers all the legislative elections that held under the Fifth republic (12 elections). I retain three independent variables: the growth rate of GDP, the outcome of the previous presidential ballot, and the evolution of the popularity of the French Prime minister. The later is defined as $EPOP_t = POP_{t-1} - POP_{t-3}$ and POP_t is the popularity of the French Prime minister during the quarter of the election[14].

The second explicative variable is the second ballot vote of the previous presidential election in favor of the ruling party before the legislative election ($PVOT_t$)[15]. This is a stock variable that takes into account some inertia in the voting behavior.

The growth variable is defined as the arithmetic mean of the semi-annual growth of the two half-years before the elections:

$$MACRO_t = \frac{SEM\_GDP\_FR_{t-1} + SEM\_GDP\_FR_{t-2}}{2}$$

This is consistent with the Key's voting behavior theory in which the voters take into account only the recent past macroeconomic outcomes.

One has then:

$$LVOT_t = \lambda_0 + \lambda_1 PVOT_t + \lambda_2 MACRO_t + \lambda_3 EPOP_t + \varepsilon_{2t}$$

In an immediate way, all the expected sign are positive. The estimates on the period 1958-2002 are:

$$LVOT_t = 41.80 + 0.04 PVOT_t + 3.75 MACRO_t + 9.59 EPOP_t + e_{2t}$$
$$(43.16)\ (2.91) \qquad (5.04) \qquad (10.08)$$

[13] When the Right is the incumbent, I do not include the extreme right-wing vote since extreme right does not participate to right-wing governments.

[14] Expressed as the ratio (percentage of people satisfied by the Prime minister on percentage of people not satisfied by the Prime minister) according to the IFOP polls institute and published monthly by the *Journal du Dimanche* (the data are then aggregated to obtain quarterly data).

[15] For the 1969 and the 2002 elections, there was no left-wing candidate at the second round. For 1969, I have classified at the Left the most distant candidate from the Right that was the ruling party. For 2002, I have classified the extreme-right candidate with the opposition since the Left was ruling majority. Hence, for 2002, the value for PVOT is 0.

Adj. $R^2 = 0.94$, N = 12, $Q_{e_{2t}}(10) = 10.94$, $Q_{e_{2t}^2}(10) = 9.58$.

The *ex post* and *ex ante* predictions are:

Table 10. Ex post and ex ante predictions (1958-2002)

	Actual vote	Ex post prediction	Ex ante prediction
1958	56,94	56,75	-
1962	55,22	55,24	-
1967	53,53	55,67	-
1968	58,05	56,09	-
1973	53,81	52,61	-
1978	50,37	50,30	50,83
1981	43,14	43,22	44,24
1986	44,02	44,63	45,73
1988	46,79	49,42	49,40
1993	36,07	36,30	36,79
1997	46,09	44,34	43,69
2002	45,34	44,81	43,16
Absolute Mean Error		0,95	1,44

The model performs quite well by making small forecasting errors. Unfortunately, the vote result does not inform us on the winner of the election. The 1997 elections are a classical example with a victory of the left-wing parties' coalition with 46.09 % of the ballot vote. To fill this gap, one has to build a seat-function that translates votes into seats. The dependent variable ($SEATS_t$) is defined as the ratio: seats obtained by the incumbent majority on the total of two-party seats[16]. The sole independent variable is the vote defined as before.

$$SEATS_t = \rho_0 + \rho_1 LVOT_t + \varepsilon_{3t}$$

$$SEATS_t = -83.32 + 2.72VOT_t + e_{3t}$$

$$(-4.80) \quad (7.78)$$

Adj. $R^2 = 0.84$, N = 12, $Q_{e_{3t}}(10) = 9.78$, $Q_{e_{3t}^2}(10) = 8.08$.

As before, the table below presents the *ex post* and *ex ante* predictions[17]:

[16] Left-wing parties seats plus moderate right-wing parties seats.

[17] The *ex ante* forecasts are true ones (i.e. computed with the *ex ante* prediction of the vote of the politico-economic model).

Table 11. Ex post and ex ante predictions

	Actual seats	Ex post prediction	Ex ante prediction
1958	80,86	71,78	-
1962	57,63	67,10	-
1967	50,64	62,49	-
1968	81,49	74,80	-
1973	60,89	63,26	-
1978	58,02	53,89	-
1981	31,86	34,19	26,62
1986	46,73	36,59	37,83
1988	47,29	44,13	52,12
1993	14,77	14,93	20,44
1997	44,58	42,23	36,82
2002	30,81	40,18	35,61
Absolute Mean Error		5,93	6,20

I can now define more precisely the LEFT variable and the RIGHT variable that I used in section 2:

$$\text{LEFT}_t = \begin{cases} 1 \text{ in the 2 half} - \text{years following the elections if } \text{SEATS}_t > 50\,\% \text{ and Left is incumbent} \\ 1 \text{ in the 2 half} - \text{years following the elections if } \text{SEATS}_t < 50\,\% \text{ and Right is incumbent} \\ 0 \text{ otherwise} \end{cases}$$

$$\text{RIGHT}_t = \begin{cases} 1 \text{ in the 2 half} - \text{years following the elections if } \text{SEATS}_t > 50\,\% \text{ and Right is incumbent} \\ 1 \text{ in the 2 half} - \text{years following the elections if } \text{SEATS}_t < 50\,\% \text{ and Left is incumbent} \\ 0 \text{ otherwise} \end{cases}$$

Section 4. Experiments with the model: Vote in 2002 and GDP in 2002 and 2003

To test the accuracy of the whole model, I have done some forecasts. The table below presents the sequence of the predictions, the forecasts, and the actual values.

Table 12. Various ex ante forecasts (2002-2003)

Sequence of the predictions	Predicted value	Actual value
Forecast LVOT 2002	43,16	44,81
↓		
Deduction SEATS 2002	35,61	30,81
↓		
Deduction RIGHT for 2002(2)	1	1
Deduction RIGHT for 2003(1)	1	1
Deduction LEFT for 2002(2)	0	0
Deduction LEFT for 2003(1)	0	0
↓		
Forecast GDP 2002(2)	0,35	0,42
Forecast GDP 2003(1)	-0,05	-0,21

As one can see, the model seems to perform quite well on the political side as on the economic side.

Section 5. Conclusion

The simple model I have built clearly outperforms the OECD in forecasting GDP growth. Thus, one can think that the negligence of political factors explains, at least partially, the strong forecasting errors of the OECD concerning the GDP growth.

What are the possible extensions? The first and maybe the most important improvement is to endogenize the popularity variable (POP), the presidential vote variable (PVOT), and above all, the European Union GDP growth variable (SEM_GDP_AREA). In all the simulations I have done, I have supposed that the values for these variables are perfectly anticipated. One other limit is the lack of flexibility of the partisan variables in the growth equations. Indeed, Carlsen and Pedersen (1999) and Maloney *et al.* (2003) endogenize these dummies by using elections' winning probabilities. As one has seen, the entire Alesinian framework is based on the uncertainty about the future majority. If the probability of victory of a left-wing coalition is closed to 1, the economic expansion that follows the elections will be perfectly anticipated and then will not hold.

Appendix 1: Sources of the data

GDP actual values: OECD Website (http://www.oecd.org/topicstatsportal).
GDP forecasted values: *OECD Economic Outlook*, various issues.
Vote: Lancelot (1998).
Seats: Lancelot (1998) and Home office (ministère de l'Intérieur).
Popularity: *Journal du Dimanche*, various issues.

Appendix 2: How to translate semi-annual growth rates in annual growth rates?

If S_i^t is the semi-annual growth rate for the half-year i of the year t, it can be shown that the growth of the year t, A^t, is:

$$A^t = \left[S_1^t \left(S_2^t + 1 \right) - \left(S_2^{t-1} \right)^{-1} - 1 \right] \left[\left(S_2^{t-1} \right)^{-1} + 1 \right]^{-1} + 1$$

To simply, the rates are not expressed in percentage but in increase coefficients. For example, a growth rate of 4.25 % is an increase coefficient of 1.0425.

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