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Forecasting the 2007 French Presidential Election: Ségolène Royal and the Iowa Model

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Scientific election forecasting has become a thriving enterprise in the leading democracies, and France is no exception. Among the first French efforts was the so-called 'Iowa Model,' a political economy equation predicting the winner on the basis of national economic performance and government popularity. The Iowa Model was applied to the 2007 French presidential contest, and did not fare as well as expected. We explore diagnostics on the Iowa Model, in an attempt to see what went wrong, meanwhile comparing it to rival forecasting efforts. It appears that an important omitted variable may be a direct measure of the quality of the campaign itself.
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Introduction

Scientific election forecasting, while relatively new in political science, has a lengthening shadow. The work, begun with isolated efforts to forecast United States presidential elections in the early 1980s, is now flourishing in the United States, the United Kingdom, and France. (For a current general review, see Lewis-Beck (2005); with respect to the latest United States work, see Campbell and Lewis-Beck (2008); for the case of the United Kingdom, see Bélanger *et al.* (2005); with respect to France, the case at hand, see the earlier reviews in Jérôme and Jérôme-Spéziari (2004), and Dubois and Fauvelle-Aymar (2004).) The 'Iowa Model', as it has come to be dubbed, follows in the general political economy tradition characteristic of these investigations. It has offered pre-election forecasts for the French national elections of 1997, 2002, and 2007 (Fauvelle-Aymar and Lewis-Beck, 1997, 2002; Bélanger *et al.*, 2007).

The Iowa Model is simple in conception, offering the vote (V) as a function of government (P) and economic performance (E). Theoretically, the model is one of reward-punishment (Key, 1966; Tufte, 1975). Citizens reward the democratic ruler with their votes if they are pleased with how the government is handling the economy and other matters of state. Otherwise, they vote against. For 2007, the model expressed itself thusly, in this regression equation,

$$V_1 = a + bP + cE + u \quad (1)$$

The model was estimated at the national level, on all possible presidential elections from the Fifth Republic. Then, the model was cross-validated on a sample of regional data, from the presidential elections of 1981, 1988, 1995, 2002. The results of this estimation, and the forecasts (based on data available three months before the election), appear in Table 1, along with details on measurement and data sources.

How the Iowa Model Fared in 2007

First, the model consistently failed to predict the political coloration of the winner, right as opposed to left (see again Table 1). Further, none of the percentage point estimates could be subjectively described as 'very good', or even 'good.' The estimate for the national model, for the first-round, is unambiguously 'poor,' for it is greater than twice the average within-sample prediction error (of 3.89). Second-round estimates are better than first round, suggesting that error in the former received considerable correction in the latter. Still, even the second-round forecast from the regional model, while relatively closer than any of the others, is still only 'just OK.' (After all, the entire range on the dependent variable, across all these elections, is only 8.5 points on the second round.) Possible sources of these forecasting errors are discussed in more detail below.

The Iowa Model Compared to Other Forecasting Models

Fortunately, the community of election forecasters in France is growing. Besides the perennial efforts of the pollsters, there are various modeling efforts to forecast the 2007 presidential election outcome. (A useful review of the history of French presidential election forecasting appears in Lafay *et al.*, 2007.) Most of these efforts pose political economy models, estimated statistically on time-series data. The Iowa Model is but one of these political economy models. Others are from Auberger (2007), Evans and Ivaldi (2007), Jérôme and Jérôme-Spéziari (2007), and Lafay *et al.* (2007). Standing beside these is a different approach by Lemennicier and Lescieux (2007), who offer a median voter model. While these models may vary, in their methods and their

Table 1 Iowa Model forecasts for the French presidential election, 2007[a]

	National model		*Regional model*	
	Vote 1[b]	*Vote 2*[c]	*Vote 1*[d]	*Vote 2*[e]
Economy	−6.16*		−1.53*	
	(2.02)		(8.50)	
Popularity	0.248*		1.07*	
	(2.23)		(14.64)	
Vote 1		0.427*		0.71*
		(3.48)		(18.81)
Constant	47.09	30.66	3.96	2.17
R-sq.	0.555	0.801	0.470	0.80
SEE	6.05	1.79	0.67	2.17
N	7	5	88	66
Forecast	51.5%	52.7%	46.44%	51.0%
Actual	36.4	46.9	36.4	46.9
Point Error	15.1	5.8	10.0	4.1
Abs. Avg. Error	3.89	1.14	3.28	5.43

[a] *Data source*: Ministère de l'Intérieur (diffusé par le Centre de données socio-politiques), INSEE for the unemployment data and IFOP for the popularity data.
[b] OLS estimation on national presidential election data, 1965–2002. Vote 1 = first-round vote for candidates on the left (extreme left, communist, socialist, diverse left, ecologist); economy = the log of the unemployment rate, measured 3 months before (multiplied + 1 if the President was on the left and −1 if not); popularity = percentage satisfied with the President in the IFOP poll 3 months in advance (multipled + 1 if the President was on the left and −1 if not); *R*-sq. = coefficient of multiple determination; $N = 7$; figures in parentheses are *t*-ratios; * = absolute value of *t*-ratio greater than 2.00; SEE = the standard error of estimate; Point error = forecast−actual 2007 result; Abs. Avg. Error = the average absolute prediction error within the sample.
[c] OLS estimation on presidential election data, 1965, 1974, 1981, 1988, 1995. Vote 2 is second-round vote for candidate on the left. Vote 1 defined as in footnote b above.
[d] Fixed effects regression estimation on regional presidential election data, 1981–2002. Vote 1 is defined as in footnote b above; economy is defined as in footnote b above; popularity is the average satisfaction with left parties (1/3 for the communists, 2/3 for the socialists), 3 months in advance.
[e] OLS estimation on presidential election data (1981, 1988, 1995). Vote 2 is defined as in footnote c above.

forecasts, they are united by one thing: they issue true forecasts. That is, all of them offer unique vote predictions in advance of the contest. Thus, they distinguish themselves from most political science and economics work, which attempts to explain things that have already happened.

Briefly, we describe the structure of each of these models, as applied to forecasting the 2007 presidential election outcome. Then, we evaluate their performance. Auberger (2007) aims to forecast the second-round vote share of the left in the department, as a function of the popularity of the ideological composition of the department and the popularity of the socialist party

(measured as the average of the last 3 months before the second round). Jérôme and Jérôme-Spéziari (2007) forecast first- and second-round results 2 months in advance, in a pooled analysis of local data that places considerable weight on the economic performance of the incumbent (change in the unemployment rate and executive credibility). Evans and Ivaldi (2007), utilizing data available in the election month, confine their forecasting to that of the National Front first-round vote share, eschewing the larger task of forecasting overall winners. (It is noteworthy that Auberger (2007) and Jérôme and Jérôme-Spéziari (2007) also, as a preliminary stage, attempt to forecast the National Front vote.) Lafay *et al*. (2007) have a very straightforward model, which predicts second-round left vote from the popularity of the socialist party 2 months before the election. Finally, Lemennicier and Lescieux (2007), in a novel approach, claim that the winner will be the candidate who represents the median voter, as defined by where the two major candidates fall on a left-right vote intention scale, 1 month before the first round.

How did these models do? All made a forecast for 2007, and these are noted in Table 2. (The Iowa Model using national data, already listed in Table 1, is not reviewed in this table — it is discussed again later on.) With respect to the first round, the models clearly overestimated the left vote. LL (2007) had the best forecast here, which still yielded an error of +3.2 percentage points. (In parentheses in the table, the model is ranked in terms of its forecasting success.)

Table 2 2007 French presidential election forecasts, from different forecasters[a]

Forecaster	*Forecast, first round*	*Forecast, second round*
AA		49.4% for left (3)b
BFL	46.4% for left (3)	51.0% for left (5)
JJS	44% for left (2)	47.1% for left (1)b
LFA		48.6% for left (2)b
LL	39.6% for left (1)	<50% for left (4)b,c
JE	16.7 % for Le Pen	
AA	15.6% for Le Pen	
JJS	16.0% for Le Pen	

[a]The forecasters are listed alphabetically, and indicated by letters: AA = Auberger (2007), BFL = the regional model of Bélanger *et al*. (2007), JJS = Jérôme and Jérôme-Spéziari (2007), LFA = Lafay *et al*. (2007), LL = Lemennicier and Lescieux (2007).

[b] = correctly predicted the presidential winner.

( ) = the figures in parentheses in the table indicate the relative rank of the forecast, comparing its success to the others. For example, (1) indicates the most accurate forecast.

[c]LL did not make a point forecast for the second round, rather only a win-lose forecast, calling a loss for the left. Further, the second-round forecast is based on visual inspection of the pre-election distribution of vote intention in a survey 1 month before the first round, while the first-round forecast is based on a multiple regression equation.

Further, all the models greatly overestimated the Le Pen vote (of 12%), by about the same margin. Looking at the second round, the models generally fare better, with average error falling compared to the first round. Four out of the five models correctly picked the winning side. Moreover, the JJS model in particular was quite accurate, with an error of only 2/10 of one percentage point ($47.1-46.9=0.2$).

Evaluating Model Quality: A Guide

In the evaluation of an election forecast, a central standard is accuracy. How precise is the forecast? Is it exactly right? If not, how far off is it? For example, it is not enough to say that the model predicts the winning candidate; we also want to know how well it predicts the winning candidate vote margin. But accuracy, important as it is, is not the only standard. A second is lead time. That is, how far in advance is the forecast made? One day? One week? One month? Several months? The forecast has more value, the farther away it is made from the election contest itself. A forecast made very close to the event lacks intrinsic interest; it is merely tracking, or reporting, what is about to happen. This is why poll forecasts, even when they are right, deflate us. In contrast, a model sharply foretelling an election outcome several months prior suggests the achievement of a deeper, even powerful, understanding of pivotal electoral conditions.

Concern over accuracy and lead points to questions of model specification. Other things being equal, a model that faithfully reflects a sound theory of the vote should perform better than model that is a-theoretical (such as in a poll), or is data-driven (as in a search to maximize the *R*-squared). Of course, formulation of theory boils down to including the right variables in the model, rightly measured. This brings up another criterion: parsimony. Most models are based on a small N, say the number of national elections in the Fifth Republic. Given this circumstance, it is simply not possible to include very many independent variables. When $N<10$, the degrees of freedom quickly evaporate. Furthermore, a rule of parsimony, besides allowing for theoretical clarity, prevents capitalization on chance, that is, boosting the goodness-of-fit statistics by adding too many variables. (This is a major health hazard in the forecasting industry.)

Finally, in the evaluation of any model, there must be a concern for reproducibility. Can another scholar, with reasonable care, replicate your model, working on his or her own? Are the variables and sources clearly enough defined, as well as the steps for construction? Of course, a good forecast is not simply something that comes out of 'intuition,' or some 'mysterious' formula. It comes from available data whose use is made clear to

the reader. Thus, all together, these are five criteria for evaluating the quality of a forecasting model: accuracy, lead, specification, parsimony, and reproducibility. (These criteria are more fully discussed, and applied to earlier forecasting models, in Lewis-Beck (2005).)

Let us informally apply these criteria to the Iowa Model 2007. The model scores well with respect to the very important quality of lead (3 months before). Indeed, of all the models, it offers the earliest forecast. The Iowa Model also gets excellent marks on parsimony (only two independent variables) and reproducibility (the measures are straightforward, explained, and available). With respect to accuracy, it does less well, at least this time around. Further, this lack of precision raises questions about specification. These last two issues — accuracy and specification — we address more fully below, in a discussion of regression diagnostics.

Diagnostics on the Iowa Model

The first question is whether diagnostics can detect worrisome signs with respect to the model, before the 2007 election even occurred. In Table 3 are some diagnostic results on that model, for the first round. The Durbin–Watson statistic suggests no first-order autocorrelation. The highest Cook's D-value is not troublesome. The residuals are evenly split above and below zero. The collinearity between the economic and popularity variables ($r = 0.87$) puts some strain on the *t*-ratios. Nevertheless, the regression's VIF (variance

Table 3 Regression diagnostics on the Iowa Model (National version)

	Not including 2007		*Including 2007*	
	Vote 1	*Vote 2*	*Vote 1*	*Vote 2*
Economy	−6.16*		−2.78	
	(2.02)		(.92)	
Popularity	0.248*		0.143	
	(2.23)		(1.22)	
Vote 1		0.427*		0.410*
		(3.48)		(4.25)
Constant	47.09*	30.66*	44.10*	31.51*
	(15.31)	(5.56)	(13.66)	(7.49)
R-sq.	0.555	0.801	0.238	0.819
SEE	6.05	1.79	7.42	1.57
N	7	5	8	6
Durbin–Watson	2.06		1.39	
Highest cook's D	0.27		0.60	

* = absolute value of the *t*-ratio (in parentheses) is greater than 2.00.

inflation factor) is only 5.47, far from the cut-off of 10.0 warning that there is a collinearity problem. Finally, the most extreme case, that of 1974, produces a within-sample forecasting error of 8.5; yet, if we remove that case from the estimation, the model's coefficients remain very stable.

Overall, the implication is that the model is solid, at least as far as it goes. However, this does not mean that the specification is complete. That is, other variables might improve it. Therefore, we first added a cohabitation effect; unfortunately, this actually worsens the forecast for 2007, at 55.7% for the left. Second, we altered the economic variable measure (to change in unemployment rate, then to change in GDP); neither yielded statistically significant results. Third, we experimented with the popularity variable, on the assumption that Sarkozy was not fully affected by Chirac's extremely low popularity, since he was 'le candidat de la rupture'; in particular, we controlled for whether the election was an 'open seat' or not, with popularity having less of an effect when it was an open seat. Again, this yielded no significant results.

We concluded that the original model was not visibly flawed, and was not easily improved upon, given the constraints of the data at hand. The implication is that 'things went wrong' with the 2007 election, not before. To explore this possibility, we included the 2007 result in the model, and applied diagnostics to the first-round result (see Table 3). The Durbin–Watson value now suggests a possible autocorrelation problem. The highest Cook's D has more than doubled in value, and represents the 2007 case. (The distance between the predicted and actual values for 2007 is $45.0-36.4=8.6$.) The SEE inflates, the *R*-squared is more than halved. The coefficients substantially change their value and, remarkably, fall far from statistical significance. Note that these dramatic changes do not occur on the second round; there the coefficients and the *R*-squared hardly budge; put another way, the transmission of the total left vote across the two rounds follows the usual pattern. The trouble rests with the first round, and the candidacy of Ségolène Royal as the left standard-bearer. In complex ways, she stands as an outlier in first-round Fifth Republic elections, leading the left (i.e., the combination of Royal, Besancenot, Buffet, Voynet, Laguiller, Bové, and Schivardi) to their weakest result since 1969 (when they won only 32.6% of the first-round ballot).

The diagnostics on the regional estimation of the model, first round, reinforce the above conclusion on the peculiar outlier status of the 2007 election. First, in the model estimated with 2007 excluded, no outlier problem is detected. In particular, if the four cases with absolute studentized residuals above 1.97 are excluded, the coefficients and the forecast do not really change. However, if 2007 is included in the model, one observes that it introduces systematic prediction error. For example, looking at the 23 largest residuals, 22 of them are from 2007. Again, Ségolène's Royal candidacy is shown to produce a highly unusual first-round result.

Why Did the Left Do So Badly?

The key to model improvement may lie with a fuller understanding of why the left did so badly. Identification of those variables could lead to better model specification, and better luck next time. First, there are two popular explanations that do not seem supported: an unexpected ideological surge to the Center, and a rejection of Royal on grounds of gender. With respect to the former, French presidential elections on the first round usually exhibit a strong centrist showing: 1969 (Poher, 23.3%), 1974 (Giscard, 32.6%), 1981 (Giscard, 28.3%), 1988 (Barre, 16.5%), 1995 (Balladur, 18.6%), and 2007 (Bayrou, 18.5%). Note that, in this context, Bayrou's share is not exceptional. Moreover, the center, as the name implies, tends to be ideologically split, when the second-round choice is left *vs* right. According to polling data, first-round Bayrou voters made an unsurprising 50-50 split on the second round (*The Independent*, 7 May 2007, p. 2). These numbers reflect, in sum, a common first-round ideological dynamic.

With respect to the gender issue, Ségolène Royal clearly made a special appeal for the female vote: 'The whole world is asking whether France will dare to elect a woman president. I say to France: Be daring!' (*The Independent*, 5 May 2007, p. 24). However, the French voter may not have responded in a significant way to this appeal. Sarkozy won the majority of both male and female votes, with almost no percentage difference between them. (Royal received 48% of the female vote, compared to 46% of the male vote, according to an Ipsos poll (*The Independent*, 8 May 2007, p. 21).)

We come to the question of what sorts of variables, yet to be included, might have made a difference. There appear at least two possibilities: the debate (on the second round) and the campaign (on both rounds). The politics surrounding the setting up of the Sarkozy–Royal debate got the attention of voters, as registered in the record number of viewers. Polling data indicate that Ségolène Royal was the 'loser' of the debate. The first survey taken after the verbal contest found 53% of the watchers 'impressed' by Sarkozy, but only 31% 'impressed' by Royal (*The Guardian*, 4 May 2007, p. 25). Research on debate effects, which comes mostly from that on US presidential debates, suggests that their impact is very short-lived. However, this debate was quite close in time to the actual electoral contest; thus, its effects may not yet have dissipated. It is not impossible to believe that the sudden widening of the gap between the two candidates in the final days, of between 6 and 8 points in the polls, could be at least partly attributed to the debate (*The Independent*, 5 May 2007, p. 24). Furthermore, Giscard d'Estaing said himself that the debate was crucial to his victory in 1974. Including a debate variable in a forecasting model poses some practical problems. For one, in French presidential elections, debates have not always taken place. For another, when they do occur, they

may be very near the election, so cutting greatly into the lead time of a model into which it is incorporated.

The quality of the Royal campaign may have played an important part in her defeat. This hypothesis appears plausible in part because, while she topped the opinion polls as late as January, she soon fell from that position, never to recover it in the next 3 months (*New York Herald-Tribune*, 4 May 2007, p. 3). Ongoing in the press was discussion of the vagueness of her policy pronouncements, which of course makes it difficult to attract swing voters. More generally, much of the public came to view her as a weak candidate. In a relevant CSA poll, 65% of those interviewed called Sarkozy 'solid', in contrast to only 24% for Royal (*The Times*, 1 May p. 31). Overall, the majority of voters (63% in one survey) saw her campaign as 'poor' (*The Financial Times*, 7 May 2007, p. 6). One view is that her campaign was very personal, with only loose links to the party and its leaders. A major rival within the party, ex-Prime Minister Laurent Fabius, sums up this perspective: she 'led an idiosyncratic campaign that often left senior Socialists looking on in bewilderment from the sidelines as she put forth proposals they had not endorsed' (*New York Herald Tribune*, 8 May 2007, p. 3). Introduction of a campaign variable into the model would not be impossible, although it is not clear what the best measure would be — perhaps some assessment of the candidates' strength within their own party.

Conclusion

While the judicious introduction of one or two new variables, perhaps debate or campaign, might increase model accuracy, there is an argument against. The most accurate model for 2007, that of Jérôme and Jérôme-Speziari, does not include either of these variables. Despite that, its forecast is dead on. Further, it is a classic political economy model, resting heavily on the notion of rewarding the incumbent on the basis of sound economics. One interpretation from the press is that this election was simply a referendum on the economy: 'The voters had one message. It's the economy, mon cher,' proclaimed the day-after-election headline of the *New York Herald Tribune* (7 May 2007, p. 1). While Sarkozy and Chirac had their disagreements, they both headed the same party, and served the same government. Chirac himself, in the end, gave the candidacy of Sarkozy his blessing.

It is worth observing that the final results of the 1995 election — Chirac, 52.7; Jospin, 47.3 — are almost exactly the same as 2007 — Sarkozy, 53.1; Royal, 46.9. The Chirac victory of 1995 could be accurately forecast in a straightforward economic voting model (Lewis-Beck, 1997). Perhaps 2007 has, at least empirically, duplicated that scenario. In that case, Royal would be no

more, and no less, to blame, than her Socialist predecessor. As often happens in France, the electorate appears stalled, in a seemingly endless cycle of old alliances and battles, leading to repeated, familiar outcomes (Lewis-Beck, 2002, 11). If this is so, then any re-specification of the Iowa Model should proceed cautiously, and probably confine itself to the more stable second-round outcome that, after all, is the decisive one.

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