FORECASTING THE 1992 PRESIDENTIAL ELECTION: THE MESSAGE IS IN THE CONFIDENCE INTERVAL

By Nathaniel Beck

When I wrote this commentary in August 1992, most analysts were finding George Bush well behind in his drive for reelection. But academic forecasting models were telling a different story.[1] The two most popular models, those of Ray Fair and of Michael Lewis-Beck and Thomas Rice have Bush well ahead.[2] The Fair model predicts that Bush will get about 56% of the *popular vote*, the Lewis-Beck and Rice model that he will get 58% of the *electoral vote*.

It is easy to understand why Fair would have Bush ahead. His model forecasts popular vote (as a percentage of the two party vote) based on incumbency and the pre-election economy.[3] His prediction equation for 1992 (based on 19 elections from 1916 through 1988) is (in rounded form)

Bush Popular Vote = 56% + Real GNP Growth (per cap) - Inflation
$$\frac{}{3}$$

where the growth in GNP per capita is measured in the first half of 1992 and the inflation rate is from July 1990 to June 1992. Real economic growth (per capita, annualized) is about 1% and inflation is about 3%, yielding the prediction.

Fair's prediction uses no information about the candidates or the campaign; it can be read as saying that, all other factors being equal, a Republican incumbent running in an economy showing no real growth but little inflation should win fairly easily. This is a good description of our state of knowledge before the beginning of the 1992 campaign. The Fair model does not take into account current information about the campaign and candidates.

The Lewis-Beck and Rice (hereafter "LBR") forecast is more surprising, since it uses Bush's popularity in June and a measure of Bush's "candidate appeal," as well as GNP growth. Their model should be able to take into account the Bush weaknesses that others see yet, according to Tom Rice, "what we're saying is that given the long-term trends and the relationship of these key factors to election outcomes, our best guess is that Bush is going to win this election."[4]

LBR forecast the Bush proportion of the total electoral vote. Their forecasting model, based on 11 elections from 1948 through 1988, is

Bush Electoral Vote = 6.8% + 7.8 * Real GNP Growth + 0.9 * Pop + 0.5 * Party Str + 19.7 * CandAppeal

where Real GNP Growth (not per capita, not annualized) is measured in the first half of 1992 (.5%), "Pop" is Gallup Poll approval measured in June 1992 (33%), "PartyStr" is the Republican gain in House Seats in the 1990 Election (-8) and "CandAppeal" is a dummy variable measuring Bush's performance in the primaries (1). These figures yield a forecast that Bush will get slightly more than 58% of the *electoral vote*.

It is hard to interpret the LBR forecast in terms of electoral votes. Is 58% of the electoral vote a landslide or a close election? Electoral votes are obviously more dispersed than are popular votes. A candidate getting 60% of the popular vote will get almost all the electoral votes. I can estimate a model identical to the LBR model, but predicting the incumbent's percentage of the two party vote, rather than his electoral vote.[5] The resulting forecast model for 1992 is

Bush Popular Vote = 42.8% + 1.6 * Real GNP Growth + 0.2 * Pop + 0.1 * PartyStr + 2.4 * CandAppeal

This model forecasts that Bush will receive just under 52% of the two party popular vote—a good though narrow victory for the GOP.

Track Record

The Fair and LBR models have been used to forecast elections over the last decades. How well have they fared?

Fair reports that his predictions were off by just above one point for the last six elections; the corresponding figure for LBR, is 1.3 points.[6] Based on these figures, it appears as though Bush should be quite confident.

But this would be a false confidence. The errors reported above are based on using all information a*vailable in 1992 to make "forecasts" for the earlier years.* We should not be so impressed with a

model that can "forecast" well for 1988 when the 1988 election is almost 10% of the data used to fit the model. The true test of a forecasting model is how well it forecasts elections based on the information that would have been available *before* that forecast was made.

The table below reports the true forecast errors for both models. The 1976 forecast error, for example, is computed by estimating the model with data through 1972 and then using those estimates to compute a true forecast for 1976, with the error being the difference between the Democratic percentage of the two party vote and the forecast value.[7] Not surprisingly, these true forecast errors for both models are much larger than the errors reported by Fair and LBR. For the last six elections, Fair's average forecast error was just under 2 points.[8] The LBR average forecast error (for popular vote) for those six elections is 3.5%. *In four of the last six elections, the LBR forecast error exceeded their 1992 predicted margin of victory for Bush.*

It is clear that the Fair model forecasts election outcomes better than the LBR model, at least through 1988. This is surprising, given that LBR use more current information. The superiority of Fair's forecasts is not due to his using a larger number of elections, since the method

used here to compare the two forecasts gives no necessary advantage to forecasts based on a large amount of data. The one variable in the Fair model that is not in the LBR model is whether the incumbent is running for reelection. Including that variable in the LBR model allows it to forecast as well or better than the Fair model.

The large forecast errors for the LBR model mean that Bush should take little reassurance from its forecast of his victory. Fair's forecast that Bush will get 56% of the popular vote might appear more heartening to Bush; the predicted margin of victory exceeds the model's typical forecast error for the last six elections. But even the Fair forecast shouldn't leave Bush too sanguine. In the three elections of the 1960s, Fair's minimum forecast error was just under 5%. And had Fair not fudged in 1976 (see note 8), he would have overpredicted the Ford vote by almost 6%.

Confidence Intervals for Forecasting

Forecasts based on econometric models have some uncertainty. There is obviously uncertainty due to lack of knowledge about whether and how the environment has changed, whether the model is "correct," whether the model has been

honed by "data mining," to say nothing of whether errors follow a normal distribution with such small samples. But for present purposes I assume away all these sources of uncertainty—to focus simply on uncertainty in the parameter estimates and residual uncertainty of the model (the "error" term in the regression). As we shall see, these two sources lead to huge uncertainty about the vote forecasts, and even this is an underestimate of true uncertainty about the forecasts. The usual measure of forecast uncertainty, based only on uncertainty about the true parameters of the model and residual model error, is the standard error of the forecast. After this statistic is computed, a 95% confidence interval for the forecast can then be constructed. In practice, we take the confidence interval as giving the range of forecast values that we would be willing to entertain.

The 95% confidence interval for Fair's forecast is (48%,63%). We can be quite sure that the 1992 election will either see Bush lose by a little or win by a landslide. The corresponding interval for the LBR forecast is (45%,58%)—that Bush will either win by a near landslide or lose by a substantial margin. The interval for the LBR electoral vote forecast is (29%,86%)—not very helpful. When we take into account all the other sources of uncertainty that are not included in the

Forecast Errors of Fair and LBR Models
Differences Between Democratic Percentage of Vote and Predicted Value

	Actual Dem. % of Vote	Fair	LBR (Popular Vote)	LBR (Electoral Votes)
1948	52.4	-1.2		
1952	44.6	-2.4		
1956	42.2	-2.2		
1960	50.1	5.2		
1964	61.3	11.1		
1968	49.6	-4.7	7.0	47.1
1972	38.2	-2.7	5.1	-31.7
1976	51.1	2.0	0.5	9.6
1980	44.7	-0.2	3.3	7.1
1984	40.8	-1.4	0.0	13.1
1988	46.1	-0.9	5.0	-5.6

standard calculations, we see that the LBR forecast is of little value, and the Fair forecast would allow for either Bush or Clinton to win the election.

The "Dummy Variable" is Dumb

The LBR model uses both Bush's June approval and his performance in the primaries to predict the outcome. Bush's approval in June was unprecedentedly low. Why, then, did LBR still forecast him ahead? The answer lies in the Candidate Appeal variable. This is a dummy variable, which is scored as one if the candidate of the incumbent party receives over 60% of the primary vote. Bush is measured as having a score of one on the Candidate Appeal variable using this measurement strategy. He is thus classed with Nixon and Reagan rather than Ford and Carter. The coefficient on Candidate Appeal in Model II is about 2.5 points. *It is this scoring of Bush on the Candidate Appeal variable that leads to the forecast of his victory.*

One solution might be simply to classify Bush with Ford and Carter. This would decrease the point forecast for Bush's electoral vote to 38%, while his popular vote forecast would decrease to just under 50%. But this procedure is too *ad hoc*; it cannot be right to use measurement to make a forecast seem reasonable.[9] But there is a better alternative here. LBR report the actual percentage of the primary vote received by the incumbent. We can use that measure instead of the dummy variable version.

Now suppose Bush is scored at 70% on it, which is consistent with his performance in the primaries. This leads to a forecast for Bush of 51% (± 7%). The corresponding forecast for electoral votes is also 51% (± 30%). In other words, *the best forecast from this model for 1992 is that the race is a tossup, with results ranging from an impressive Bush victory to a major defeat not out of the question.*[10]

Endnotes

[1] R. Shogan, "Scholars Disdain The Polls, Point to Bush Trump Cards," Los *Angeles Times,* August 3, 1992: 1,13-14.

[2] R. Fair, "The Effect of Economic Events on Votes for The President," *Review of Economics and Statistics,* 1978, 60: 159-73; M. Lewis-Beck and T. Rice, *Forecasting Elections* (Washington, DC: Congressional Quarterly Press, 1992).

[3] R. Fair, "The Effect of Economic Events on Votes for The President," Cowles Foundation, Yale University, p.1.

[4] Quoted in Shogan, *op. cit,* p.14.

[5] LBR argue that one should use electoral vote percentages since we are interested in forecasting who wins. They note that in three of the 11 most recent elections the winner received less than half the *total* popular vote. They also argue that there is a strong linear relationship between popular and electoral vote, so that they can use ideas derived from studying the individual vote decision. Using the percentage of the two party popular vote, as Fair does, avoids the problem of winners receiving less than half the vote. This also avoids adding the uncertainty of translating popular vote into electoral vote, a process that is hard to model. If I were interested in predicting electoral votes, I would use state

level data, as in the forecasting models of Steven Rosenstone, *Forecasting Presidential Elections* (New Haven: Yale University Press, 1983), and James Campbell, "Forecasting the Presidential Vote in The States," *American Journal of Political Science,* 1992, 36: 386-407.

[6] LBR are off by about 5 points in their prediction of electoral vote for the last six elections. Remember that electoral vote is much more dispersed than is the popular vote.

[7] The LBR model forecasts the incumbent party's vote. All reestimations of the LBR model used that convention. The LBR forecasts were then transformed to make them consistent with Fair's.

[8] This average is based on Fair's acknowledged "fudge" for 1976. After observing the election, he decided not to count Ford as an incumbent running for reelection, reducing his (true) forecast for Ford by 3.8%. Had he not fudged, his average prediction error would have been half a point higher. He still would have outperformed LBR.

[9] Such a strategy is not unknown. In the forecasting literature, it is called "judgmental" forecasting. It should be noted that the measurement of Candidate Appeal cries out for some judgment. As just one example, LBR score Johnson as zero on this variable for 1964. This is because he received only 17% of the primary vote. This figure is totally misleading. The 1964 nomination was not contested, and Johnson's name appeared on the ballot in only two states. Most (70%) of the total primary vote went to unpledged slates and favorite sons. Almost all of the unpledged vote was in California, which saw two unpledged slates in opposition. California cast about two-fifths of the total primary vote. There is no question that Johnson should have been scored one on the Candidate Appeal Measure.

[10] This conclusion holds for a wide range of scores for Bush's candidate appeal on the continuous measure.

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