INDEX METHODS FOR FORECASTING: AN APPLICATION TO THE AMERICAN PRESIDENTIAL ELECTIONS

by J. Scott Armstrong and Alfred G. Cuzan

Preview: Scott Armstrong and Alfred Cuzan describe Allan Lichtman's Keys Model as an example of an index method of forecasting, which assigns ratings of *favorable*, *unfavorable*, or *indeterminate* to influencing variables. They describe how index methods have been applied in other decision-making contexts, and they discuss when such methods might be useful analytical tools for business forecasters. In the context of presidential election forecasting, they compare the Keys model to several regression models and find that the Keys model stacks up quite well against these more sophisticated alternatives.

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- Indexes like Allan Lichtman's Keys model are worthy of the attention of practitioners and researchers. Lichtman's easily understood method can help forecasters when there are (1) many causal variables, (2) good domain knowledge about which variables are important, and (3) limited amounts of data.

- The Keys model has been able to pick the winner of every presidential election since 1860, but we tested how it compared against three traditional regression models in forecasting the percentage of the vote obtained by the incumbent party's candidate. We found that Lichtman's perfect record in forecasting the out-of-sample winner was matched by only one of the three regression models, while its average error was almost as low as those of the best regression models.

- We believe that the Keys model is useful for presidential election forecasting because it uses a different method and different information than do current regression models.

Introduction

Allan Lichtman (2005) reports that the Keys model has picked the winner of every presidential election since 1860, retrospectively through 1980 and prospectively from 1984

to 2004. Given this record, it seems sensible to examine this index *method*. We tested how well the Keys model predicted the winner of the popular vote, and also how closely it forecasted the actual percentage of the two-party vote won by the incumbent ticket. The index method performs well compared with regression models. It also offers the opportunity to incorporate many policy variables. Index methods can be applied to various choice problems faced by organizations.

Index vs. Regression Models

In the early days of forecasting, analysts would sometimes use an index to forecast. They would prepare a list of key variables and determine whether they were favorable (+1), unfavorable (-1), or indeterminate (0) regarding a particular outcome. They would then add the scores and use the total in making forecasts. Thus each variable was assigned the same weight. Applied to forecasting, this use of judgmental indexes has been called an "experience table" or an "index method."

Index methods have been used for various types of forecasting problems, including prediction of the success of prisoners seeking parole. If the candidate exceeded a

certain score, he or she was paroled. In an effort to improve parole predictions, Glueck and Glueck (1959) recommended using only the most important variables and assigning differential weights to different variables. This can be done by regression analysis. While regression analysis has been widely adopted, however, little research has been devoted to index methods.

Which approach yields the most accurate forecasts, index methods or regression models? Gough (1962) addressed this issue for parole predictions and found that regression modeling did not improve accuracy. Reviewing the research in this area, Armstrong (1985, p. 230) found three studies in which regression was slightly more accurate (for academic performance, personnel selection, and medicine); however, five studies found that regression was less accurate (three on academic performance, and one each on personnel selection and psychology).

A related approach is to use equal weights in a regression, which brings regression modeling closer to the index method. The equal weights are applied to standardized variables to avoid scaling problems. A large-scale study by Dana and Dawes (2005) found that equal weights forecasts were generally more accurate than regression on a wide variety of cross-sectional data. The gain from equal weights was larger when sample was small and when predictability was poor.

For most problems, regression analysis is limited in that only a few explanatory variables can be put into the model (perhaps three or four variables) because of limited data, measurement errors, and correlations among the explanatory variables (a problem called collinearity). Subjective indexes avoid these estimation problems. Given the many variables and the small amount of data, index methods would seem appropriate for forecasting presidential elections.

Lichtman's Index: The 13 Keys

Allan Lichtman is a historian, and, to the best of our knowledge, the only scholar who has applied an index method to predict the winner of presidential elections. His "Keys to the White House" model consists of 13 explanatory variables. Each variable consists of a statement which, if true, bodes well for the incumbents and, if false, for the opposition, such as KEY 2 (Contest Key): *There is no serious contest for the incumbent party's nomination.*

True (or likely to be true) statements are scored 0, and false statements scored 1. We then count the number of false statements. If fewer than six are false, the incumbents are forecast to win. Conversely, if six or more Keys turn against the incumbents, they are likely to lose.

Some aspects of the Keys model concern us:

1. It uses only 13 variables. One of the benefits of the index method is that there is no limit on the number of variables.
2. Only one of the variables makes a reference to policy (KEY 7, Policy Change: *The incumbent administration effects major changes in national policy*), but it is vague as to the type of policy or the direction of change. One could imagine popular as well as unpopular changes. In ignoring policy variables, however, the Keys model is no worse than most other presidential forecasting models.
3. The assessment as to whether each Key is true or false is done subjectively by one person (Lichtman). For example, what constitutes a "major" change in national policy? Presumably this procedure could be improved by using a panel of experts.
4. The model challenges credibility because to win, the incumbent requires a larger number of favorable factors than does the challenger. To win, the incumbent needs 7 of the 13 Keys in his or her favor. In general, incumbents are thought to have the advantage in political elections.

Using the Lichtman Index to Forecast the Vote Percentage

Most forecasters of presidential elections, economists and political scientists alike, have estimated the percentage of the two-party vote going to the incumbents by using differential weights in regression models. Accordingly, we tested how well Lichtman's method predicts the actual percentage of the two-party vote that will go to incumbents.

We use V to represent the percentage of the two-party vote that will go to the incumbent, and L to represent the Lichtman index, which we define as the total number of Keys favorable to the incumbent. (This is the reverse of Lichtman's coding, as he counts the number of keys that have turned *against* the incumbents.) We fit a regression model relating V to L over the period 1860-2004,

alternatively including and omitting the 1912 election, when the Republican Party split in two. (Some researchers, like Fair (2004), whose data series we use, add the William Howard Taft and Theodore Roosevelt vote together for a counterfactual incumbent victory of 54 percent.) We found very little difference in model errors from the inclusion or exclusion of the 1912 election, so we will report results for the inclusive model only.

We obtained the following regression results:

$$V = 37.3 * 1.8\,L \quad \text{where}$$
V = the percentage of the two-party split going to the incumbent
L = the number of Keys favoring the incumbent

Thus the model predicts that an incumbent would start with 37 percent of the vote (even if all Keys are unfavorable) and would add 1.8 percent to this base with each favorable Key. To measure model accuracy, we use two metrics. One is the absolute percentage error—the magnitude of the average errors, whether they are positive or negative. The second metric is the call ratio, which is the percentage of forecasts that correctly pick the election's winner. Retrospectively— that is, when we include all elections in fitting the model, and we look at how closely the model reproduces the historical results—the Keys model came within 3.1 points of the actual percentage going to the incumbent. When we exclude one election at a time and see how the model would have predicted the excluded election (a procedure called a jackknife), the error averaged 3.2 percentage points. This was larger than any of the eight presidential regression models we analyzed for this period; the average error for the other eight models was 2.2 percentage points.

When we retrospectively calculated the percentage of correct predictions by the Keys model (the call ratio), it was 100 percent. (We credit Lichtman's model with a correct call in 1912 because it predicted defeat for the incumbents, even though in Fair's data series they "won" with 54 percent of the vote.) Given the relatively high percentage error compared to other models, the finding that all elections were correctly forecast is surprising. However, one must remember that this is retrospective analysis, a fit of a model to the data. Prior research in other areas has shown a poor relationship between fit and predictive ability (Armstrong 2001, pp. 460-462).

The critical test is how well the models forecast prospectively (that is, for years not included in the estimation sample). In Table 1 we compare the Keys model against three others: Abramowitz (2004), Campbell (2004), and Fair (2004). These are traditional regression models, variations of which have been used in forecasting presidential elections for the better part of two decades. We estimated each of these four models through the 1980 election, which was the final observation included in the original Keys model. Then we used those models to forecast all subsequent elections through that of 2004.

In this prospective test, the Keys model performed well (Table 1). Not only were all election winners picked correctly, but its error was 2.3 percentage points, only slightly higher than the 2.1 percentage point errors for Abramowitz and Campbell, and about half as large as Fair's forecasts. Of the regression models, only Campbell's correctly predicted the winner of all six elections.

Extensions of the Index Method

Index methods do not have to be restricted to equal weights. In a 1772 letter to Priestly (http://homepage3.nifty.com/hiway/dm/franklin.htm) on how to make choices, Ben Franklin described another way, which he called "prudential algebra":

> I endeavor to estimate their respective weights; and where I find two, one on each side, that seem equal, I strike them both out. If I find a reason pro equal to some two reasons con, I strike out the three. If I judge some two reasons con, equal to three reasons pro, I strike out the five; and thus proceeding I find at length where the balance lies....

Given Ben Franklin's excellent record at problem solving, perhaps we should revisit his method, for it provides a useful way to capitalize on the value of expertise.

Table 1. Presidential Elections, 1984-2004 (6 elections)

Model (estimation period)	Forecast Accuracy	
	Absolute Percentage-Point Error	Call Ratio
Abramowitz (1948-1980)	1.9	67
Campbell (1948-1980)	2.1	100
Fair (1916-1980)	4.5	67
Lichtman (1860-1980)	2.3	100

Index methods can be tailored to the situation at hand. Certainly the needs and interests of the electorate have changed since 1860. The index methods could include all key issues for a given election. For recent elections, the issues could include gay rights, abortion, terrorism, union support, health care, minimum wage, estate taxes, tax rates, and free trade. The position of a candidate could be scored on whether it agrees with the agenda of a certain bloc of voters, such as swing voters.

This list could also include findings related to such personal characteristics as the height of the candidates and whether they look competent. When many elections have been prospectively or retrospectively predicted in this way, the resulting scores could be translated into a percentage vote for the incumbent.

Summary

Although the Keys model has correctly called the winner in 37 consecutive presidential elections, 31 of these were used to fit the model. It is the prospective forecasts of the last six elections that are of prime interest. In these, Lichtman's perfect record was matched by one of the three regression models against which it was compared, and its average error was almost as low as those of the best models. We conclude that the Keys model provides a useful alternative, but there is little reason to prefer it to the exclusion of other models. We expect the Keys model to serve as one of the important components for long-term (at least up to a year) forecasts of presidential elections. It should be especially useful because it uses a different method and different information than do current regression models.

Indexes like the Keys model are worthy of the attention of practitioners and researchers of causal methods. This easily understood method is expected to aid forecasting in situations where there are (1) many causal variables, (2) good domain knowledge about which variables are important and about the direction of effects, and (3) limited amounts of data. These conditions apply where discrete choices must be made, such as for the selection of personnel, retail sites, investment opportunities, product names, or advertising campaigns.

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