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Forecasting Elections from Voters' Perceptions of Candidates' Ability to Handle Issues

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Abstract: When deciding for whom to vote, voters should select the candidate they expect to best handle issues, all other things equal. A simple heuristic predicted that the candidate who is rated more favorably on a larger number of issues would win the popular vote. This was correct for nine out of ten U.S. presidential elections from 1972 to 2008. We then used simple linear regression to relate the incumbent's relative issue ratings to the actual two-party popular vote shares. The resulting model yielded out-of-sample forecasts that were competitive with those from the Iowa Electronic Markets and other established quantitative models. This model has implications for political decision-makers, as it can help to track campaigns and to decide which issues to focus on.

Keywords. index method, unit weighting, experience table, presidential election, accuracy

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Introduction

When deciding for whom to vote, voters use many different strategies. Redlawsk (2004) reported experimental data showing that some people aim to evaluate the candidates on all issues in order to make the “best” decision, whereas others use simple heuristics to limit their comparison to a small subset of issues. In the extreme case, people may compare candidates on a single issue such as the economy, a behavior known as single-issue voting.

Graefe and Armstrong (2012) developed the *big-issue model* to forecast U.S. presidential election outcomes centered on only a single piece of information. Based on the take-the-best heuristic (Gigerenzer & Goldstein, 1996), the big-issue model predicts that the candidate with the strongest voter support on the single most important issue facing the country will win the popular vote. The big-issue model provides a quick and inexpensive forecast that is expected to be accurate when the most important issue is of widespread importance.

In situations where there is no single issue that is clearly more important than all others combined, or if the relative importance of issues changes over time, it would seem prudent to include more issues. This is likely to improve on accuracy and stability of the forecast. We developed a model for forecasting U.S. presidential elections that incorporates voters’ perceptions of the candidates’ relative performance on the complete set of issues raised in polls. For this, we used the *index method*, as it is especially useful for selection problems with many important variables and a substantial amount of prior knowledge. The resulting *issue-index model* can aid candidates in developing campaign strategies around issues.

Index method

The index method has long been used for forecasting and selection problems. Analysts prepare a list of key variables and specify from prior evidence whether they are favorable (+1), unfavorable (-1), or indeterminate (0) in their influence on a certain outcome. Alternatively, the scoring can be 1 for a positive position and 0 otherwise. The analysts simply add the scores to determine the forecast. The higher the total score, the higher the forecast of the dependent variable. For selection problems with multiple choices, the analyst would pick the option with the highest score.

Conditions

The index method does not estimate weights from historical data on the variable of interest. This makes the method particularly valuable in situations with small samples and many variables, or in situations in which the variables change over time. The underlying idea is to use unit weights for assessing each variable’s directional influence on the outcome. Thus, the index method requires good domain knowledge (e.g., prior research or expert knowledge).

In general, the index method is useful if (1) a large number of variables are important, (2) good knowledge exists regarding which variables have an effect and the direction of that effect, and (3) new variables are likely to arise. The primary disadvantage of the index method is that it is difficult to estimate

the size of a variable's effect on the outcome. For a discussion of the conditions under which index models are useful see Graefe and Armstrong (2011).

Prior research on unit weights

The index method has been criticized for giving each variable a unit weight. Many analysts believe that employing differential weights will increase the accuracy of a model. However, prior evidence on the relative performance of unit weighting and multiple regression (which estimates optimal weights from the given data set for which predictions are needed) suggests that the issue of weights is *not* critical for selection problems (e.g., Dawes & Corrigan, 1974; Dawes, 1979). Rather, evidence has shown that unit-weight models often provide more accurate *ex ante* forecasts than regression weights *for the same data*.

Einhorn & Hogarth (1975) compared the predictive performance of multiple regression and unit weights for selection problems. They concluded that unit weighting is more accurate than regression if the sample size is not large, and the number of predictor variables and inter-correlation among these variables is high. For an analytic solution of the conditions under which unit weights outperform regression see Davis-Stober et al. (2010).

Empirical studies have been consistent with this finding. In analyzing published data in the domain of applied psychology, Schmidt (1971) found regression to be less accurate than unit weighting. In a review of the literature, Armstrong (1985:230) found regression to be slightly more accurate in three studies (for academic performance, personnel selection, and medicine) but less accurate in five (three on academic performance and one each on personnel selection and psychology). Czerlinski et al. (1999) compared multiple regression and unit weighting for 20 prediction problems (including psychological, economic, environmental, biological, and health problems), with the number of variables varying from 3 to 19. Most of these examples were taken from statistics textbooks, where they were used to demonstrate the application of multiple regression. The authors reported that, not surprisingly, multiple regression exhibited the best fit to the data set that was used to build the model (i.e., the training data). However, unit weighting showed higher accuracy when predicting new data.

Cuzán & Bundrick (2009) applied an equal weighting approach to three regression models for predicting popular vote shares in U.S. presidential elections: Fair's equation (Fair, 1978) and two variations of the fiscal model (Cuzán & Heggen, 1984). For the 23 elections from 1916 to 2004, the equal weighting scheme outperformed two of the three regression models – and did equally well as the third – when making out-of-sample predictions. When the authors used data from the 32 elections from 1880 to 2004, they found that equal weighting yielded a lower mean absolute error than the three regression models.

Index models for election forecasting

Lichtman (2008) was the first to use the index method for forecasting U.S. presidential elections. His “Keys” model assigns values of zero or one to an index of thirteen predictor variables. The model predicts the incumbent party to lose the popular vote if it loses six or more of the thirteen keys. Examples of the keys include two measures of economic conditions, questions of whether the incumbent president was

involved in a major scandal, and whether the current administration was affected by foreign or military success (or failure). The “Keys” model provided correct forecasts retrospectively for all of 31 elections since 1860 and prospectively for all of the last seven elections. No model has matched this level of accuracy in picking the winner of the popular vote. In addition, the forecast of the “Keys” model has some (though few) decision-making implications: it advises political parties to nominate candidates that are highly charismatic or considered national heroes.

Armstrong and Graefe (2011) used an index of 59 biographical variables to predict the winner of the popular vote among the 29 U.S. presidential election winners from 1896 to 2008. The variables included the candidate’s relationship status (married vs. single), educational background (prestigious college or not), and height (taller or shorter than opponent). The “bio-index” model correctly predicted the winner in 27 of the 29 elections and yielded *ex ante* forecasts of the popular vote shares for the four elections from 1996 to 2008 that were as accurate as the best of seven econometric models. The bio-index model uses variables that have decision-making implications for political campaigns. It can help political parties select candidates running for office.

Issue-indices

To capture the perceived issue-handling competence of candidates and translate it into a single score, the index method seemed an appropriate choice for several reasons: (1) the number of issues (i.e., variables) that are considered important in a particular election campaign is large (sometimes more than 40), (2) the importance of certain issues (e.g., the economy, crime, war, global warming, or health care) changes during, as well as between, elections, and (3) the number of observations is small (i.e., information about how voters perceive candidates to handle the issues was available only for the last ten elections from 1972 to 2008).

Data

We collected and analyzed data from polls that asked voters to name the candidate who would be more successful in handling an issue. For example: “*Now I’m going to mention a few issues and for each one, please tell me if you think Barack Obama or John McCain would better handle that issue if they were elected president...*” (cf. CNN/Opinion Research Corporation Poll. July 27-29, 2008). The issues included topics such as terrorism, the economy, and immigration.

The availability of polling data on issues is a recent development. Polling data were obtained by searching the *iPOLL Databank* of the Roper Center for Public Opinion Research for the time frame starting exactly one year before each respective Election Day. For the elections before 1988, data were collected by manually searching for all available polls. For the elections from 1988 to 2008, data were collected by searching “better job OR best job” to manage the large number of available polls. For 2008, data were collected from www.pollingreport.com. Given the lack of data on issues in the earlier years, the analyses were conducted starting in 1972. As shown in Table 1, a total of 427 polls were reviewed to determine voters’ opinion on 314 issues for the ten elections from 1972 to 2008.

Table 1: Final number of polls, issues, and index scores per election year

Election year	No. of Polls	No. of Issues	Total issue-index score (S) for		Winner of the popular vote (R / D)
			Republican candidate (R)	Democratic candidate (D)	
1972	9	24	17	7	R
1976	5	23	6	17	D
1980	15	23	10	13	R*
1984	34	37	27	10	R
1988	6	23	13	10	R
1992	60	36	9	27	D
1996	70	27	6	21	D
2000	68	41	19	22	D
2004	96	33	17	16	R
2008	64	47	16	31	D
Sum	427	314		Correct predictions	9 out of 10

* incorrect prediction

Selecting the issues

The selection of issues followed an operational definition: “A political issue is a matter of public concern and is something that the next president can be expected to take action about. An issue always focuses on a particular problem. Issues do not include policies for solving problems.” Four coders (both authors and two research assistants) independently classified each item of a list of 129 potential issues as to whether or not it fits this definition. The coders fully agreed on 70% of the items and were tied for 5%. If a tie existed between the four coders on a particular item (i.e., two coders did classify an item as an issue while the remaining two coders did not), the authors made the final decision. For the remaining 26%, the coders voted 3 to 1. The complete data, including the coding of the issues, used in this study are available with the supporting information in the online version of this article.¹

Generating the index and calculating scores

Voters’ support for the candidates on each issue was used as a variable in the index. On each day in the forecast horizon, results were averaged from all available polls to calculate the voters’ support for the candidates on a particular issue. In case of repeated polls by the same polling institute, poll results were first averaged for each polling institute. Averaging was expected to improve reliability and thus, reduce forecast error.

For each issue, index scores were generated for the candidates, assigning “1” to the candidate receiving the higher voter support and “0” to the opponent. In cases in which candidates achieved equal voter support, both candidates were assigned “0.” Finally, the index scores were summed to calculate the overall index score (S) for each candidate. Table 2 displays a sample calculation for an index made of two issues.

¹ The data can be accessed at <http://tinyurl.com/pollyissues-data>

Table 2: Example calculation of simple two-issue index scores

Issue of concern to voters	Polling institution	Voter support		Index scores	
		McCain	Obama	McCain	Obama
Health care	ABC News/Washington Post Poll. June 12-15, 2008	33	53		
	Diageo/Hotline Poll. June 5-8, 2008	24	54		
	Mean	28.5	53.5	0	1
Terrorism	ABC News/Washington Post Poll. July 10-13, 2008	49	43		
	Time Poll. June 18-25, 2008	53	33		
	Mean	51	38	1	0
Total issue-index scores (S)				1	1

Issue-index heuristic to determine the election winner

The following heuristic was used to predict the popular vote winner: *the candidate with the higher overall index score (S) will win the popular vote*. Note the heuristic’s simplicity; it does not require historical information from previous elections. In using S to forecast the election winner of a specific election, the model only draws on information from the given election.

Table 1 shows the heuristic forecasts on Election Eve of a particular election. The forecasts correctly predicted the winner of the popular vote for nine of the ten elections in our sample. In 1980, it did not predict Reagan to win against Carter.

Issue-index model to predict two-party vote shares

Simple linear regression was utilized to generate the issue-index model in order to predict the two-party popular vote shares. The regression model is advantageous to the heuristic in that it compensates for the uncertainty in the estimated relationship. The predictor variable is the relative index score (R) of the incumbent party’s candidate, which represents the percentage of issues that favored the candidate of the incumbent party.

That is, only a single predictor variable is used to represent all issues. The dependent variable is the actual two-party popular vote share received by the candidate of the incumbent party (V). For the ten elections from 1972 to 2008, this yielded the following vote equation:

$$V = 40.3 + 0.22 * R.$$

Thus, the model predicts that an incumbent would start with 40.3% of the vote; from there, depending on the value of R, the incumbent would be able to increase his share of the vote. If the percentage of issues favoring the incumbent went up by 10 percentage points, the incumbent’s vote share would go up by 2.2 percentage points. Consistent with traditional forecasting models, the model reveals a slight advantage for the incumbent. If the candidates each achieve equal index scores (i.e. R = 50%), the candidate of the incumbent party is predicted as the winner (i.e., V = 51.3%).

Testing the predictive validity of issue-indices

As noted above, the issue-indices are designed to improve decision-making. As a test of this, we looked at predictive validity by comparing the forecasts to those from other methods.

The issue-indices provide two ways for predicting the outcome of elections: (1) a simple heuristic to predict the popular vote winner and (2) the issue-index model to predict both the popular vote winner and the two-party popular vote shares.

Predicting the popular vote winner

For each election year, the forecast origin started 150 days prior to Election Day, which moved forward one day at a time until Election Eve. For elections that occurred from 1980 to 2008, forecasts could be calculated for each of the 150 days prior to Election Day. For the elections in 1972 and 1976, the first issue poll was released 88 and 124 days prior to Election Day, respectively. Thus, a sample of 1,412 forecasts was collected over all ten elections.

As shown in Table 1, the number of polls was quite small from 1972 through 1988, ranging from 5 in 1976 to 34 in 1984. Since 1992, each election encompasses at least 60 polls, so we expected that the index method would be relatively more accurate during that period.

The performance of issue-indices for predicting the winner varied as new polls became available during the forecasting horizon. The results, reported as the hit rate, are shown in Table 3. The hit rate is the percentage of forecasts that correctly determined the election winner.

Table 3: Number of daily forecasts and hit rates of the issue-index heuristic, the issue-index model, and the IEM winner-takes-all markets

Year	1972	1976	1980	1984	1988	1992	1996	2000	2004	2008	1972-2008	1972-1988	1992-2008
No. of forecasts	88	124	150	150	150	150	150	150	150	150	1412	662	750
Issue-index heuristic	100%	100%	0%	100%	54%	100%	100%	70%	11%	100%	74%	71%	76%
Issue-index model	100%	100%	0%	100%	54%	100%	100%	100%	51%	100%	81%	71%	90%
No. of forecasts	-	-	-	-	-	116	150	150	150	150	-	-	716
IEM	-	-	-	-	-	78%	100%	44%	95%	100%	-	-	83%

Benchmark approaches

We compared the hit rates of the two issue-index approaches to the naïve model and to forecasts from the Iowa Electronic Markets (IEM). The naïve model is a common benchmark in forecasting research that states that it is not possible to predict the winner. That is, the hit rate of the naïve model equals 50%.

The IEM is a prediction (or betting) market that was first launched in 1988 as a futures market in which contracts were traded on the popular vote shares achieved by the two major parties. Betting markets for predicting election outcomes have an interesting history. Rhode & Strumpf (2004) studied historical betting markets that existed for the 15 presidential elections from 1884 through 1940 and found that these markets “did a remarkable job forecasting elections in an era before scientific polling” (2004:127). The

reason is that prediction markets are a sophisticated approach for aggregating information and creating forecasts. The market forecasts reveal the combined judgment of market participants, who bet real money and therefore, have an incentive to efficiently process relevant information. In comparing IEM vote share prices with 964 trial-heat polls for the five presidential elections from 1988 to 2004, Berg et al. (2008) found that IEM market forecasts were closer to the actual election results 74% of the time. However, Erikson and Wlezien (2008) found polls to be more accurate than IEM forecasts when the polls' pre-election lead times were discounted by regressing the vote on polls taken at comparable times across elections.

Since 1992, the IEM also operates a winner-take-all market that provides a forecast of which candidate will win the popular vote. Table 3 shows the hit rates of the IEM winner-take-all markets for the last 150 days prior to Election Day; except for 1992, when the winner-take-all markets were only available from 116 days prior to Election Day.

Accuracy of the issue-index heuristic

The issue-index *heuristic* correctly predicted the winner 74% of the times and therefore, performed well in comparison to the naïve model. This performance was achieved without using information from previous election years. As expected, the heuristic was more accurate since 1992 when the number of issues was much larger; the hit rate was 71% for the 1972-88 elections and 76% for the 1992-2008 elections. However, the heuristic was less accurate than the IEM forecasts, which achieved a hit rate of 83% across the five elections from 1992 to 2008.

Accuracy of the issue-index model

The forecasts of the issue-index *model* were calculated through N-1 cross-validation, which is a standard procedure in forecasting research for measuring out-of-sample accuracy. This means that for each election, we dropped the observation from that year, fitted the model based on the remaining data, and then forecasted the omitted observation.

Across the ten elections, the resulting models correctly predicted the winner 81% of the times. This was substantially better than the naïve forecast of 50%. The model was also more accurate in the most recent five elections at 90%, up from 71% in the five elections from 1972 to 1988. In addition, the issue-index model's hit rate of 90% from 1992 to 2008 was slightly better than that of the IEM (83%).

Predicting the incumbent's two-party vote share

The vote equation of the issue-index model allows for forecasting two-party popular vote shares. To compare the model's accuracy to other models, it is necessary to define a certain lead-time for when the forecast is generated. Most of the traditional forecasting models produce their forecasts around Labor Day, about eight to nine weeks prior to Election Day in the respective election year. Therefore, Tables 4 and 5 report the forecasts of the issue-index model calculated at about nine weeks, or 63 days, before Election Day. Note that such a one-off comparison conceals an important advantage of the issue-index model, which is the ability to continuously incorporate new information and thus, track campaigns.

The *out-of-sample* forecasts presented in Table 4 were again calculated through N-1 cross-validation. The *ex ante* forecasts for the last three elections from 2000 to 2008 presented in Table 5 were generated by successive updating. That is, only data that would have been available at the time of the respective elections were used to build the model: to predict the 2008 election, data on the nine elections from 1972 to 2004 were used; for the 2004 election, data on the eight elections from 1972 to 2000 were used; and, for the 2000 election, data on the seven elections from 1972 to 1996 were used.

Benchmark approaches

We used the naïve model, the big issue model, eight established econometric models, and the IEM vote share markets as benchmarks for assessing the accuracy of the issue-index model's vote share forecasts.

Again, the naïve model assumes that it is not possible to make a forecast and simply predicts a fifty-fifty split of the two-party popular vote.

The big-issue model (Graefe & Armstrong, 2012) predicts the election outcome based on how voters expect the candidates to deal with the *most* important issue facing the country. This model was the first attempt to develop a policy model for issues. The big-issue model provided a good initial rule of thumb and fast advice on which issues candidates should stress in their campaigns. Since it is based on the take-the-best heuristic (Gigerenzer & Goldstein, 1996), it works best if the most important variable dominates any combination of less important variables (Martignon & Hoffrage, 2002). Since, for elections, it might seldom be the case that one issue is more important than all other issues together, we expected further improvement from using an index of issues.

Most econometric models are usually able to predict the correct election winner far in advance. However, the models' individual track record in predicting vote shares is mixed, and forecast errors for a single model can vary widely across elections. Most of the established econometric models use between two to five predictor variables, thereby usually including a measure of the economy's state and some measure of the incumbent's popularity. For an overview of the predictor variables used in most of the econometric models, see Jones and Cuzán (2008).

The IEM vote-share markets provide daily updated forecasts of the two-party popular vote shares achieved by the candidates. Forecasts from these markets are available from 1988.

Out-of-sample accuracy of the issue-index model

As shown in Table 4, the issue-index model's 63-day ahead out-of-sample forecasts correctly predicted 8 out of the 10 elections and yielded a mean absolute error (MAE) of 3.5 percentage points. This is an error reduction of 22% compared to the naïve model (MAE: 4.5 percentage points). As expected, with a MAE of 1.7, the model was more accurate for the five elections since 1992, compared to a MAE of 5.3 for the five elections from 1972 to 1988.

The out-of-sample forecasts of the issue-index model were also compared to the IEM's vote-share markets for the six elections from 1988 to 2008. Across the 150 days prior to Election Day, the MAE over the six elections from 1988 to 2008 was similar: 2.3 percentage points. However, as shown in Figure 1, there were differences between both methods over time. While the issue-index model was more accurate

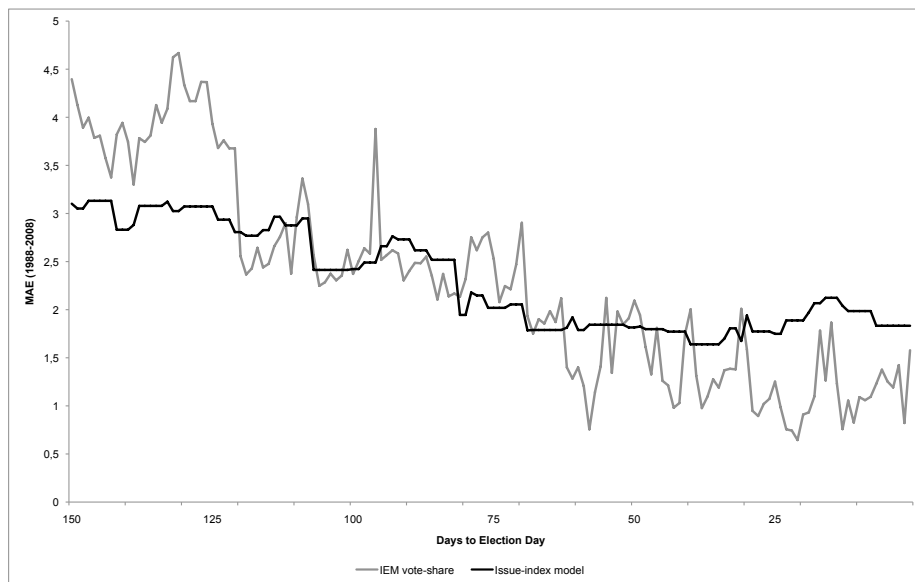
early in the forecasting horizon, the IEM was superior closer to Election Day. The results suggest that issue-indices are particularly helpful for long-term forecasting.

Table 4: Out-of-sample forecasts of the issue-index model and actual two-party vote-shares for the candidate of the incumbent party:

Election	Actual	Absolute error		
		Issue-index model forecast	Issue-index model	Naïve model
1972	61.8	53.4	8.4	11.8
1976	48.9	47.0	2.0	1.1
1980	44.7	52.9*	8.2	5.3
1984	59.2	53.4	5.7	9.2
1988	53.9	51.5	2.4	3.9
1992	46.5	46.7	0.1	3.5
1996	54.7	57.7	3.0	4.7
2000	50.3	51.4	1.1	0.3
2004	51.2	48.8*	2.4	1.2
2008	46.3	48.1	1.7	3.7
MAE			3.5	4.5

* predicted wrong election winner

Figure 1: MAE of the issue-index model and the IEM vote-share markets (1988-2008)



Ex ante accuracy of the issue-index model

The critical test is how well the models forecast prospectively (that is, for years not included in the estimation sample). Table 5 provides the errors for the *ex ante* forecasts of the issue-index model, the big-issue model, eight econometric models, the IEM vote-share markets, and the naïve model. The forecasts of most econometric models were published in *PS: Political Science and Politics*, 34(1), 37(4), and 41(4). The forecasts for Fair’s model were obtained from his website (<http://fairmodel.econ.yale.edu>). The

forecasts of the big-issue model were derived from Graefe & Armstrong (2012).

Table 5: Issue-index model vs. benchmarks: Absolute errors of ex ante forecasts

Forecast model	Approximate date of forecast	Forecast error			
		2000	2004	2008	MAE
Issue-index model	Early September (63 days prior to Election Day)	1.4	2.7	1.5	1.9
Econometric model					
Norpoth	January	4.7	3.5	3.6	3.9
Lockerbie	May / June	10.0	6.4	4.5	7.0
Fair	Late July	0.5	6.3	2.2	3.0
Abramowitz	Late July / early August	2.9	2.5	0.6	2.0
Lewis-Beck & Tien	Late August	5.1	1.3	3.6	3.3
Wlezien & Erikson	Late August	4.9	0.5	1.5	2.3
Holbrook	Late August / early September	10.0	3.3	2.0	5.1
Campbell	Early September	2.5	2.6	6.4	3.8
	MAE	5.1	3.6	2.6	3.8
Heuristic					
Big-issue model	Early September (63 days prior to Election Day)	6.8	0.8	3.1	3.6
Prediction market					
Iowa Electronic Markets (vote-share market)	Early September (63 days prior to Election Day)	1.0	1.2	0.9	1.0
Naïve model	No lead time	0.3	1.2	0.7	1.7

On average, the early September forecasts yielded a lower MAE than each of the eight econometric models. In addition, the MAE was only about half as large as the average error of the econometric models and the big-issue model. The IEM forecasts were most accurate, missing actual vote shares on average by only 1 percentage point. Ironically, due to the closeness of the past three elections (particularly in 2000 and 2004), the naïve model was the second most accurate model in that time period.

Discussion

The issue-index model continues the stream of research on using the index method for forecasting elections by incorporating information about how voters perceive the candidates to handle the issues considered important in a particular campaign. Issues play a fundamental role in election campaigns. Campaign strategists try to make their candidate look competent on issues that are perceived as important and run campaigns to emphasize this issue advantage. If crime handling differentiates the candidates, crime will be emphasized by a campaign. In turn, the issue of crime will become more salient to the electorate. In recent years, an increasing number of polls have been directed at exploring voters' perceptions about issues, and the Internet has made this information more readily available.

Traditional election forecasting models regard a U.S. presidential election as a referendum on the incumbent president's performance. That is, if voters are happy with the incumbent's performance, they

will vote for the incumbent party's candidate; otherwise, they will vote for the candidate of the opposing party. Most existing models use a measure of the economy (e.g., GDP growth), usually along with one or more political measures. Thereby, the incumbent president's popularity has been identified as the single best predictor variable for forecasting election outcomes (Lewis-Beck & Rice, 1992). A common explanation for the success of this measure is that it can be considered as a proxy for how the president is handling both economic and noneconomic issues.

Measuring issue handling performance: Issue-indices vs. incumbent popularity

However, there are some disadvantages with using the incumbent's popularity as a proxy for issue handling performance. (1) Incumbent popularity is a retrospective measure as voters are asked to assess how the president is (or has been) handling his job. Yet, U.S. presidential voters not only evaluate past performance, but they also look at how well off they will be in the future. (2) The measure focuses solely on the president's performance and ignores the performance of the challenger. For example, there might be situations in which voters are satisfied with how the president is handling the issues, but still think that the challenger could do an even better job. Vice versa, voters might rate the incumbent president's job performance as poor, but expect the alternative to be even worse. Models based on the incumbent president's popularity cannot capture such information. In addition, the validity of the incumbent's performance measure is questionable in open-seat elections without the incumbent president running. (3) The measure does not provide insights on which issues the president is favored. Therefore, strategists cannot use it for campaign planning purposes.

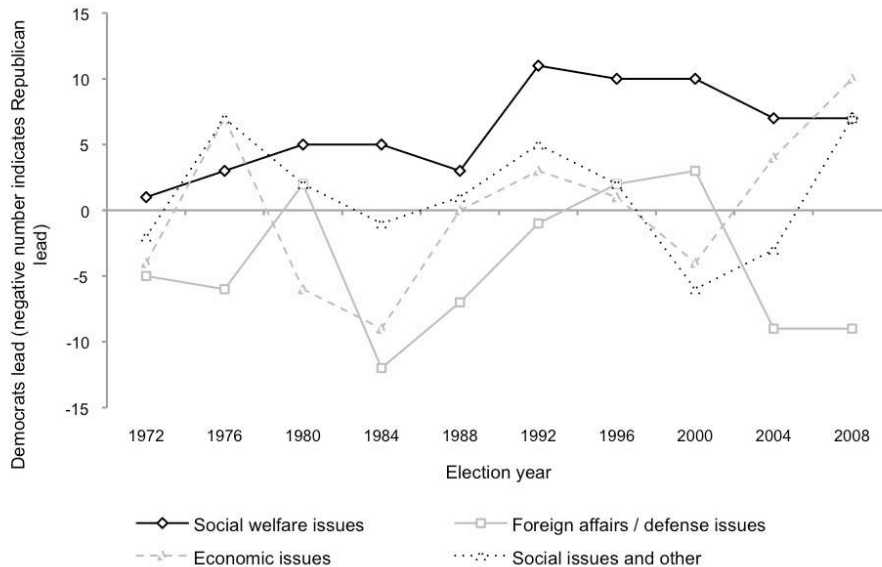
The issue-index addresses these limitations of the incumbent's popularity as it allows for a prospective assessment of the relative performance of the candidates of the two major parties on each individual issue. As a result, issue-indices represent *aggregate* voter decision-making, but do not allow for drawing inferences on *individual* voter decision-making. As noted earlier, Redlawsk (2004) found that the strategies voters use to decide for whom to vote range from simple single-issue voting to a complex evaluation of the candidates' performance on all available issues. Our approach cannot shed further light on this question, as the election result could be the outcome of different individual voting strategies. Future research should evaluate whether, and how, individual voters (should) use an issue-index when deciding whom to vote for.

Issue-indices as decision aids

While the issue-index model is limited in providing insights on individual voter decision-making, it can provide advice to political decision makers. According to the issue-index model, the election outcome is the result of a referendum on the issue-handling reputation of the candidates. A candidate's issue-handling reputation is influenced by issue ownership of the candidate's party (Petrocik 1996). In addition, it might be influenced by relative candidate evaluations. The candidate that is favored on one issue might also be favored (or less repudiated) on issues that normally favor the candidate of the other party. For example, in the 1992 elections, Clinton was viewed as better than Bush on almost all issues, including some of which Democrats almost never fare well, such as dealing with crime.

Figure 2 shows how voters perceived the candidates' issue-handling competence for the elections from 1972 to 2008. Consistently, Democrats were seen as better in dealing with social welfare issues. Except for 1980, 1996, and 2000, voters favored the Republican candidate on foreign affairs and defense issues. Perceptions of economic and social issues were mixed.

Figure 2: Perceived issue-handling competence of candidates (1972-2008)



Note that, as the number of issues increased for more recent elections, differences between the candidates became clearer. In the last two elections, Democrats were favored for economic and welfare issues. The Republicans gained back and kept their advantage for foreign policy and defense in a post-9/11 world. In 2008, voter support on social and other issues switched from Republicans to Democrats.

Candidates might be able to influence their issue-handling reputation by effective campaigning. If issue-handling reputation for a certain problem is about equal for both candidates, a candidate could increase his marketing effort to gain ownership of this issue. Candidates could raise and promote issues that favor them, but which have not received attention from the public yet. Finally, candidates could adopt new or revised positions and diverge from traditional party views. By emphasizing such changes, a candidate might be able to change his issue-handling reputation as perceived by voters. Issue-indices can help candidates identify issues to focus on in their campaign.

Although the issue-index model implies that candidates can increase their appeal to voters by effective campaigning, the common view in political science is that campaigns have only a limited impact on the election outcome. The main reason for this is the strong degree of partisanship among U.S. voters. As noted by Campbell (1996:423), “no matter how bad the campaign goes for a party, it can count on receiving about 40% of the two-party vote; no matter how well a campaign goes for a party, it will receive no more than about 60% of the two-party vote.” With the intercept of about 40.3% and the coefficient 0.22, the vote equation of the issues-index model is consistent with this view. Imagine a situation in which the incumbent’s campaign completely fails and the voters favor the challenger on all issues (i.e., relative index score $R=0$). In this case, the issue-index model would predict the incumbent to gain 40.3% of the

popular vote. Vice versa, if voters favored the incumbent on every single issue ($R=100$), the model would predict the incumbent to receive at maximum 62.3% of the popular vote.

Benefits and limitations of issue-indices

Issue-indices are simple to use and easy to understand. By using a simple heuristic, issue-indices allow for the prediction of the popular vote winner without a need for historical data analysis. In addition, issue-index scores can be used in combination with simple linear regression to allow for quantitative predictions. However, a disadvantage is the cost of summarizing knowledge to both develop the model and update it with new information.

Unfortunately, the index method's simplicity may be its biggest drawback. Summarizing evidence from the literature, Hogarth (2012) showed that people exhibit a general resistance to simple solutions. Although there is evidence that simple models can outperform more complicated ones, there is a belief that complex methods are necessary to solve complex problems.

Thus, it is not surprising that the index method has faced some skepticism. An early example is Burgess (1939), who described the use of the index method for predicting the success of paroling individuals from prison. Based on a list of 25 factors, which were rated either "favorable" (+1) or "unfavorable" (0), an index score was calculated for each individual to determine the chance of successful parole. This approach was questioned since Burgess (1939) did not assess the relative importance of different variables, and no consideration was given to their magnitude (i.e. how favorable the ratings were).

The issue-index might face similar reservations, as it does not (a) weigh the importance of issues and (b) measure by how much voters favor a candidate over the other on a particular issue. However, the issue-index deliberately did not include such information for a number of reasons.

First, it is not clear that this would increase forecast accuracy. The empirical evidence summarized earlier does not support the use of differential weights over unit weights for many problems in the social sciences. Also, when addressing the concerns with the approach used by Burgess (1939), Gough (1962) did not obtain more accurate parole predictions.

Second, there is reason to believe that the relative importance of issues might not matter much. Based on results from a 1985 survey of U.S. voters, Petrocik (1996:830) concluded that for many voters "almost any problem is important." In this survey, respondents (divided into Republican and Democratic identifiers) had to rate the importance of 18 issues on a scale from zero (least important) to ten (most important). The average score was 7.8. Of all 36 ratings, 29 achieved a mean score of seven or higher.

Third, weighting the importance of issues and measuring the magnitude of candidate evaluations would boost the model's complexity, particularly in terms of collecting and analyzing data on issue importance. Furthermore, the importance of weights may vary over time.

We hope that other researchers will address these issues. To support them in this endeavor, we have made our data publicly available.

Summary

The index method was applied to the ten U.S. presidential elections from 1972 to 2008 in order to provide a forecast based on voters' perceptions regarding how the candidates would handle the issues. In using a simple heuristic, the approach correctly predicted the popular vote winner in 9 of 10 elections. By tracking issue polls that are now widely available, candidates can use this information to decide which issues they should stress in their campaigns.

By using a simple linear regression of the incumbent's relative index scores against the actual votes, forecasts of the popular two-party vote shares were obtained. The resulting model provided *ex ante* forecasts that were competitive with forecasts from eight econometric models and more accurate than the big-issue model for the three elections from 2000 to 2008. Across the last five elections from 1992 to 2008, the issue-index model provided out-of-sample forecasts that yielded a higher hit rate – and similar MAE – than the Iowa Electronic Markets.

Index models are expected to be useful for other problems involving a large number of variables, small data sets, and a good knowledge base, conditions that are common for many prediction problems in the social sciences. Examples include selection problems such as predicting which CEO a company should hire, where to locate a retail store, which product to develop, or whom to marry.

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