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ABSTRACT. We propose, in this article, a model for multimember districts in which voting choice is a function of the product of relative benefits and the probability of breaking a tie between their preferred party and its trailing party. We transform people’s perception of the parties’ positions on specific issues in order to obtain the probability of each party winning. “Feeling thermometer” and “like/dislike” questions are employed to measure the perceived benefit that an individual might expect to receive from each party if elected. We test our model using the 1995, 1998, and 2001 legislative elections in Taiwan, simulating the level of closeness with logistic estimates. Based on the simulation, we identify four types of voting behavior: sincere, straightforward, irrational, and strategic. The study of these four types of voting behavior sheds light on party competition in Taiwan and provides models likely to be useful elsewhere as well.

Keywords: • Expected utility • Voting behavior • Single nontransferable voting system • Political parties • Taiwan

Introduction

Downs’s expected-utility theory states that a voter “first decides what party he believes will benefit him most; then he tries to estimate whether this party has any chance of winning” (1957: 48). Since Downs’s model was proposed, many scholars have applied it to the empirical study of voting behavior (Black, 1978; Ferejohn and Fiorina, 1974; McKelvey and Ordeshook, 1972; Riker and Ordeshook, 1968). Some scholars have extended their analyses to strategic voting (Abramson et al., 1992; Cain, 1978).

In this article, we apply the expected-utility voting model to the study of voting behavior in Taiwan. Taiwan was selected because it has an unusual electoral system: a single nontransferable voting system (SNTV) with multimember districts,
in which every eligible voter has one vote and the top-placed candidates win the seats. Studies by Cox (1997), Cox and Niou (1994), and Grofman (1999) have found that parties in such systems manage to coordinate both electorate and candidates in order to maximize their number of seats, thereby encouraging voters to take both the candidates' chances of winning and the candidates' offerings into account. However, other research indicates that voters in Taiwan tend to choose parties first, and then pick their favorite candidates within those parties (Liu, 1997).

Taiwan shifted from one-party politics to a multiparty system during the 1990s. The Kuomintang (KMT), which fled from China to Taiwan in 1949, dominated legislative elections after 1969, but its share of seats declined after it allowed the formation of the Democratic Progressive Party (DPP) in the late 1980s. The DPP promoted the idea that Taiwan should become a sovereign state, while the KMT accepted the formula of "one China" and opposed Taiwan's independence. In 1994, some former KMT legislators founded the Chinese New Party (CNP), advocating the greater-China ideology and future unification with China. James Soong, former governor of the Taiwan provincial government, founded another splinter party of the KMT, the People First Party (PFP). Its participation in the 2001 legislative election partly contributed to the decline of the KMT's share of votes from 46.43 percent to 31.28 percent. Founded just three months before the 2001 election, the Taiwan Solidarity Union (TSU) won an impressive 13 seats due to the backing of former president Lee Teng-hui. The TSU advocated a more radical pro-independence policy. These five parties allow us to concentrate on parties instead of individual candidates, assuming that candidates with the same party label represent a single party ideology.

In this article, we will briefly review the differences between the social-psychological voting model and the expected-utility voting model. Next, we will show how we derive the expected-utility model. Using a logistic regression model, we test the expected-utility model with the 1995, 1998, and 2001 survey data. We then discuss four types of voting behavior in the multimember districts.

Voting Models and the Context of Taiwan's Elections

In the 1960s, a group of scholars at the University of Michigan conceptualized partisanship as a stable predisposition toward parties, assisting individuals to perceive the political world (Campbell et al., 1960; Converse and Markus, 1979). Partisanship is acquired from socialization (Niemi and Jennings, 1991) and has both direct and indirect influences on political participation, including voting choices (Converse and Markus, 1979). It is not only a voting guide, but also a long-term, affective attachment toward political parties. Scholars in Taiwan have extensively applied the Michigan model to Taiwanese voting behavior, revealing the impact of partisanship on party choices and national identity (for example, Liu, 1996; You, 1996).

The attitude-oriented model has thus received support from scholars in Taiwan, but the unique context of Taiwan requires other approaches in order to study its voting behavior. First of all, meaningful party competition did not occur prior to the late 1980s, when the KMT government allowed the formation of the DPP. It is therefore difficult to discern whether partisanship will be stable over time or is simply a response to short-term forces. In addition, the political parties promised the electorate such dramatic changes (prosperity, peaceful cross-strait relations, improved social welfare, and so on) as to render the attitude-oriented model that
emphasizes long-term predisposition, the socialization process, and past performance inadequate. Lastly, the SNTV system, which by its nature allows multiple parties to compete for more than one seat, encourages sophisticated voting more than the single-member district system does, to the extent that the attitude-oriented approach, built on the basis of the single-member district system, may not account for Taiwanese voting behavior.

Downs (1957), Black (1958), and Farquharson (1969) set up the major groundwork of the economic approach. Its premise is that every individual is rational regardless of the context and has some preference regarding outcomes, which can be either for candidates or policies (Enelow and Hinich, 1984). In other words, individuals' decision-making is not contingent on the psychological forces or personal characteristics of candidates; instead, candidates or issues are "sold" to individuals as commodities in a market. In single-member districts, the electoral equilibrium is unique: all candidates adopt the position of the median voter (Downs, 1957). Voters will concentrate their votes on the top two candidates to maximize their chance of affecting the outcome. Riker and Ordeshook (1968) found that the electorate simply estimates whether one candidate can reach 50 percent of voters; the probability of voting depends on how close in their standing the top two contenders are. Downs's and Riker and Ordeshook's work inspired further research on the calculus of voting and strategic voting in single-member and multimember districts (Black, 1978; Blais and Nadeau, 1996; Cain, 1978; Ferejohn and Fiorina, 1974; McKelvey and Ordeshook, 1972; Ordeshook and Zeng, 1997). Some scholars found voting equilibria in multimember districts using approval voting (Cox, 1994; Myerson and Weber, 1993). They proved that candidates can converge on more than one position, which implies uncertainty of voting behavior in multimember districts.

The research cited thus far shows how parties and candidates reach voting equilibria in terms of a candidate's position and voter preference. More importantly, the economic approach has been used to predict voting behavior with success. Based on such models and with the national sampling data collected after the 1995, 1998, and 2001 legislative elections, we have an opportunity to test the expected-utility voting model in Taiwan. In the next section, we present our model and relevant measurements.

The Expected-Utility Voting Model in Multiparty Politics

According to the decision-making logic of the economic voting theory, it is rational for people to turn out to vote if they can change the outcome by voting, that is, if they expect their vote to have utility. The only way to affect the outcome in a single-member district with plurality rule is to break the tie between the top two competitors. Riker and Ordeshook (1968) showed that voters can perceive the possibility that one candidate could receive a majority of votes. In this case, voters can estimate their opportunities to change the outcome by voting for the trailing candidate. McKelvey and Ordeshook (1972) extended the model to the multi-candidate case. They express the utility of voting against abstention as a series of paired comparisons of utility and probability. Black (1978) applied McKelvey and Ordeshook’s model to two-member districts in Canada. Each utility comparison is attached to the probability that the citizen’s vote can break a tie between two candidates. His finding suggests that differential probabilities account for multi-candidate voting choices.
Riker and Ordeshook (1968) proposed a calculus of voting in single-member districts. The formula is \( R = PB - C + D \), where \( R \) is the utility of voting, \( P \) is the probability that the citizen will bring about the benefit, \( B \), if the candidate is elected, and \( C \) is the cost of voting. To offset the cost of voting, a rational voter must have a high sense of citizen duty, \( D \). The formula states that one will go out to vote if, and only if, the expected utility of voting plus civic duty is greater than the cost of voting. Ferejohn and Fiorina (1974) asserted that voters turn out to vote for a given party not in order to maximize a positive return, but in order to minimize their regret. Setting aside the debate, we adopt the \( k \)-candidate calculus of voting that Riker and Ordeshook (1968) developed. The expected utilities of voting for one party and of abstention, respectively, are as follows:

\[
E^k = p_1 u_1 + p_2 u_2 + \ldots + p_{k-1} u_{k-1} + (1 - p_1 - p_2 - \ldots - p_{k-1}) u_k - C + D
\]

\[
E^0 = p_1 u_1 + p_2' u_2 + \ldots + p_{k-1}' u_{k-1} + (1 - p_1' - p_2' - \ldots - p_{k-1}') u_k
\]

Equation 1 states that the expected utility of voting for one candidate among \( k \) parties is the function of the probability of victory multiplied by the benefit. Equation 2, however, is the expected-utility function of abstention, in which one saves the cost of \( C \), but still enjoys the benefit if any party gets elected. We subtract Equation 2 from Equation 1, giving us the following:

\[
E^k - E^0 = (p_1 - p_1') (u_1 - u_k) + (p_2 - p_2') (u_2 - u_k) + \ldots + (p_{k-1} - p_{k-1}') (u_{k-1} - u_k) - C + D
\]

Equation 3 states that the relative likelihood of winning an election between what might be referred to as the "\( k \)-th" party and the others, as well as the differential benefits, decide whether one goes out to vote or abstains. Notice that the number of pairwise comparisons will be one less than the number of parties. If there are three parties and we are interested in party one, for instance, the utility function is written as follows:

\[
E^1 - E^0 = (p_2 - p_2') (u_2 - u_1) + (p_3 - p_3') (u_3 - u_1) - C + D
\]

In Equation 4, \( p_2 - p_2' \) represents the differential probability between two cases: party two winning the election with or without one's vote. Furthermore, it also means the probability that one can break a tie between party two and party one by casting a ballot. We can rewrite \( p_2 - p_2' \) as \( p_{21} \) (the probability that party two and party one will tie). Likewise, \( p_3 - p_3' \) becomes \( p_{31} \) (the closeness in standing of party three and party one). The expected utility of voting for party one against abstention is the function of the closeness in standing between party one and the other two parties multiplied by the pair of differential benefits. The expression of multiparty voting choice is written as follows:

\[
E^k - E^0 = p_{k1} u_k + \ldots + p_{k-1} u_{k-1} - C + D
\]

Equation 5 represents the utility received by a citizen who does not participate in the election, but waits to see what electoral outcome will be. Unlike Riker and Ordeshook, we do not assign a different benefit term to the citizen who does not turn out; we plainly assume that the benefit is the same to the citizen as long as the party wins the seat. If one decides not to vote, one can save the cost of voting associated with the probability that the candidate will win (or lose) the election without one's vote.

Equation 5 can be taken as the primary form of the individual voting model.
However, the probability term has not yet been addressed. In practice, we were reluctant to ask the respondents to estimate the probability of the possible outcomes with or without their votes. Their estimates were likely to be either wild guesses or ad hoc knowledge, resulting in large response variations. Instead, we assumed that every individual estimates the subjective probability based on her understanding of the ideological gap between a given party and mainstream society. Suppose that every individual thinks of the preference distribution of the whole population over a critical issue as a bell-shaped symmetrical distribution on which each party has a fixed position. People map a party’s position onto the probability density function to estimate how many votes the party will receive. The median point of the ideological issue (x-axis) stands for the average voter or the mainstream of society. The number of voters at this position is higher than at any other point, whereas the two extreme points have the smallest number of voters. The small parties are usually viewed as ones whose positions are far from the average voter; they have a slim chance of capturing a majority of voters.

From Figure 1, it is clear that there are two ways to get the same scores in terms of the distance between the median voter and a given party; the relationship is not represented on a one-dimensional scale. To solve the two problems (the inverse relationship of distance and two-dimensional scaling), we transformed the perceived party positions into probability terms by substituting the positions into the normal distribution function, as follows:

\[
p(X) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{-\frac{(X-\mu)^2}{2\sigma^2}}
\]

where we assume that \( \mu \) is equal to .5 and \( \sigma \) is equal to 1.0.

Moreover, we calculate the ratio of the probabilities to obtain an indicator of closeness between 0 and 1. When the two parties occupy the same position on the same side or on opposite sides of the curve, they will acquire the same number of votes.
votes, as suggested by the spatial voting model. Voters will perceive there to be a tie, therefore, when the two parties happen to take the same position or equally opposite ones.

We can, then, rewrite the final equation as follows:

\[ E^k - E^0 = \frac{[p(i)/p(k)]*(u_k - u_i) - C + D}{p(X)} \]

where \( i \neq k \) and

\[ p(X) = \frac{1}{\sqrt{2\pi\alpha^2}} e^{-\frac{(X-\mu)^2}{2\sigma^2}} \]

Suppose that there are three parties in the race. Equation 6 yields expressions of voting for each party as follows:

\[ E^1 - E^0 = \frac{(P_3/P_1)\ast(u_1 - u_3) + (P_2/P_1)\ast(u_1 - u_2) - C + D}{p(X)} \]

\[ E^2 - E^0 = \frac{(P_3/P_2)\ast(u_2 - u_3) + (P_1/P_2)\ast(u_2 - u_1) - C + D}{p(X)} \]

\[ E^3 - E^0 = \frac{(P_3/P_2)\ast(u_3 - u_2) + (P_1/P_2)\ast(u_3 - u_1) - C + D}{p(X)} \]

As for the derivation of the left-hand side of Equation 5, we did not set up a differential utility of two alternatives as the dependent variable; instead, we compared the utility between the act of voting for a given party and abstention. We set it in this way because the logistic procedure estimates the effect of each element by maximizing the probability of each group versus another specific group. In this case, maximizing the probability of voting for each party against abstention is the easiest way to estimate the effect of each weighted benefit.

**Variables**

Having mentioned the elements of our model, we shall now give detailed descriptions of the variables. The probability term is derived from perceived party positions on the unification issue, which has been a critical issue in Taiwan since the 1990s (Wang, 1994; You, 1996). Although some scholars have suggested the importance of the socioeconomic equity issue (Chu and Lin, 1996), we presumed that each party's stand on the unification issue is more distinct for the electorate than for other issues. The “don't know” and “refused” (to answer) responses are treated as missing data.

We measured the benefits of a party's electoral victory by assessing individual preferences for each party. In both the 1995 and 1998 surveys, the respondents were asked if they liked or disliked each party. We recorded the score on a five-point scale. In the 2001 survey, the feeling thermometer questions allowed us to establish each voter's preference toward each party. Unlike the other party-related questions, the feeling thermometer module covers all of the parties in the election. Respondents were asked to give a 0–10 score for each party to represent how much they liked the party in question. Some people, of course, made no response to one or more parties, and we simply treated those responses as missing data.

Lastly, we used the level of political efficacy to measure the strength of citizen duty as a motivation to vote. The assumption is that high political alienation (low sense of political efficacy) would lead to the perception that the act of voting has
little value. Riker and Ordeshook (1968) and Cain (1978) employed a "participation" index to measure people's intention to vote. Lacy and Burden (1999) used the inverse of education level as the cost of voting and Ordeshook and Zeng (1997) suggested the use of partisanship as a surrogate measure of the cost of voting. Both these cost measurements are unsatisfactory and likely to introduce specification error, and we were unable to find an appropriate measurement for cost. Therefore, we decided to leave the cost term aside, and use only the measure of political efficacy.9

The three datasets do not use the same questions to measure political efficacy (people's perceptions about their influence on policies). For the 1995 survey, we selected the following question to analyze: "When the government decides on policies, do you think it puts social well-being as its top priority?" We assumed that people who believe government has social well-being in mind when considering policies were more likely to turn out to vote because the act of voting is good for social well-being. For the 1998 survey, we chose the following question to study: "Do you agree or disagree with this statement: government officials do not really pay attention to a person like me?" For the 2001 survey, external efficacy was measured using this question: "Do you agree or disagree with the statement that we, ordinary people, have no influence on the government?" We anticipated that people who had higher levels of political efficacy would tend to vote for the incumbent KMT.

To assess the benefit from a likely victory, we chose the "like/dislike" questions for the 1995 and 1998 data. We again transformed these according to a 0–1 scale. For the 2001 data, we transformed the 11-point feeling scores into a 0–1 scale. The product of probability and benefit ranges from 0 to .5.

Since our model sets up the dependent variable as the choice between a given party and abstention, we can include abstention as the comparison group for party choices. In doing so, we keep the observations regarding who opts for abstention, estimating the effect of three parties on participation (Lacy and Burden, 1999). Downs (1957) contends that people choose not to vote when they cannot find any difference between the contenders. Therefore, we can observe how people respond to the status quo by including abstention as a choice.10

When a rational voter considers her vote for each party as against abstention, Equations 7, 8, and 9 show that she is faced with different sets of pairwise comparisons. We use a logistic regression model to estimate the effects of each element in the expected-utility voting model. The logistic procedure, through the maximization of the linear function, finds the parameters that are most likely to approach the observed distribution of the data (Cain, 1978). Assuming that the errors across choices are uncorrelated, the logistic estimates resemble multinomial logit estimates (Alvarez and Nagler, 1998). The logistic estimates are consistent and unbiased asymptotically (Long, 1997). The probability of \( Y = 1 \) is expressed as a nonlinear function of the explanatory variables:

\[
\text{Probability (voting for the "k-th" party)} = \frac{\exp(x\beta)}{1 + \exp(x\beta)}
\]

where

\[
x = \begin{cases} 
\frac{p(3)}{p(1)}(u_1 - u_3) + \frac{p(2)}{p(1)}(u_1 - u_2) + D & \text{when } k = 1 \\
\frac{p(3)}{p(2)}(u_2 - u_3) + \frac{p(1)}{p(2)}(u_2 - u_1) + D & \text{when } k = 2 \\
\frac{p(2)}{p(3)}(u_3 - u_2) + \frac{p(1)}{p(3)}(u_3 - u_1) + D & \text{when } k = 3 
\end{cases}
\]
The coefficient of each expected-utility term should be positive; the expected utility received from a given party by breaking the tie between the contending parties will have a positive influence on an individual's decision to vote. As for political efficacy, we anticipated that the ruling party or the former party in power should benefit from high levels of political efficacy; voters view the ruling party as the administration and vote for the incumbent when they are satisfied with the way that the government treats them.\footnote{11}


Tables 1, 2, and 3 present the logistic estimates for the 1995, 1998, and 2001 elections, respectively. Overall, the expected-utility variables exert significant influence on voting choices and the signs are almost as expected. In 1995, the expected utility for the KMT and the DPP had a positive and significant impact on the probability of voting for the KMT against abstention. It implied that the KMT's supporters voted for the KMT to break the tie between the KMT and the DPP. Likewise, people who expect high benefits from the DPP's electoral victory over either the KMT or the CNP tended to vote for the DPP. Those voters who expected the CNP to beat the other two parties were also willing to vote for the CNP. The coefficient of the political efficacy term is positive in the KMT model, but negative for a vote for the DPP and the CNP, which reflects the fact that the KMT benefited from approval of its government.

The 1998 election analysis returns somewhat different results from those of 1995. The KMT's vote largely came from an electorate who felt the challenge of the DPP; the coefficient for the expected utility of the KMT against the DPP is 3.955. The product of expectation and closeness between the DPP and the KMT is also positive and significant, which suggests that DPP supporters wanted to break the tie between the KMT and the DPP. As for the CNP voting model, the two coefficients show that the CNP still appealed to people who thought that the CNP was close to the KMT in ideology, but better than the KMT. The political efficacy term has a positive impact on voting for the KMT and the DPP, but a negative impact on the CNP vote.

The 2001 election gave rise to two new parties and marked the decline of the KMT. How did the electorate reach their final decision after evaluating the

| Table 1. Logistic estimates of the expected-utility voting model, 1995 |
|--------------------------|-----------------|-----------------|
|                         | KMT             | DPP             | CNP             |
| Constant                | -1.571 (.297)   | -.468 (.330)*** | -2.597 (.492)***|
| \( P_{\text{KMT,DPP}} \cdot U_{\text{KMT,DPP}} \) | 1.824 (.342)*** | 1.764 (.387)*** | -               |
| \( P_{\text{KMT,CNP}} \cdot U_{\text{KMT,CNP}} \) | .968 (.302)***  | -               | 2.732 (.558)*** |
| \( P_{\text{DPP,CNP}} \cdot U_{\text{DPP,CNP}} \) | -               | 1.726 (.360)*** | 2.737 (.539)*** |
| Political efficacy      | .238 (.088)**   | -256 (.107)***  | -                |
| Number of cases         | 489             | 489             | 489             |
| Chi-square (3)          | 104.01***       | 121.34***       | 132.59          |
| Log likelihood          | -276.238        | -202.467        | 129.063         |
| Pseudo R²               | .158            | .230            | .339            |

Note: Parentheses are standard errors. * indicates \( p < .05 \), ** indicates \( p < .01 \), *** indicates \( p < .001 \), one-tailed.
**Table 2. Logistic estimates of the expected-utility voting model, 1998**

<table>
<thead>
<tr>
<th></th>
<th>KMT</th>
<th>DPP</th>
<th>CNP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-.774 (.312)*</td>
<td>-1.200 (.345)***</td>
<td>-3.461 (.639)***</td>
</tr>
<tr>
<td>(p_{\text{KMT to DPP}})</td>
<td>3.955 (.421)***</td>
<td>2.639 (.450)***</td>
<td>-</td>
</tr>
<tr>
<td>(p_{\text{KMT to CNP}})</td>
<td>.912 (.386)*</td>
<td>-</td>
<td>3.374 (.717)***</td>
</tr>
<tr>
<td>(p_{\text{DPP to CNP}})</td>
<td>-</td>
<td>1.818 (.401)***</td>
<td>2.144 (.566)***</td>
</tr>
<tr>
<td>Political efficacy</td>
<td>.001 (.064)</td>
<td>.067 (.071)</td>
<td>-.184 (.127)</td>
</tr>
<tr>
<td>Number of cases</td>
<td>628</td>
<td>628</td>
<td>628</td>
</tr>
<tr>
<td>Chi-square (3)</td>
<td>175.57***</td>
<td>176.36***</td>
<td>79.99***</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>-326.376</td>
<td>-283.398</td>
<td>-129.548</td>
</tr>
<tr>
<td>Pseudo R²</td>
<td>.212</td>
<td>.237</td>
<td>.235</td>
</tr>
</tbody>
</table>

*Note: Parentheses are standard errors. * indicates p < .05, ** indicates p < .01, *** indicates p < .001, one-tailed.*

political parties and their viabilities? The coefficients of the KMT voting model imply that the DPP, as well as the PFP, was a challenge for KMT voters to overcome: the effects of the KMT-DPP and the KMT-PFP comparison are positive and significant. The TSU was not on the KMT voters’ agenda, mainly because the TSU was too new for its threat to be evaluated. Likewise, the KMT and the PFP were the targets of the DPP’s voters.

The result also suggests that PFP voters not only aspired to break the tie between the PFP and the KMT as well as the DPP, but also aimed at the TSU: all of the coefficients of the three expected-utility closeness variables are positive and significant. However, the TSU’s voters resolved to break the tie between their party and both the PFP and the DPP. Once again, the level of political efficacy is not a strong predictor.

The logistic estimation confirms our expected-utility model: voters cast their ballots for a given party rather than sitting at home or voting for other parties because they could maximize their utility. Although we aimed to include all of the

**Table 3. Logistic estimates of the expected-utility voting model, 2001**

<table>
<thead>
<tr>
<th></th>
<th>KMT</th>
<th>DPP</th>
<th>PFP</th>
<th>TSU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-1.616 (.359)**</td>
<td>-2.792 (.386)***</td>
<td>-2.292 (.429)***</td>
<td>-.447 (.632)***</td>
</tr>
<tr>
<td>(p_{\text{KMT to DPP}})</td>
<td>1.864 (.454)***</td>
<td>1.816 (.430)***</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(p_{\text{KMT to PFP}})</td>
<td>1.305 (.373)**</td>
<td>-</td>
<td>1.221 (.492)*</td>
<td>-</td>
</tr>
<tr>
<td>(p_{\text{KMT to TSU}})</td>
<td>.460 (.457)</td>
<td>-</td>
<td>-</td>
<td>-.094 (.727)</td>
</tr>
<tr>
<td>(p_{\text{DPP to PFP}})</td>
<td>-</td>
<td>1.995 (.390)***</td>
<td>1.486 (.503)**</td>
<td>-</td>
</tr>
<tr>
<td>(p_{\text{DPP to TSU}})</td>
<td>-</td>
<td>-.162 (.429)</td>
<td>-</td>
<td>2.485 (.886)**</td>
</tr>
<tr>
<td>(p_{\text{PFP to TSU}})</td>
<td>-</td>
<td>-</td>
<td>1.516 (.535)**</td>
<td>1.831 (.677)**</td>
</tr>
<tr>
<td>Political efficacy</td>
<td>.092 (.124)</td>
<td>.461 (.128)***</td>
<td>-.005 (.146)</td>
<td>-.147 (.225)</td>
</tr>
<tr>
<td>Number of cases</td>
<td>987</td>
<td>987</td>
<td>987</td>
<td>987</td>
</tr>
<tr>
<td>Chi-square (4)</td>
<td>117.56***</td>
<td>272.40***</td>
<td>174.23***</td>
<td>40.70***</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>-441.426</td>
<td>-446.616</td>
<td>-333.467</td>
<td>-165.598</td>
</tr>
<tr>
<td>Pseudo R²</td>
<td>.117</td>
<td>.233</td>
<td>.207</td>
<td>.109</td>
</tr>
</tbody>
</table>

*Note: Parentheses are standard errors. * indicates p < .05, ** indicates p < .01, *** indicates p < .001, one-tailed.*
observations in the data, we ended up losing many cases due to non-response regarding voting choices, party positions, and party preferences, particularly for the new parties. The political efficacy term, measured by the political efficacy question, also contributed to the loss of cases. Certainly, we should heed this caution when we make inferences from the result.

Simulation with the Logistic Model

To show the impact of expected utilities on the probability of voting for a given party, we fixed the preference order of political parties and calculated the probability of voting with different levels of closeness. Following the scheme developed by Abramson et al. (1992), we looked at the probability of voting with different settings for closeness between the first and second parties. When people vote for, say, the KMT, as it is first in rank order and its viability is better than the other two parties \((p_i/p_{kmt} = 0)\), we call this act of voting “straightforward voting.” When people vote for the KMT, as it is ranked number one but its viability ranking is tied with the trailing party \((p_i/p_{kmt} = 1)\), we call it “sincere voting.” “Strategic voting” takes place when the KMT is ranked number two, but people think the number one party is less viable than the KMT \((p_i/p_{kmt} \not= 0)\). Lastly, “irrational voting” refers to the situation in which people rank the KMT as the least favorite party, but with the same likelihood of winning the election as the top-ranked party. However, it is irrational to vote for the KMT: people should not desert their favorite party and vote for the second-ranked party when there is a 50-50 chance that it will be elected. The typology of voting is presented in Table 4.

We assigned arbitrary values to the level of closeness which ranged from 1.00 to .05 and assigned the benefits of voting for a given party as 1.0, .1, and 0, representing the descending preference order of voting for the three parties. For the trailing party, we assigned .5 as its probability of breaking a tie between it and the second-ranked party. The vector of preference order is therefore 1.0, .1, and 0, and the vector of the expectation of breaking the tie is 1.00-.05 and .50. In addition, we assigned the mean of the political efficacy to the political efficacy term and 1 to the constant term. In the 2001 election, there were four parties in our model. The benefit for each party in order of preference is given as 1.00, .75, .25, and 0, and the probability of a tie between the three pairs of parties is 1.00-.05, .50, and .50. Due to space limitations, we present only the simulation results for the KMT and PFP in 2001. The simulations and discussions for the KMT in 1995 and the KMT in 1998 are available upon request.

Figure 2 illustrates that the motive for voting for the KMT is to break the tie between it and the other three parties when the KMT is favored. The preference order KMT > TSU > DPP > PFP has the highest probability of voting for the KMT, which is .48, while the lowest probability, at .18, goes to the preference order DPP.

| TABLE 4. Four voting types by the order of preference and viability |
|--------------------------------|-----------|----------------|
| Level of closeness | Ranking of preference of a chosen party | First | Second |
| Large              | sincere  |                  |
| Small              | straightforward | irrational |


A KMT > PFP > TSU. Overall, the change of probability due to different levels of closeness is not impressive – all of the lines are fairly flat. The steepest sloping lines are seen in the preference order KMT > DPP > PFP > TSU, partly because of the confrontation between the KMT, which was the majority party in the Legislative Yuan before 2001, and the DPP, the president's party. Other than this preference order, people voted for the KMT simply because they liked the party; it is not a sign of spite toward the trailing parties.

Figure 3 shows clearly that voting for the PFP is mainly about preference: the level of closeness has nothing to do with the change in the probability of voting.
The difference between the initial and the last probability of voting is very small, which implies that people follow their preference toward the PFP no matter which party shows a real threat to the PFP or what the probability of a tie between the PFP and another party is. The highest probability of voting for the PFP appears when people perceived a tie between the PFP and the DPP. The second highest probability of voting for the PFP appeared when the TSU was trailing the PFP.

Figure 2 and Figure 3 suggest that the level of closeness is not relevant to voting choice in the four-party race: the probability of voting changes very little when the level of closeness changes from 1.00 to .05. One possible explanation is that the number of parties increases the difficulty of collecting information, thus voters simply follow up on the cues provided by the political parties. If so, does the expectation of getting elected determine voting choices (Cox, 1997)? Does the expected-utility model make sense in this multiparty system? Because we have had only one four-party election so far, any answer to this question is tentative. The simulation with hypothetical values merely illustrates the relatively small change in the probability of change due to variation in the level of closeness: the effect of the expected utility still exists, but requires further examination.

Reconsidering Strategic Voting in Multimember Competition

In this article, two factors are brought in to extend the dimensions of voting choice: electoral expectation and preference order. This extension was proposed in Cox’s (1997) seminal book as the main means of achieving Duverger’s equilibria or coordinating game with entry deterrence. In contrast to abstract, rational expectation, this article uses electoral expectations to produce a typology of voting by supplementing the classic binary (sincere and strategic voting) with “straightforward voting.”

As displayed in Table 4, the voters’ situation can be differentiated into four categories produced by interconnecting the voters’ preferences with expectation orderings. The problem in classic binary thinking, “sincere versus strategic,” results from a wrong assumption that voters can behave sincerely no matter the level of expectations. When the gap between two alternatives is reduced and the strategic settings emerge, voters can make decisions strategically or in a straightforward manner.

Furthermore, the expected-utility function of these voting types clarifies the respective impacts of different variables in the various electoral competition settings. Failing to include the voters’ electoral expectation, the classic binary model not only oversimplifies the strategic choice set, but also omits some straightforward sense of “sincere voting,” such as strategic expressive voting. We compare it to protest voting (Bowler and Lanoue, 1992) and signaling voting (Cox, 1997): even though voters believe that their preferred candidate will tend to lose, they still vote for that candidate, wishing to send a signal to the other actors.

Conclusion

We have, in this article, considered McKelvey and Ordeshook’s multiparty, expected-utility model, which set up voting choice as a function of the paired comparison of expected utility between a given party and other parties. We then used a new measurement for the subjective estimating of the probability of winning, and applied it to three election surveys. The logistic estimation shows the
positive impact of the expected-utility terms on the dependent variable: whether to vote for a given party. Using a simulation with logistic estimates, we demonstrated four types of voting: sincere, straightforward, irrational, and strategic. As for the 2001 election, we found that the change in the probability of voting is very small when the level of closeness varies, and argued that the electorate primarily conducted sincere voting.

We suggest that the expected-utility function of these voting types clarifies the respective impacts of different variables in the various electoral competition settings. Breaking down the four types of voting helps us to understand the reason behind people's voting decisions. Once we know which factors affect the level of expectations and voters' preferences, we should be able to predict the aggregate-level shift of party votes. More sophisticated analysis beyond what we have accomplished in this article certainly will advance our understanding of voting behavior in Taiwan.

Notes

1. Regarding the view of partisanship as being a running tally of a party's past performance, see Fiorina (1989).

2. There has been also a good deal of research that addresses party coordination in multimember districts (Cox, 1990, 1997; Lin, 1996; Shevetsova, 1995). Candidate entry in multimember competition is another important topic for game theorists (Feddersen et al., 1990; Shepsle and Cohen, 1990).

3. The 1995 and 1998 surveys were conducted by the Election Study Center, National Cheng-chi University. The 2001 Taiwan Election Democratization Survey was administered by National Chung-cheng University. All of the three datasets are available at the Election Study Center.

4. Notice we can use Equation 5 to calculate the utility of voting for the "k-th" party, rather than the "k-th"-ranked party. We will transform the former type of utility function to the latter one when we proceed to the discussion of strategic voting.

5. Cain (1978) also used the actual results to derive subjective probability; however, Abramson et al. (1992) and Blais and Nadeau (1996) turned to the scores of viability given by the respondents. 6. For positions taken on the unification issue, the 1995 and 1998 surveys asked the respondent whether the political parties supported independence, unification, or the status quo, but the 2001 data contained an 11-point scale and let the respondents locate the parties' positions on the scale. Therefore, we transformed the close-ended questions in the 1995 and 1998 data to a five-point scale. We transformed both scales into a 0-1 score, which allowed us to compare the coefficients.

7. We assume that μ is equal to .5 because the respondents have been shown the 0-10 scale when they estimate where the party stands on the issue and five should be a reference point as the median. That σ is equal to one is an arbitrary value based on the hypothesis that the deviation of the political knowledge of every individual is constant.

8. Unfortunately, the three datasets do not share the same questions and scales across the board. For positions taken on the unification issue, the 1995 and 1998 surveys asked the respondent whether the political parties supported independence, unification, or the status quo, but the 2001 data contained an 11-point scale and let the respondents locate the parties' positions on the scale. Therefore, we transformed the close-ended questions in the 1995 and 1998 data to a five-point scale. We transformed both scales into a 0-1 score, which allowed us to compare the coefficients.

9. Several other strategic voting models have also dropped the cost term. See Abramson et al. (1992) and Blais and Nadeau (1996).

10. As for the new parties, we assumed that people treated them in the same way as the existing parties because they offered new options. Therefore, voting for these new parties was a rejection of both the status quo and abstention.
11. The independent variables, except political efficacy, in these equations are arguably interaction terms of relative preferences and likelihood. Given that here we are focusing on the calculus of voting, the zero-order variables will be added to our model in later research.

12. Certainly, we can fix the order of viability and change the benefit for each party; however, we assume that people's preference order over electoral outcomes is fixed, but their estimates of viability can vary during the campaign.

13. In Taiwan, irrational and strategic voting may take place when parties buy votes when they are not the leading parties. Equalization among parties may also explain strategic voting. However, we do not have evidence to confirm this speculation. The 1993 simulation shows that in 1998 loyal, partisan supporters of the KMT were eager to break the tie between the KMT and its opponents. As the KMT's position is secured, particularly from the DPP's threat, people will not turn out or vote for other parties.

14. When the differential benefit (the relative difference in benefits brought by the two parties) increases, the corresponding probability of voting decreases.

15. By setting up the two levels of closeness between the first and the third and between the first and the fourth candidates as the same, the preference order after the second-ranked candidates still matters with regard to the probability of voting. In this case, with four parties, there should be 18 combinations of preference orders, but we only present six of them in order to make the graphs readable.

16. The 1992 simulation shows that the probability of sincere voting for the KMT as the top-ranked party with the DPP trailing (KMT > DPP > CNP) is higher than any other type of voting.

References


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