UTILITY THEORY AND PARTISAN DECISION-MAKING: CUMULATIVE VOTING IN ILLINOIS[1]

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THIS ARTICLE IS A DISCUSSION OF PARTISAN DECISION-MAKING UNDER THE condition of risk. A condition of risk exists when individuals (or groups) must decide among alternatives of which they know the probability of a number of various outcomes. For example, the decision to gamble or not with a coin flip where heads produces a $10 reward and tails produces a $5 loss is a risky decision. Each reward ($10 or −$5) can be assigned a specific probability and compared to the reward of not entering the gamble.[2]

Decision-making has two other classifications. Under the condition of certainty each decision is known to lead to a specific reward (or outcome). When decisions are made under the condition of uncertainty the probabilities of the outcomes are not known to the player.[3] Thus the certainty-risk-uncertainty classification of decision-making refers to the assignment of probabilities to various outcomes of a decision and whether these probabilities are known to the players.

Though the above classification of decisions is useful for utility theory, much of the social science literature makes more restrictive assumptions about the conditions of decision making than are necessary. For example, game theory has had wide application in electoral and legislative behavior.[4] Technically game theory deals with decisions of uncertainty, but the uncertainty in most social science applications is "reduced through the assumption that each player knows the desires of the other player and the assumption that they will each take whatever actions appear to gain their ends."[5] In some situations these assumptions make the application of game theory restrictive.

[1] I wish to thank David Kenney who provided me with considerable information about the development of cumulative voting in Illinois. Mark Levine and Richard Farkas helped clarify my thoughts in the original draft of this research. Patti James once again found time in her busy schedule to type and proof read the final manuscript. The author acknowledges the aforementioned whose professional dedication made this research a very pleasant experience.

[2] R. Duncan Luce and Howard Raiffa, *Games and Decisions: Introduction and Critical Survey* (New York: John Wiley & Sons, 1957), p. 13.

[3] *Ibid.*

[4] For annotated bibliographies of game theory in political science, see Martin Shubik, "A Bibliography with Some Comments," in Ira R. Buchler and Hugo G. Nutini, *Game Theory in the Behavioral Sciences* (Pittsburgh: University of Pittsburgh Press, 1969), pp. 253–261; Stephen L. Wasby, *Political Science—The Discipline and Its Dimensions: An Introduction* (New York: Charles Scribner's Sons, 1970), p. 150; William D. Coplin, *Introduction to International Politics: A Theoretical Overview* (Chicago: Markham Publishing Company, 1971), pp. 291–293.

[5] Luce and Raiffa, *Games and Decisions*, p. 275 .

This restriction of game theory can be seen by looking at partisan decisions for electoral nominations in the Illinois General Assembly. Legislators in Illinois' lower house are selected from multimember districts by a system of cumulative voting (explained in more detail below). A key decision by each party is whether to nominate and support one, two, or three candidates. The use of game theory to analyze the decision of the party nominating committee requires that each party make assumptions about the opposition.[6] That is, a party wishing to choose a rational strategy must assume the opposition knows its own desires and that the opposition will also choose its most desired alternative. These assumptions may not be isomorphic with the political factors operating on the party leaders.

For example, party leaders may wish to make decisions based upon their estimated electoral strength. The growing sophistication and political use of polling techniques suggest that these estimates can be made quite reliably. Thus a decision based on estimated electoral behavior rather than the expectations of the opposition may be an advantageous situation for the party leader.

Furthermore, recent constitutional changes have made the assumptions of previous game theory applications less tenable. The following sentence was added to the 1970 Illinois constitution: "No political party shall limit its nominations to less than two candidates for Representative in any Legislative District."[7] The parties can, of course, discourage nominees from running or give little support to party nominees, but they cannot limit their nominations. In some situations the most desirable alterative may be to nominate a single candidate, but party leaders may not be able to follow this strategy if two candidates from their party enter the race. Thus a party cannot assume that the opposition will "take whatever actions appear to gain their end."

If the nominating process is analyzed as a decision under the condition of risk, some of the restrictions from previous applications of game theory can be relaxed. Probabilities can be assigned to various nominating alternatives of a party at different estimates of electoral strength. The party leaders need not make assumptions about the behavior or number of nominees from the opposition. Thus the number of candidates to support depends upon the estimated electoral strength of one's own party. In this way the application of a risk decision to the Illinois Assembly elections is less restrictive than other applications of game theory.

CUMULATIVE VOTING IN ILLINOIS

Cumulative voting in Illinois is a device for insuring proportional representation. The method insures the election of minority party candidates from all but a few of Illinois' 59 General Assembly districts. Historically the method has also limited the majority party representation to a maxi-

[6] For a discussion of Illinois cumulative voting as a game, see Jack Sawyer and Duncan MacRae, Jr., "Game Theory and Cumulative Voting in Illinois: 1902–1954," *American Political Science Review*, 56 (Dec., 1962), pp. 936–946.

[7] Illinois Constitution, article IV, section 2, paragraph b.

mum two-thirds majority.[8] While some British education districts, a few corporate boards and a few municipalities have used the system, statewide cumulative voting is unique to the Illinois Lower House.[9]

The 1970 Illinois constitution provides:

> In elections for Representatives, including those for nomination, each elector may cast three votes for one candidate or distribute them equally among no more than three candidates. The candidates highest in votes shall be declared elected.[10]

As it is applied, three representatives are elected from each district and each voter has three votes which he may distribute 3–0, 1½–1½, or 1–1–1 among the candidates. Each party may nominate two or three candidates announced prior to the primary. The decision of how many candidates to nominate is made by a three-member committee of each political party.

The decision to nominate two or three candidates is a crucial decision for the majority party just as the decision to support one or both party nominees is a crucial decision for the minority party. The party committee in choosing a strategy may well affect the outcome of the election. Under such conditions it is natural that students of Illinois cumulative voting have attempted to demonstrate the conditions for rational party behavior.

[8] Indeed this limitation has been legally recognized by the Assembly. After the Supreme Court ordered reapportionment, Illinois was unable to come up with a suitable plan for the 1964 election. The famous "bed sheet ballot" had all 177 Assembly seats elected from the state at-large. Since at-large elections were likely to produce a lopsided victory for one party or the other, the leaders of both parties decided to nominate only 108 (exactly 2/3) candidates from each party. All 108 Democratic candidates won in the election—in which Adlai Stevenson III received national attention by leading the ticket.

[9] For a history of the adoption and changes in Illinois cumulative voting see Blaine F. Moore, *The History of Cumulative Voting and Minority Representation in Illinois, 1870–1919* (Urbana: University of Illinois, 1919), pp. 13–27, and George S. Blair, *Cumulative Voting: An Effective Device in Illinois Politics* (Urbana: The University of Illinois Press, 1960), pp. 1–11. In general the system was to insure Republican representation in the Chicago area and Democratic representation in the down state area. The effect today is to insure the exact opposite representation.

For additional studies on cumulative voting in Municipal charter board elections see Paul D. Stewart, "West Virginia Uses Cumulative Voting," *National Municipal Review*, 47 (Dec., 1958), p. 577. Cumulative voting was considered in the United States House of Representatives in 1869, 1870 and 1871 at about the time it was adopted in Illinois. Charles W. Dunn, "Cumulative Voting Problems in Illinois Legislative Elections," *Harvard Journal on Legislation*, 9 (May, 1972), p. 630.

[10] Illinois Constitution, article IV, section 2, paragraph b. This is a slight change in wording from the 1870 Constitution which provided: "In all elections of representatives aforesaid, each qualified voter may cast as many votes for one candidate as there are representatives to be elected or may distribute the same, or equal parts thereof, among the candidates as he shall see fit; and the candidates highest in votes shall be declared elected." Illinois Constitution, article IV, section 7, paragraph c.

The change in wording was to alleviate the ambiguity in requirements for equally distributed votes. In practice the voter could not cast two votes for one candidate and one for another as the 1870 constitution provided, but court rulings had made the legality of such a distribution ambiguous.

REVIEW OF THE LITERATURE

While often not placing the discussion in the formal context of "utility theory," previous discussions of cumulative voting in Illinois have dealt with closely related subjects. In general the literature deals with three topics: (1) undue representation of the minority;[11] (2) deviations from proportional representation;[12] (3) game theory solutions to a nominating strategy.[13] All have the common element of dealing with one or more aspects of rational behavior. It has not been uncommon for some authors to use terms like "rationality" and "minimax solutions" which are inherently related to utility theory.[14]

First, undue representation of the minority party has been demonstrated in separate studies. For the period 1872 to 1919 the minority party made maximum use of its party strength in 23 district elections by either "plumping" for a single candidate when the majority nominated three or electing two when the majority nominated three.[15] From 1920 to 1954 undue minority representation has occurred in 45 districts.[16] Since 1954 there has been only one district election where the majority has had three candidates, and in that election all three were elected.[17] Furthermore a minority party often receives one representative even with a very small percentage of the vote. For example, in 1968, seven representatives were elected with less than 16 percent of the vote.[18]

Second, the question of minority party representation is related to proportional representation. Separate studies have shown that the party distribution of the Illinois General Assembly more closely reflected the distribution of the party vote than legislative chambers in Indiana, Iowa, Michigan, Wisconsin, New York or New Jersey.[19] These aggregate statewide voting figures demonstrate that the minority party generally gets its "fair share" under cumulative voting.

Third, using "game theory," Sawyer and MacRae have demonstrated the rationality of party nominations in the Illinois Assembly from 1902 to

[11] Moore, *Cumulative Voting and Minority Representation*; Blair, *Cumulative Voting*; George S. Blair, "Cumulative Voting: Patterns of Party Allegiance and Rational Choice in Illinois State Legislative Contests," *American Political Science Review*, 52 (March, 1958), pp. 123–130.

[12] Blair, *Cumulative Voting*. Charles S. Hyneman and Julian D. Morgan, "Cumulative Voting in Illinois," *Illinois Law Review*, 32 (1937), pp. 12–31.

[13] Jack Sawyer and Duncan MacRae, Jr., "Game Theory and Cumulative Voting in Illinois: 1902–1954," *American Political Science Review*, 56 (Dec., 1962), pp. 936–946.

[14] For example Blair states: "The second [conclusion] is the capacity for voters and party managers to manipulate the possibility of cumulative voting by rational calculation to get the maximum advantage from it." *Cumulative Voting*.

[15] Moore, *Cumulative Voting and Minority Representation*, pp. 28–42.

[16] Blair, *Cumulative Voting*, p. 105. Blair's discussion also included the failure of a majority party to nominate two candidates, and is not comparable to Moore's figure.

[17] State of Illinois, Secretary of State, *Official Vote*, 1956–1970.

[18] Dunn, "Cumulative Voting Problems," p. 652.

[19] Blair, *Cumulative Voting*, pp. 63–86. Hyneman, "Cumulative Voting in Illinois," p. 18. See also Dunn, "Cumulative Voting Problems," p. 642.

TABLE 1

Expected Number of Party Nominees and Percent of Party Vote in Illinois General Assembly

Percent of the Vote to Party A	Expected Number Nominated	
	Party A	Party B
0– 25	1	3
25– 40	1	2
40– 50	2	2
50– 60	2	2
60– 75	2	1
75–100	3	1

1954.[20] They have argued that the expected number of nominations within a district will depend upon (1) the distribution of the vote among the various party nominees, (2) the division of the vote between the two parties and (3) the number of candidates nominated by each party. Assuming an equal distribution of votes among the party nominees, they showed that 935 of the 1,353 district elections from 1902 to 1954 conformed to the expectations in Table 1. The greatest source of deviation from Table 1 expectations was the failure to nominate three candidates when a party had a 75 percent majority.

Sawyer-MacRae Reconsidered. Three factors make the assumptions of the Sawyer-MacRae game theory solution worth reconsidering. The first relates to the restrictive assumptions of the game theory application and is discussed in the opening section of this paper.

In the second place, the 1970 constitutional change made many of the "optimal" party strategies unconstitutional. To discourage the nominations of two candidates by one party and one candidate by the other (the voter has no choice in this "set up" election), the 1970 constitution prohibited a party from limiting its nominees to less than two. The number of set up elections has been the concern of most of the students of Illinois cumulative voting. Furthermore, Illinois has a greater percent than several other midwestern states of district contests that give a voter no choice.[21] The effect has been to make unconstitutional most of the game theory solutions hypothesized by Sawyer and MacRae. The only nomination decision constitutionally possible is whether to nominate two or three candidates, though the party could discourage candidates from entering at all. In practice the most likely elections are the 2 v. 2 and 3 v. 2.[22]

[20] Sawyer and MacRae, "Game Theory and Cumulative Voting," pp. 936–946.

[21] Set up elections are associated with a low voter turnout.

[22] A 3–1 race occurred in 1972 due to a highly extraordinary set of circumstances. Only one Republican candidate filed for the primary election in a heavily Democratic district. In the same district an incumbent Democrat failed to get his party nomination and filed in the general election as an Independent. The three Democrats won the four man contest.

However a party organization which decided to nominate three candidates (as is

Theoretical considerations should be limited to a strategy with maximum utility under these conditions.

The third factor which makes the earlier application of game theory discussions worth reconsidering is the rationale for a minimax solution. Sawyer and MacRae argue that the party strategists would rather "provide a sure minimum rather than a chance for a greater gain."[23] Their rationale is that a stable political system is compatible with a party strategy which excludes the possibility of demolishing the opposition completely at considerable risk to the party. The assumption is a requirement of the game theory model.

The inadequacy of the above assertion is demonstration by Sawyer and MacRae's discussion. While they assume party strategists do not want to "demolish" the opposition, one solution to the minimax strategy for the majority party is to nominate three candidates. Presumably a party would nominate three candidates only if it intended to elect three candidates, and this would result in the minority electing none. Thus the assumptions necessary for an application of the game theory model are inconsistent with one of the minimax solutions to the game!

This paradox can be solved by describing alternative conditions of "utility theory." Game theory assumes each player knows the desires and the strategy of an opponent. That is, the uncertainty of knowing specific outcomes to a decision is reduced by assuming (1) the opponent will order his alternatives according to a predetermined utility function and (2) the opponent will select alternatives according to the maximum payoff. Thus the players in Sawyer-MacRae's game know the outcome of the game which depends only upon the percentage of the party vote and the number of nominees.[24] Game theory decisions of this type are but one classification of utility theory.

Another classification of decision-making models is the decision under the condition of risk. The idea is illustrated by Luce and Raiffa:

> Suppose that our subject prefers alternative A to B, B to C, and A to C . . . . Suppose we ask [the subject's] preference between (i) obtaining B for certain, and (ii) a gamble with A or C as the outcome, where the probability that it is A is p and the probability that it is C is 1 — p. We refer to these as the "certain option" and the "lottery option."[25]

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likely to happen in the above district since there are three Democratic incumbents) would see to it that the opposition could not protect itself constitutionally by limiting its nominations. Thus a party nominating three candidates could persuade a "friend" to file in the opposition. The long ballot, party strategy, and election reporting (the number of straight party votes are made public) encourages a single straight party vote. As Illinois law is presently constituted, any straight party ballots would automatically be cast for both candidates.

[23] Sawyer and MacRae, "Game Theory and Cumulative Voting," p. 939.

[24] The outcome also depends upon the distribution of the vote among the party candidates. The optimal strategy for a party is to distribute its votes equally when it is attempting to elect two or three candidates. As with previous discussions, I will assume that the party votes are evenly distributed among the party candidates.

[25] Luce and Raiffa, *Games and Decisions*, p. 21.

A decision with a certain option and a lottery option is made under the condition of risk.

As the value of p approaches unity, the lottery option has greater utility since the probability of the more preferable alternative approaches 0.0. Let us now look at the decisions of the majority and minority party and the probabilities of their occurrence.

PARTY STRATEGY UNDER THE CONDITION OF RISK

A majority and minority party are faced with different substantive strategies which both conform to decision-making under the condition of risk. A majority party (the party with more than 50 percent partisan support) has three possible outcomes to consider in its strategy:

Outcome A is electing 3 party candidates.
Outcome B is electing 2 party candidates.
Outcome C is electing 1 party candidate.[26]

The certain option can be selected by nominating only two candidates; the lottery option can be chosen by nominating a third candidate. A minority party (the party with less than 50 percent partisan support) also has three possible outcomes to consider in its strategy:

Outcome A′ is electing 2 party candidates.
Outcome B′ is electing 1 party candidate.
Outcome C′ is electing 0 party candidates.

Again these outcomes conform to the conditions of a risky decision. The certain option is chosen by supporting only one candidate or discouraging a second candidate to run; the lottery option is chosen by nominating and supporting two party candidates.

To determine which strategy has greater utility for the party, it is necessary to make some assumptions about party decision-making. First it is necessary to assume that a party prefers to elect the greatest number of candidates possible. This is a requirement of a two party competitive system. In other words the election of three party candidates is preferable to the election of two party candidates which is preferable to one, etc. Secondly, the solution is greatly simplified by assuming an even distribution among the party candidates of the decision-making party. This distribution has been shown always to be optimal for the party.[27] Furthermore, an equal distribution of party votes is, in practice, the easiest strategy party leaders can pursue.[28] Historically the distribution among party candidates had conformed to this assumption in a risk decision.[29]

[26] In theory electing none is also a possibility for the majority party. However this would require the minority to nominate three candidates, which has never happened in the 103 year history of cumulative voting in Illinois.

[27] Sawyer and MacRae, "Game Theory and Cumulative Voting," p. 937.

[28] The 1970 constitution provides that a person's votes can be cast equally among three candidates. The party strategist could thus give instructions to vote for any number of candidates, but the voter must cast those votes equally.

Furthermore straight party voting is possible by a single mark at the top of the ballot. Straight ticket voting is encouraged and checked by party leaders who often receive the information from county clerks.

[29] Of the elections since 1900 in which one party nominated three candidates, the

For both the majority and the minority party there are critical support values above which a lottery option has greater utility than a certain option. Given the above assumptions, a majority with greater than 60 percent support will never do worse than Outcome B and with an equal distribution in the opposition Outcome A may result. Similarly for the minority the critical value is 40 percent. Above that level of support, a minority will never do worse than Outcome B′ (regardless of the distribution of either party) and Outcome A′ may result if the opposition distributes its votes equally.[30] In other words above the critical value, the probability of a less preferred outcome is 0.0. Thus there is no risk in nominating the extra candidate. Under these conditions a rational party strategist will choose the lottery option, since it has greater utility.

MAJORITY PARTY STRATEGY SINCE 1900

It is possible to test majority party strategy in Illinois in each of the competitive Assembly races since 1900. Of the 1,794 biennial district elections 974 were "set up"; that is, one party nominated two candidates and the other party nominated one candidate leaving no choice for the voters. For these elections party strategists were motivated by factors other than maximizing party strength. It might by stated that the utility of the "side payments" for the party was greater than either the utility of the certain option or the utility of the lottery option. These races have thus been ex-

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range of candidate votes within the party was less than the difference between the means of the two parties 78 percent of the time.

[30] Consider the following examples:

Party S	Party T
Candidate A	Candidate X
Candidate B	Candidate Y
Candidate C	

If more than 60 percent of the voters support candidates A, B, and C equally, each candidate will receive (60+)(1) = 60+. If the other 40 percent support candidates X and Y, the minority candidates will each receive (40—)(1½) = 60—.

The three majority party candidates can win with 60 percent of the vote. Thus if candidates A and B have more than 60 percent of the vote to distribute equally, they will not be hurt by sharing their party votes with candidate C.

The point can be illustrated historically by looking at the races where incumbents added a third candidate against two from the opposition. This has occurred in 17 elections since 1900 resulting in a 3 v. 2 race. In only three instances has an incumbent from the majority lost to another member of his (or her) party and in each case the loss was to another incumbent. See C. Anthony Broh, "Cumulative Voting and Party Nomination Strategies in Illinois," *Public Affairs Bulletin*, 6 (Jan.–Feb., 1973), p. 7. Thus the addition of a third candidate has not hurt the chances of the first two from a majority.

Consider the possibilities of a minority party with greater than 40 percent. Candidates X and Y can now both win the election. Furthermore if X and Y together account for more than 40 percent of the vote one will always win regardless of how the votes are distributed among A, B, and C.

TABLE 2

Majority Party Strategy Decisions and Electoral Outcome, 1900–1970

Majority Party Strategy	Percent of Electorate Voting for Majority Party 50–60 (N=650)	Above 60 (N=170)
Certain Option	98	68
Lottery Option	2	32

cluded from this analysis.[31] 820 races had at least four candidates from the two major parties. The conformity to a maximum utility model of partisan decisions can be tested for each of these electoral contests.

Table 2 presents the electoral outcome of the majority party strategy decisions in all competitive elections since 1900. For party strategy decisions where the electoral outcome was between 50 percent and 60 percent, the majority party clearly has chosen the strategy with maximum utility. In 98 percent of the 650 competitive elections below the critical point, the party chose to nominate only two candidates. In only 2 percent of the cases did the party nominate a third candidate when that decision was not a maximum utility strategy.

Electoral outcomes with greater than 60 percent vote for the majority can best be interpreted in relation to the previous findings. There was a greater tendency during the period under investigation for a majority with greater than 60 percent to nominate a third candidate than was true for majorities with less than 60 percent. The relationship is not strong, but the tendency is in the direction of the maximum utility model of behavior.[32] For example the lottery option was chosen in only 2 percent of the elections below the critical point while the lottery option was chosen 32 percent of the elections above the critical point.

The failure of a majority party to support additional nominees when party strength would suggest such a strategy is optimal has been noted elsewhere.[33] The data presented here support these earlier findings. However the tendency to support a third candidate by choosing a lottery option is greater for majorities whose electoral strength exceeds 60 percent. In general it may be concluded that majority party leaders historically have shown a tendency to prefer a strategy option with higher utility in making risk decisions in competitive districts.

[31] This exclusion is based on the possibility of collusion between the two parties. A set up election could be the result of an agreement not to compete in the election.

[32] The data in Table 2 cannot be described accurately with a correlation statistic since most of the cases fall in a single cell. The statistic would simply be reflecting the fact that most elections are close and the majority rarely chooses three candidates. Thus we have avoided discussion of correlation coefficients in the text. Wilcoxen sign tests were computed for Tables 2 and 3 and were .45 and .44 respectively.

[33] Sawyer and MacRae, "Game Theory and Cumulative Voting," p. 941.

MINORITY PARTY STRATEGY

It is more difficult to evaluate the strategy of the minority party from past elections for at least three reasons. In the first place the options of the minority party are fewer. The party only has a possibility of electing two candidates when the majority nominates three.[34] Thus the decision to support one or two candidates from the minority party will affect the outcome only when the majority has chosen the lottery option. These elections are numerically quite small when compared to the total number of competitive district elections.[35]

Second, the decision to support one or two minority party candidates has been qualitatively altered by the 1970 constitution. Before the new constitution, a minority could limit its nominations to one candidate. If the party chose a "plumping" strategy, it would nominate only one candidate. Since this is no longer constitutionally possible, a "plumping" strategy requires support for only one of two party nominees. The decision of a party leader not to support one of the party nominees is qualitatively different than the decision to limit the nomination to only one candidate.

There is a third reason why evaluation of minority party strategy is difficult under present constitutional provisions. Prior to the 1970 constitution the minority party could "set up" an election by nominating only one candidate. Such a strategy is tantamount to surrender for the minority. If the majority nominates only two candidates, a minority would never do worse by nominating two candidates.[36] The fact that the minority party often has set up the election indicates that considerations other than maximizing the number of elected candidates had greater utility in the decision-making process.[37] Again side payments to the minority party may be the explanation. This discussion, of course, violates constitutional requirements since 1970. Thus past experience with cumulative voting may not be completely applicable to the proposed model of utility theory. It is still possible to evaluate the general pattern of minority strategy since 1900. However, one must be aware that past minority decisions might not be an indication of future minority party strategy under the existing constitution.

With these reservations in mind the data for minority party strategy in all elections in which the majority chose the lottery option since 1900 are presented in Table 3. The number of cases in which the minority chose between the certain and lottery option is much smaller than the majority

[34] By definition the minority party has less than 50 percent of the electorate which is required to elect two candidates in a 2 v. 2 election.

[35] The majority has chosen the lottery option in only 8 percent of total district races since 1900.

[36] This statement is in direct contradiction to Sawyer and MacRae's game theory solution which found a set up election to be an optimal solution for a minority with 40 percent to 50 percent of the electorate. Sawyer and MacRae, "Game Theory and Cumulative Voting," p. 939.

[37] One such consideration might have been the resources which were saved by not contesting the election.

TABLE 3

Minority Party Strategy Decisions and Electoral Outcome, 1900–1970

Minority Party Strategy	Percent of Electorate Voting for Minority Party	
	Below 40 (N=54)	40–50 (N=12)
Certain Option	83	33
Lottery Option	17	67

party cases. As noted above the restrictions for the decision are much greater. In only 66 cases since 1900 were the restrictions for a risk decision met for the minority in competitive district races. Nevertheless these few cases are instructive.

In 83 percent of the races where a minority had less than the critical value, the party chose to support a single candidate. In some cases this was done by limiting nominations to a single candidate (now unconstitutional); in some cases the party elected a single candidate by distributing its votes unequally between the nominees. Above the critical point the minority chose the lottery option in 67 percent of the elections. The close resemblance of these data to the predictions of utility theory suggests the minority party too has behaved rationally in past competitive elections.

DISCUSSION AND CONCLUSIONS

There are practical implications of this discussion to both party leaders and voters in Illinois. In most instances it is important for party leaders to see that candidates of approximately equal electoral appeal receive the party nomination. An equal distribution of votes among partisan nominees is optimal in all situations except where a minority of less than 40 percent is attempting to elect only one candidate. In the latter situation party leaders may wish to see that only one strong candidate enters the primary or they may discourage a second nominee.

TABLE 4

The Number of Candidates to Nominate and Support for a Rational Election Strategy

Percent Partisan Support	Number of Candidates to Nominate[a]	Number of Candidates to Support
0– 40	2	1
40– 60	2	2
60–100	3	3

[a] There are constitutional limitations on the number of nominees.

Party leaders may also demonstrate maximum utility in their decisions by estimating the party strength before the nominations are made. The number of candidates to nominate and support should conform to Table 4.

The decision for a voter who wishes to get maximum utility from a partisan vote should also conform to Table 4. Plumping for a single candidate has maximum utility for the voter's party only when party support is estimated to be less than 40 percent. For elections between 40 percent and 60 percent partisan support, the voter should make two choices for his party preference. In the rare election where a partisan voter is faced with three party choices, voting for all three has maximum utility only if the estimated party support is greater than 60 percent.[38]

Several conclusions might be drawn from this discussion. In the first place utility theory has generated several interesting hypotheses with empirical support in the analysis of partisan decisions in Illinois Assembly races. Previous discussions of rationality have been too restrictive with the necessary assumptions of the model. Utility theory suggests a risk decision which seems to conform to the strategy decisions of many party leaders and voters. It allows for less conservative strategies which game theory solutions also describe as rational behavior.

Secondly, there is evidence to suggest that party leaders in Illinois have behaved rationally in their strategy decisions. Generally the majority party has shown a tendency to prefer a lottery option when party strength suggested such a strategy would have maximum utility. Minority party strategy is more difficult to evaluate due to constitutional changes since 1970. Generally the minority also has chosen the lottery option when partisan strength would suggest such an option had maximum utility. The present make-up of the Illinois General Assembly (the Republicans have a one vote majority) emphasizes the importance of considering the utility of partisan decisions.

[38] Of course a voter may wish to cross party lines when voting. In this case it is necessary to estimate the strength of the candidate choices to see if all are above the critical point.