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Measuring and Explaining Strategic Voting in the German Electoral System

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Arbeitsbereich II / Nr. 21
Mannheim 1998
ISSN 0948-0080

Working papers

Arbeitspapiere

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Paul W. Thurner, Franz Urban Pappi:
Measuring and Explaining Strategic Voting in the German Electoral System.
Mannheimer Zentrum für Europäische Sozialforschung (MZES).
Mannheim, 1998 (revised version).
(Arbeitspapiere Arbeitsbereich II / 21)
ISSN 0948-0080

Deckblattlayout: Uwe Freund

Nicht im Buchhandel erhältlich
Schutzgebühr: DM 5,--
Bezug:
Mannheimer Zentrum für Europäische Sozialforschung (MZES), Postfach, 68131 Mannheim

<u>Redaktionelle Notiz</u>:

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Abstract

Contrary to Duverger's hypothesis, new theoretical and empirical insights demonstrate that strategic voting is a common feature of nearly every electoral system. The aim of this paper is to provide an operational definition of strategic voting in a given institutional context. In order to identify strategic voters we compare the voter's complete preference ordering with his actual stated vote intention. Ordinal rank orderings of parties are achieved by pairwise comparisons conducted in a representative national sample. Relative effects of theoretically identified factors conducive to strategic voting are estimated by means of (nested multinomial) logit models.

* We would like to thank Gary W. Cox (UCLA) and Melvin J. Hinich (University of Texas, Austin) for helpful comments.

Introduction

Multiparty systems raise many questions which cannot simply be answered by applying existing theories of party competition and voting behavior. As has been shown by the overview of possible research aspects in Shepsle (1991), multiparty systems have been neglected so far. As regards spatial theory of voting and its market analogy of party competition, Shepsle states: „Although Downs did devote some casual attention to multiparty circumstances his legacy is a model of dualistic competition in the Anglo-American mold" (Shepsle 1991: 2). This now canonical model is the basis for most formal studies, however it "presumes a degenerate legislative structure" (Austen-Smith 1996: 113).
Concerning voters' choices in multiparty systems, Downs already pointed to the irrationality of 'preferential voting' in multiparty systems when first-ranked parties have no chance to win the elections. Formal theories have tried to model rational decision processes in settings whith actors facing multiple alternatives. Gibbard (1973) and Satterthwaite (1975) demonstrate the general existence of incentives to vote strategically in any democratic system. The 'dominance elimination process model' of Farquarson (1968) is one of the first attempts to formalize strategic/sophisticated voting. But his concept and most follow-up models have been formulated for purposes of decision making in committees and legislatures, where, in general, prospective actors with full information[1] have been assumed. Therefore, Shepsle proposed to make a clear-cut distinction between 'sophisticated voting' in committees and 'strategic voting' in mass electorates (1991: 63).[2]
Formal studies of strategic voting in mass elections are provided f.ex. by McKelvey/Ordeshook (1972), Felsenthal/Maoz (1988), Gutowski/Georges (1993), Cox (1997). A considerable theoretical and empirical contribution is Cox (1997), starting with Duverger's hypothesis on the consequences of electoral systems. Duverger argued that plurality systems lead to two-party systems because the voter tries to avoid the wasting of his vote. Following conjectures made by Leys (1959) and Sartori (1968), Cox is able to systematically demonstrate, that we have to expect a considerable amount of strategic voting under different electoral rules. However, there is a lack of propositions on how much strategic voting empirically takes place given a specific electoral system and legislative decision-making mechanism.

[1] For an overview see Ordeshook 1986.

[2] He even prefers to term 'strategic voting' as 'parametric voting', in order to describe voting in mass elections where "prospective voter i does not engage in any introspection about the symmetric decision problem of each and every other voter. Rather he summarizes his beliefs about the aggregate of those decisions in the probabilities of various events with and without his vote" (Shepsle 1991: 46).

In the following we first characterize the German electoral system and discuss its behavioral implications. In this section we try also to point to different forms of strategic voting in the German electoral system. We raise the question whether wasted vote is the only decision criterion for strategic choices in multiparty systems. Then we review several selected empirical studies on strategic voting. Based on a decision-theoretic approach, the so called random utility models, we propose an operational model for the measurement and explanation of strategic voting in the German electoral system. Derived hypotheses are tested with (nested multinomial) logit models.

Implications of the German Electoral System

For the purpose of this study we only focus on the institutional rules for the Federal Assembly elections. Its members are elected by the people in universal, free, equal, direct and secret elections, for a term of four years. Any person who has reached the age of 18 is eligible to vote (Art. 38 GG[3]). Germany is partitioned into 328 constituencies. Each voter has two votes, the first vote (Erststimme) for a constituency candidate, and the second vote (Zweitstimme) for the party list at the national level. Votes cast for party lists determine the total number of seats. The total number of seats to which a party is entitled is determined on the basis of list votes aggregated to the national level. Transformation of votes into seats follows the Hare-Niemeyer formula[4]. One special feature of the electoral system is a 5% national threshold: parliamentary seats are awarded only to parties which have gained at least 5 per cent of the second votes aggregated to the national level, or a minimum of three constituency seats through plurality in the first votes. Another special feature are so-called 'surplus mandates' (Überhangmandate)“ Surplus seats in the Federal Assembly arise from the possibility of a party winning more constituency mandates than it is entitled by its total share of second votes. In this case the party gets the respective seats and the Federal Assembly is enlarged accordingly.

Strategic voting as opposed to sincere voting is generally defined as not voting for the first-ranked party of a complete preference ordering: "Sincere voting requires each voter to vote according to its preferences in any pairwise comparison of alternatives. An actor casts a sophisticated vote when it votes against its preferences in a pairwise comparison" (Morrow 1994: 134, see also Ordeshook 1986: 258 ff.). Strategy comes in when probability beliefs are used in addition to preferences arising in electoral decisions (cf. Cox 1984: 726). Voters seek to maximize their expected utility gain from the outcome of the election. This means that additional to utility considerations they have probability beliefs about how other voters will cast their ballots and which coalitions will be formed (Cox 1984). Strategic voting is therefore the result of the total calculus of voting given preferences and beliefs on the probababilities of the relevant states of a specific electoral situation.

[3] GG: Grundgesetz, the German Constitution.

[4] Since 1985.

It has often been argued that ticket splitting in the German electoral system constitutes a special type of strategic voting. Ticket splitting can be observed as government level dependent party choice and in elections to the Federal Assembly as a split between first and second vote.

Studies on the German electoral system have to consider German federalism and to differentiate between elections to the Laender[5] parliaments and elections to the Federal Assembly, the Bundestag, on the other side. Electoral systems in the Laender differ from the electoral formula of the elections to the Bundestag. Divergent compositions of the Federal Assembly on the one side and the Federal Council (Bundesrat)[6] on the other side reflect an important aspect of strategic voting in Germany which plays a central role in policy-making: The often stated present gridlock in social and economic policy reforms is due to the German variant of divided government and mirrors voters' different electoral behavior depending on the level of election. Such government level dependent party choice is one variant of ticket splitting which has been discussed recently in the context of divided government literature. Alesina/Rosenthal (1989) put forward the general behavioral hypothesis that voters try to balance local governments against national governments in order to obtain policy moderation. This may also apply to German federalism. Another criterion, however, for this type of ticket splitting may simply be different decision-making and implementation rights of different government levels. The voter may attribute different policy competences to different parties and therefore consequently split his votes. So far, in the German context this question has only been raised in the study of Jesse (1988) where the author compares the results of parties in a ‘double election’, i.e. Federal election and Land election at the same time.

Ticket splitting between first and second vote, on the contrary, has relatively often been discussed (Jesse, 1988, Roberts, 1988). Roberts gives several behavioral reasons for this variant. The splitting may indicate a preference for a particular candidate in the constituency. The voter may see no chance of winning for his most preferred candidate and vote for another one. Deviating from a 'straight ticket' may also mirror the desire to support a particular coalition. And last but not least, the voter may misunderstand the relative importance of the respective votes.

As indicated by the suggested decision criteria underlying the different forms of ticket splitting, ticket splitting is not congruent with strategic voting in the narrower sense, i.e. observed ticket splitting and 'divided government voting' may in some cases indicate strategic voting, in some cases ordinary preferential voting. Ticket splitting can induce specific forms of strategic voting in the German electoral setting, which are worth to be studied for their own. However, it should be clear that they constitute only variants of strategic voting, i.e. not voting for the most preferred party. Ticket splitting is neither a necessary nor a sufficient condition for the identification of strategic voting.

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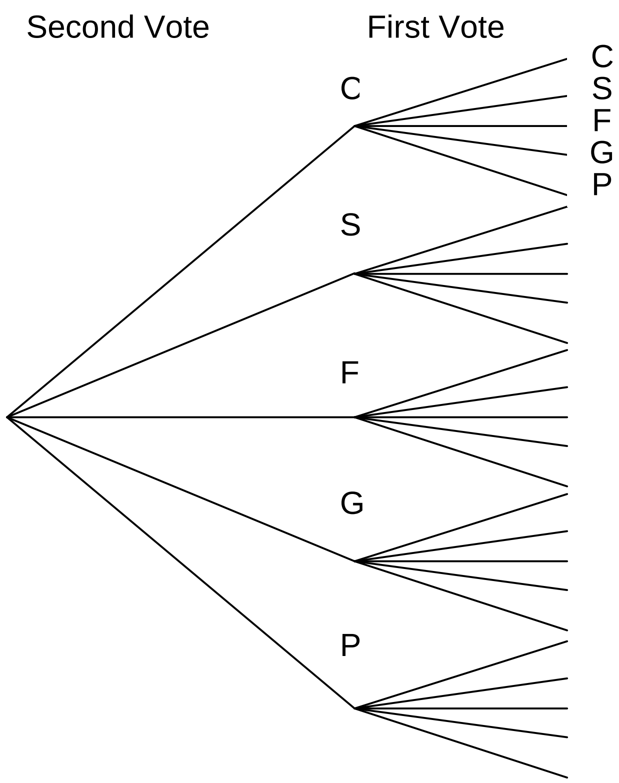
5 Federal subunits.

6 Through the Federal Council (Bundesrat) the states (Laender) participate in the legislation and administration of the Federation. It consists of members of the Land governments, which appoint and recall them (Art. 51 GG).

This is in line with Cox' (1997) argument that "casting a list vote for the FDP and a candidate vote for, say, the Christian Democratic Union (CDU) is not unambiguous evidence of 'ordinary' strategic voting, however. It may be that the voter truly prefers the CDU, casts a sincere vote for the CDU candidate, but casts her list vote strategically for the FDP, because the FDP is both in alliance with the CDU and in danger of falling below the 5% national threshold (in which case the FDP would get no seats and the CDU might not be able to form a government) ... So how is one to tell whether some component of the discrepancy between the FDP’s candidate and list votes is due to ‘ordinary’ strategic voting, intended to avoid wasting the constituency vote?" (Cox 1997: 82).

Following these suggestions we decompose the complex voter decision and propose a sequential tree presentation (figure 1) of a voter facing Germany’s electoral rule in legislative elections.

Figure 1: Voting Tree in the German Electoral System: Ticket Combinations[7]



Despite some distortions (threshold, 'surplus mandats'), the German electoral system is a PR system with the seat share of a party nearly exclusively determined by the second vote. Therefore, we assume the voter in a first step to decide which

[7] C: CDU/CSU: Party cartel of Christian Democratic Party and Christian Social Party; S: SPD: Social Democratic Party; F: FDP: Free Democratic Party; G: GREENS/B90: Party cartel of the Ecologic Party and East German movements; P: PDS: Party of Democratic Socialism.

of the parties to vote for[8]. With his/her first vote (s)he is able to directly influence the selection of candidates.
Since a party is in general not a unitary actor and local candidate strategies may differ, voters' individual preference orderings for second and first vote may differ. Therefore, ticket splitting does not by itself already indicate strategic voting. Decision criteria for both sequences may be different, as several authors have suggested.
Playing sincere at both sequences may nevertheless lead to different optimal alternatives and playing strategic at both sequences may lead to identical choices for first and second vote respectively. The decision process can be assumed to comprise a sequence of otherwise unrelated choices with the following strategy combinations:

Figure 2: Sequential Voting Strategies

Second Vote	First Vote
Sincere	Sincere
Sincere	Strategic
Strategic	Sincere
Strategic	Strategic

In general, however, rational actors are assumed to optimize over the whole range of choices with the choices on the higher level being made in the light of the fact that the lower-level alternatives are already chosen as optimal in the respective lower sets. Another possibility would be to assume a single stage decision over multidimensional alternatives (Ben-Akiva/Lerman 1985: 276). Suppose we define
$F = \{f_1,...,f_{j_F},....,f_{J_F}\} =$ {all candidates with respective party affiliation to party j},
and
$S = \{s_1,...,s_{j_S},...,s_{J_S}\} =$ {all party lists, with j denoting party j}.
In this case any set $F \times S$ with $\times$ denoting the Cartesian product will contain J_F*J_S elements and will also be a choice set.
Any simultaneous trading off between different weights of the respective votes, different decision criteria as well as probabilities for relevant states should be a nontrivial optimization problem for the voter. In the following empirically operational model we confine ourselves to a reduced form model in order to derive selective hypotheses which will be tested empirically.

Previous Empirical Measurement of Strategic Voting

There is now a growing body of literature tackling the problem of empirical measurement of strategic voting[9]. A useful classification has been provided by

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8 We assume therefore different decision weights for first and second vote respectively.

9 See cited studies in: Blais/Nadeau (1996) and Cox (1997).

Blais/Nadeau (1996). The authors differentiate between at least three strategies of measurement:

1. Indirect measurement of aggregate data analysis of electoral outcomes;
2. direct elicitation of voters' strategic/tactical motivations;
3. comparison of voters' preference orderings and their revealed choice/stated vote intention.

Indirect measurement of strategic voting in the German context by means of aggregate data can be found in Barnes et al. (1962), Fisher (1973), Jesse (1988), Bawn (1993). In general, the authors calculate differences between a candidate‘s own total vote (cast for him or her in a given constituency) and a candidates' partys' vote total (cast for the party list in the same constituency). Candidates having significantly small shares compared with their parties are considered as having been strategically deserted. Especially in the case of small parties, a substantial degree of desertion is found. FDP desertion rates have been found to be as high as 61.8% in 1972, 70.9% in 1983, and 61.3% in 1987 (Jesse 1988). Again, however, we caution against thinking ticket splitting to be strategic voting per se.

The direct elicitation of strategic motivations to vote for a specific has especially been implemented in British surveys (Heath et al. 1991, Niemi/Whitten/Franklin 1992). So far there has been no application of these study design in the German context. In our view this method seems to be susceptible to respondent rationalizations.

We agree with (Blais/Nadeau 1996) in considering such approaches as the most promising procedure to analyze strategic voting which are based on a 'hiatus' between preference ordering and revealed choice/stated vote intention. Black (1978) as well as Cain (1978) derive preference orderings indirectly from feeling thermometer questions. As regards Blais/Nadeau (1996), we strongly disagree with their research strategy. The authors propose to determine in a first step empirically cardinal utilities by binary logistic regression estimations with normalized thermometer scores as independent variables and vote intention as dependent variable. The results are used to measure the rank-order and intensity of voters' preferences. In a second step revealed partisan preferences are regressed on cardinal utility differences and differences of scores on a scale measuring the perceived likelihood that a party is winning a constituency. However, this implies a sequentiality of the voter’s choice process which is never justified or even discussed. Furthermore, it should be noted that probabilistic choice theory assumes the observer not knowing all decision criteria of the decision makers. Therefore, the authors' two step procedure seems to be not very convincing, since the specification of additional variables could always lead to changing cardinal utilities.

But even more questionable is the usage of three independent dichotomous logistic regressions, since this leads the probabilistic assumption ad absurdum, i.e. that all probabilities sum up to one. Last but not least, an application of three separately estimated dichotomous regressions would make sense only if the assumption of the independence of irrelevant alternatives would hold, a concept that is not even mentioned by the authors. Having said this, we doubt their main result, namely that „expectation lag behind utilities“.

A Model of Strategic Voting in the German Multiparty System

Let N be a finite set of voters, each voter be denoted by i. There is a finite set of parties with the following elemental alternatives A = $\{a_1,....,a_j,....a_J\}$. We assume Downsian parties, i.e. homogenous teams of candidates, competing in a single district polity. Suppose that each voter in a random sample of people is asked to rank his preferences among a fixed set of J parties. We distinguish between a voter's strict preference relation denoted by P_i and a voter's weak preference relation R_i. Let us assume that every voter has a preconditioned complete and transitive order of parties R_i^0 derived by the voter's exclusive consideration of non-strategic decision criteria (sincere voting). Each voter's preference ordering[10] R_i^0 of candidates can be described by an m×1 column vector $\mathbf{d}_i = [d_1,..,d_j,...,d_J]$, where d_{ij} denotes the rank assigned to party j by voter i. Ranks for parties in this vector range from 1 (most preferred) to J (least preferred). For any two parties a_j and a_h in this vector:

$$
\begin{aligned}
&d_{ij} < d_{ih} \quad \text{iff} \quad a_j \, P_i \, a_h, \quad \text{and} \\
&d_{ij} = d_{ih} \quad \text{iff} \quad a_j \, I_i \, a_h \quad \forall j,h \in A,\ j \neq h.
\end{aligned}
\qquad (1)
$$

Any parties perceived as tied will get the same rank in $\mathbf{d}_i$ depending on the respective position where the tie occurs. The preference ordering of parties in the sample can be described by an J×I matrix **D** = $\{d_1,...,d_i,...,d_J\}$. Let an element $a_{i,\mathrm{opt}\,R_i^0}$ in A_i be denoted as a best element of A_i with respect to the binary relation R_i^0 iff for every a_{ih} in A_i, $a_{ij} \, P_i^0 \, a_{ih}$.

Let us further assume that each voter has a postconditioned complete and transitive weak order of parties R_i^1 which takes account of strategic decision criteria, i.e. probability beliefs about other voters' strategies, about voter's i decisiveness, and about parties' coalition building strategies. It is assumed that probability beliefs can be described parametrically, where the voting context for i's decision is given exogenously and remains fixed. Analogously, let $a_{i,\mathrm{opt}\,R_i^1}$ be called the unique best strategic element in A_i. Strategic voting occurs when the respective optimal alternatives are not identical: $a_{i,\mathrm{opt}\,R_i^0} \neq a_{i,\mathrm{opt}\,R_i^1}$. By definition, ties on first rank preclude the identification of strategic voting.

In the following we consider the alternative set A = {CDU/CSU, SPD, FDP, GREENS/B90, PDS, Others, Abstention}. Voters are facing institutional constraints: legislative elections are held under a proportional representation

[10] For the following see also Felsenthal/Maoz 1988: 118.

system[11] with a threshold t=5%. If there is no single party that controls a majority of the seats, the parties bargain among themselves to select a governing coalition disposing of the majority of legislators. Voters looking ahead to the government formation stage have to consider the coalition building rule (Austen Smith/Banks 1988, Austen-Smith 1996). We assume[12] that all voters believe 1) that no party will achieve a majority of parliamentary seats at its own; 2) either CDU/CSU or SPD will be the largest party; 3) the largest party will have the first opportunity to form a government a government with one of the small parties B90/GREENS or FDP[13]; 4) parties prefer to build minimum sized winning coalitions (Riker 1962). We assume exclusively two-party coalitions. This assumption is made for operational reasons, but it is nevertheless plausible: All German national governments with the exception of two legislatures (1949-1953 and 1953-1957) have been two party coalitions. There has never been a government constituted by a single party. Let C therefore be the set of all defined coalitions[14] C = {(CDU/CSU-SPD), (CDU/CSU-FDP), (SPD-FDP), (SPD-GREENS/B90), (CDU/CSU-GREENS/B90)}.
We conceive strategic voting as a covert sequencing process where the voter first determines his most preferred coalition, and, in second stage, according to his probability beliefs chooses a party with his second vote. To investigate into this problem it is crucial to know 1) which coalitions voters prefer and 2) which expectations of the other voters' moves an elector forms during the campaign and how he reacts to his probability beliefs. We define 'most preferred coalition' as the voter's first tupel of R_i^0. For voters which have the following non-viable coalition preferences $\overline{C}$={(FDP-B90/GREENS)}, viable tupels are constituted by the first-ranked party and the third-ranked party.

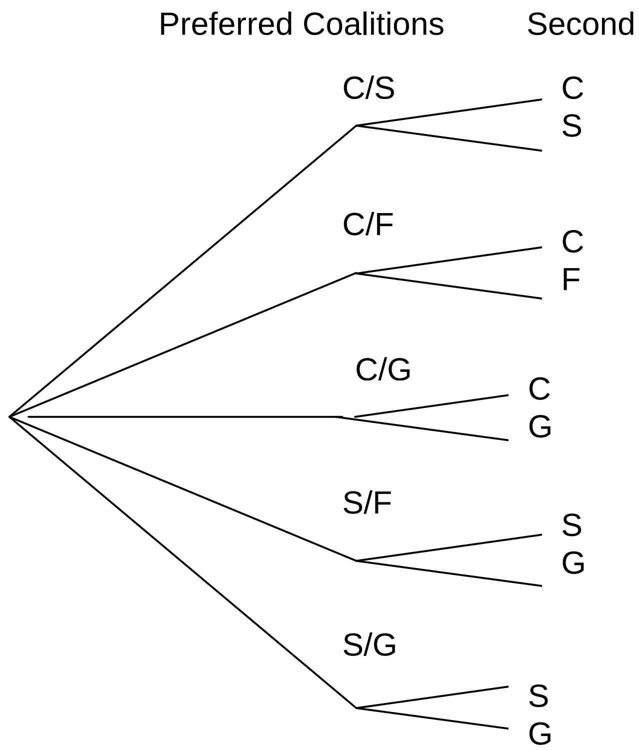
11 For reasons of simplification we do not consider the first vote.

12 Here we partly follow Austen-Smith/Banks 1988, see also Cox 1997: 194.

13 All parties have declared that they will not build a coalition with the PDS after the elections.

14 We consider the coalition between CDU and the regional party CSU as an inseparable party cartel. Threats of coalition breaking and federal wide extension of the CSU (1976 and 1990) have proven not to be credible, at least until now.

Figure 3: Voting in the German Electoral System (Reduced Form): Two-Party Coalition Preferences and Assumed Second Vote



Assume that parties are uncertain about voters' final choices and therefore aim to maximize expected votes. Let $\Omega_i^s(0,1)$ denote the parties' common subjective conditional probability for the event 'i will vote strategically (1), given specific combinations of preference order and probability beliefs' which will be derived below. Let $\Omega_{ij}^a(a_1,...,a_j,...,a_6)$ denote the parties' common subjective probability for the event 'i will vote strategically for party j, given specific combinations of preference order and probability beliefs' which will be derived below.
According to random utility theory we assume probabilistic choices (c.f. Couglin 1992). Unobserved components of voters' utility functions are distributed with general extreme value distribution (GEV) and the voter’s choices can be therefore represented by (nested) multinomial logit models (McFadden 1974, 1978, 1981, Thurner 1998, Thurner/Eymann 1997) where choice probabilities for a multinomial logit model are derived as follows:

$$\Omega_{ij} = \frac{\exp(\mu V_{ij})}{\sum_{h=1}^{J} \exp(\mu V_{ih})} \qquad \forall j, h \in A \ , \qquad (2)$$

with V constituted by a deterministic utility component U of alternatives attributes z_j, and attributes of the voters s_i, and a stochastic component ε. $\mu > 0$ denotes a scale parameter of the extreme value distribution, where $\mu = 1$ defines a simple multinomial model. The expected market share ES for party j is given by:

$$ES_j(z_j, z_h, s_i) = \sum_{i=1}^{n} \Omega_{ij}(z_j, z_h, s_i), \quad \forall j, h \in A, j \neq h. \qquad (3)$$

We follow Tsebelis' (1986) argument that the "flow of votes (in proportional systems P.Th.) is not only from small parties to big parties, but also vice versa, as well as between big parties or beetween small parties" (Tsebelis 1986: 404). For the empirical identification of $\Omega_i^s(0,1)$ we will differentiate between strategic voting type 1: $\Omega_i^{s1}(0,1)$ denoting the flow from small to large parties, and strategic voting type 2: $\Omega_i^{s2}(0,1)$ denoting the flow from large to small parties[15].

However, we will not only formulate hypotheses about the amount of strategic voting in a political system, but will also provide c.p. hypotheses, whether the impact of strategic voting has an impact on conditional individual choice probabilities or the market shares of individual parties respectively: $\Omega_{(i)j}^{a_j}(a_1,...,a_j,...,a_6)$. Therefore, we also provide hypotheses for a model whith the dependent variable 'stated vote intention'.

Hypothesis 1: Party Specific Ranking Impact

a) Being on rank 1 has no alternative-specific effects on voting chances for each of the parties.

Hypothesis 2: Probability Beliefs I: Closeness of large parties:

a) If large party m, being element of the most preferred coalition, is on second rank and its perceived probability of becoming the largest party is around 0.5, we expect an increase of strategic voting typ 1 (flow from small to large parties).
b) If large party m, being element of the most preferred coalition, is on second rank and its perceived probability of becoming the largest party is around 0.5, we expect a positive effect on voting the second placed large party.
c) Effects in hypothesis 2a), b) do not vary significantly depending on respective party.

Given a system specific threshold of a party becoming represented of a parliament, voters are sometimes unsure whether a small party fails to reach the respective level. We derive the following hypotheses:

Hypothesis 3: Probability Belief II: Wasted Vote:

a) If small party n, is on first rank and party n's perceived probability of transcending the threshold is near 0.0, then chances of strategic voting type I (flow from small to large parties) increase significantly.

[15] Which has been called 'inverse tactical voting' by Tsebelis 1986.

b) If small party n, is on first rank and party n’s perceived probability of transcending the threshold is near 0.0, then chances of party n being chosen decrease significantly.
c) Effects in hypotheses 3a), b) do vary significantly depending on the respective small party considered.

Hypothesis 4: Probability Belief III: Threshold insurance for small parties
a) If small party n, being element of the most preferred coalition, is not on first rank and party n’s perceived probability of transcending the threshold is around 0.5, then chances of strategic voting type II (flow from large to small parties) increase significantly.
b) If small party n, being element of the most preferred coalition, is not on first rank and party n’s perceived probability of transcending the threshold is around 0.5, then chances of party n being chosen increase significantly.
c) Effects in hypotheses 4a), b) do not vary significantly depending on the respective small party considered.

Hypothesis 5: Probability Belief IV: Threshold insurance for small parties and Assuring Minimum Sized Winning Coalitions
a) If large parties m_h and m_j are on first and second rank respectively, and third-ranked small party n’s perceived probability of transcending the threshold is around 0.5, then chances of strategic voting type II (flow from large to small parties) increase significantly.
b) If large parties m_h and m_j are on first and second rank respectively, and third-ranked small party n’s perceived probability of transcending the threshold is around 0.5, then chances of party n being chosen increase significantly.
c) Effects in hypotheses 5a), b) do not vary significantly depending on the respective small party considered.

We do not dispose of the necessary data to directly test hypotheses 2, but we will empirically test the other hypotheses.

Empirical Results

The data base of the following analyses is a national pre-election 1994 study[16] financed by the Mannheim Center for European Social Research (MZES). In the following we confine the analysis to the sample of all transitive weak preference orderings.

Empirically we found 187 actual combinations. In table 1 we extracted for representational reasons all transitive rankings named by at least 30 respondents. Here, without exception, all first tupels are 'viable coalitions'. Only two rankings start with small parties. Of the total sample, only 1.0 percent of the respondents indicate most preferred coalitions which are not viable (FDP/GR-B90). An interesting feature of table 1 is the relatively large segment of party-frustrated (non?)voters who report a tie between all parties, this represents the second-largest segment.

[16] The study has been conceptualized by the authors and Gabriele Eckstein.

Table 1: Proportions of Most Current Party Rankings (N > 30)

	Frequency	Percentage	Cum. Percent.
CSFGP	133	7.1	7.1
C~S~F~G~P	131	7.0	14.1
CFSGP	124	6.6	20.8
SGCFP	81	4.3	25.1
SC~F~G~P	72	3.9	29.0
SCGFP	71	3.8	32.8
CS~F~G~P	70	3.7	36.5
CSGFP	65	3.5	40.0
SGFCP	55	2.9	43.0
CFSG~P	47	2.5	45.5
CFS~G~P	46	2.5	47.9
CFGSP	43	2.3	50.2
SGC~F~P	40	2.1	52.4
SCFGP	36	1.9	54.3
GSCFP	31	1.7	56.0
FCSGP	30	1.6	57.6
Total	1075	57.6 %	

N = 1867

Another interesting multiway tie is the naming of one of the two large parties as most preferred and considering all other parties as tied (SC~F~G~P and CS~F~G~P). These two respective segments combined would represent the largest segment.

In order to provide a general overview of the ranking patterns we created an additional vector where 1 indicates that party j is strongly preferred, whereas n>1 indicates the number of parties being perceived as tied on a specific ranking position. Zeros are placeholders for tied alternatives. Table 2 reads as follows: 7% of the sample population perceive a tie between all five parties (5), 53.7%, on the contrary, have a complete, transitive strong order over the alternatives (11111). 11102 means that there is no tie on rank 1 to 3, but a tie on the fourth rank.

Table 2: Proportions of Ranking Patterns

	Frequency	Percentage	Cum. Percent.
5	131	7.0	7.0
41	5	.3	7.3
302	3	.2	7.4
311	2	.1	7.6
2003	13	.7	8.2
2021	10	.5	8.8
2102	10	.5	9.3
2111	27	1.4	10.8
10004	152	8.1	18.9
10031	8	.4	19.3
10202	16	.9	20.2
10211	29	1.6	21.7
11003	188	10.1	31.8
11021	64	3.4	35.2
11102	207	11.1	46.3
11111	1002	53.7	100.0
Total	1867	100.0	100.0

N = 1867

89.2 % of the voters have a unique optimal alternative, whereas, on the contrary 10.8 % have a tie at least on the first rank. According to our operational definition, we are not able to distinguish between straight votes and stragic votes in this segment. 11 % have a tie on the second rank (10211, 10202, 10031, and 10004) which would require further hypotheses concerning direction of strategic voting, which will not be provided in this article.

How many voters do not vote their first-ranked party, i.e. how many voters vote strategically? To address this question, we simply crosstabulate first-ranked parties by stated vote intention. Not taking into account ties on first rank we find out that 15.7 % (N=294) vote strategically. The proportion of voters voting sincere and revealing a unique choice is highest for voters of CDU/CSU and of SPD, closely followed by the PDS, respectively. The probability of voting for one's first-ranked party is lowest for those voters having the B90/GREENS on first rank: it is lower than .5.

Table 3: First Ranked Party and Stated Vote Intention (% within rank 1)

Rank 1	CDU/ CSU	SPD	FDP	GREEN/B90	PDS	Other	Miss.	Total N
C	66.3	3.1	7.1	1.0	.1	2.0	20.3	703
C~F	-	-	50.0	-	-	-	50.0	2
C~G	-	-	-	-	-	-	100.0	1
C~S	11.1	11.1	-	2.8	-	-	75.0	36
C~S~F	50.0	-	-	-	-	-	50.0	2
C~S~F~G	-	-	-	-	-	-	100.0	5
C~S~F~G~P	2.3	7.6	-	.8	-	.8	88.5	131
C~S~G	--	-	-	-	-	-	100.0	1
F	18.2	5.2	53.2		1.3	2.6	19.5	77
G	4.3	15.4	1.1	49.5	2.1	.5	27.1	188
G~P	-	50.0	-	-	-	-	50.0	2
P	1.8	8.8	-	3.5	61.4	1.8	22.8	57
S	2.7	63.3	1.4	7.8	1.7	1.0	22.2	641
S~F	-	100.0	-	-	-	-	-	1
S~G	-	26.7	-	13.3	-	-	60.0	15
S~G~P	-	-	-	-	-	-	100.0	2
S~P	-	-	-	33.3	-	-	66.7	3
	27.5	26.0	5.5	8.4	2.8	.5	28.4	100.0 %

N = 1867

Another interesting feature of this table is that 88.5 of those perceiving a tie between all parties do not state a vote intention for a party. Interpreting missings in this variable as potential non-voters would be an a preliminary confirmation of the indifference hypothesis in multiparty systems[17].

In the following we address the questions: How many voters, who have a specific party on second or third rank respectively do actually choose these parties? And: How much contributes the proportion of voters who rank a party on second or third position to the parties overall market share, defined as the share of stated vote intentions for this party? We consider only cases which have no tie on second or third position respectively:

[17] Alienation and indifference have been put forward by Riker/Ordeshook 1973 as factors explaining abstention in the context of the theory of spatial voting. A policy-specific operationalization of alienation and indifference has been proposed and tested by Thurner/Eymann 1997.

Table 4: Second Rank and Stated Vote Intention

a) Proportion of Second-Ranked Parties Chosen by Second Vote (SV)

Rank2	SV	Σrow
CDU/CSU	13.8	225
SPD	10.7	392
FDP	10.1	306
GR/B90	11.4	306
PDS	22.7	44

N[18] = 1273

b) Proportion of Overall Market Share of a Party in The Segment of Second Rankers

SV	Rank2	Σrow
CDU/CSU	8.0	387
SPD	11.8	357
FDP	34.1	91
GR/B90	28.2	124
PDS	24.4	41

Considering Table 4 a) it becomes clear that compared to the other parties, the PDS gains overproportionally when the it is ranked on a second position. However, this effect may be due to the small subsample size. All other parties achieve about the same proportion from segments which place them on second rank. Results of Table 4 b) are more clearcut: it shows that small parties' overall market share is more dependent on segments which place them on second rank. It is interesting that there is also variation between small parties, with the FDP being the most dependent in its overall market share on the flux of voters which place them on second rank.

This pattern is impressingly repeated when considering the pattern of third-ranked parties (table 5). Compared to other third ranked parties, the FDP gets the highest share, i.e. 5.3 %. Again, the overall market share of the FDP is heavily constituted by voters who rank it on third rank only. Therefore, by simple means of descriptive tables, the degree and impact of strategic voting in the German multiparty system can be shown. The special role of the FDP which has up to now most of the time been the pivotal player in coalition games is represented also in the voter's decision making.

Table 5: Third-Ranked Party and Stated Vote Intention

a) Proportion of Third-Ranked Parties Chosen by Second Vote (SV)

Rank3	SV	Σrow
CDU/CSU	2.9	172
SPD	3.3	241
FDP	5.3	281
GR/B90	3.3	215
PDS	3.4	58

N = 1273

b) Proportion of Overall Market Share of a Party in Segment of Third Rankers

SV	Rank3	Σrow
CDU/CSU	1.3	375
SPD	2.4	339
FDP	17.6	85
GR/B90	6.1	115
PDS	5.0	40

[18] Not including 'Other Parties', Missings, Abstention in the Second Vote-Variable.

Testing our hypotheses would require even higher dimensional tables. Therefore, we prefer to present only results of causal discrete choice models in the following. Considering, first, the flow from small to large parties, i.e. testing hypotheses 3 a), b) and c) on the impact of 'waste vote' it turns out that this is precludeed: there is no empirical constellation with a voter ranking a party on position 1 and at the same time perceiving her probability for transgressing the threshold of about .0. This should not indicate psychological biases, since preference orderings are derived indirectly by pairwise comparisons. Therefore this result will be considered as a rejection of the 'wasted vote' hypothesis in the German electoral system. The result is in line with findings of Shively (1970) and Fisher (1973), however it is not conclusive as long as we do not have pairwise comparisons including parties which are not represented in the Federal Parliament.

Considering now the flow from large to small parties $\Omega_i^{s2}(0,1)$ and testing empirically hypotheses 4a), 4c) and 5a), 5c) we get the results in table 6. For this subcategory of strategic voting we identified N = 108 strategic voters, i.e. the response category 'movements from large parties to small parties' is strongly asymmetrically distributed. The results should therefore be interpreted prudently.

Table 6: Estimated impacts of identified determinants on strategic voting, type 2

Variable	ß	t-Ratio	P-Value
Treshold Insurance-FDP	1.008**	3.408	0.001
Treshold Insurance-Gr/B90	0.988**	3.166	0.002
Treshold Insurance-PDS	1.758**	3.811	0.000
MWC/TRI[19]-FDP	0.324	0.900	0.368
MWC/TRI-Gr/B90	0.216	0.512	0.608
MWC/TRI-PDS	1.401	1.252	0.210
Constant	-3.011**	-13.196	0.000
2*(LL(N)-LL(0)) = 24.513, DoF = 6, P-Value = 0.000, Pseudo R^2 = 3.4 %			
Percentage of Correct Predictions: 85.1 %			

N = 1273

Perceiving the probability of a second-ranked small party around .5 increases significantly the probability of strategic voting. This applies to all parties. Wald tests conducted for each pair of coefficients whether respective coefficients are

19 MWC: Minimum Winning Coalition; TRI: perceived threshold insurance of a third-ranked party.

identical and they indicate that the hypothesis of significant alternative specific differences has to be rejected[20] in each case.
Hypotheses 5a) and c) have to be rejected as well: none of the derived effects fom the combined minimum sized winning coalition and threshold insurance hypotheses are significantly different from zero.
Before coming to a final conclusion we will present results of the test of our NMNL models. As has been seen in table 3, most of the voters of the segment perceiving an indifference between all parties do not reveal a most preferred party when questioned directly. We will interpret this option as an indicator of potential abstention. An additional hypothesis to be tested is, whether this choice can be signficantly explained by a perceived indifference of all parties. Categories 'abstention' and 'others' will be combined to a residual choice alternative and our choice set for which we will estimate simultaneous choice probabilities, will therefore be constituted by six alternatives.
Hausman/McFadden tests[21] indicate, that the IIA assumption is violated when specifying a simple MNL model[22]. Further tests[23] lead to the following NMNL-model

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[20] TRI-FDP-TRI-GR/B90: χ^2=0.005, df=1, P-Value= 0.942; TRI-FDP-TRI-PDS: χ^2=2.864, df=1, P-Value= 0.091; TRI-PDS-TRI-GR/B90: χ^2=2.879, df=1, P-Value= 0.090.

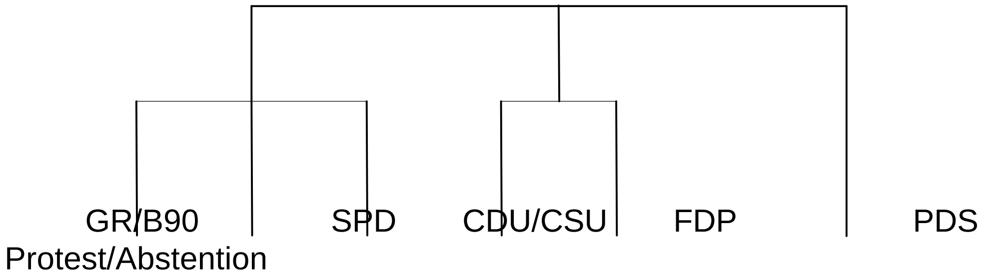
[21] The form of the test statistic proposed by Hausman/McFadden (1984) is: $\chi^2(c) \sim (\hat{\beta}^r - \hat{\beta}^u)'\left[\hat{C}ov(\hat{\beta}^r) - \hat{C}ov(\hat{\beta}^u)\right]^{-1}(\hat{\beta}^r - \hat{\beta}^u)$, where: $\hat{\beta}^u$: estimator based on full choice set, $\hat{\beta}^r$: estimator based on restriced choice set, $\hat{C}ov(\hat{\beta})$: estimated covariance matrix of estimator

[22] Removing CDU/CSU yields: c=12.801, df=15, P-value=0.617; SPD: c= 3.095, df=15, P-value=0.999; FDP: c=22.937, df=13, P-value=0.042; Gr/B90: c=4.946, df=13, P-value= 0.976; PDS: c=25.233, df=13, P-value= 0.022; Prot./Abst.: c=412.674, df = 15, P-value=0.000.

[23] Hierarchical likelihood ratio tests of NMNL versus MNL specification as well as lower and upper level tests for dissimilarity parameters: Model I (CSG-FP-P/A): χ^2=21.046, df=2, P-value=0.000, dissimilarity parameters are compatible with stochastic utility maximization. Model II (CSG-FP-P/A): χ^2=27.814, df=3, P-value=0.000, dissimilarity parameters are compatible with stochastic utility maximization. Model III (CSG-F-PA/P): χ^2=17.646, df=3, P-value=0.000, the PO-dissimilarity parameter is not significantly different from 1 on a 5% level. Model IV (CSG-P-FP/A): χ^2=18.24, df=2, P-value=0.000, dissimilarity parameters are compatible with stochastic utility maximization.

which assures equal cross-substitution wthin and between nests of alternatives and is at the same time compatible with assumptions on stochastic utility maximization[24].

Figure 3: Nested Structure of Estimated NMNL-Model



In order to test hypothesis 1 several preliminary remarks have to be made concerning the applied models. One important aspect of the specification of (nested) multinomial models is the distinction between alternative-specific and generic attributes: "A generic specification imposes restrictions of equality of coefficients on a more general model with alternative-specific attributes" (Ben-Akiva/Lerman 1985: 168). The respective null hypothesis of generic attributes can be tested by likelihood ratio tests with $-2(\mathrm{LL}(\vec{\beta}_{G}) - \mathrm{LL}(\vec{\beta}_{AS})$, where G and AS denote the generic and the alternative-specific models, respectively. The test statistic is χ^2 distributed with the number of degrees of freedom equal to the number of restrictions. Setting now an equality constraint over all alternative-specific Rank 1 variables and comparing the respective likelihood functions yields χ^2 =20.264, df = 4, which is highly significantly different from zero. Hence, we conclude, that the impact of being ranked on first position does vary depending on the respective party considered. As the results show, being ranked on first position increases enormously the chances of FDP and PDS, respectively.

Comparing models I and II yields χ^2=6.768, df=1, P-value=0.009 and points therefore to model II as the most adequate specification.

24 For the compatibility requirements of NMNL models with stochastic utility maximization, see Boersch-Supan 1990.

Table 7: Impact of Rank 1, Threshold Insurance and Assurance of MWC on Party Choice

Variable	ß	t-Ratio	P-Value
Rank 1-CDU/CSU	3.501**	14.403	0.000
Rank 1-SPD	2.399**	11.439	0.000
Rank 1-FDP	7.227**	6.696	0.000
Rank 1-Gr/B90	1.720**	6.723	0.000
Rank 1-PDS	7.492**	5.648	0.000
Treshold Insurance-FDP	3.381**	4.876	0.000
Treshold Insurance-Gr/B90	0.204	0.465	0.642
Treshold Insurance-PDS	-0.186	-0.216	0.828
MWC/TRI-FDP	2.261**	3.081	0.002
MWC/TRI-Gr/B90	-0.312	-0.301	0.763
MWC/TRI-PDS	-10.658	0.000	0.999
Indifference-Protest/Abstent	4.074**	12.938	0.000
Constant-SPD	0.588**	2.656	0.008
Constant FDP	-4.590**	-4.743	0.000
Constant-GR/B90	0.335	1.514	0.130
Constant-PDS	-4.377**	-4.897	0.000
Constant-Protest/Abstent.	0.483	1.514	0.129
Dissimilarity Par.-CSG	0.462**	4.413	0.000
Dissimilarity Par.-FP	0.431**	5.403	0.000
Dissimilarity Par.- Pr/Abst.	Fixed Parameter		
2*((LL(N)-LL(0)) = 2964.990, df = 19, P-Value = 0.000, Pseudo R^2 = 32.00 %			
Percentage of Correct Classifications:			

N = 1867

Testing hypotheses 4 b) and c) on the impact of threshold insurance for smaller parties, it turns out that in this model only the perception of a precarious probability of the FDP for being reelected significantly increases the chances of this party to be chosen. Regarding hypothesis 4 c) we conclude, that, the impact of having a small party on rank two and perceiving her probability of reaching the threshold being around .5 does vary depending on which small party is considered.

The minimum sized winning coalition hypothesis (H 5) formulated on the voter level must be rejected for parties PDS and B90/Greens. The only significant effect is the FDP parameter which means that, having two large parties on first and second rank, respectively, and at the same time perceiving the reelection probabilities of third-ranked FDP increases significantly the chances of the FDP to be chosen for.

Conclusion

Guided by a priori knowledge and descriptive analysis we made assumptions in order to be able to test at least several c.p. hypotheses of the multifacetted phenomenon of strategic voting in multiparty systems with coalition governments. As data have shown, most of the mathematically possible orderings of a weak preference order are empirically negligible. Since we are only interested in population regularities and not in ideosyncratic decision making, we think that our results provide a relevant picture of the phenomenon 'strategic voting' in the German electoral system. According to our definition we identified about 15 percent of strategic voters. In order to identify factors inducing strategic voting we differentiated between the flow from large to small parties and vice versa. The wasted vote hypothesis postulating a flow from small to large parties has to be rejected. Wasted vote considerations play no role at all in our data set. Predicting the flow from large to small parties we demonstrate that for all parties only the threshold insurance variable is significantly different from zero.

The simultaneous models of party choice and abstention shows that being ranked on first position has not equal impacts on the choice probabilities of all parties. However, contrary to our expectations, small parties profit at least as well as and partly even more than large parties from the first-rank position. This may be due to the PR system and coalition governments. Concerning our hypotheses on threshold insurance and the combination of minimum sized winning coalitions and threshold insurance, only in the case of the FDP we found significant effects. This result impressingly underscores the important role of this party for strategic voting and preference misrepresentation in the German electoral system.

Future studies should apply segmentation techniques in order to find out differentiated strategic voting depending on population segments. Furthermore, all mentioned types of strategic voting should be reconsidered in detail within the proposed approach.

Appendix

Question Formats

Pairwise Comparisons:

"In the following I'll give you the names of two parties. Imagine you would have to choose between them: Which of the parties would you prefer?"

CDU/CSU or SPD ?.......

There was no direct elicitation of indifferences in order to avoid question format induced ties. From the resulting rank order we created a dummy variable R1-j for each party j, coded as 1 when the respective party is on first rank, 0 otherwise.

Probability Beliefs:

"In the general election for the Bundestag, the result of the smaller parties as well is of importance for coalition building. How probable do you consider the FDP to reach the 5% threshold? What about the Greens/B0? What about the PDS?"

- Absolutely certain
- Relativelely certain
- Rather improbable
- Totally improbable

Categories 'relatively certain' and 'rather improbable' have been interpreted as indicating a percentage margin around .5 and the combined category was dummy-recoded for each of the respective parties and used for the threshold insurance hypotheses.

Category 'totally improbable' was dummy-recoded for each of the respective parties and used for the wasted vote hypothesis.

Vote Intention:

In the general election to the Bundestag you have two votes. The first vote is for the candidates of a party in the respective constuencies. The second vote is for the list of a party. Would you please tell me, for which party you will vote for with your first vote. For which party will you vote for with your second vote?

Design Matrix of the NMNL Model

$$
\begin{bmatrix}
0 & 0 & 0 & 0 & R1-C & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & R1-S & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
1 & 0 & 0 & 0 & 0 & 0 & R1-F & 0 & 0 & 0 & 0 & 0 & T-F & 0 & 0 & 0 & 0 & 0 & M-F & 0 & 0 & 0 \\
0 & 1 & 0 & 0 & 0 & 0 & 0 & R1-G & 0 & 0 & 0 & 0 & 0 & T-G & 0 & 0 & 0 & 0 & 0 & M-G & 0 & 0 \\
0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & R1-P & 0 & 0 & 0 & 0 & 0 & T-P & 0 & 0 & 0 & 0 & 0 & M-P & 0 \\
0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & Ind & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{bmatrix}
\bullet
\begin{bmatrix}
\bar{\alpha}_1 \\ \alpha_2 \\ \alpha_3 \\ \alpha_4 \\ \alpha_5 \\ \alpha_6 \\
\beta_{A11} \\ \beta_{A12} \\ \beta_{A13} \\ \beta_{A14} \\ \beta_{A15} \\ \beta_{A16} \\
\bar{\beta}_{A21} \\ \bar{\beta}_{A22} \\ \beta_{A23} \\ \beta_{A24} \\ \beta_{A25} \\ \bar{\beta}_{A26} \\
\bar{\beta}_{A31} \\ \bar{\beta}_{A32} \\ \beta_{A33} \\ \beta_{A34} \\ \beta_{A35} \\ \bar{\beta}_{A36}
\end{bmatrix}
$$

Where:

y_i: Dependent variable (number of discrete alternative j)
R1: Rank 1 of party j
Ind: Perceived indifference over all parties
T: Perceived Threshold insurance for party j
M: Assuring MWC and Perceived Threshold Insurance for party j
α: Alternative-specific constant for party j
β_A: Alternative-specific coefficient
$\bar{\alpha}, \bar{\beta}$: Alternative-specific coefficients normalized to zero

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