Coalitional Stability of Multi-Party Systems: Evidence from Poland.¹

Marek M. Kaminski
Assistant Professor
New York University
and
CEEERC

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Mailing address: Department of Politics, NYU
715 Broadway
New York, NY 10003
Email: marek.kaminski@nyu.edu
Web: www.nyu.edu/projects/kaminski

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ABSTRACT

The electoral law and voter preferences are modeled as a partition-function form game that represents payoffs of electoral coalitions in a multi-party system. Three empirical hypotheses are formulated under the assumption that seat-maximizing parties modify coalitional structures to extract gains from coalescing. The hypotheses say that party systems under stable voter preferences and electoral law tend to stability with respect to splits and coalescing. The partition function is estimated for various coalitional structures for the Polish party system with simulation based on district-level election results and survey data. The estimates show that the Polish party system is split stable. While the opportunities for gains from coalitions on the Right were exhausted between the years of 1993 and 1997, some opportunities for such gains emerged on the Left.
1 Introduction

A typical model of PR elections represents some of the following activities of parties and voters: (i) policy announcements; (ii) voting; (iii) cabinet bargaining; (iv) payoff distribution; (v) and final policy choice (Austen-Smith and Banks 1988, 408). Before an election, no party negotiates coalitional arrangements. Parties form coalitions only at the post-electoral stage of cabinet bargaining.

Transitional party systems work differently. Preferences of uninformed voters are in flux while numerous parties lack gate-keeping power. New entries, mergers, splits of old parties, and defections from one party to another precede policy announcements. Identity transformations of parties are often more important than tuning their platforms. Frequently, a change of the electoral law influences the rules of the electoral game and creates strong incentives for parties to split or merge before the election. The implicit goal of coalescing or splitting is usually to win more seats under a new electoral law favoring larger or smaller parties.

This article examines changes of party systems resulting from coalitional adjustments. Such adjustments are most spectacular in emerging democracies like the Czech Republic, Poland, Russia, Slovakia, or Ukraine (Cotta 1996; Kaminski 1998; Olson 1998). However, the problem is universal in all systems with at least three parties. In such systems, a subset of parties can often gain seats by splitting or forming an “electoral coalition,” i.e., by merging or creating a joint list of candidates. The incentives for mergers or splits are shaped by the electoral law and voter preferences.

Three empirical hypotheses of this paper are formulated with the use of partition function form games. The “coalitional stability” hypothesis (CSH) and the “split stability” hypothesis (SSH) say that, when the electoral law and voter preferences remain unchanged over a longer period of time, party systems evolve over time towards coalitional stability, or split stability, respectively. In mature democracies, we observe infrequent coalitional adjustments which is consistent with both hypotheses. In emerging democracies, we observe frequent and dramatic changes in the coalitional structure. The “reduction of coalitional instability” hypothesis (RIH) says that such changes, evaluated at the time of consecutive elections, when voter preferences and electoral law remain constant, and the present level of instability is not minimal, strictly decrease the degree of instability of a party system.

CSH and SSH offer a new perspective on the relationship between electoral laws and the properties of party systems. Systematic examination of the relationship between electoral laws and the number of parties was initiated by Duverger’s (1954) formulation of what is now called “Duverger’s Law.” The present framework helps to understand how deviations from the empirical regularity recorded by Duverger can arise.

RIH is illustrated with a narrative and data from the Polish parliamentary elections in 1993 and 1997. In the 1993 elections, the fragmentation of the party system caused a surprising and dramatic political turbulence. Under a new electoral law favoring larger parties, two post-communist leftist parties with a combined 37% of popular support won 65% of the lower house seats and ruled the country for four
years. The source of this generous seats-to-votes ratio was the fragmentation of post-solidarity parties on the Right which failed to adjust quickly enough to a new electoral law. If all Right parties had been united, the alliance of post-communist parties would not have won a lower house majority and would not have been able to form a cabinet (Kaminski et al. 1998).

A massive move towards coalitional stability took place in Poland between 1993 and 1997, and surprising political consequences followed again. Although between 1993 and 1997 there were few new entrants on the Polish political scene, popular support for the main clusters of parties in the 1993 and 1997 elections was almost identical, and the electoral law remained unchanged, the political outcome of the 1997 election was strikingly different. After the 1993 post-communist victory, the consolidation of the Right parties brought a post-solidarity triumph and a strong post-solidarity cabinet in 1997. These different political outcomes can be attributed exclusively to the changing coalitional structures of competing parties.

In Section 2, the partition function form game is defined as a model for coalitional politics. Two solution concepts embody two related notions of stability. Next, three empirically testable hypotheses are formulated and their possible applications are discussed in Section 3. Section 4 introduces the reader to the labyrinth of Polish politics between 1993 and 1997. This section also shows how the coalitional instability of a party system was gradually reduced by the Right parties after a change in the electoral law in 1993. Section 5 introduces a new methodology for estimating partition functions with a special survey that simulates elections under various coalitional structures. Next, a key fragment of the partition function for the Polish party system is examined. The results show a clear move towards stability on the Right, where the opportunities for gains from splits or mergers are exhausted. Interestingly, some possible gains from coalescing on the Left were detected. The coalitional instability of the entire party system decreased by an order of magnitude.

2 A model of electoral coalition formation

2.1 Basic definitions

Parties’ incentives to create electoral coalitions are represented as an n-person cooperative game in partition function form.²

² The naming convention of this paper merely serves as a convenient shortcut in identifying the main clusters of parties. The division into Right or Left represents the main dimension in Polish politics, along with the division into post-communist and post-solidarity parties. The terminology mimics naming customs in the Polish literature. The inclusion of parties in various clusters is based on informal estimates of spatial distances. See the Appendix for the decoding of all acronyms and the election results by parties and coalitions.

³ This concept is a slightly modified version of Thrall’s “generalized characteristic function form games” (1962). The present name was proposed in Thrall and Lucas (1963).
A coalition \( K \) is any nonempty subset \( K \subset P \). Any exhaustive family of at least two disjoint coalitions \( S = \{ K_1, ..., K_r \} \) is a coalitional structure, i.e., \( S \) satisfies the following conditions: \( r \geq 2 \); \( K_i \cap K_j = \emptyset \) for \( i, j \in \{ 1, ..., r \} \) and \( i \neq j \); \( \cup_{i=1}^{r} K_i = P \). When empirical coalitional structures are considered, the coalitional structure of the existing party system will be simply called the party system. A party or a coalition will sometimes be called a member of \( S \). The number of coalitional structures increases rapidly with the number of parties. Since the grand coalition is not a coalitional structure, for four parties, there are 14 different coalitional structures, and, for five parties, there are 51 such structures.

**Partition Function:** For any set of parties \( P \), the partition function \( \nu \) assigns to every coalitional structure \( S \) and every coalition \( K_i \in S \) the payoff \( \nu(K_i|S) \) which is a nonnegative real number subject to constraint \( \sum_{K_i \in S} \nu(K_i|S) = 100 \).

**Partition Function Form Game:** A partition function form game, or simply a game, is a pair \( \langle P; \nu \rangle \).

The condition that the sum \( \sum_{K_i \in S} \nu(K_i|S) \) is equal to 100 follows from our interpretation of the payoff \( \nu(K_i|S) \) as the expected percentage of seats that \( K_i \) would obtain in the Lower House if the parties formed the electoral coalitional structure \( S \). Under such interpretation, the partition function \( \nu \) describes concisely how, for all conceivable coalitional structures, the electorate’s preferences are translated by the electoral law into Lower House seats. Payoffs of any coalition \( K_i \), \( \nu(K_i|S) \), may vary with \( S \) while the standard characteristic function does not represent the impact of different coalitional structures on a coalition’s payoff.

Making and breaking coalitions is represented by the concept of superstructure. For coalitional structures \( S \) and \( T \), \( T \) is a superstructure of \( S \) if for some \( K \in S, M \in T \) (i) \( K \subset M \) and (ii) for any coalition \( L \in T, L = M \) or \( L \in S \). In words, a superstructure \( T \) includes some old coalitions from \( S \) and, as the only new coalition, \( M \) that was formed by \( K \) and at least one other coalition from \( S \). Similarly, \( S \) is a substructure of \( T \).

The way coalitions can affect the outcomes, or the specification of the “effectiveness” function, is crucial for modeling coalition formation (Rosenthal 1972, Chwe 1994). In the present model, the coalitional structure changes via breaking coalitions that belong to this structure or via making new coalitions out of the old ones, i.e., via splits or mergers. This assumption is supported by the data from actual coalitional adjustments on the Polish political scene. Between 1993 and 1997, there were about 29 coalitional splits or mergers, and only four relatively unimportant defections of a small fraction of one party/coalition to another party/coalition (see Figure 2).

In our model, differences in total payoffs are the main forces behind coalitions and splits. Let \( T \) and \( S \) be two structures such that \( M \in T \) and for all \( L \in S, L \subset M \) or \( L \setminus M = \emptyset \). Thus, \( M \) is a coalition of two or more members of \( S \). The difference between the payoff of \( M \) and the payoffs of its constituting members is
denoted as $\Delta(M;S,T) = v(M|T) - \sum_{L=\emptyset}^{M\neq\emptyset} v(L|S)$. If $\Delta(M;S,T)=0$ then we will say that $M$ is additive with respect to $S$ and $T$. When $S$ and $T$ are obvious in the context, we will skip “with respect to $S$ and $T$.” If $\Delta(M;S,T)>0$, we will say that $M$ is superadditive, and if $\Delta(M;S,T)<0$, we will say that $M$ is subadditive. The whole game is additive, superadditive, or subadditive if every coalition $K$ is always additive, superadditive, or subadditive, respectively.

When $T$ is a superstructure of $S$, there is exactly one coalition $M$ in $T$ that was created by players from $S$ and we can define $\Delta(S,T)=\Delta(M;S,T)$ and $\Delta(T,S)=-\Delta(S,T)$. In such a case, additivity of $M$ means that parties which decide to coalesce into $M$ get the same total payoff as before coalescing. Superadditivity or subadditivity denote gains or losses, respectively.

Consider the cabinet-formation game in a post-election parliament. A coalition of two parties with $p$ and $q$ seats always gets a total of $p+q$ seats. Moreover, coalescing of some parties does not influence payoffs of the others. Thus, the game is additive. (Of course, a seat-based partition function does not represent the voting power of parties or coalitions well.)

In contrast to seat-based cabinet-formation games, in electoral bargaining, deviations from additivity are the essence of coalitional politics. Subadditivity or superadditivity of a coalition have an intuitive interpretation. For parties close in the issue space and with an electoral law promoting larger parties, one expects superadditivity both in votes and in seats.

There are various factors that can be responsible for non-additivity of a coalition. The electoral support of coalescing parties may increase due to extra votes obtained from voters strategically abandoning an old favorite for a new, larger player. For parties remote in the issue space, such as a libertarian and a communist party, one expects massive abstentions and a heavy loss of a portion of the electorate to third parties. Finally, losses or gains of support due to coalescing are translated into seats by electoral laws which are rarely linear in votes and often have implicit or explicit mechanisms, like vote thresholds, that prevent small parties from winning any seats at all. In general, we cannot separate these various effects just by examining the seat-based partition function.

### 2.2 Example 1: A hypothetical partition function.

The following example illustrates strategic opportunities encoded by a specific partition function. In a multiparty system, there is one leftist party $P_1$, one centrist party $P_2$, and three small rightist parties $P_3$, $P_4$, and $P_5$. Before the parliamentary election to a 100-seat Lower House, a new electoral law promoting larger parties was introduced. Seat-maximizing parties $P_3$, $P_4$, and $P_5$ decided that an electoral coalition, i.e., a joint list of candidates, will help them to win more seats under the new law.

Table 1 depicts a hypothetical distribution of seats calculated or anticipated by party analysts, i.e., it depicts the expected payoffs for a few different coalitional structures. Since $P_1$ and $P_2$ abstain from negotiations, we consider only five possible
structures. The party system $P_1P_2P_3P_4P_5$ consists of all parties competing separately; the notation $P_1P_2\{P_3,P_4\}P_5$ denotes the fact that $P_3$ and $P_4$ formed a coalition; etc.

--- TABLE 1 ABOUT HERE ---

In Table 1, only $P_1$ is unaffected by coalitional re-arrangements and always wins 25 seats. Other payoffs are more sensitive to changes. Although we cannot immediately separate various sources of effects recorded by the table, we can formulate a couple of hypotheses. $P_2$ is a clear beneficiary of the fragmentation of the right, possibly due to strategic support of a part of the rightist electorate. Total payoffs of the three negotiating parties, perhaps due to expected electorate’s flow among them and the properties of the electoral law translating votes to seats, vary between 30 and 55 seats. All two-party coalitions get about twice as many seats compared to the initial state of fragmentation while the payoff of a rightist party not entering a coalition drops to between 2 and 8 seats. This suggests a strong effect of strategic voting within the right. The grand coalition of the right assures the three rightist parties the largest total number of seats, almost twice as many as in the fragmented system. Possibly, the grand coalition attracted the voters strategically choosing $P_2$ in the fragmented system and benefitted from the magnifying effect of the electoral law.

One may speculate that a grand coalition of the right will eventually form. Whichever coalitional structure is predicted as final, it is clear that parties $P_3$, $P_4$, and $P_5$ can gain a lot from coalescing. Once they recognize this opportunity, they will work hard to capture possible gains.

2.3 Solution concepts

The partition function does not represent all complexities of coalitional structure adjustments. It does not discriminate between temporary coalitions and mergers nor does it account for such phenomena as the potential for splits of old parties, emergence of new parties, withdrawals, dissolutions, and defections from one party to another. It also disregards other payoffs such as Senate seats or the impact of purely sociological factors. With all these limitations in mind, the partition function can be used to formulate some empirical hypotheses based on the following solution concepts.

**Solution Concepts:** Let $\langle P, v \rangle$ be a game and $S$ a coalitional structure and let $\hat{\delta}(S) = \max \left\{ x : x = \Delta(S,R) \right\}$ where $R$ is a substructure of $S$ or $x = 0$ and $\Delta(S) = \max \left\{ x : x = \Delta(S,T) \right\}$ where $T$ is a superstructure of $S$ or $x = 0$.

(i) $S$ is split stable if $\hat{\delta}(S) = 0$;
(ii) $S$ is coalitionally stable if $\Delta(S) = 0$.

The indicators of instability $\hat{\delta}(S)$ and $\Delta(S)$ denote the maximal gain that players from $S$ can achieve by splitting or coalescing, respectively, or 0 if no gain is possible. $S$ is split stable if no player can strictly benefit from splitting. It is coalitionally stable if no players can strictly benefit from further coalescing.
Some split stable structures are not coalitionally stable and vice versa. Simple examples can be found among two-coalition structures and structures with single parties. Two-coalition structures are always coalitionally stable while structures with single parties only are always split stable.

Let us examine the properties of coalitional structures from Table 1 with respect to the partially listed partition function of the game. Since breaking the “grand coalition of the right” always hurts its members and no further coalescing is possible, $P_1-P_2\{P_3,P_4,P_5\}$ is the unique split-coalition equilibrium. This fact is consistent with the intuition that the “grand coalition of the right” will form.

Typically, models of coalition formation involve some concept of “farsightedness” that embodies how players evaluate the present outcome in the light of possible alternative outcomes attainable from that outcome (Chwe 1994, Ray and Vohra 1999). Concepts of split and coalition stability involve a one-step evaluation of the total gains or losses by a player or players, that result from a single split, or coalescing, respectively. Players do not take into account any further adjustments of the coalitional structure. This “myopia” of players is well justified in the present empirical context by scarcity of data and the high cost of obtaining relevant poll information. Actual changes of coalitional structures that involve a player are too costly to be used for evaluation. The only feasible alternative is the estimation of payoffs with pollsters for counterfactual coalitions or splits. However, even the evaluation of a single one-step change involves significant resources and usually takes a lot of time. In addition, the validity of poll estimates would diminish rapidly with the number of coalitional adjustments a respondent has to imagine. During coalitional adjustments of the Polish party system between 1993 and 1997, the pollsters attempted to estimate the effects on voters of a few especially interesting one-step changes, but there were no attempts to estimate the effects of more complex coalitional adjustments (see Section 4).

3 Empirical hypotheses and applications

3.1 Empirical hypotheses

A first guess could be that the outcome of the coalitional adjustment process is both split and coalition stable. However, there are games with no split-coalition stable structures. Thus, there is a good reason to separate hypotheses related to split and coalitional stability and to test them independently.

Let us assume that the electoral law and the partition function do not change over a longer period of time. Then:

**Coalitional Stability Hypothesis (CSH):** The party system $S$ at the election time is coalitionally stable, i.e. $\Delta(S)=0$.

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4 For three parties, there exists at least one split-coalition equilibrium. For four parties and more, this is not true (see the Appendix).
SPLIT STABILITY HYPOTHESIS (SSH): The party system $S$ at the election
time is split stable, i.e. $\delta(S) = 0$.

A justification for both hypotheses is that, when the informational
environment is sufficiently stable over a longer period of time, party leaders learn
how to solve the dilemmas of coalitional politics, thereby continuing to coalesce and
merge until all gains from such activity are exhausted. (Section 4 reconstructs the
process of learning the partition function by the Polish party leaders and assesses the
importance of their estimates for coalitional adjustments.)

Since every two-coalition structure is coalitionally stable, we are assured
that coalitional stability can be attained via coalescing from any structure $S$.
Similarly, the structure with no proper coalitions can be reached via splitting from
any $S$. We also know that there are many paths from any coalitional structure $S$ to
another structure $T$ via coalescing or splitting (e.g., all coalitions in $S$ can dissolve
gradually and next gradually form coalitions from $T$). Thus, there exists a path from
any initial structure $S$ to any split-coalition stable structure via splitting and
coalessing. We cannot be assured that all moves along such a path increase, or even
do not decrease, the total payoff of coalition members. The hypotheses say nothing
about the properties of intermediate outcomes along such a path, though the existence
of such a path would make the final outcome more plausible to emerge. However,
one can speculate that, for most empirical partition functions, such a path in fact
exists.

In transitional democracies, party systems may remain in flux over longer
periods of time but some “stabilization” can be recorded. Thus, our third empirical
hypothesis characterizes the path of coalitional adjustments evaluated at consecutive
elections. Let us define the degree of instability of $S$ as $\Delta^{\text{MAX}}(S) = \max \{\Delta(S), \\
\delta(S)\}$. $\Delta^{\text{MAX}}(S)$ denotes the maximal potential gain from altering a coalitional
structure $S$ via splits or coalitions, and equals zero if no gains exist. Let us define the
minimal attainable instability for $\forall$ as $\Delta^{\text{MINMAX}} = \min \{\Delta^{\text{MAX}}(S): S$ is a coalitional
structure\}.

Let us assume that the electoral law and the partition function do not change,
and $S_t$ and $S_{t+1}$ denote the party system at the time of consecutive elections $t$ and $t+1$.
Then:

REDUCTION OF INSTABILITY HYPOTHESIS (RIH): If $\Delta^{\text{MAX}}(S_t) > \Delta^{\text{MINMAX}}$, then
$\Delta^{\text{MAX}}(S_{t+1}) < \Delta^{\text{MAX}}(S_t)$.

RIH says that if, as is frequently the case in young democracies, the level of
instability can be decreased, it will be strictly decreased, and the potential positive
gains from altering a coalitional structure will be at least partially consumed during
the next elections.

A justification for this hypothesis is that the support of party leaders for
coalescing, mergers, or splits is strongest, and the action most likely, when potential
gains are largest. Thus, larger instabilities are more likely to be removed. The
timing of evaluation in both hypotheses is important since the proximity of elections
provides the ultimate incentives for optimizing the coalitional structure. When the
election date is remote, parties may experiment with various coalitional arrangements
and, since the public interest in the elections decreases, fewer and less precise estimates of \( V \) are available from the pollsters.

The assumptions of stability of the electoral law and voter preferences are vital. A new electoral law or a change in voter preferences may clearly increase the instability of the party system. In Poland, between 1989 and 1997, there were two changes in the electoral law and both changes generated significant instabilities.

RIH implies that at some point no further reduction is possible. For games with at least one split-coalition stable structure, split-coalition stability of \( S \) is equivalent to \( \Delta^{\text{max}}(S) = 0 \). When no split-coalition stable structure exists, the terminal outcomes predicted by all three hypotheses can be different. The minimal level of instability may be reached at a structure that is unstable with respect to splits, coalitions, or both. For such games, CSH and SSH cannot be satisfied simultaneously. A well-founded guess is that all, or almost all, partition functions of empirical party systems have at least one split-coalition stable structure. However, the scarcity of data makes such a guess difficult to falsify. It is also unclear what the class of “empirically valid” partition functions is, so that one can derive existence by imposing the corresponding restriction on the class of games.

3.2 Applications

Three possible applications of the empirical hypotheses seem most interesting. These applications include testing mature party systems for split-coalition stability; using coalitional stability to throw light on Duverger’s Law and other political consequences of electoral laws; and investigating the path of identity transformations in transitional party systems.

3.2.1 The assumption of a “sufficiently long period of time” in CSH and SSH suggests that they are better suited to address mature party systems that remain informationally stable, or “frozen,” for years rather than to address systems in transition. Split and coalition stability of any mature party system can be tested with the survey-based method developed in this paper, perhaps slightly modified to account for specific details of electoral laws. For three- or four-party systems, such a test would be quite simple to conduct. Clearly, both the corroboration and rejection of the hypothesis for every specific polity would be an interesting result. A large and persistent instability in an established democracy would be an especially interesting phenomenon.

3.2.2 Relations between electoral laws and the numbers of parties has been studied intensively at least since the publication of Duverger’s seminal book (Duverger 1954; Rae 1967; Lijphart 1990, 1994; Taagepera and Shugart 1989). Other authors emphasized the explanatory and causal importance of societal cleavages (Lipset and Rokkan 1967). The present model gives a heuristic tool that helps to understand how cleavages and electoral laws jointly exercise pressure towards increasing or reducing the total number of parties in the system.

The best known statement linking electoral laws and the number of parties is “Duverger’s Law,” which expresses an empirically observed strong correlation between the presence of single-member-district, plurality electoral laws and two-
party systems, sometimes with a claim of causality added (Duverger 1954; Riker 1982). A strong game-theoretic case for Duverger’s Law was made by Palfrey (1989), who, building on an earlier work by Ledyard (1981) and Cox (1987), shows a model of three-party elections under plurality in single-member constituencies. In equilibrium, strategic voting essentially limits the number of parties with considerable support to two. Palfrey noticed that there is a “need to explicitly study the coalition formation process,” both under plurality and PR systems, since it may be consequential for the electoral outcomes.

In multi-district systems, exceptions from “Duverger’s Law” arise and geographic differentiation of cleavages is an important factor for shaping the party system (Kim and Ohn 1992). Quantitative studies show clearly the importance of ethnic heterogeneity and other cleavages for explaining multipartism as well as a non-linear character of the relationship (Ordeshook and Shvetsova 1994; Neto and Cox 1997).

Split and coalition stability are applied below to a specific partition function and shows how a deviation from Duverger’s Law in a single-member-district, plurality system can arise (see also Kaminski 1994). Consider the game in Table 2. We assume that the payoffs represent expected support with strategic voting in districts taken into account.

--- TABLE 2 ABOUT HERE ---

The partition function presumably reflects deep inter- and intra-district cleavages. Parties have no incentive to coalesce or merge. When parties compete separately, each one wins one seat. When a coalition of two parties forms, it loses in all three districts. Consequently, the unique split-coalition equilibrium is a three-party system while two-coalition systems are not split stable.

To compare possible outcomes for different electoral laws within the present framework, one needs a partition function indexed by electoral laws. For the purpose of empirical estimation, an assumption akin to the invariance of vote-partition function under various electoral laws would be probably necessary. One would expect that electoral laws more friendly to large parties increase the payoffs of large coalitions at the expense of smaller ones, thus increasing incentives for coalescing. To prove a result that would imply an empirical regularity like Duverger’s Law, one needs to take into account an empirically observed distribution of partition functions and demonstrate that various electoral laws increase substantially the probability of obtaining an equilibrium party system with desired characteristics. Needless to say, such a task may prove computationally complex. Moreover, existing data does not suggest clearly any specific assumptions.

3.2.3 RIH can be applied to investigating transformations of emerging party systems. Frequent changes of electoral law in the face of uncertain consequences for the party system create ample opportunities for splits or consolidation. Fragmentation, atomization, or “over-partycization” has been a striking property of early Eastern-European party systems (McGregor 1993; Remington 1994). Filippov
et al. (1999) suggest that fragmentation is facilitated by presidentialism and other institutional variables as well as low costs of entry.

Initial fragmentation in an emerging democracy, or in any polity experiencing abrupt social, economic and political changes, is typically followed by a gradual consolidation, documented by a steep decrease in the effective numbers of electoral and parliamentary parties (Cotta 1996; Olson 1998). In the consolidation phase, electoral law often remains unchanged, cleavages and voter preferences “freeze,” party leaders get better estimates of payoffs and learn how to maximize gains and share them with others, and the cost of entry increases.

The next two sections analyze consolidation of the Polish party system during the 1993-1997 inter-election period that followed the 1990-1993 fragmentation. First, a detailed narrative of politicians’ activities and declarations documents the political activities behind coalitional arrangements. Second, the estimated partition function is used for testing the empirical hypotheses.

4 Reduction of coalitional instability in Poland: narrative

4.1 Background

On May 28, 1993, a new electoral law was introduced in Poland. Changes favoring larger parties included country thresholds, smaller districts, and a new apportionment method. (See Table 4 in the Appendix.) Accidentally, the non-confidence motion was passed on the same day and led to an early parliamentary election.

On the eve of the election, the Right was divided into tiny factions. This fragmentation was a result of the old electoral law that favored smaller parties and, under the new law, it became dangerous for the Right. The threat was recognized, and the unification talks started soon thereafter. However, the negotiations collapsed, and on September 19, 1993, the Right faced the elections fragmented. The results were disastrous, with some of the Right parties finishing just below the threshold.

The Right’s failure helped two parties with a communist ancestry. The return of the Polish post-communists, along with similar comebacks in Lithuania and Hungary, was declared a surprising “shift-to-red” in Central European politics.

The 1993 election taught the Right’s politicians a tough lesson. The Right faced the next election united into one large coalition, the AWS, except for a minor party, ROP. After the election, the AWS and the centrist party UW formed a majority cabinet. Many political commentators considered the results of the 1997 elections to be surprising again. However, the popular votes obtained by major ideological clusters of parties in the 1993 and the 1997 elections were surprisingly similar. (See Table 5 in the Appendix.) The real difference was only in the distribution of seats.

The remainder of this section is based on Kaminski (1998) and tells the story of what happened on the Right between 1993 and 1997. The narrative is organized around the dilemmas that coalescing parties face; i.e., payoff estimation, promotion of the new entity on the political market, and sharing the expected seats.
4.2 Payoff estimation

The estimation problem is caused by the deficit of reliable information. In a transitional party system, prospective coalescents hardly know the partition function, but rather its proxies based on popular support. Polls provide estimates of popular support under the existing structure, but estimates for other hypothetical structures are infrequent and less reliable. Such estimates are often plagued by methodological problems unknown elsewhere.

The Right’s coalitional failure before the 1993 election is a good illustration of estimation problems. The threat of a poor votes-to-seats translation ratio was evident, and the talks started soon after the parliament was dissolved. In early June of 1993, three Right coalitions were formed and further coalescing was expected. However, the surprising poll estimates showed that two of the new coalitions were deeply vote-subadditive and that only the smallest one was approximately vote-additive. Both subadditive coalitions were soon dissolved. (See Figure 1.) Political analysts concluded that a large part of the electorate was lost due to coalescing (CBOS 1993a, 5). Polls clearly halted further negotiations (Kaminski et al. 1998).

--- FIGURE 1 ABOUT HERE ---

The election results of the Right were poor but still better than the polls suggested. Some politicians believed that the polls were used to initiate a self-fulfilling prophecy. The leader of PC, Jaroslaw Kaczynski, inferred that “so-called public opinion polls are manipulated” (quoted in Sulek 1995). Though fragmentation-based explanations are more plausible (Kaminski et al. 1998), the predictive failure of polls seems unquestionable.

Over time, polling companies better understood the methodological problems of poll estimates in a fragmented party system. Politicians learned how to interpret polls as well. Calculations based on estimates of the partition function were substituted for the ideological language of early negotiations. Obviously, estimates of different politicians were sometimes inconsistent. When Jan Olszewski, the leader of ROP, suggested a grand coalition with the AWS, he implicitly assumed superadditivity and argued that such a coalition could win a qualified majority of seats. Marian Krzaklewski, the AWS leader, was more conservative. He responded that, “We have to check first whether our electorates are additive” (Zdort 1997a). In fact, polls showed a 2% vote loss for a potential grand coalition which, possibly, prevented any agreement between the ROP and AWS.5

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5 After the 1993 election, parties actively sought estimates of the partition function. During intensive coalitional negotiations of the Right in early 1996 and mid-1997, polling companies conducted surveys on potential gains from coalescing. In April 1998, one of the largest parliamentary parties performed a secret survey, designed similarly to the
4.3 Name recognition

Votes come from voters who must recognize the political entity for whom they are voting. The brand name of a new entity must be implanted in voters’ ears and hearts. In a transitional multiparty system, the successful promotion of a new brand name is a complicated endeavor – particularly amidst the informational noise of splits, mergers, coalitions, negotiations, withdrawals, defections, and entries.

The first coalitions on the Right — PJL, SUC, and PdP — formed soon after the defeat in 1993 in order to compete in the 1994 local election. All three coalitions assumed new names that were entirely unknown to their supporters. No intra-coalitional mechanisms promoting the new names were created, and no popular politician advertised these new entities. None of the competing coalitions created a well-recognized identity. As a result, it was no wonder that their political life was short. In May 1994, “about half of Poles had not heard about the main organizational force on the Right [PdP]” (OBOP 1994, 6). Analysts were heard to complain that, “many respondents do not recognize differences among the PdP, PJL, and SUC, and do not know which parties comprise these coalitions” (OBOP 1995, 6). In fact, the first three years of coalitional adjustments brought a dizzying informational noise of frequent splits, mergers, and changes of names (see Figure 2).

— FIGURE 2 ABOUT HERE —

Long negotiations at St Catherine’s Church failed with no joint presidential candidate selected. A victory in the 1995 presidential election by a post-communist candidate provided a strong stimulus for consolidation. The first success was accomplished by a relatively popular presidential candidate, Jan Olszewski. Olszewski’s popularity attracted considerable support in the polls for his new party, the ROP. The ROP’s entry mobilized the remaining players on the Right who formed another broad coalition around the Solidarity trade union. The name AWS, Electoral Action Solidarity, included the magical word “Solidarity,” which proved to be an excellent vehicle for promotion. In 1996, the AWS emerged as a focal point for the Right’s electorate.

The consolidation of the Right resulted from a three-year search for a credible brand-name. The dynamics of learning explained in McKelvey and Ordeshook’s model (1984) shows how an uninformed voter might use a poll to make an informed decision. When spatial positions of a cluster of small parties are virtually identical, voters are virtually indifferent among the parties and ready to vote strategically for the party which seems to be the most serious contender. Well-promoted coalescing offers them a “focal coalition.” The existence of such a coalition induces more voters to strategically declare their support in polls, and the survey used in this research, to measure potential benefits from coalitions with various partners.
coalition gradually takes over a larger share of the cluster. Voters coordinate their intentions by learning about a new coalition’s strength from polls or through media hype. A successful coalition displays a characteristic pattern of monotonic growth of support over time. For the ROP and the AWS, the support increased monotonically over the first several months since inception from 9% to 14%, and from 22% to 28%, respectively (OBOP 1996a, 1996b, 1997).

4.4 Sharing seats and stabilizing the coalition

Even if parties figure out the benefits of coalescing and establish a solid name for their coalition, they still have to divide seats among themselves. Even if a sharing scheme is in place, heavy internal and external bargaining are inevitable. Until the deadline for registration of candidates, conflicts over the seat-shares can tear the coalition apart.

In all negotiations after the defeat in the 1993 elections, bargaining over seat-shares was the central part of the dispute. Marian Krzaklewski, the leader of the Solidarity trade union and the AWS coalition, worked out a marvelous solution to the sharing problem. Instead of proposing an exact sharing scheme in advance, Krzaklewski designed a set of institutions for intra-coalitional decision-making, with voting power allocated on the basis of a transparent scheme.

In the chief legislative and coordinating body of the AWS, the National Council, votes were allocated by a formula measuring the relative input of every partner to coalitional power. Krzaklewski, a computer scientist, operationalized the input of the partners with a formula based on several variables, including poll estimates.\(^6\) The essence of the scheme was that Solidarity had blocking power, but not winning power, in all national and regional executive and legislative bodies. To assure decisiveness, Krzaklewski assumed a dictatorial power to break the tie in the event of two voting stalemates over an issue (Krzaklewski and Raina 1997, 253; Graniszewski 1997).

Krzaklewski’s solution offered a minimum security level to all members of the AWS. Solidarity was perceived as roughly equidistant to all Right parties, the political appetites of its activists were constrained by the trade union’s internal rules, and Krzaklewski was regarded as an unbiased arbiter. His almost-dictatorial voting power was curbed by every member’s exit power. Not specifying seat shares in advance moved potential conflicts into the future when candidates were to be selected. In the meantime, the coalition focused on promoting the AWS brand name.

\(^6\) Variables included membership, numbers of representatives in legislatures at all levels, territorial span, media access, know-how potential, input to local AWS organizations, votes in recent presidential and parliamentary elections, and the mean support in recent polls for parties and leaders. The formula was not released to the public.
When positions on the AWS lists were allocated just before the 1997 elections, they disappointed many coalescents. Solidarity trade-unionists sneaked smoothly into the world of politics. With blocking power in all voting games, Solidarity’s local branches formed minimal winning coalitions in districts with other AWS members and grabbed a disproportionate share of best places on district lists.\(^7\) The position of trade-unionists was further improved by an ad hoc Solidarity-dominated Election Committee with a line-item veto power over the candidates.

The victory of Krzaklewski’s heresthetic was not easy. During the final weeks before the registration deadline for candidates, an extraordinary spectacle of threats took place. Almost every major partner threatened to exit. However, the exit threat of any single party turned out to be incredible. The AWS built such a strong brand name that a defection of one or two parties would not change its support. Solidarity spokesman Piotr Zak announced that “he did not expect any major deserters that might weaken the AWS [since] most such politicians would face oblivion outside the AWS umbrella.” (CEO 1997)

The only somewhat successful threat was carried out by a large subcoalition parties that included PC, Ruch STU, KPN, BBWR-SwW, PN, KK and ChD-SP, whose leaders submitted names of candidates who should be removed, added, and moved up on the lists (Zdort 1997b). Some of the group’s suggestions were accepted.

The second attempt to mobilize a strong sub-coalition failed. A KPN leader declared, “we got offers from the UPR [a minor libertarian coalition]. If BBWR-BdP and BBWR-SwW join us, we will pass the five percent threshold. Now, the seven-eight percent for us means 10-15 percent less for the AWS” (Zdort 1997c). However, the prospective partners accepted small advances from the AWS and the sub-coalition soon broke down. After failed negotiations with the UPR, the lonely dissenter, KPN, withdrew from the elections in face of a total defeat.

5 Reduction of coalitional instability in Poland: estimations

5.1 Components of the empirical test

Testing the three empirical hypotheses formulated in Section 3.1 requires (i) checking whether electoral laws were the same in 1993 and 1997 and the partition function remained unchanged, and (ii) estimating the degree of split-coalition instability in 1993, i.e., \(\Delta(S_{1993})\) and \(\delta(S_{1993})\), and the degree of split-coalition instability in 1997, i.e., \(\Delta(S_{1997})\) and \(\delta(S_{1997})\).

\(^{7}\) A high position on a list greatly improved the electability of a candidate. In the 1991 elections candidates on the top of alphabetical lists (i.e., lists considered random with respect to candidates relative popularity) received an average of 31\% votes for the entire list; while for the next places the numbers were 19\%, 13\%, 10.5\%, and 8\% (Raciborski 1997, 235).
Ad. (i): The electoral laws in 1993 and 1997 were the same except for a negligible transfer of one seat between two districts.

Unfortunately, the entire partition function is difficult to estimate for six or more parties. A proxy for the change in the partition function is the change in the support for main ideological clusters, as measured by Pedersen’s (1979) volatility index:

$$V^v = \frac{1}{2} \sum_{i=1}^{5} |v_i^{93} - v_i^{97}|$$

where $v_i^{93}$ and $v_i^{97}$ denote the vote for bloc $i$ in the 1993 and 1997 elections, respectively. The value of $V^v=0.076$ denotes a minuscule change.\(^8\) A similar number calculated for the change in seats distribution ($V^s=0.37$) is very high.

Ad. (ii): The 1993 party system was evidently coalitionally unstable. Estimates show that the largest instability was on the Right, where the grand coalition could have won about 131 to 160 seats more than the actual total of fragmented parties (Kaminski et al. 1998). This means that $\Delta(S_{1993}) \approx 31.6$. A well-founded guess is that the system was split-stable, i.e., that $\delta(S_{1993})=0$.

The remainder of this section explains the methodology and presents the estimated post-1997 partition function, based on a survey designed specifically for this purpose.\(^9\)

### 5.2 Methodology

The partition function $V$ is estimated for various coalitional structures $S$ on the basis of available district-level election data and survey results. The following data, in addition to the parameters of Polish electoral law, were used:

---

\(^8\) Values of $V^v$ for other recent Central European elections are higher: Hungary 1990-94, 0.25; Czechoslovakia 1990-92, 0.22; Poland 1991-93, 0.23 (Raciborski 1997). However, the results of the two post-communist parties differed significantly in 1993 and 1997 (see the Appendix). If these parties are counted separately, $V^v$ increases to 0.14.

\(^9\) The survey was conducted by the OBOP, between May 9-14, 1998, on a representative sample of Poles (N=1047) 15 years of age and older. The wording of questions was the subject of a sequence of roundtable debates with the OBOP experts and the validity of a final version of the questionnaire was tested with a pilot survey. The questionnaire, election data, estimated election matrices, simulation program SEATS, etc., are available on the web at the following address:

www.nyu.edu/projects/kaminski/research.html#5.
\(P = [p_{ij}]\) — the \(m \times d\) election matrix where \(m\) is the number of parties or coalitions in recent elections, \(d\) is the number of districts, and \(p_{ij}\) denotes the proportion of votes for the party or coalition \(K_i\) in district \(j\). Under Polish electoral law from 1993-1998, \(d = 53\), with the nationwide list regarded as a separate district;

\(S = [s_{ij}]\) — the \(q \times d\) hypothetical election matrix for structure \(S\) where \(q\) is the number of members of \(S\), \(d\) is the number of districts, and \(s_{ij}\) denotes the hypothetical proportion of votes for a party or a coalition \(K_i\) in district \(j\);

\(T_S = [t_{ki}]\) — the \(q \times m\) flow matrix for structure \(S\), where \(t_{ki}\) is the proportion of supporters of a party or coalition \(K_i\) from \(P\) who would vote for \(K_k\), the member of \(S\). The estimate of \(T_S\) is used to simulate the distribution of support in districts;

\(\hat{T}_S = [\hat{t}_{ki}]\), \(\hat{S} = [\hat{s}_{ij}]\) — estimates of \(S\) and \(T_S\).

The basic relations between \(P\), \(S\), and \(T_S\) are introduced below. Next, the questionnaire questions and procedures applied to estimate \(T_S\) for all relevant structures \(S\) are described. Following that, I briefly comment on the conversion of votes to seats. Finally, Example 2 shows step-by-step calculations for a simple three-party system.

5.2.1 Let us express the total number of supporters of \(K_k\) as the sum of supporters coming from all members of \(P\) and former nonvoters in all districts. Formally:

\[
\text{For all } k = 1, \ldots, q \text{ and } j = 1, \ldots, d, \ s_{ij} = e_{ij} + \sum_{i=1}^{m} t_{ij} P_{ij} \tag{2}
\]

where \(e_{ij}\) is a correction factor for the behavior of nonvoters in districts. Two relatively unrestrictive assumptions about voter behavior make this equation operational:

(i) the flow matrix is identical for all districts, i.e., \(T_{Sj} = T_{Sl} = T_S\) for all \(j, l\);

(ii) the effect of nonvoters can be omitted, i.e., \(e_{ij} = 0\).

Assumption (i) says that the proportion of supporters of any member of \(P\) who would vote for a given member of \(S\) is independent of districts. Assumption (ii) says that those who vote under one structure but abstain under another structure do not influence the election results.

Thus, we can skip the superscript \(j\) in \(t_{ij}\) and substitute \(T_{Sj}\) with \(T_S = [t_{ij}]\), the flow matrix for all districts. Under (i) and (ii), identity (2) becomes:

\[
S = T_S P \tag{3}
\]

where \(T_S P\) is a matrix product. On the right-hand side of (3), matrix \(P\) contains district-level election data and \(T_S\) can be estimated from a survey.

5.2.2 In the survey, every respondent declared his preferences under the present party system \(P\). A generic procedure for estimating \(T_S\) was to ask a respondent to “vote” with a ballot-like card that listed all members of \(S\). The
columns in matrix $\hat{T}_S$ included conditional distributions of support for members of $S$ corresponding to all members of $P$. In order to lower the computational task for a respondent confronted with many hypothetical choices, only a subset of structures was considered and an interpolation procedure was applied to data for two-party coalitions (Footnote 10 explains the details).

5.2.3 The electoral law is a function that assigns to the estimated election matrix $\hat{S}$ a vector of seats of an appropriate dimension, i.e., $\hat{\Phi} (\cdot | S)$. In this paper, the present Polish electoral law, reconstructed in Table 4, was used (see the Appendix). A simulation program (SEATS) was used to simplify the calculations.

5.2.4 Example 2: Simulating the partition function for two coalescing parties in a three-party, two-district system under single-member-district first-past-the-post electoral law.

In the election, the district-level support for parties $A$, $B$, and $C$ is as follows:

$$
P = \begin{bmatrix}
0.4 & 0.3 \\
0.31 & 0.45 \\
0.29 & 0.25
\end{bmatrix}
$$

- support for $A$
- support for $B$
- support for $C$

Thus, $\nu(A|P) = 50$, $\nu(B|P) = 50$, and $\nu(C|P) = 0$.

In a survey, the respondents were asked about their choices if $A$, $B$, and $C$ competed separately, i.e., for $P = A-B-C$. The next question asked about their choices if parties $A$ and $C$ coalesced, i.e., for $S = \{A,C\}-B$. The answers were as follows:

(i) 90% of supporters of $A$ under $P$ would vote for $\{A,C\}$ and 10% would vote for $B$ if $A$ and $C$ coalesced;
(ii) all supporters of $B$ under $P$ would vote for $B$ if $A$ and $C$ coalesced;
(iii) all supporters of $C$ under $P$ would vote for $\{A,C\}$ if $A$ and $C$ coalesced.

\[
A \quad B \quad C
\]

\[
\begin{array}{ccc}
1 & 0 & 0 \\
0 & 1 & 0
\end{array}
\]

From these data, we obtain the flow matrix $\dot{T}_S = [\begin{bmatrix} 0.9 & 0 & 1 \\ 0.1 & 1 & 0 \end{bmatrix}]$ and, next, we calculate the matrix $\hat{S} = \hat{T}_S P = [\begin{bmatrix} 0.65 & 0.52 \\ 0.35 & 0.48 \end{bmatrix}]$.

Since the electoral law is simply single-member-district first-past-the-post, the estimated partition function can be calculated easily: $\hat{\Phi} ([A,C]|S) = 100$, $\hat{\Phi} (B|S) = 0$. We can also calculate that $\hat{\Delta} (P,S) = \hat{\Phi} ([A,C]|S) - \hat{\Phi} (A|P) - \hat{\Phi} (C|P) = 50$ and conclude that, according to our estimates, structure $P$ is not coalitionally stable since $A$ and $C$ can strictly gain from coalescing.

5.3 Results

The partition function was estimated with a survey for the party system involving six major parties (see Footnote 9). AWS, PSL, ROP, SLD, UP, and UW
captured together 97.8% of seats in the survey and 99.6% of seats in the 1997 elections (see Table 5).

The computational complexity of estimating the entire relevant $v$ is too great for a standard survey. After the grand coalition is excluded, there are 56 superstructures of the party system corresponding to 56 coalitions among the six parties involving between two and six parties. The number of substructures (with respect to factions in the AWS and the SLD) is even higher. Fortunately, the number of superstructures that could possibly generate gains for coalescing parties is much smaller, and it is unlikely that under present electoral law any split would be profitable. Thus, only these potentially profitable superstructures and one most important substructure were examined.\(^{10}\) The results are presented in Table 3.

--- TABLE 3 ABOUT HERE ---

For the estimation of $\delta(S_{1997})$, only one split was examined. The AWS coalition was broken down into a set of major factions including ZChN, KPN, Ruch Stu, BBWR - SwW, PC, the Solidarity trade union, Instytut Lecha Walesy, and SKL.

\(^{10}\) To estimate $v$ for a few hundred of the superstructures and substructures, one would have to “vote” a few hundred times, a task exceeding the computational ability and patience of virtually every respondent. For superstructures involving coalition of three parties or more, only four potentially most beneficial coalitions out of 41 possible many-party coalitions were considered. Only one split, i.e., a dissolution of the AWS coalition into major factions, was considered. Finally, for two-party coalitional structures, an interpolation procedure was applied to obtain every matrix $T$ with the help of respondents’ second preferences. Instead of voting in every case, a respondent was asked whether s/he would still vote for a two-party coalition of his/her party with each of the remaining five major parties. A “yes” vote was recorded as a vote for coalition. A “no” vote was assigned to the voter’s second preference party. Votes of other voters were assumed unchanged. Moreover, every coalition’s vote was adjusted for possible transfers of votes from other parties. The adjustment was derived as follows: all three-party coalitions received about 82% of their support from the former supporters of the coalition’s members and the remaining 18% from the supporters of other parties. The adjustment for two-party coalitions was assumed as 2/3 of the adjustment for three-party coalitions.
The Solidarity trade union was able to capture the bulk of the AWS electorate but the AWS successors still suffered a big loss of 6.5, or 30 seats. For the estimation of \( \Delta(S_{1997}) \), all two-party coalitions and four three-party coalitions were examined.

For the two-party case, \( \Delta(P,S) < 0 \) for all \( S \). Thus, the point estimates show that all two-party coalitions would lose seats, with the typical loss being substantial. Expected losses of seats for coalitions including the AWS are especially big. Except for cases including a small ROP, relatively smaller losses are located on the Left, i.e., within the \{SLD,UP,PSL\} triangle. The leftist post-solidarity party UP is the one with smallest relative average losses. For two coalitions, \{UP,SLD\} and \{UP,PSL\}, the upper estimate of \( V \) even shows a possibility of a slight gain.

Due to the location of the ideological platforms of the six major parties, the four three-party coalitions are the only plausible candidates for superadditivity. As the two-party case suggests, other coalitions, especially those containing the AWS and the SLD, lose so many supporters that they can be rejected as clearly harmful.\(^{11}\)

Two out of four potentially most beneficial three-party coalitions actually turned out to be beneficial. The surplus of the \{SLD,UP,PSL\} coalition, amounting to 12.2, or 56 seats, is especially substantial. For the two coalitions built around the AWS, the potential gains from coalescing are close to zero. However, the formation of a potentially successful grand coalition could invoke some strategic voting on the other side of the political spectrum to support larger parties, an effect that could not be detected in a survey. Thus, the numbers in Table 3 may slightly overestimate the gains from three-party coalescing.

The results show that the Right, after a period of intensive splits and mergers, exhausted possible gains from coalescing. There is also evidence that unrealized gains are present on the Left side of the political scene.  

5.4 Evaluation of empirical hypotheses

The results suggest that both the 1993 and 1997 party systems were split-stable. The 1993 system was deeply coallyionally unstable, but the degree of instability decreased over time significantly, from \( \Delta(S_{1993}) = 31.6 \) to \( \Delta(S_{1997}) = 12.2 \). However, the positive value of the estimate of \( \Delta(S_{1997}) \) still demonstrates the 1997 system’s coallitional instability.

\(^{11}\) Thrall wrote in his pioneering (1962) paper that “In the political arena [subadditive payoffs of two coalescing parties] might represent clashing ideologies ... in which an open union would rather weaken support for both.” The payoff for the \{AWS,SLD\} coalition illustrates of how deep the loss representing “clashing ideologies” can be. Only one in nine supporters of both the AWS and the SLD would vote for their coalition, and such a coalition would lose about 317 seats out of 336!
The results corroborate RIH and SSH and do not support CSH. The present data does not allow to decide whether a split-coalition stable structure exists or not, i.e. whether all three hypotheses can be satisfied simultaneously. A well-founded guess is that split-stable structures actually exist.

The discovered coalitional instability of the post-1997 system must be interpreted with caution. First, CSH is intended to describe mature party systems, with longer periods of stable voter preferences and unchanged electoral laws. Whether the Polish party system is mature enough is disputable. Second, it is unclear whether the discovered instability will be sustained over “a longer period of time.” Since 1997, two two-party coalitions with positive upper estimates of $\Delta$ have actively sought some coalitional arrangement. After this research was completed, PSL and UP formed a coalition in the local election in the fall of 1998. UP and SLD were repeatedly negotiating a possible merger as well. Such a merger became the main issue for the smaller UP.

6 Conclusion

That we can analyze political systems of emerging democracies with concepts devised for mature ones is almost as much a miracle as the fact that mathematics is capable of describing the empirical world. However, as different empirical domains require different mathematical formalisms, transition begs for domain-specific models. Unfortunately, only a handful of models represent transition-specific phenomena, such as the unanticipated character of revolutions (Kuran 1991), the dilemma of a rational dictator who faces democratization (Przeworski 1991), or mistakes in transitional manipulation (Kaminski 1999). Along these lines, this article provides a model of an important political phenomenon characteristic of emerging democracies — strategic electoral coalescing in a fragmented party system, a kind of strategic coordination that can be found in many forms in various political systems (Cox 1997).

The complexity of the problem, as documented in Figure 2, suggests that a non-cooperative model of coalitional processes would be unmanageable, although non-cooperative models of coalitional “wars of attrition” can throw some light on incentives involved in coalitional negotiations (Zielinski 2000). A simpler cooperative approach disregards details of the process and focuses on the properties of a final party system. Three testable hypotheses are formulated within the cooperative games framework. CSH and SSH say that when the electoral law and partition function do not change over a long period of time, the party system evolves towards coalitional stability or split stability, respectively. RIH says that when the electoral law and partition function do not change between the elections, and if the level of instability is not minimal, the degree of instability evaluated at the time of elections strictly decreases as an effect of coalitional re-arrangements in the party system. Any increase of instability is due to a change of the electoral law or a shift in voter preferences.

Although a single case study cannot strongly corroborate the hypotheses, some relevant findings can be reported. The results suggest that the Polish party
system is split stable but not coalition stable (though the unconsumed gains decreased by an order of magnitude between 1993 and 1997). Apparently, the chaotic actions of politicians (see Figure 2 again) can be meaningfully interpreted as a trial-and-error search for a most beneficial coalitional structure. The search produced two clear effects: first, a party system in which the Right exhausted potential gains; and, second, instabilities on the Left which provided incentives for a possible consolidation.

Electoral coalescing exemplifies a more universal phenomenon of emerging democracies. Frequent transformations of the identity of the political players are caused by entries, mergers, electoral coalitions, splits, defections, and dissolutions. Identity transformations happen in mature democracies as well, but their frequency is low. This fact makes the assumption of exogenous player identities in a typical formal model realistic. In emerging democracies, such an assumption is, for many purposes, empirically invalid. A descriptively correct analysis requires endogenizing the identities of the players. In the absence of such an attempt, we might as well wait until the transition is over to perform our analysis.

Though coalitional and other identity transformations are not so spectacular in mature democracies, stable party systems can be seen as end-products of coalitional transformations. Two main components of every electoral game — “political cleavages” and “electoral laws” — are represented jointly by the partition function. CSH and SSH predict that the outcome in such a game is a coalitionally, or split, stable party system, respectively, and help to explain deviations from Duverger’s Law. The methodology developed in this article, which is based on district-level election and survey data, provides analytical tools for testing both hypotheses for most party systems. Coalitional and split stability of some kind along with spatial stability seem to be necessary conditions for any realistic “general equilibrium” model of party systems.

The Appendix

A1 Existence of split-coalition equilibria

Proposition 1: Every three-person game has a split-coalition equilibrium.

Proof: Assume that structure 1-2-3 is unstable, e.g., that $\Delta(1-2-3,\{1,2\}-3) = V(\{1,2\}|\{1,2\}-3)-V(\{1\}|1-2-3)+V(\{2\}|1-2-3)>0$. The only structure that results from $\{1,2\}-3$ through splitting or coalescing is 1-2-3. Thus, since $\Delta(\{1,2\}-3,1-2-3) = -\Delta(1-2-3,\{1,2\}-3)<0$, structure $\{1,2\}-3$ is both coalition and split stable.

Proposition 2: For $n>3$, there exist $n$-person games with no split-coalition equilibrium.

---

12 Examples of models with endogenous parties and/or coalitions can be found in Baron (1993), or in a series of recent papers by Schofield and co-authors (Schofield and Sened 1999; Schofield et al. 1998; Schofield and Parks 2000).
Proof (outline): Case 1: \( n=4 \). The following game \( <P^i, v^i> \) has no equilibrium:

\[
\begin{align*}
&v(1|2-3-4) = v(2|1-2-3-4) = v(3|1-2-3-4) = v(4|1-2-3-4) = 25 \\
&v(\{1,2\}|\{1,2\}-3-4) = 51; \ v(3|\{1,2\}-3-4) = 25; \ v(4|\{1,2\}-3-4) = 24; \\
&v(\{1,2\}|\{1,2\}-\{3,4\}) = 50; \ v(\{3,4\}|\{1,2\}-\{3,4\}) = 50; \\
&v(1|1-2-\{3,4\}) = 25; \ v(2|1-2-\{3,4\}) = 26; \ v(3|\{3,4\}|1-2-\{3,4\}) = 49.
\end{align*}
\]

A cycle: \( 1-2-3-4 \rightarrow \{1,2\}-3-4 \rightarrow \{1,2\}-\{3,4\} \rightarrow 1-2-\{3,4\} \rightarrow 1-2-3-4 \), where \( \preceq \) denotes the binary relation between structures of domination via split or coalition.

For structures involving coalitions \( \{1,3\} \) and \( \{2,4\} \), and \( \{1,4\} \) and \( \{2,3\} \), we construct a similar cycle by permutation. For any structure involving a three-party coalition, e.g., \( \{1,2,3\}-4 \), we put \( v(4|\{1,2,3\}-4) = 26 \).

Case 2: \( n>4 \). The following game \( <P^i, v^i> \) lacks an equilibrium:

For all structures involving single parties \( 5-\ldots-n \) except for the structure \( 1234-5-\ldots-n \), the payoffs for parties \( 5,\ldots,n \) are equal to \( 100/n \); other payoffs are equal to \( 4n \) of the payoffs from \( <P^i, v^i> \). Cycles similar to those from Case 1 exist for every such structure. For any other coalitional structure \( S \), the payoff of the largest coalition \( K \) (or one of such coalitions) equals 0 and the payoffs of other coalitions are strictly positive. Then the split of \( K \) into single parties is profitable.

A2 Acronyms and English names of major parties, coalitions, and organizations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>English name</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWS</td>
<td>Electoral Action Solidarity</td>
</tr>
<tr>
<td>BBWR</td>
<td>Non-Partisan Bloc for Supporting the Reforms</td>
</tr>
<tr>
<td>BdP</td>
<td>Bloc for Poland</td>
</tr>
<tr>
<td>CBOS</td>
<td>Center for Social Opinion Study (polling company)</td>
</tr>
<tr>
<td>KdR</td>
<td>Coalition for the Republic</td>
</tr>
<tr>
<td>KKW O</td>
<td>Country’s Electoral Committee “Fatherland”</td>
</tr>
<tr>
<td>KLD</td>
<td>Liberal-Democratic Congress</td>
</tr>
<tr>
<td>KPN</td>
<td>Confederation of Independent Poland</td>
</tr>
<tr>
<td>MN</td>
<td>German Minority</td>
</tr>
<tr>
<td>NSZZ S</td>
<td>Solidarity Trade Union</td>
</tr>
<tr>
<td>OBOP</td>
<td>Center for Public Opinion Study (polling company)</td>
</tr>
<tr>
<td>PC</td>
<td>Centrum Alliance</td>
</tr>
<tr>
<td>PdP</td>
<td>Alliance for Poland</td>
</tr>
<tr>
<td>PJL</td>
<td>Alliance of 11th November</td>
</tr>
<tr>
<td>PSL</td>
<td>Polish Peasant Party</td>
</tr>
<tr>
<td>PSL-PL</td>
<td>Polish Peasant Party-Peasant Alliance</td>
</tr>
<tr>
<td>RdR</td>
<td>Movement for the Republic</td>
</tr>
<tr>
<td>ROP</td>
<td>Movement for the Reconstruction of Poland</td>
</tr>
<tr>
<td>SLD</td>
<td>Alliance of Democratic Left</td>
</tr>
<tr>
<td>SUC</td>
<td>Secretariat of Parties of the Right</td>
</tr>
<tr>
<td>UD</td>
<td>Democratic Union</td>
</tr>
<tr>
<td>UP</td>
<td>Labor Union</td>
</tr>
<tr>
<td>UPR</td>
<td>Realpolitik Union; in 1997 election: Union of the Republic’s Right</td>
</tr>
</tbody>
</table>
References


CBOS. 1993b. “Preferencje wyborcze społeczeństwa w lipcu ’93.” (“Political Preferences in July ’93.”) Warszawa, CBOS.


UW Freedom Union
ZChN Christian-National Union


Krzaklewski, Marian, and Peter Raina. 1997. Chcemy byc narodem z przyszloscia. (We want to be a nation with the future.) Warszawa: Ksiazka Polska.


Figure 1. Poll standings of the Right coalescing parties (percent of supporters)

<table>
<thead>
<tr>
<th></th>
<th>May</th>
<th>June I</th>
<th>June II</th>
<th>July</th>
<th>August</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSL-PiL</td>
<td>3.7</td>
<td>2.0</td>
<td>1.2</td>
<td>2.4</td>
<td>2.3</td>
</tr>
<tr>
<td>ZChN</td>
<td>3.8</td>
<td>3.4</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>PK</td>
<td>1.2</td>
<td>1.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SLCh</td>
<td>1.3</td>
<td>0.5</td>
<td>2.5</td>
<td>1.2</td>
<td>3.7</td>
</tr>
<tr>
<td>PChD</td>
<td>1.5</td>
<td>0.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RdR/KdR</td>
<td>2.7</td>
<td>3.4</td>
<td>3.7</td>
<td>2.4</td>
<td>1.8</td>
</tr>
<tr>
<td>PC/ZP</td>
<td>1.9</td>
<td>1.6</td>
<td>3.7</td>
<td>2.4</td>
<td>1.0</td>
</tr>
</tbody>
</table>

BBWR | 12.5 | 12.5 | 7.7 |

Notes: The height of the graph represents the mean support for a party or coalition computed from the following polls: May: OBOP and CBOS; June I: OBOP and CBOS; June II: CBOS; July: CBOS; August: two OBOP and two CBOS. Merged graphs represent coalitions of corresponding parties created at the time the poll was conducted. BBWR entered the race as a new party in June. For each poll, N\in[1083, 1376]. “Undecided” excluded.
Notes: Every line represents the story of coalitional, split, merger, etc. activity of a non-ephemeral political party or coalition on the Right or Center. Minor players, minor changes of players’ identities or names, and players other than political parties (except for the Solidarity trade union) are omitted. Dates are approximate. Relative players’ strength not shown. Vertical positions of the players do not represent their spatial positions within the Center-Right cluster. 

Table 1. A hypothetical partial partition function (expected percentages of House seats) for five parties under five different coalitional structures

<table>
<thead>
<tr>
<th>Coalitional structure</th>
<th>Percentage of seats under the corresponding coalitional structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_1$-$P_2$-$P_3$-$P_4$-$P_5$</td>
<td>$v(P_1) = 25$ $v(P_2) = 45$ $v(P_3) = 10$ $v(P_4) = 9$ $v(P_5) = 11$</td>
</tr>
<tr>
<td>$P_1$-$P_2$-${P_3,P_4}$-$P_5$</td>
<td>$v(P_1) = 25$ $v(P_2) = 30$ $v{P_3,P_4} = 40$ $v(P_5) = 5$</td>
</tr>
<tr>
<td>$P_1$-$P_2$-${P_3,P_5}$-$P_4$</td>
<td>$v(P_1) = 25$ $v(P_2) = 30$ $v{P_3,P_5} = 38$ $v(P_4) = 7$</td>
</tr>
<tr>
<td>$P_1$-$P_2$-$P_3$-${P_4,P_5}$</td>
<td>$v(P_1) = 25$ $v(P_2) = 30$ $v(P_3) = 2$ $v{P_4,P_5} = 43$</td>
</tr>
<tr>
<td>$P_1$-$P_2$-${P_3,P_4,P_5}$</td>
<td>$v(P_1) = 25$ $v(P_2) = 20$ $v{P_3,P_4,P_5} = 55$</td>
</tr>
</tbody>
</table>
Table 2. Expected percentages of votes and the numbers of seats for a hypothetical first-past-the-post three-district electoral system with three parties

<table>
<thead>
<tr>
<th>Coalitional structure</th>
<th>Coalition or party</th>
<th>Percentage of votes in a district</th>
<th>Total seats</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>D1</td>
<td>D2</td>
</tr>
<tr>
<td>( P_1 \cdot P_2 \cdot P_3 )</td>
<td>( P_1 )</td>
<td>28</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>( P_2 )</td>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>( P_3 )</td>
<td>28</td>
<td>40</td>
</tr>
<tr>
<td>( P_1 \cdot { P_2, P_3 } )</td>
<td>( { P_2, P_3 } )</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>( P_1 )</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>( { P_1, P_3 } \cdot P_2 )</td>
<td>( { P_1, P_3 } )</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>( P_2 )</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>( { P_1, P_2 } \cdot P_3 )</td>
<td>( { P_1, P_2 } )</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>( P_3 )</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>Substructure or superstructure $S$ (denoted by the change in the party system)</td>
<td>$\phi(*</td>
<td>P)$</td>
<td>$\phi(*</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>1) AWS splits into factions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solidarity-ZChN-KPNOP-RuchStu-BBWRSwW-PC-ILW-SKL</td>
<td>40.6</td>
<td>34.1</td>
<td>-6.5</td>
</tr>
<tr>
<td>2) Two parties coalesce</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AWS+PSL</td>
<td>45.0</td>
<td>14.8</td>
<td>-30.2</td>
</tr>
<tr>
<td>AWS+ROP</td>
<td>44.8</td>
<td>30.9</td>
<td>-13.9</td>
</tr>
<tr>
<td>AWS+SLD</td>
<td>73.0</td>
<td>4.1</td>
<td>-68.9</td>
</tr>
<tr>
<td>AWS+UP</td>
<td>43.3</td>
<td>20.4</td>
<td>-22.9</td>
</tr>
<tr>
<td>AWS+UW</td>
<td>54.3</td>
<td>39.1</td>
<td>-15.2</td>
</tr>
<tr>
<td>PSL+ROP</td>
<td>8.5</td>
<td>1.1</td>
<td>-7.4</td>
</tr>
<tr>
<td>PSL+SLD</td>
<td>36.7</td>
<td>32.2</td>
<td>-4.5</td>
</tr>
<tr>
<td>PSL+UP</td>
<td>7.0</td>
<td>4.8</td>
<td>-2.2</td>
</tr>
<tr>
<td>PSL+UW</td>
<td>18.0</td>
<td>1.3</td>
<td>-16.7</td>
</tr>
<tr>
<td>ROP+SLD</td>
<td>36.5</td>
<td>0.4</td>
<td>-36.1</td>
</tr>
<tr>
<td>ROP+UP</td>
<td>6.7</td>
<td>3.9</td>
<td>-2.8</td>
</tr>
<tr>
<td>ROP+UW</td>
<td>17.8</td>
<td>1.5</td>
<td>-16.3</td>
</tr>
<tr>
<td>SLD+UP</td>
<td>35.0</td>
<td>33.7</td>
<td>-1.3</td>
</tr>
<tr>
<td>SLD+UW</td>
<td>46.1</td>
<td>19.6</td>
<td>-26.5</td>
</tr>
<tr>
<td>UP+UW</td>
<td>16.3</td>
<td>13.0</td>
<td>-3.3</td>
</tr>
<tr>
<td>3) Three parties coalesce</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AWS+PSL+ROP</td>
<td>49.1</td>
<td>48.5</td>
<td>-0.6</td>
</tr>
<tr>
<td>AWS+ROP+UW</td>
<td>58.5</td>
<td>59.4</td>
<td>+0.9</td>
</tr>
<tr>
<td>SLD+PSL+UP</td>
<td>39.3</td>
<td>51.5</td>
<td>+12.2</td>
</tr>
<tr>
<td>SLD+UP+UW</td>
<td>48.7</td>
<td>55.2</td>
<td>+6.5</td>
</tr>
</tbody>
</table>

**Notes:** Six main members of the party system $P$ are listed. All estimates come from a survey conducted on May 9-14, 1998, by the OBOP.
Column 1: Coalitional substructures or superstructures are indexed by the change in the party system, i.e., a new coalition or a set of parties resulting from a split. All payoffs shown in columns 2-6 are for parties or coalitions listed in the first column;
Column 2: $\phi(*|P)$ is the payoff of a member, or the sum of payoffs of members, of the party system $P$ listed in Column 1;
Column 3: $\phi(*|S)$ is the payoff of a member, or the sum of payoffs of members, after splitting or coalescing;
Column 4: $\Delta(P,S) = \phi(*|S) - \phi(*|P)$ is the expected gain or loss from splitting or coalescing;
Column 5 and 6: $\phi(*|S)^L, \phi(*|S)^U$ are lower and upper bounds of an approximate 95% confidence interval for $\phi(*|S)$, respectively. The approximate CIs were calculated as follows: for a coalition $K$, a 95% $t$-distribution based CI for the proportion of total support for $K$ in all districts was obtained. Second, the votes in districts for $K$ were decreased for the lower bound (increased for the upper bound) in proportion to the decrease or increase in the total support for $K$. Next, all votes in districts were normalized. The resulting election matrix was used to compute the distribution of seats.
Table 4. Main components of the Polish open-list PR electoral law for the Sejm (House) elections in 1993 and 1997

<table>
<thead>
<tr>
<th>Categories of candidate lists</th>
<th>Single party or political organization</th>
<th>Coalition of parties</th>
<th>Committee of citizens</th>
<th>Minority group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ballot format</strong></td>
<td>Single vote for a candidate from one of the lists in a district</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>District structure</strong></td>
<td><strong>Categories of districts</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>regional</strong></td>
<td><strong>nationwide</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of districts</td>
<td>52</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seats in districts (total)</td>
<td>391</td>
<td>69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eligibility (nationwide thresholds)</td>
<td><strong>Single party or organization</strong></td>
<td><strong>Coalition of parties</strong></td>
<td><strong>Committee of citizens</strong></td>
<td><strong>Minority group</strong></td>
</tr>
<tr>
<td></td>
<td>5%</td>
<td>7%</td>
<td>7%</td>
<td>5%*</td>
</tr>
<tr>
<td>Information used for seat allocation</td>
<td>votes for a list in a district</td>
<td>votes for a list nationwide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Allocation algorithm</td>
<td>d’Hondt-Jefferson</td>
<td>d’Hondt-Jefferson</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Among lists</td>
<td>plurality</td>
<td>plurality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Among candidates on the list</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Notes: District magnitudes for the 1993 and 1997 elections are available at the following address: www.nyu.edu/projects/kaminski/research.html#5.
* A minority group could choose one threshold to be waived.
Table 5. Percentages of Sejm (House) votes and seats in the 1993 and 1997 parliamentary elections, and the 1998 survey

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Right</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KKW O</td>
<td>6.4 0.0</td>
<td></td>
<td></td>
<td>33.8</td>
<td>43.7</td>
</tr>
<tr>
<td>ZP-PC</td>
<td>4.4 0.0</td>
<td></td>
<td></td>
<td>30.3</td>
<td>40.7</td>
</tr>
<tr>
<td>PSL-PL</td>
<td>2.4 0.0</td>
<td>AWS**</td>
<td></td>
<td>4.9 0.0</td>
<td></td>
</tr>
<tr>
<td>Solidarity</td>
<td>4.9 0.0</td>
<td>AWS**</td>
<td></td>
<td>2.7 0.0</td>
<td>5.6 1.3</td>
</tr>
<tr>
<td>KdR’</td>
<td>2.7 0.0</td>
<td>ROP</td>
<td></td>
<td>5.4 3.5</td>
<td>1.4 0.0</td>
</tr>
<tr>
<td>BBWR’</td>
<td>5.4 3.5</td>
<td>BdP</td>
<td></td>
<td>5.8 4.8</td>
<td></td>
</tr>
<tr>
<td>KPN’</td>
<td>5.8 4.8</td>
<td>PPP***</td>
<td></td>
<td>3.2 0.0</td>
<td>2.0 0.0</td>
</tr>
<tr>
<td>UPR’</td>
<td>3.2 0.0</td>
<td>UPR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35.2 8.3</td>
<td></td>
<td></td>
<td>42.8</td>
<td>45.0</td>
</tr>
<tr>
<td>Center</td>
<td></td>
<td></td>
<td></td>
<td>14.6</td>
<td>16.1</td>
</tr>
<tr>
<td>KLD</td>
<td>4.0 0.0</td>
<td></td>
<td></td>
<td>4.0 0.0</td>
<td></td>
</tr>
<tr>
<td>UD</td>
<td>10.6 16.1</td>
<td>UW</td>
<td></td>
<td>13.4</td>
<td>13.0</td>
</tr>
<tr>
<td>Total</td>
<td>14.6 16.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Post-solidarity Left</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>UP</td>
<td>7.3 8.9</td>
<td>UP</td>
<td></td>
<td>4.7 0.0</td>
<td>6.2 2.6</td>
</tr>
<tr>
<td>Post-communist Left</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SLD</td>
<td>20.4 37.2</td>
<td>SLD</td>
<td></td>
<td>27.1</td>
<td>35.7</td>
</tr>
<tr>
<td>PSL</td>
<td>15.4 28.7</td>
<td>PSL</td>
<td></td>
<td>7.3 5.9</td>
<td>6.9 4.3</td>
</tr>
<tr>
<td>Total</td>
<td>35.8 65.9</td>
<td></td>
<td></td>
<td>34.4</td>
<td>41.6</td>
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<tr>
<td>Other</td>
<td>7.1 0.9</td>
<td></td>
<td></td>
<td>4.7 0.4</td>
<td>11.8 2.2</td>
</tr>
</tbody>
</table>

Sources: Kaminski (1998), survey data.

Notes: Only main parties are shown. Minor changes of parties’ identities are omitted. Ranking within the ideological clusters does not reflect the left-right ordering.

* a major faction of this party joined the AWS coalition in 1997 election
** includes about 40 parties and organizations of the Right
*** quit before the election