3

On electoral systems

The primary purpose of this chapter is to develop a consistent set of abstract, non-country-specific terms that can be used to describe and classify electoral systems, especially as regards their coalition-promoting or -retarding properties. Most of the terms I use already appear in the literature, but I have found it necessary to introduce several new terms, or new usages of old terms, for the sake of clarity and consistency. Throughout the chapter, I use the term "structure" to denote a "subsystem" within the electoral system. Thus, I refer to a system's district structure (having to do with the number, size, and nature of electoral districts), its alliance structure (having to do largely with opportunities to pool votes), and even its formulaic structure (having to do with the multiplicity of different electoral formulas that can appear at different levels in a system).

Another purpose of this chapter is to give some idea of the recent state of the art in electoral design. I have taken a "snapshot" sample of the world's democracies: all 77 polities that scored either a 1 or 2 on the "political rights" index in the *Freedom House* survey for 1992-3.[1] This sample excludes some countries with long democratic traditions, such as India and Venezuela, that have hit hard times more recently. It also includes about a dozen countries that have only held free and fair elections very recently, have little democratic experience, and have by no means emerged as consolidated democracies. Examples include Benin, Cape Verde, and Mali in Africa, Bulgaria, Lithuania, and Slovenia in Eastern Europe. Finally, some of the countries in the sample had already slipped below the threshold score (of 2) in the next available *Freedom House* survey for 1993-94: Brazil, the Dominican Republic, Honduras,

[1]For a similarly synoptic description of electoral systems in an even larger sample of nations, see Blais and Massicotte (N.d.). For a pioneering effort to classify the world's electoral systems, that provides generally a greater depth of discussion on each system, see Nohlen (1981). Other sources are cited in the tables and Appendix A.

Nepal, Slovakia, Turkey, and Zambia. The sample thus covers *all* qualifying democracies – whether new and possibly ephemeral, old and presumably stable, or somewhere in between – as of 1992. For each country in the sample, I have attempted to provide a full description of the electoral system.[2]

An "electoral system" is understood here to be a set of laws and party rules that regulate electoral competition between and within parties. Electoral systems have many aspects, and can govern elections to many offices – executive, legislative, and judicial – simultaneously. Here I shall focus on the legislative electoral system and four of its aspects: those laws and rules regulating how parties make their nominations; how citizens vote and how those votes are counted; what the district structure of the polity will be; and how counted votes are translated into seats. The second, third, and fourth of these aspects are determined by electoral law, the first by a combination of law and party regulations.

3.1 HOW PARTIES NOMINATE

In some polities there are no laws regulating how parties make their nominations; everything is left to the parties themselves to decide. This was the case, for example, in the United States for most of the nineteenth century. There are, however, many ways that the state can get involved. Turn-of-the-century laws require U.S. parties to decide their nominations by direct primary elections of various kinds, with profound consequences (cf. Epstein 1986). The German *Wahlgesetz* (Electoral Law) contains detailed prescriptions regarding how parties make nominations, intended to ensure that their procedures are democratic. The Brazilian *candidato nato* clause requires that parties renominate their incumbent federal deputies, should the deputies so wish. As Mainwaring (1991:25) puts it, "a politician can violate all of the party's programmatic concerns, consistently vote against the leadership, and still be guaranteed a place on the ballot."

What features of nomination are relevant depends on the problem at hand. If one is interested in strategic voting and electoral coalition, as here, the relevant laws are those regulating fusion candidacies (in plurality/majority systems) and joint lists (in PR systems). Fusion candidacies,

[2]The rest of the book certainly does not deal with all of the 77 electoral systems canvassed here. Neither is the book limited to these systems. The current chapter provides a systematic overview of the range of electoral possibilities, with later chapters carving out particular parts of this range for deeper scrutiny. Those already familiar with the "range of possibilities" may wish to skim or skip this chapter, using the index when they come across unfamiliar terms in later chapters.

wherein the candidate is nominated by more than one party, were common in state elections in the nineteenth-century United States (Argersinger 1980) and are currently allowed, for example, in New York (Scarrow 1985) and Hungary (Tóka N.d.). Joint lists are similarly those supported by more than one party, typically including candidates from all participating parties.[3] Thus, for example, the Israeli list submitted under the name of *Maarach* (Alignment) in the 1969 elections contained candidates from both *Mapai* and *Achdut Haavoda* (Aronoff 1978:122). Both fusion and joint listing allow small parties to survive in alliance with a partner, as will be seen in succeeding chapters.

In some systems, joint lists face higher threshold requirements than single-party lists. The Czech Republic and Slovakia, for example, both require joint lists to pass a higher threshold than single-party lists before they are eligible to participate in seat distributions above the constituency level (on which, see Section 3.4).

Yet other systems outlaw joint lists. Of course it may not be difficult to create "front" parties that serve the same purpose. Thus, for example, the Chilean system of 1973 banned joint lists, but this just prompted two transparent evasions of the law – in the form of *Unidad Popular* and *el Code,* organizations that Tagle (1993:329) has called *partidos de fachada* (façade parties).

Nonetheless, if it is costly to form a new party, then outlawing joint lists may have some effect. Consider, for example, the costs of forming a new party in Bolivia. Under the electoral reforms passed in 1986 all political parties, fronts, and alliances must register with the *Corte Nacional Electoral,* establishing their status as persons for legal purposes. Whereas previously existing groups polling at least 50,000 votes (a bit less than 3% of the vote) in the preceding election automatically qualified, new groups were required to submit a list of members *certified by a notary public* that showed them to possess a membership equal to at least .5% of the vote in the latest national election. A Bolivian jurist opposed to the reforms has argued that no notary would simply stamp an already completed membership list; they would need to certify the

[3]Joint lists typically appear on the ballot just once, with all the participating parties' names or symbols indicated together. With this ballot format it is not possible to determine where the votes for the joint list are coming from – from party A's supporters? from party B's? – if the list is closed. If the ballot is laid out so that joint lists appear as many times as there are sponsoring parties, however, then voters can vote for the AB joint list either under the A or the B symbol. The vote contributions of the various alliance partners to the joint list can thus be monitored. This system of "multiple-appearance joint listing" is rare but was used, for example, in the 1986 and 1990 elections in the Dominican Republic (and maybe in the 1994 elections as well). I thank Mark Jones for bringing this to my attention.

physical existence of each one of about 8,641 persons (approximately .5% of the last election's total vote) affirming their allegiance to the new party. This would entail about $43,205 in notarial fees, not to mention the logistical difficulties in getting everyone to the notary (or notaries) to begin with (Miranda Pacheco 1986:31-32). Obviously, if this analysis is correct, new parties need to find sympathetic notaries public in Bolivia – willing to give a group rate! For present purposes, however, the point is this: Given the cost of forming a new party, if the Bolivians were to outlaw joint lists, then presumably setting up a front party would not be so attractive an option as it was in Chile in 1973.

3.2 HOW CITIZENS VOTE AND HOW THEIR VOTES ARE COUNTED

There are many different ways to vote. I shall make an initial distinction between single-ballot systems, in which voters vote just once, and multiballot systems, in which two or more rounds of voting may be entailed. Since multiballot methods are built up out of single-ballot methods, I shall begin with the latter.

Voting in single-ballot systems can take a variety of forms: writing out the name of a candidate, checking a box next to a party's name or symbol, pulling a lever, punching a hole in a computer punch card, writing a sequence of numerals in boxes next to candidates' names, and so forth. These different physical actions become abstractly similar when they are counted and thereby reduced to various numerical vote totals. Not all vote totals are created equal, of course. Some totals, such as the sum of all votes cast for candidates whose last names begin with the letter "S," are irrelevant to any further operation of the electoral system. Other vote totals, however, form the basis upon which seats are awarded to candidates, lists, or cartels (on which see below). These vote totals – those that figure in the mathematical operations by which seats are allocated – I shall call *seat-relevant* vote totals.

Three questions are fundamental in sorting through the single-ballot voting methods actually in use, or proposed for use, in democratic elections:

1. For what entities does the voter vote? Sometimes citizens vote for candidates only, sometimes for party lists only, and sometimes they have the option to do either or both.
2. How many votes may each voter cast? The number of *candidate* votes (i.e., votes cast for individual candidates) each voter possesses can range from one to the total number of candidates competing.

Box 3.1: The pooling vote in Finland and Poland

Voters in Finland and Poland cast their votes for individual candidates. Once cast, however, these votes can pool at two different levels. First, candidates join together in lists (known as "electoral alliances" in Finland). Seats are allocated to lists before they are allocated to candidates, on the basis of *list* vote totals arrived at by summing the votes of all candidates within the list. This is the first kind of pooling that can occur. In Poland, *apparentement* (or "blocking") of lists is allowed: Lists can join together in cartels for the purpose of seat distributions (see Section 3.4). Seats are allocated to cartels before they are allocated to the lists within the cartel, on the basis of *cartel* vote totals arrived at by summing the votes of all lists within the cartel. Thus, in Poland, candidate votes can pool at two levels: within lists, and within cartels. The closest approximation to the second kind of pooling in Finland does not entail further vote pooling *sensu stricto*. Finnish parties can run joint lists, with candidates from more than one party on the list. This has some of the same political consequences for small parties as does allowing *apparentement* in Poland.

Similarly, the number of *list* votes each voter possesses can range from one to the total number of lists competing.[4]

3. What seat-relevant vote totals are affected by the vote(s) cast? If each voter casts one vote, then a basic distinction is between votes that affect only a single seat-relevant vote total (exclusive votes) and those that can affect more than one seat-relevant vote total (nonexclusive). If each voter casts more than one vote, then how those votes affect seat-relevant vote totals can be described in terms of whether cumulation, plumping, and/or panachage are allowed.

Further discussion will clarify the meaning of the terms – exclusive vote, cumulative vote, etc. – introduced in the preceding paragraphs. Consider first those systems in which voters cast a single vote for a candidate. An *exclusive* candidate vote is one that benefits *only* the candidate for whom it is cast. Such a vote increases the vote total of the candidate for whom it is cast and never transfers to, or otherwise appears in, any other vote total that is used for purposes of seat allocation. Single exclusive votes are cast in ordinary Anglo-American single-member districts wherever they are used, e.g., in Antigua and Barbuda, India, and

[4]Theoretically, both the number of candidate votes and the number of list votes might exceed the number of candidates or lists competing, but I shall not consider such systems here.

New Zealand. They have also been cast in Japan and South Korea under the name of the single nontransferable vote, and still are in Taiwan.[5]

A *nonexclusive* candidate vote, in addition to appearing in the vote total of the candidate for whom it is cast, also affects other vote totals used in the allocation of legislative seats. There are three main types of nonexclusive vote in current use: the transferable vote, which transfers to the vote total of another individual candidate (who may or may not be politically allied with the candidate originally receiving the vote); the pooling vote, which transfers to the vote total of the party list to which the candidate originally voted for belongs; and the fused vote, which simultaneously affects the vote totals of candidates running for two or more different offices. Nonexclusive candidate votes that transfer to *candidate* vote totals are cast in Australia, Ireland, Malta, and Nepal (in the Senate) under the name of the single transferable vote (STV). Nonexclusive candidate votes that transfer to *list* vote totals are cast in Brazil, Chile (1958–73 and 1989–present), Finland, Liechtenstein, Poland (see Box 3.1), and formerly in West Germany (1949). There is no term for this latter kind of vote in the literature; I shall call it a *pooling* vote.

By a *fused* vote I mean one similar to that long used in Uruguay, where voters cast a single vote for a slate that includes a candidate for the presidency as well as candidates for the Senate and the lower house. The Uruguayan fused vote simultaneously affects three separate vote totals: one relevant to determining who the president will be, one relevant to filling Senate seats, and one relevant to filling House seats. Split-ticket voting, in the sense of supporting one party's presidential candidate while voting for another's congressional candidates, is thus not technically possible. Bolivia and Honduras also currently have fused votes. Venezuela had a fused vote for various legislative offices until the electoral reforms of 1993. The Dominican Republic has used a legislative-executive fused vote frequently in the past. The old party-strip ballot in the United States was similar in that it was difficult for voters to split their votes across statewide offices (Burnham 1965; Rusk 1970; although see Reynolds 1995). And of course the United States still has a (constitutionally mandated) fused vote that links presidential and vice presidential candidates from the same party.

Consider now the possibility that voters cast *multiple* candidate votes. I shall ignore the possibility that different voters dispose of different numbers of votes – as has occurred for example under plural voting provisions in the United Kingdom, Belgium, and the United States – and focus on the issues of plumping, panachage, and cumulation. That *plumping* is

[5]The only other countries that use the single nontransferable vote system, of which I am aware, are Jordan, Malawi (according to Blais and Massicotte N.d.), and possibly Vanuatu (in this case, my sources are not very clear).

Box 3.2: Plumping and panachage (split voting) in nineteenth-century England

Many English constituencies before passage of the third Reform Act in 1884 returned two members to the House of Commons. Each voter possessed two votes that he (the suffrage was restricted to men) could cast in any way he wished, short of cumulation. An example of the possibilities is given in the returns from the election of 1874 in Pontefract (see Cox 1987a:96). Two Conservative candidates, Waterhouse and Pollington, faced a single Liberal, Childers. 699 voters plumped for Childers: that is, they gave one of their votes to Childers, and abstained from using the other. 60 voters plumped for Waterhouse and 37 plumped for Pollington, indicating that some Conservative voters saw significant distinctions between the two Conservative candidates. 619 voters cast a partisan double vote: giving one vote to each of the two Conservative candidates. Another 235 voters took advantage of the possibility of panachage, or splitting their votes across party lines: 182 gave one vote to each of Childers and Waterhouse, while 53 gave one vote to each of Childers and Pollington. (In the event, the Liberal Childers and the more moderate Conservative Waterhouse both won seats, Waterhouse benefiting in particular from the large number of split votes that the two shared.)

allowed means voters need not use all of their votes: they can partially abstain. That *panachage* is allowed means voters need not vote only for candidates of a single party: they can split their votes.[6] That *cumulation* is allowed means voters who cast m votes need not vote for m candidates: they can give more than one of their votes to a single candidate.

To illustrate these terms, suppose voters can cast as many votes as there are candidates, with plumping and panachage (but not cumulation) allowed. This is the approval voting method in which voters can vote for as many candidates as they "approve," but need not use all their votes, need not confine them to candidates of a given party, and cannot give more than one of them to any single candidate (Brams and Fishburn 1983). Alternatively, suppose voters can cast as many votes as there are seats to be filled, with plumping and panachage (but not cumulation) allowed. Such a system was used, for example, in U.K. parliamentary

[6]The term "panachage" is typically used in regard to systems in which (1) voters can vote for lists as well as candidates; and (2) candidate votes pool to the list level. I extend use of the term here to include systems in which voters vote only for candidates, and candidate votes do not pool. In such systems, panachage is *always* allowed, as far as I know. It would in principle be possible to outlaw it, however.

elections before the third Reform Act (Cox 1987a), in many state elections in the nineteenth- and early twentieth-century United States (Klain 1955; Hamilton 1967), and in India from 1952 to 1957 (in about a third of the districts). Finally, suppose voters can cast as many votes as there are seats to be filled, with panachage (but neither plumping nor cumulation) allowed. This is the system that has been employed in Mauritius since its independence in 1968.[7]

The terms just reviewed are used similarly when speaking of list, rather than candidate, votes. Suppose, for example, that voters possess a single list vote. If this vote affects only the vote total of the list for which it is cast, then it is exclusive. If it affects other vote totals used in the allocation of seats, then it is nonexclusive. The only kind of nonexclusive list vote in current use is of a pooling variety: The vote cast for list X may pool with the votes of other lists – *Y* and *Z*, say – that are allied with *X* in a cartel (on cartels, see Section 3.4). The process is analogous to the pooling *to lists* of votes cast for individuals in Brazil and Finland.

Having described the range of possibilities, I turn now to a description of actual voting practice in the lower houses of the 77 countries judged by *Freedom House* to have democratic elections circa 1992 (Table 3.1). Voting options are described in terms of the number of *candidate* and *list* votes each voter may cast, along with the nature of restrictions on those votes.

Systems with closed lists can be easily identified in Table 3.1 by looking in the "candidate votes" column: If there is a zero in this column, then necessarily there will be a unity in the "list votes" column and, as there will be no basis other than the order of names on the list to decide which candidates get the seats allocated to the list, the list will be closed. Systems with flexible lists are those with at least one candidate vote in addition to a list vote. Finally, systems with open lists have no list vote but a pooling candidate vote. (The terms *closed, flexible,* and *open* are defined in Section 4.3.)

The second column in Table 3.1, labeled "vote type," shows that most candidate votes in lower house elections are exclusive. Transferable votes are cast only in Australia, Ireland, Malta, and Nauru. Pooling votes are cast in Belgium, Brazil, Chile, Denmark, Finland, Hungary, Italy, Liechtenstein, Luxembourg, the Netherlands, Poland, and Switzerland. The candidate votes in the Netherlands and Belgium do truly yeoman service, both pooling to the list level and transferring among candidates

[7]The term "plumping" is used in regard to Mauritian elections (e.g., by Mannick 1989) to mean voting for one or two serious candidates, then wasting the remaining votes (all Mauritian constituencies, Rodrigues aside, are three-member ones) on a clearly hopeless candidate. This accomplishes the same end as would ordinary plumping, in which the voter would be able simply not to use the second or third votes.

Table 3.1. Voting options in 77 democracies

Country	*Candidate votes*	*Vote type*	*Panachage?*	*Plumping?*	*Cumulation?*	*List votes*	*Vote type*
ARGENTINA	0					1	exclusive
AUSTRALIA	1	transferable	yes			0	
AUSTRIA	1	exclusive				1	exclusive
Bahamas	1	exclusive				0	
BANGLADESH	1	exclusive				0	
Barbados	1	exclusive				0	
BELGIUM	1[a]	pooling				1	exclusive
Belize	1	exclusive				0	
BENIN	0					1	exclusive
BOLIVIA	0					1	pooling[b]
BOTSWANA	1	exclusive				0	
BRAZIL	1	pooling				1	exclusive
BULGARIA	0					1	exclusive
CANADA	1	exclusive				0	
Cape Verde	0					1	exclusive
CHILE	1	pooling				0	
COLOMBIA	0					1	exclusive
COSTA RICA	0					1	exclusive
Cyprus (Greek)	1-5[c]	exclusive				1	exclusive
CZECH REPUBLIC	4	exclusive				1	exclusive
DENMARK	1	pooling				1	exclusive
Dominica	1	exclusive				0	
DOMINICAN REPUBLIC	0					1	exclusive
ECUADOR	0					1[d]	exclusive
FINLAND	1	pooling				0	
FRANCE	1	exclusive				0	
The Gambia	1	exclusive				0	
GERMANY	1	exclusive				1	exclusive
GREECE	1-3[e]	exclusive				1	exclusive
Grenada	1	exclusive				0	
HONDURAS	0					1	fused[f]
HUNGARY	1	exclusive				1	exclusive
Iceland	0[g]					1	exclusive
IRELAND	1	transferable	yes			0	
ISRAEL	0					1	pooling
ITALY (pre-reform)	3-4[h]	pooling[i]		yes		1	exclusive
JAMAICA	1	exclusive				0	
JAPAN (1947–93)	1	exclusive				0	
Kiribati							
KOREA, SOUTH	1	exclusive				0	
Liechtenstein	1	pooling				1	exclusive

Table 3.1. (cont.)

Country	*Candidate votes*	*Vote type*	*Panachage?*	*Plumping?*	*Cumulation?*	*List votes*	*Vote type*
LITHUANIA	1	exclusive				1	exclusive
Luxembourg	M	pooling	yes	yes	yes	1	exclusive[j]
MALI	0					1	exclusive
Malta	1	transferable	yes			0	
Marshall Islands							
MAURITIUS	M	exclusive	yes			0	
Micronesia	1	exclusive				0	
NAMIBIA	0					1	exclusive
Nauru	1	transferable	yes			0	
NEPAL	1	exclusive				0	
NETHERLANDS	1	pooling				0	
NEW ZEALAND	1	exclusive				0	
NORWAY	0[k]					1	exclusive
PAPUA NEW GUINEA	1	exclusive				0	
POLAND	1	pooling				0	
PORTUGAL	0					1	exclusive
St. Kitts-Nevis	1	exclusive				0	
St. Lucia	1	exclusive				0	
St. Vincent & the Grenadines	1	exclusive				0	
San Marino						1[l]	exclusive
São Tomé and Príncipe	0					1	exclusive
SLOVAKIA	4	exclusive				1	exclusive
SLOVENIA	1[m]	exclusive				1	exclusive
Solomon Islands	1	exclusive				0	
SPAIN	0					1	exclusive
SWEDEN	0					1	pooling[n]
SWITZERLAND	M	pooling	yes	yes	yes	1	exclusive
TRINIDAD and TOBAGO	1	exclusive				0	
TURKEY	0					1	exclusive
Tuvalu	M	exclusive	yes	yes		0	
UNITED KINGDOM	1	exclusive				0	
UNITED STATES	1	exclusive				0	
URUGUAY	0					1	pooling[o]
Vanuatu	1	exclusive				0	
Western Samoa	1	exclusive				0	
ZAMBIA	1	exclusive				0	

Table 3.1. (cont.)

Notes:

The columns of this table dealing with whether a system allows panachage, plumping, and cumulation are left blank if these options are irrelevant to the system in question, or if the options are relevant but not allowed; a "yes" in these columns indicates that the option is allowed. Countries with populations less than one million are listed with an initial capital letter followed by lower-case letters; larger countries are listed using capital letters throughout.

[a]Voters in Belgium may cast one preferential vote for a list candidate and one preferential vote for a supplemental candidate, so in that sense they have two candidate votes. See Dewachter 1983, p. 95.

[b]Bolivians cast a fused vote: They have one vote, which they cast for a slate including presidential, senatorial, and chamber candidates. See Nohlen 1993.

[c]Greek Cypriot voters have one preference vote for every four seats to be filled in the constituency.

[d]Ecuadorian voters vote once for a provincial list and once for a national list. In this sense they have two list votes.

[e]As of the election of November 5, 1989, preference votes were cast as follows. In the first and second districts of Athens, voters could cast preference votes for one, two, or three candidates. In the first district of Thessaloniki, voters could cast one or two preference votes. In the remaining constituencies, voters were entitled to express one preference. Leaders of parties or alliances and former prime ministers are deemed to have secured as many preference votes as ballots cast for their party lists in the constituency concerned.

[f]Hondurans cast one vote for both the presidential and the congressional election. See Nohlen 1993, p. 396.

[g]Icelandic voters can change the order of the names on the lists presented by their parties, but over half the voters must make the same alterations in order to have any effect. See Helgason 1991.

[h]Italian voters could cast three preference votes in constituencies returning up to 15 members, and four preference votes in larger constituencies.

[i]See Amoroso 1979, p. 164.

[j]The Luxembourg list vote is equivalent to voting once for each of the M candidates on the list. It thus might be said to pool "downward" (to candidates) but it does not pool "upward" (to cartels).

[k]Norwegian voters can change the order of the names on the lists presented by their parties, but over half the voters must make the same alterations in order to have any effect.

[l]The Inter-Parliamentary Union (1993, p. 71) reports that "voters indicate their preferences either for a list or for a maximum of six candidates."

[m]Slovenians cast a kind of fused vote due to the rules governing nominations. Each constituency is divided into *M* "electoral districts," where *M* is the number of seats in the constituency. Each party must, in the simplest case, nominate *M* candidates and legally associate each of them with exactly one of the electoral districts in the constituency. After seats have been allocated to party lists, they are allocated to candidates on the list in order of "their" votes – that is, the votes that the party list got in the district in which the candidate stood.

[n]The vote pooling occurs over multiple lists from a given party, not over lists from different parties. See Särlvik 1983, p. 134.

[o]The vote pooling occurs over multiple lists from a given *sub-lema* (faction), and over *sub-lemas* within a given *lema* (party), not over lists from different parties. The Uruguayan vote is fused, simultaneously affecting the presidential, congressional, and senate races.

service, both pooling to the list level and transferring among candidates on a given list.[8]

The "vote type" column for list votes is read as follows. If the vote type is exclusive, then votes for a given list benefit only that list. If the vote type is pooling, then votes for a given list can pool within "cartels" to which the list belongs, a possibility discussed in greater detail in Section 3.4. As can be seen, pooling list votes are used in Israel, the Netherlands, and Switzerland (where they pool across parties; cf Lijphart 1994:134) and in Sweden and Uruguay (where they pool within parties). In addition, the candidate vote in Poland, as previously noted (Box 3.1), pools not just to the list but also to the cartel level.

3.3 DISTRICT STRUCTURE

The district structure of an electoral system refers to the number and magnitude of all electoral districts used in that system – where an electoral district is defined as a geographic area within which votes are aggregated and seats allocated and a district's magnitude is the number of representatives it is entitled to elect.[9] If a district cannot be partitioned into smaller districts within which votes are aggregated and seats allocated, it is called *primary.* Thus, for example, the districts used in U.S. House elections are all primary. Although these districts are divided into smaller subdistricts for purposes of vote administration and counting (aggregation), no seats are attached to or allocated within the subdistricts, thus they do not count as "electoral districts" as defined here. Systems possessing only primary electoral districts are typically called *single-tier* in the literature.

A secondary electoral district is an electoral district that can be partitioned into two or more primary electoral districts. Usually, seats are allocated first within primary districts, then, if any remain to be allocated, within secondary districts. An example is Belgium, where the prima-

[8]Once seats have been allocated to lists in the Netherlands, they are reallocated to the candidates on those lists as follows. A "list quotient" is calculated, equal to the number of votes obtained by the list divided by the number of seats obtained by the list. "Candidates who have reached the list quotient or above are elected. The votes obtained by these candidates surplus to the list quotient are then transferred," first to candidates whose vote exceeds half the list quotient, then to remaining candidates in list order. The surplus votes transfer only once, not continually as under STV. "If seats still remain to be distributed after the preferential votes procedure has been completed, they are allocated in descending list order to the candidates that have not yet been elected." See Seip (1979:211).

[9]Geographically defined groups of voters are not the only groups that are apportioned seats. Many systems set aside seats for ethnic minorities, e.g., the long-standing Maori seats in New Zealand. I shall focus in the text only on seats apportioned to geographic districts.

ry districts (*arrondissements*) are grouped into secondary districts (provinces), with a second round of seat allocation at the provincial level. The initial allocation of seats occurs as follows. The total number of valid votes cast in an *arrondissement* is divided by the number of seats in the Chamber to which the *arrondissement* is entitled, yielding the Hare quota. Each party then acquires as many seats as there are whole quotas contained in its vote. After this allocation, certain parties qualify for participation in the provincial allocation of seats (those garnering at least 66% of the quota in at least one *arrondissement* in the province, and having formally affiliated the various *arrondissement* lists within the province). Each party's total vote in the province is divided by the number of seats it has won in the *arrondissement* allocations, plus one. The party with the largest quotient (the "highest average") wins the next available seat. Its quotient is then recalculated and the d'Hondt allocation process continues until all seats are allocated. In the final stages of allocation, it is decided how the seats won by the party at the provincial level should be distributed to its *arrondissement* lists, and thence to the candidates on those lists (cf. Hill 1974:57-8).

As the Belgian example suggests, primary and secondary electoral districts are hierarchically ordered, not just in the sense that secondary districts comprise several primary districts but also in the sense that votes and/or seats transfer from the primary to the secondary level for purposes of seat allocation. It is also possible for a system to have geographically overlapping districts that are not hierarchically ordered. In Ecuador, the whole nation serves as a district for the election of *diputados nacionales,* while the provinces serve as districts for the election of *diputados provinciales.* But Ecuadorians have two votes, one for each kind of deputy, and there are no vote transfers between the provinces and the national district. Thus Ecuador has two different kinds of primary district, rather than a hierarchical structure of districts.

Even tertiary districts can exist. In Greece, for example, seat allocations are made to district-based deputies in three stages: in primary districts (*nomoi*), secondary districts ("major districts"), and a single tertiary district (the nation). Tertiary districts, along with secondary districts, are sometimes called *upper tiers* in the literature. Systems possessing them are called *multi-tier* or said to feature complex districting.[10]

A survey of district structures in the 77 countries in the sample appears in Table 3.2. The number of secondary and tertiary districts is visible in the far right-hand columns. As can be seen, only Greece and Germany currently have tertiary districts but thirteen mostly European countries (Austria, Belgium, Bulgaria, the Czech Republic, Hungary, Iceland, Italy, South Korea, Norway, Poland, Slovakia, Slovenia, and Uruguay) have secondary districts.

Table 3.2. District structures in 77 democracies

How to read this table: N1 = number of primary electoral districts. Thus, for example, Argentina has 24 such districts. Of these, none return 1 member, five return 2 members, eleven return 3 members, and so on. N2 = number of secondary electoral districts. N3 = number of tertiary electoral districts.

Country (years)	*N1*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*>20*	*N2*	*N3*
ARGENTINA	24	0	5	1	2	2	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	1[a]	0	0
AUSTRALIA (1984–87)	148	148	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AUSTRIA (1983)	9	0	0	0	0	0	1	1	0	0	1	0	0	2	0	0	0	0	0	0	0	4[b]	2	0
Bahamas	49	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BANGLADESH	300	300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barbados	28	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BELGIUM	30	0	3	4	3	5	6	0	3	1	1	0	1	1	0	0	0	0	0	0	1	1[c]	9	0
Belize	28	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BENIN[d]	6	0	0	0	0	0	0	0	1	0	2	2	0	0	1	0	0	0	0	0	0	0	0	0
BOLIVIA	9	0	0	0	0	0	0	1	0	2	1	0	0	1	0	0	0	1	1	1	0	1[e]	0	0
BOTSWANA	34	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BRAZIL	26	0	0	0	0	0	0	0	10	1	2	0	1	0	0	0	2	1	1	0	0	8[f]	0	0
BULGARIA	31[g]																						1	0
CANADA	295	295	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cape Verde	22	0	15	2	0	2	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
CHILE	60	0	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
COLOMBIA	26	2	3	3	2	2	2	2	5	1	0	1	1	0	0	0	0	0	0	0	0	2[b]	0	0
COSTA RICA	7	0	0	0	2	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1[i]	0	0
Cyprus (Greek)	6	0	0	1	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1[j]	0	0
CZECH REPUBLIC	8	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	6[k]	1	0

DENMARK	19	0	3	0	2	0	0	1	3	2	2	1	1	0	0	0	1	0	2	0	0	1[l]	0	0
Dominica	21	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DOMINICAN REP.	30	0	16	7	1	3	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1[m]	0	0
ECUADOR	22	5	4	9	0	1	1	0	0	1	0	0	1[n]	0	0	0	0	0	0	0	0	0	0	0
FINLAND	21	1	0	0	0	0	0	1	2	0	2	0	1	2	0	1	0	1	2	0	1	1[o]	0	0
FRANCE	577	577	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
The Gambia	36	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GERMANY	248	248	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
GREECE[p]	56	5	9	9	10	5	5	4	5	1	0	0	0	1	0	0	0	0	0	0	0	2[q]	14	1
Grenada	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HONDURAS	18	2	1	2	2	1	1	3	1	3	0	0	0	0	0	0	0	0	0	0	1	1[r]	0	0
HUNGARY[s]	196	176	0	0	3	4	7	0	2	1	0	1	0	0	1	0	0	0	0	0	0	1[t]	1	0
Iceland	8	0	0	0	0	4	1	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0
IRELAND	41	0	0	0	13	15	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ISRAEL	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1[u]	0	0
ITALY	42	1	1	0	1	0	0	2	1	1	1	0	0	0	3	1	2	2	1	0	4	11[v]	1	0
JAMAICA	60	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
JAPAN	129	0	8	39	34	46	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kiribati	23	?	?	?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
KOREA, SOUTH[w]	225	225	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Liechtenstein	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
LITHUANIA	72	71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1[x]	0	0
Luxembourg	4	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2[y]	0	0
MALI[z]	55	19	23	6	4	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malta[aa]	13	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Marshall Islands																								
MAURITIUS	21	0	1	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Micronesia	14	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NAMIBIA	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1[bb]	0	0

Table 3.2. (cont.)

Country (years)	*N1*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	*>20*	*N2*	*N3*
Nauru[cc]	8	0	7	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NEPAL	205	205	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NETHERLANDS	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1[dd]	0	0
NEW ZEALAND	99	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NORWAY	19	0	0	0	2	2	3	3	2	0	3	0	2	0	0	2	0	0	0	0	0	0	1	0
PAPUA NEW GUINEA	109	109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
POLAND[ee]	37	0	0	0	0	0	0	5	4	3	7	6	4	4	1	1	0	2	0	0	0	0	1	0
PORTUGAL	20	0	0	1	4	3	2	0	1	1	3	0	0	0	1	0	2	0	0	0	0	2[ff]	0	0
St. Kitts and Nevis	11	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
St. Lucia	17	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
St. Vincent & the Grenadines	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Marino	33																							
São Tomé and Príncipe	12																							
SLOVAKIA	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3[gg]	1	0
SLOVENIA	8	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	1	0
Solomon Islands	38	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SPAIN	52	2	0	8	7	14	4	4	3	4	2	0	1	0	0	0	1	0	0	0	0	2[hh]	0	0
SWEDEN	28	0	1	0	0	1	1	0	1	1	3	6	7	2	0	0	1	1	0	1	0	2[ii]	0	0
SWITZERLAND	26	5	4	1	0	2	3	3	1	1	0	1	1	0	1	0	0	1	0	0	0	2[jj]	0	0
TRINIDAD & TOBAGO	36	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TURKEY[kk]	104	0	0	?	?	?	?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tuvalu	8	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UNITED KINGDOM	670	670	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UNITED STATES	435	435	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
URUGUAY	19	0	11	5	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1[ll]	1	0
Vanuatu	14	0																						
Western Samoa	47	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ZAMBIA	150	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Main Sources: (1) Dick and Natkiel, 1987. (2) Gorwin, 1989. (3) Inter-Parliamentary Union, 1993. (4) Information received from the International Foundation for Electoral Systems, the East-West Center, the Center for the Study of Constitutionalism in Eastern Europe, and various articles, web sites, and scholars.

Notes:

Countries with populations less than one million are listed with an initial capital letter followed by lower-case letters; larger countries are listed using capital letters throughout.

[a]The remaining district returns 35 members.

[b]The remaining 4 districts return 30, 30, 35, and 39 members.

[c]The remaining district returns 33 members.

[d]Allen 1992.

[e]The remaining district returns 28 members.

[f]The remaining 8 districts return 22, 25, 30, 31, 39, 46, 53, and 60 members.

[g]Districts in Bulgaria are not assigned prespecified numbers of seats. How many seats a given district gets depends on turnout in the various districts.

[h]The remaining districts return 26 and 29 members.

[i]The remaining district returns 21 members.

[j]The remaining district returns 21 members.

[k]The remaining six districts return 21, 23, 24, 24, 37, and 40 members. Districts in the Czech Republic are not assigned prespecified numbers of seats. How many seats a given district gets depends on turnout in the various districts. The district magnitudes given are arrived at by multiplying by two-thirds the "maximum number of candidates on lists of candidates" given in appendix 2 of the Czech electoral law.

Notes to Table 3.2 (cont.)

[l]The remaining district returns 21 members.

[m]The remaining district returns 31 members.

[n]This is the nationwide district within which the national deputies are elected.

[o]The remaining district returns 30 members.

[p]My source for these figures is a paper put out by Greece's General Secretariat for Press and Information, "The Electoral System of 5th November 1989."

[q]The remaining two districts return 21 and 32 members. The number of secondary districts includes 13 major districts, plus the nationwide tier within which the state deputies are elected (see the formulaic matrix for Greece in Appendix A).

[r]The remaining district returns 23 members.

[s]Tóka N.d.

[t]The remaining district returns 28 members.

[u]The remaining district returns 120 members.

[v]The remaining 11 districts elect these numbers of members: 23, 23, 25, 25, 26, 27, 30, 36, 42, 51, 53.

[w]Cheng 1993.

[x]The remaining district returns 70 members.

[y]The remaining two districts return 21 and 23 members.

[z]Vengroff 1994.

[aa]Howe 1987.

[bb]The remaining district returns 72 members.

[cc]Inter-Parliamentary Union 1993:61.

[dd]The remaining district returns 150 members.

[ee]From the appendix to "The Act of June 28, 1991 on Election to the Sejm of the Republic of Poland," Law Journal of the Republic of Poland [Dziennik Ustaw Rzeczypospolitej Polskiej], 1991, no. 59, item 252.

[ff]The remaining two districts return 37 and 50 members.

[gg]The remaining three districts return 42, 46, and 51 members.

[hh]The remaining two districts elect 33 and 33 members.

[ii]The remaining two districts elect 26 and 37 members.

[jj]The remaining two districts elect 29 and 35 members.

[kk]Information as of the 1987 election, from Turan 1994. 46 of the districts returned 5 or 6 members. The rest returned 3 or 4 members.

[ll]The remaining district returns 47 members.

Table 3.3. Median magnitudes of primary electoral districts in 72 democracies

PANEL A: MEDIAN MAGNITUDES UP TO 15[a]

N	*Countries whose median district magnitude equals N*
1	AUSTRALIA, Bahamas, BANGLADESH, Barbados, Belize, BOTSWANA, CANADA, Dominica, FRANCE, The Gambia, GERMANY, Grenada, HUNGARY, JAMAICA, KOREA, LITHUANIA, Micronesia, NEPAL, NEW ZEALAND, PAPUA NEW GUINEA, Solomon Islands, St. Kitts & Nevis, St. Lucia, St. Vincent, TRINIDAD, Tuvalu, U.K.,U.S., Western Samoa, ZAMBIA [30]
2	Cape Verde, CHILE, DOMINICAN REPUBLIC, Kiribati, MALI, Nauru, URUGUAY [7]
3	ARGENTINA, EQUADOR, MAURITIUS [3]
4	GREECE, JAPAN, TURKEY [3]
5	BELGIUM, IRELAND, ICELAND, Malta, SPAIN [5]
6	COLOMBIA, COSTA RICA, HONDURAS, SWITZERLAND [4]
7	NORWAY, PORTUGAL [2]
8	Cyprus (Greek) [1]
9	DENMARK [1]
10	BENIN, POLAND [2]
11	BRAZIL, SLOVENIA, SWEDEN [3]
12	—
13	AUSTRIA, BOLIVIA, FINLAND, Liechtenstein [4]
14	—
15	LUXEMBOURG [1]

PANEL B: MEDIAN MAGNITUDES ABOVE 15

N	*Countries whose median district magnitude equals N*
17	ITALY
23.5	CZECH REPUBLIC
44	SLOVAKIA
72	NAMIBIA
120	ISRAEL
150	THE NETHERLANDS

[a]Countries with populations less than one million are listed with an initial capital letter followed by lower-case letters; larger countries are listed using capital letters throughout.

Strategic voting

The median primary district magnitudes for 72 of the 77 countries are indicated in Table 3.3. As can be seen, the median magnitude of primary districts is typically rather low. By far the single largest group of countries are those that rely exclusively or predominantly on single-member districts. Even among countries using multimember districts, however, 18 of 42 (43%) have median magnitudes between 2 and 5. The importance of this for the issues of alliance formation and strategic voting is fairly straightforward: Larger district magnitudes typically make the system more proportional (unless a majoritarian electoral formula such as that in Mali is used), which lessens the pressure both for electoral coalitions and strategic voting.

3.4 HOW VOTES BECOME SEATS

Translating votes into seats is the domain of electoral formulas. In simple systems, such as the United States', there is just one electoral formula in operation. In complex systems, however, such as Germany's, there are several levels at which different electoral formulas operate. In order to trace the process of votes-to-seats translation in complex systems to its final outcome – an allocation of seats among candidates – one must navigate through an entire subsystem of electoral formulas. This subsystem I shall call the formulaic structure. In order to explain this notion more thoroughly, I first review some of the better-known formulas and categories of formulas.

The conventional typology

Electoral formulas are customarily divided into two main families: plurality/majority rules and proportional representation (PR) methods. Plurality rule (which usually applies only in systems in which citizens vote for candidates, not for lists[10]) awards seats in an M-seat district to the top M finishers in the poll. Majority rules of various kinds (which also tend to apply in systems with candidate but without list votes) are discussed in Section 3.5. PR methods can be divided into two chief families, one based on quotas and largest remainders, one based on divisors and largest averages.

The first kind of PR proceeds as follows. An electoral quota, Q, is established and each list receives as many seats as there are whole quotas contained in its vote total. Any remaining seats are then allocated in order to the parties with the largest remainders, where a party's remain-

[10]Exceptions include the Bolivian, Mexican, and Argentine Senates and the U.S. Electoral College.

der equals its vote total less the product of (1) the number of quota seats it won in the first round of allocations and (2) the quota Q. One can think of Q as the "price" of a seat, denominated in votes. If a party wins 5 seats, it must "pay" $5Q$ to acquire them, leaving it with a remainder of v-$5Q$ (where v is the party's total vote).

The electoral quota can be calculated in a number of different ways, usually dependent on the district magnitude, M, and the total number of valid votes cast, V. Common quotas include the Hare (or simple) quota, $Q_{\text{Hare}} = V/M$; the Droop quota, $Q_{\text{Droop}} = [V/(M+1)] + 1$ (where $[x]$ denotes the greatest integer less than or equal to x); and the Hagenbach-Bischoff quota, $Q_{\text{HB}} = V/(M + 1)$.[11] Note that with any quota less than or equal to $V/(M + 1)$ it is theoretically possible for each of $M + 1$ parties to amass a quota, hence to allocate more seats than are available in the district. In practice, therefore, quotas at or below the Hagenbach-Bischoff level need auxiliary rules to decide how seats are to be allocated, in case more lists garner quotas than can be given seats.

If seats remain unallocated after each list gets its "quota seats" then the remaining seats are distributed in order to the lists with the largest remainders. Thus, the first unallocated seat goes to the list with the largest remainder, the second unallocated seat goes to the list with the second largest remainder, and so on until all seats are allocated. I shall use the notation "LR-Q" as a shorthand for "the largest remainders method of PR with the Q quota," referring to LR-Hare, LR-Droop, and so forth.

The second main family of PR methods is based on the calculation of ratios (or "averages") that reflect how much each party has paid in votes for its seats. Let $a_i(t)$ denote party i's average at stage t and $s_i(t)$ denote the number of seats allocated to party i in previous stages. The method invented by Viktor d'Hondt sets $a_i(t) = v_i/(s_i(t) + 1)$ for all i and t, where v_i is the vote total for party i. At any stage, one seat is allocated to the party with the highest average. Thus, for example, at the first stage, for which $t = 1$, $s_i(1) = 0$ for all parties (since no seats have yet been allocated) and $a_i(1) = v_i$. Accordingly, the first-stage seat is allocated to the list garnering the most votes. At the second stage, this party's average is now $v_i/2$, all other parties' averages are unchanged, and again the party with the highest average receives a seat. And so forth.

[11] As Taagepera and Shugart (1989:30) and Lijphart (1990:494 n. 5) have noted, the Droop and Hagenbach-Bischoff quotas are technically equivalent in many discussions of quota-and-remainder systems. Nonetheless, in discussions of the so-called Hagenbach-Bischoff variant of the d'Hondt method, used for example in Luxembourg, the quota mentioned is that given in the text. As it is convenient to have separate names for the separate quotas, and not too useful to have two names for the same thing, I shall use the Hagenbach-Bischoff quota as described in divisor systems, rather than the one described in quota-and-remainder systems.

Another divisor method is that invented by A. Sainte-Laguë, which sets $a_i(t) = v_i/(2s_i(t) + 1)$ for all i and t.[12] There are various other methods as well, differing in the sequence of numbers they use to divide parties' vote totals. Regardless of the formula used, the allocation of the next available seat is always to the party with the highest average. I shall use the shorthand "PR-d'Hondt" to refer to "the d'Hondt method of PR," and similarly for other divisor methods.

Having reviewed the mechanics of some of the various electoral formulas in current use, one can ask why the major distinction made among them is that between plurality/majority rules, on the one hand, and PR methods, on the other. The answer is that much of the variance in two of the major variables that electoral systems are thought to influence – namely, the level of disproportionality between each party's vote and seat shares, and the frequency with which a single party is able to win a majority of seats in the national legislature – is explained by this distinction (Rae 1971; Powell 1982; Blais and Carty 1987; Lijphart 1994). Or, more accurately, of the variance in these variables that can be explained by electoral structure at all, much of it is explained by this simple distinction. Plurality/majority rules generally tend to produce more disproportional results and also to raise the likelihood of a single-party majority in parliament. PR methods produce, as the label "proportional representation" would suggest, more proportional results; they also lower the likelihood of single-party majorities (cf. Powell 1982; Blais and Carty 1987; Lijphart 1994).

The distinction between plurality/majority and PR does not exhaust the distinctions to be made. For example, within the category of PR, the d'Hondt method is well known to be the least favorable to small parties. Moreover, some formulas do not fit comfortably in the main categories, prompting the creation of a category of "semiproportional" or "nonlist PR" formulas.[14]

[12]Both the d'Hondt and the Sainte-Laguë methods had been previously invented by Americans (Thomas Jefferson and Daniel Webster, respectively) attempting to deal with the apportionment of representatives to states in the U.S. House of Representatives. See Balinski and Young (1982).

[13]I find the notion of a semiproportional formula misleading. Consider, for example, the single nontransferable vote (SNTV) system, formerly used in Japan. SNTV entails that each voter cast a single vote, for a candidate. Most districts are multimember and, in an M-seat district, the winning candidates are simply the M candidates garnering the most votes. It is very clear that the Japanese *formula*, considered as nothing more than a method of taking a set of vote totals and awarding seats on that basis, uses plurality rule as defined above. But there has been a reluctance to place Japan in the plurality rule column, since its elections have yielded lower indices of disproportionality than typical for plurality rule in single-member districts. Thus,

I shall use the term "electoral formula" to mean a method for translating candidate and/or list vote totals into an allocation of seats among cartels, lists, or candidates. Mathematically, the electoral formula is just a function that takes various vote totals as input and produces a distribution of seats as output. Usually, the process is purely mechanical. That is, given a set of input vote totals, the electoral formula deterministically produces an allocation of seats.[14]

As noted above, many electoral systems have more than one electoral formula. In the Brazilian system, for example, there are two. One electoral formula (d'Hondt) converts list vote totals into an allocation of seats among lists. Another formula (plurality rule) converts the votes cast for candidates on a given list into an allocation of the list's seats (awarded in the first stage) among its candidates.

In addition to electoral formulas as defined above (mappings from votes to seats), some electoral systems also employ other rules in allocating seats. For example, in closed list systems, the method of allocating a list's seats is a mapping from list order (and the number of seats won by the list) to an allocation of seats among the candidates on the list.[15]

many in essence have defined "plurality rule" in multimember districts so as to preserve the essential political features of plurality rule as it operates in single-member districts. Lijphart, for example, writes: "The plurality formula ... stipulates that, in single-member districts, voters can cast one vote each and that the candidate with the most votes wins. (In two-member districts, voters have two votes and the two candidates with the most votes win; and so on.)" (1994:18). I would say that this is a perfectly logical generalization of the one-vote, single-member, plurality rule *system* to the multimember case, in such a way as to preserve the majoritarian nature of the system. I find it confusing, however, to refer to the plurality *formula* as stipulating how many votes each voter casts. In my view, it is clearer to preserve the narrow definition of the plurality rule formula, admit that it clearly existed in Japan, and accommodate the fact that Japanese elections under the 1947–93 system were more proportional than other elections also using plurality rule by reference to the voting options and district magnitudes in force there. The point is really only a terminological one, a plea to reserve the term *formula* for the mechanical translation of votes into seats, and accommodate political reality by reference to the electoral *system*. This avoids conflating two logically separate aspects of electoral systems, formulas and voting options, and puts the emphasis where it belongs in identifying the causal origins of the former Japanese system's greater proportionality: on the voting options and the district magnitude, not on the formula (see Cox 1991).

[14]An exception to this statement occurs under STV in Ireland, where a small element of chance sneaks in, due to the way ballot papers are handled (Harrop and Miller 1987:49).

[15]Of course, the formula allocating seats among candidates on a closed list could be taken as a *constant* function with respect to candidate vote totals (thus making the fact that such vote totals do not really exist irrelevant), or it could be supposed that voters in supporting the list are supporting the order of names on the list, so that list order reflects the voting outcome.

I shall refer to the set of all electoral formulas and other seat allocation rules in a given system, and their interrelationships, as the system's *formulaic structure* (or formulaic subsystem). Knowledge of the formulaic structure by definition allows one to construct a "complete mapping" of votes as initially cast (whether for lists, candidates, or both) into seats for candidates. In Brazil, for example, the complete mapping would take candidate and list votes as input, and produce an allocation of seats among candidates as output. Mathematically, this function would correspond to a *composition* of the various electoral formulas in the formulaic structure.[16]

If one wishes to speak of *the* electoral formula in a complex system, it would either have to be the complete mapping just mentioned or one would have to specify which of the "level-specific" electoral formulas one meant when speaking of *the* formula. I have found it useful to continue current usage in the literature and reserve the term "electoral formula" for votes-to-seats translations at a given level in the system, rather than for the complete mapping of a system. I shall clarify what counts as a "level in the system" throughout the rest of this section. The first step is to discuss the alliance structure of an electoral system.

The alliance structure of an electoral system

Any formulaic structure must eventually allocate all seats to candidates but some arrive at this final outcome via a series of broader allocations. Within a given primary district, seats are always allocated first to cartels (if any), then to lists (if any), and finally to candidates.

In some systems, of course, there are neither cartels nor lists. This is the case in the United Kingdom and Japan, for example, and in both countries there is only one kind of seat allocation – directly to candidates.

In other systems, lists but not cartels exist as entities to which intermediate seat allocations can be made. Usually this means that voters can vote directly for lists, but this is not always the case (e.g., Poland). When intermediate seat allocations are made to lists, then the question arises as to how the list's seats are to be allocated among the candidates on the list. One method is to have the party establish an order of candidates on the list, with the first candidate on the list getting the first seat to which the party is entitled, the second on the list getting the second seat, and so on. This is the *closed* list system (used, for example, in Spain's lower house). Another method is to let the party's voters decide which of its

[16]If g is a function mapping X (e.g., votes) into Y (e.g., seats for parties), and f is a function mapping Y into Z (e.g., seats for candidates), then the composition of g and f – call it h – is such that $h(x) = f(g(x))$.

candidates will win the seats allocated to the party's list. This is the *open* list system (used, for example, in Finland). Finally, there are also intermediate methods that give both party leaders and voters some say in the allocation of a list's seats among its candidates. These are the *flexible* list systems (used, for example, in Greece). A necessary condition for voters to have any influence on list allocations, of course, is that they have the ability to vote for individual candidates (possibly in addition to the ability to vote for lists). Candidate votes that influence seat allocations among the members of a given list are generally referred to as *preference votes* (Marsh 1985; Katz 1986).[17]

In yet other systems, intermediate seat allocations are made both to lists and to cartels. A cartel is a group of lists that are legally allied for purposes of seat allocation. The cartel vote is determined by summing the votes of all lists participating in the cartel. The initial allocation of seats is to the cartel, based on the cartel vote (although at this same stage allocations to unallied parties, if any, will also be made). Naturally, the question arises of how the cartel's seats are to be allocated among its component lists but here the answer is always in terms of votes cast for lists. In practice, citizens do not vote separately for cartels and there are no closed or flexible cartels; they are all open.

Sweden 1911-1952 is an example of a polity in which *apparentement*, i.e., the formation of list cartels, was legal. On the ballot paper, both the name of the party and the name of the cartel to which it belonged (if any) would appear. *Apparentement* was important in that it "allowed the nonsocialist parties to overcome the underrepresentation of small parties that is built into the d'Hondt method" (used in Sweden at that time) without going through the difficulties of an actual merger (Särlvik 1983:127).

In the example just given, the cartels were composed of lists from different parties but the same constituency. Two other possibilities – *apparentement* between lists from the same party and constituency, and between lists from the same parties but different constituencies – have also arisen in practice.

Sweden's contemporary electoral system provides an example of the first possibility: Swedish law allows multiple lists with the same party label in a given constituency, the votes for all these lists being summed for purposes of the initial seat allocation to parties. Which candidates from which lists secure the seats allocated to the party is "determined by the number of votes cast for the various [lists within the party]" (Särlvik 1983:134).

Belgium provides an example of *apparentement* of lists from the same party but different constituencies. Parties must formally affiliate their vari-

[17]In some systems, voters are allowed to alter the order of names on the ballot; I include this possibility under the general rubric of "preference votes."

ous *arrondissement* lists within each province, if they wish to participate in the provincial seat distribution. This creates a cartel of same-party different-constituency lists. Allocation of the seats awarded to the provincial cartel among the cartel's component *arrondissement* lists is by PR-d'Hondt.[18]

The existence or absence of cartels and lists, along with the rules regulating the nature of any cartels and lists that do exist (Are the cartels *partisan* – composed of same-party lists – or *inter-party*? Are the lists open, flexible, or closed? Are joint lists allowed? etc.), together establish what I shall call the *alliance structure* of an electoral system. The alliance structure refers only to the potential relationships that may obtain between candidates and lists, not to any actual pattern of use of the legal options.

Thresholds and bonus seats

Another important wrinkle in discussing electoral formulas concerns the existence of thresholds and bonus seats. Pure electoral formulas may be hedged about by various thresholds that a candidate or list must satisfy before being eligible to receive any seats. Such thresholds are part of the mathematical translation process which converts votes into seats, and thus properly a part of the electoral formula as defined here.

I shall consider two main categories of threshold here: those defined at the level of the primary district, and those defined at the level of the secondary district. Examples of the first are as follows:

- Argentina: Only lists whose vote exceeds 3% of the registered electorate in the district can receive seats.
- Israel: Only lists whose vote exceeds 1.5% of the vote in the district (which in this case coincides with the nation) are eligible to receive seats (the 1.5% threshold came in with the June 1992 election, replacing the older 1% threshold; see Stellman 1993:127).
- Japan: Only candidates whose vote exceeds 25% of the Hare quota are eligible to receive a seat.
- Lithuania: In the first round of a dual-ballot contest (in single-member districts), only candidates whose vote exceeds 50% of the total

[18]In principle, *apparentement* might continue indefinitely: There might be second-order cartels composed of cartels, third-order cartels composed of second-order cartels, and so forth. In practice, few democracies go beyond cartels. One of these is Uruguay. In the terminology used here, Uruguay's *sub-lemas* are cartels (as they are composed of a number of different lists whose votes pool for purposes of seat allocation), while the *lemas* (composed of a number of different *sub-lemas* whose votes pool for purposes of seat allocation) are second-order cartels. Seat allocations occur first to second-order cartels (*lemas*), then to cartels (*sub-lemas*), then to lists, finally to candidates (Taylor 1955; Franco 1986; Gonzalez 1991).

vote are eligible to receive a seat, and then only if turnout in the district exceeds 40% of the registered electorate.

Examples of thresholds that operate at the level of the secondary electoral district are:

- Austria: Only lists associated with parties that have won at least one seat in a primary district contained in the secondary district are eligible to receive a seat.
- Belgium: Only partisan cartels associated with parties that have won at least .66 of a Hare quota in at least one of the primary districts within the secondary district are eligible to receive seats.
- Germany 1949: Only lists associated with parties that had either won at least one seat in a primary district contained in the secondary district, or had won at least 5% of the total vote in the secondary district, were eligible to receive seats.
- Greece 1974-1981: Only lists associated with parties that had won at least 17% of the national vote, or two-party joint lists whose parties won at least 25% of the national vote, or n-party joint lists, $n > 2$, whose parties won at least 30% of the national vote, were eligible to receive seats (Clogg 1987:196).

It is conceptually possible, of course, to have threshold requirements both at the primary and at the secondary district level. An example is Iceland, where a party must win at least 2/3 of a Hare quota to win seats in a district, and must win at least one constituency seat in order to be eligible for the national distribution of seats (Helgason 1991).

Whenever there are threshold requirements that actually affect some parties, the unaffected parties will divide 100% of the seats based on less than 100% of the votes. They may divide the resulting "surplus" seats more or less equally, or the surplus may be used to create a bonus in seats for some parties (typically the largest). Even without threshold requirements, a polity may see fit to create bonus seats.

There are only three examples of bonus seats in the 77-country sample described above. In South Korea, if the party winning the most seats in the primary electoral districts does not win a majority of such seats, then it is given a bare majority of 75 nationally-allocated seats.[19] In Malta, if a party wins a majority of first preference votes but fails to win a majority of seats in the legislature, then it is given a sufficient number of adjustment seats to ensure it a parliamentary majority (Lijphart 1994:36). In Turkey, the largest party in districts returning five or more members is entitled to a bonus seat, with the remaining seats distributed by the d'Hondt method of PR (Turan 1994:54).

[19]See Cheng (1993:16-17). This law has been changed recently.

Strategic voting
The formulaic structure: 2

The formulaic structure of an electoral system can become rather complex if its district and alliance structure are complex. In working through such systems, I have found it useful to employ a *formulaic matrix,* the rows of which are defined by the various entities to which seat allocations are made (partisan cartels, lists, joint lists, independent candidates, etc.), the columns of which are defined by the electoral district within which the allocation is made (primary, secondary, tertiary). The *i-j* cell in the formulaic matrix, corresponding to the intersection of the *i*th row (or entity) and *j*th column (or level), provides a description of the formula or other rule governing the allocation of seats to the *i*th entity at the *j*th level. Appendix A contains formulaic matrices for most of the 77 countries judged democratic as of 1992.

Consider, as an example, the Belgian system. As can be seen by glancing at the row and column headings of the matrix in Appendix A, seat allocations in Belgium are made to three different kinds of entity (candidates, lists, and partisan cartels) at two different levels (*arrondissements* and provinces). As can be seen by glancing at the cells within the matrix, allocations are not made in every possible cell. Partisan cartels, for example, are not awarded seats at the *arrondissement* level; they take receipt of seats only at the provincial level. Turning now to the non-empty cells, the numerals indicate the sequence of seat allocations. The first allocation of seats is to lists within primary districts, and thus corresponds to the cell at the intersection of the "lists" row and the "primary districts" column. The second allocation of seats is to partisan cartels at the provincial level. The third allocation of seats is to *arrondissement* lists at the provincial level (corresponding, as explained in the cell, to the reallocation of the seats awarded in step 2 to each partisan cartel, among the cartel's component *arrondissement* lists). Finally, the fourth step is the reallocation of seats won by lists in steps 1 and 3 to the candidates on those lists. Each step has its own formula or rule of allocation.

The formulaic matrix forces one to be clear about what entity is receiving seats, on the basis of what votes, and at what level. It also makes certain differences in formulaic structure stand out. Consider, for example, the formulaic matrix for the Czech Republic (to be found in Appendix A). The Czech district structure has two tiers, just like the Belgian, although the second tier there consists of a single national district rather than the provincial districts favored in Belgium. Instead of using partisan cartels, however, the Czechs use national lists. Thus, seats allocated to the parties at the national level are not reallocated to the constituency lists before finally being distributed among the candidates on those lists. Rather, such seats go straight to the candidates on a

national list. As it turns out, the candidates on the national list must consist of candidates from the constituency lists who have failed to secure seats in the first allocation (to lists in primary districts). But the distinction may be important insofar as it affects the balance of power between the national party leadership, which must decide on the order of names on the national list, and local party activists, who might be expected to dominate the endorsement process in the constituencies.

The formulaic matrices presented in the Appendix are sometimes not as complicated as they might be, in that potential distinctions – e.g., between independent candidates and candidates on lists, between independent lists and lists allied in cartels, between the various kinds of cartel – are not always made. Sometimes this is due to ignorance on my part of the relevant laws, sometimes to a desire to simplify already-complicated matrices by focusing on the most important distinctions. Even with these simplifications, some 20 of the 77 systems have complex systems entailing seat allocations at more than two stages.

3.5 DUAL-BALLOT SYSTEMS

Another way of voting uses multiple ballots, typically along with a requirement that victors secure a majority of votes cast. The Catholic Church has a long tradition of such voting, which influenced the choice of early electoral institutions in continental Europe. Although multiple ballots are usually employed in single-member districts, this is not always the case. The French have used multiple-ballot multimember systems in the past (Cole and Campbell 1989), while the Swiss upper house (Aubert 1983) and Mali (Vengroff 1994) do currently.

I shall focus initially on *dual*-ballot systems in *single-member* districts. All these systems, it should be noted, are rather simple in terms of their voting options, conversion of votes into seats, and district structure: There is only one vote per voter per round; there are no lists or cartels, only candidates; and there are no secondary electoral districts. These restrictions are not inherent in the nature of dual-ballot voting. It would be possible, for example, to employ approval voting in one or both rounds, or to allow candidates to ally as do presidential candidates in Uruguay. Nonetheless, there is no empirical experience with such systems, and no argument on the table that they should be used. Thus, I shall ignore them here.

Even with these restrictions, there are many different types of dual-ballot single-member systems to consider. They differ in how they decide what a candidate must do to win in the first round, and which candidates are eligible to compete in the second round, absent a first-round winner.

The usual standard for victory in the first round is winning a majority (over 50%) of first-round votes. Some polities, however, require only a plurality that exceeds a given standard – 40% in various U.S. states (cf. Bullock and Johnson 1992) and Costa Rica; 45% under the new Nicaraguan rule. There is also the "double complement" rule, discussed briefly in Chapter 6, which sets yet another standard for victory in the first round.

As regards the qualifications for entering the second round, absent a first-round victor, some systems are very permissive. The French under Napoleon III and again from 1928 to 1936, and the Germans in their presidential elections during the Weimar Republic, let anyone enter the second stage, even if they had not run in the first stage (cf. Nilson 1983; Lakeman 1970:63). I, however, shall focus on systems in which only candidates appearing in the first round are eligible to compete in the second.

Among these *restrictive* runoff systems, there are two basic types. The first type restricts access on the basis of a relative standard: The top N finishers in the first round advance, where N is typically 2 but can in principle be larger. The second type restricts access on the basis of an absolute standard: All and only those candidates getting more than $x\%$ of the vote advance, for some x (cf. Greenberg and Shepsle 1987).[20]

Most real-world examples of restrictive majority runoff are top-two systems. This system has a long history in European elections, being used, for example, in nineteenth-century Germany and Italy (Carstairs 1980:163; p. 151), and has come in for more recent European use in Bulgaria (1990 only) and Albania. Top-two majority runoff has also been used since the nineteenth century in U.S. elections, especially in primary contests in the southern states (Wright and Riker 1989; Bullock and Johnson 1992). Finally, all current Latin American presidential runoff elections also restrict runoff access to the top two finishers (Shugart and Taagepera 1994).

Other forms of majority runoff, less restrictive than the top-two variant, have also been used. For example, Norway between 1905 and 1919 allowed any first-round candidate to continue in the second round. With such permissive rules for participation in the second round, the first rounds were really no more than "straw polls," providing information about the relative strengths of the different candidates. Such information could then presumably be used in bargaining over candidate withdrawals and alliances.

[20]There are also mixtures of and variants on these two pure types. An example of a mixed system is that used in the 1990 Hungarian elections, when the top three first-round finishers, plus any candidates exceeding 15%, were admitted to the second poll (Körösényi 1990). An example of a variant on the second or absolute standard system takes "registered voters" instead of "turnout" as the base for the percentage. This is the system used in France.

Finally, as an example of a dual-ballot *multimember* system, consider Mali. The Malian voter casts a single vote for a list of candidates. If any list gains a majority of votes in the first round, then it gets all the seats at stake in the constituency. Otherwise, a runoff election is held between the two lists getting the most votes. In the runoff, the list getting the most votes wins all the seats.

3.6 CONCLUSION

At the beginning of this chapter, I defined an electoral system as a set of laws and party rules that regulate electoral competition between and within parties. These laws and rules can affect many aspects of political competition, including the ideological cast of the policies that parties advocate at election time (e.g., Cox 1990a), the extent to which politicians traffic in pork barrel and other particularistic benefits (e.g., Myerson 1994), and the degree of factionalization of parties (e.g., Kohno 1992). For the purposes of this book, the most important features of electoral systems are those that affect the making of electoral coalitions, whether explicit alliances negotiated between party leaders or tacit alliances worked out among voters through strategic voting.

The essence of both kinds of electoral coalition, at least as conceived in most of the chapters to follow, is the reallocation of votes to produce a more efficient translation of votes into seats. From this perspective, what is crucial in any description of an electoral system is to keep close track of "where the votes go": which vote totals are used for purposes of intermediate or final seat allocations. The new terms and concepts introduced in this chapter are motivated by this need to keep careful track of how votes become seats. Thus, for example, the distinction between an exclusive and nonexclusive vote is cast precisely in terms of how many seat-relevant vote totals the vote in question contributes to. If the answer is just one, then the vote is exclusive; otherwise it is nonexclusive. Similarly, the notion of a formulaic matrix is intended as an aid to mapping out where, when, and with what votes the various seat allocations in a system are made.

Once the "where, when, and with what" of a system are understood, the logic of both explicitly negotiated alliances and tacit (strategic voting) alliances is easier to specify. Explicit alliances reduce the number of entities (whether candidates, lists, or cartels) to which initial seat allocations are made. Thus, for example, fusion candidacies reduce the number of candidates running, joint lists reduce the number of lists running, and *apparentement,* by allowing some lists to combine their votes for purposes of an initial seat distribution, may mean that rather than n lists chasing after seats, one finds $n - 2$ lists and 1 cartel.

Strategic voting

It should be stressed that reducing the number of electoral competitors (whether candidates, lists, or cartels) may or may not reduce the number of parties. Outright mergers, such as that between the Liberals and Democrats in Japan, certainly reduce the number of parties. But the whole point of a fusion candidacy or a joint list is that the parties supporting the candidacy or list continue as independent entities. And *apparentement* between lists supported by different parties allows much the same result: a contraction in the number of entities to which seats are legally allocated without a corresponding contraction in the number of parties.

It should also be noted that explicit coalitions depress the need for tacit ones (i.e., for strategic voting), by reducing the number of candidates, lists, or cartels among which voters must choose. If elites fail to coordinate sufficiently, however, "too many" candidates, lists, or cartels may enter the fray and the possibility of a wasted vote thus arises. In this case, the coordination game that began among elites at the level of alliance negotiations may continue at the level of mass voting decisions, as will be discussed in the next four chapters.