

Chapter 4. District Magnitude (December 11, 2001)

In this chapter I argue that knowing the electoral support for his party after the 1988 plebiscite, the electoral designer chose a district magnitude of 2 to increase his party's chances of transforming votes into more seats. Any other PR arrangement would have resulted in fewer seats in parliament for the designer's party. I argue that a simple formula, a rule of thumb of a sort, can be used to identify the district magnitude that will maximize one's seats holding electoral support constant.

The root of proportional representation—and most specifically the 2-seat district arrangement—in post-Pinochet Chile can be traced back to the 1980 Constitution. Article 45 provided that each region would elect two senators. That article also stated that half of the regions would elect senators concurrently with presidential elections and the other half would do so during mid-term elections. The article does not directly say that each region would constitute an indivisible 2-seat district. It would be also consistent with that article to divide each region into 2 separate single member districts for senatorial elections. Strictly speaking, the 2-seat district is not entrenched in the Constitution. For that reason, the formal adoption of a 2-seat district can be officially attributed to Law 18,700 (Organic Law on Elections and Vote Counting) approved by the Junta in May 1988. That law spelled out the electoral rules to be used in Senate and Chamber elections. Those rules included the adoption of the d'Hondt seat allocation formula and determined that each region would constitute an indivisible 2-seat senatorial district. Yet, when initially published, Organic Law 18,700 did not establish the actual boundaries or magnitude for the districts that would comprise the 120-seat Chamber of Deputies. That decision was made months after the October 5, 1988 plebiscite. On May of 1989, Law 18,799 incorporated into Organic Law 18700 the across-the-board 2-seat district formula and delineated the boundaries for the 60 Chamber of Deputies districts.¹ By making the final choice over the actual district magnitude and district boundaries *after* the plebiscite, the designer responded strategically to the electoral preferences made public by Chilean voters in the 1988 plebiscite.² The designer could count on one crucial piece of information as he set out to write an electoral law that would maximize his party's ability to convert votes into seats. The designer knew fairly well his level of support across all of Chile municipalities and voting precincts.

The electoral designer would also like to know how many opposition parties vie for all those votes that their party will not obtain. But in Chile, immediately after the plebiscite, the designer could not be certain about the way in which the opposition would face the next election. The opposition parties that had formed a coalition to support the 'No to Pinochet' vote in the

¹ Although, as discussed in Chapter 5, as early as August 1988—two months before the plebiscite—the initial bill sent by Pinochet to the Junta proposed 60 2-seat districts as the electoral formula for the Chamber of Deputies. In that sense, the choice of an across-the-board 2-seat district mapping was confirmed, rather than made, after the 1988 plebiscite.

² This view is widely shared among scholars. Loveman (1999: 219) argues that, “electoral and political party laws prevent restoration of pre-1973 proportional representation system.” Collier and Sater (1996: 381) describe the electoral system as weighted “toward the Right by favoring rural areas and also by the rule that in two-seat districts, the winning party could take both seats only if it had twice the votes of the losing party.” Roberts (1998: 143) argues that, “the military regime imposed a disproportional binomial electoral system that ingeniously over represented the political Right in congress while excluding the Communist Party and other leftist forces outside the *Concertación*.”

1988 plebiscite could stay together for the presidential and parliamentary elections scheduled for December of 1989 or they could opt to run as separate and independent parties. The designer did not know how all those who voted for the ‘No’ option would vote in the 1989 election, but the designer did know that those who had voted in favor of granting Pinochet a fresh 8-year period as president were supporters of the government. A total of 3.1 million voters had voted ‘Yes’ in the plebiscite, 43% of all those voting. The ‘No’ option had carried the day with 3.959 million votes (54.7% of the total), while blank votes and abstentions had accounted for 2.2% of the 7,236,241 Chileans who turned out to vote. Having ruled out FPTP or any other form of majority rule for the composition of the lower chamber (as discussed in chapter 3), the decision in front of the electoral designer was simple: what district magnitude would best maximize the designer’s electoral support into seats in the legislature to be elected in December of 1989.

The District Magnitude (DM) is the number of seats chosen in a district. DM varies widely across countries. In the U.S., the entire House of Representatives and the Senate emanate from single member districts.³ In Israel, the entire country constitutes an electoral district, and therefore the district magnitude equals the size of the parliament. The Israeli Knesset is elected by proportional representation from a single 120-member electoral district. As DM increases, “representation is defined less by geography and more by ideological or sectorial interests in a multiparty system” (Shugart and Carey 1992: 11). In most other countries, the district magnitude varies across districts. Districts are often defined in terms of existing political divisions in the country. In Argentina, for example, the 23 provinces and the City of Buenos Aires constitute the 24 electoral districts for the Chamber of Deputies. Because each district is guaranteed a minimum of 5 seats in the Chamber and because half of the seats in every district are elected alternately every two years for a 4-year term, the effective district magnitude in Argentina is 6.24, with a minimum of 2 and a maximum of 35 seats per district⁴ (Jones 1995: 12). In Brazil, the average district magnitude for the 495-seat Chamber of Deputies is 18.7, the highest in Latin America for multi-member districts. Recent electoral reforms in Peru and Bolivia modified their existing mid-size DM in the opposite directions. While Peru adopted a 120-seat national district for the Chamber of Deputies in 1995 (Jones 1995: 12), Bolivia adopted a mixed system, with 68 single-member districts and 9 multi-member districts (DM=6.89) to comprise the 130-seat Chamber (Jones 1997: 15).

The average district magnitude varies significantly across countries just as district magnitude within individual countries fluctuates depending on the size of the districts. Very few countries have the same magnitude for all districts. Obviously, countries that use FPTP or other forms of single member districts have the same magnitude, but in general PR systems have varying district magnitude. Notable exceptions are Korea and Chile. The Korean *Kuk Hoe* (National Assembly) has 273 members, elected for a four-year term, 226 members in two-seat constituencies and 47 members by proportional representation. The Chilean Chamber of Deputies has 120 members elected in 60 different two-seat constituencies.

In general, PR systems are intended to give representation to parties other than the largest party in every district. For that reason, PR systems assign several seats to each district, to make

³ Although each state elects 2 senators, each senator is elected in alternate elections.

⁴ Small provinces that have 5 seats elect 2 and 3 alternately while the most populated province, Buenos Aires, elects half of its 70 seats every two years.

it possible for smaller parties to gain representation. The larger the magnitude of the district, the more likely it is that smaller parties will get parliamentary representation. To prevent excessive party fragmentation, minimum thresholds are often established for parties to clinch a seat. The case of Korea, and most dramatically that of Chile, represents significant variations from traditional PR systems. While provisions are made to give representation to parties that have minority support, there is only one seat allocated for minority parties in every district. Thus, the same number of seats allocated for the party with most support in every district is allocated for minority parties. That arrangement has the obvious consequence that the first and second most supported parties will end up having equal representation in every district. In fact, assuming the use of the d'Hondt seat allocation formula, under the system any party with $33 \frac{1}{3} + 1$ of the votes secures one of the two seats. With roughly one-third of the vote, a party can secure 50% of the representation.

Maximin Strategy

A simple formula can help us understand the rationale electoral designers use when choosing the most appropriate district magnitude (DM). This is for all cases where the designer knows the electoral support for her party. I assume the electoral designers does not know how many opposition parties will compete and does not know the exact electoral support for each of those opposition parties. Yet, having good, reliable knowledge of her own electoral support and making broad assumptions about the number of other parties that will compete allows the designer to find a district magnitude that will maximize how those votes transform into seats. The designer knows that all the support not received by her party will be distributed among other parties. Some of those will be opposition parties and some might be friendly parties. But because parties can broker agreements, electoral alliances, fusions and mergers, the designer only takes into consideration the support for her own party and assumes that all other voters will support a single opposition party. That assumption can also be relaxed later on, but the safest bet (risk averse) for the designer is *to maximize how her votes will buy seats in parliament* assuming that all the opposition votes will be unified. In that sense, the designer adopts a maximin strategy.⁵

True, the support for one's own party might also be subjected to variables that might decrease it or increase it in the future. Voters are not captive audiences. They change their preferences over time. For that reason, the shorter the time span between the time the designer learns her level of support among the electorate, chooses the electoral rules and the first election is held, the more likely the designer will be able to make better use of her electoral design monopoly. The *electoral designer* chooses a district magnitude (M) such that:

⁵ As defined by the Merriam Webster's dictionary, Maximin is "the largest of a set of minimum possible gains each of which occurs in the least advantageous outcome of a strategy followed by a participant in a situation governed by the theory of games."

$$\mathbf{DM = Round Down [100 / V]^6}$$

Where V is the % of votes that the *electoral designer* expects her party to obtain in the first election. The result of the division needs to be rounded down to the integer without decimals (because district magnitude can only be expressed in whole numbers). Chart 4.1 shows a graphic depiction of the rationale that informs an electoral designer that knows fairly well the electoral support for her party but does not know how many other parties will be competing and the support for the other parties. When the electoral support for the designer's party is very small (10% or less), the designer has incentives to create large districts. The larger the district, the more likely the designer's party is to clinch a seat. As the support for the designer's party increases, the designer has incentives to reduce the district magnitude. This makes sense when we think of a designer party that commands a homogenous electoral support safely over 50%. If the designer chooses a majoritarian system (i.e. FPTP), the designer's party will win most, if not all, seats.⁷ The extreme cases are mostly trivial. The interesting cases are those when the designer knows that her party commands significant electoral support but that support is less than 50%. That rules out FPTP as the electoral formula of choice.⁸ The calculations over what electoral formula is most efficient in maximizing the number of seats that the designer can clinch with her electoral support become very important when the designer has strong support but falls short of being an outright majority. Chart 4.1 is a depiction of the formula stated above. It assumes, for simplicity purposes, that there will only be one opposition party. When the electoral designer believes that there will be more than opposition party, other considerations come into play, such as what percentage of the electoral support not captured by the designer's party will each one of the opposition parties get and, ultimately, how many opposition parties will compete. But following a maximin strategy—assuming that all the votes her party does not get will go to a single opposition party—the designer can identify the most convenient district magnitude given the level of electoral support for her party.

⁶ An error term may be included in the formula to account for the possibilities of ties. For example, without ϵ , if the *designer* expects to get 1/4 of the vote and all the remaining votes go to a single opposition party, the distribution of votes would be 75%-25% and the last seat would be a toss-up between the *designer's* party and the opposition. With a positive value of ϵ , the *designer* will prefer $M=3$.

⁷ True, the designer is also concerned about legitimacy and constraint by the need to give the opposition a chance of winning some seats in parliament. For that reason, the designer, even when knowing that she commands majority support, may choose to adopt a proportional representation system that will give additional incentives to the opposition to participate. This is discussed at length in Chapter 1.

⁸ True, it might be that with a divided opposition the electoral designer's party still commands majority support, but in choosing $DM = 1$, the electoral designer will create incentives for the opposition to form a coalition. Risk-averse electoral designers who know their level of electoral support to be below 50% will likely stay away from FPTP.

CHART 4.1 HERE

The formula shown above and depicted in Chart 4.1 seeks to maximize the number of seats that the electoral designer can buy in parliament assuming her electoral support and that of the single opposition party to remain constant.⁹ If the *electoral designer* is expected to obtain 21% of the vote, the above equation predicts a value slightly higher than 4.7. Thus, the *designer* will choose a district magnitude of four (4). In that manner, the *designer* would be guaranteed at least one (1) seat in that district: with 21% of the vote, the designer will be able to buy at least 25% of the seats. This is so regardless of how many other parties and candidates compete and regardless of the electoral preferences of the rest of the population. The worst possible outcome for the designer's party is that it will get 25% of the seats with 21% of the vote. Divisions among the opposition might actually increase the share of seats for the designer's party, but the worst it can do with 21% of the votes is to get 25% of the seats given a DM of 4.

Table 4.1 presents a simulation of seat distribution assuming that the designer's party commands 21% support of the electorate. I am assuming that there is only one district and that, when there are several opposition political parties, votes are equally split.¹⁰ The threshold to win the next seat also depends on the electoral formula allocation rule. The d'Hondt rule was widely used in Chile before 1973 and was also the rule of choice for the electoral designer. For that reason, I conduct all the simulations using that rule.¹¹

When there is only one opposition party—that obtains the remaining 79% of the vote—the designer's party is better off with a 4-seat distribution. With 21% of the votes, the designer's party gets 25% of the seats (a net gain of 4%). Any other DM would give the electoral designer's party fewer seats than its share of the electoral vote. However, when the number of opposition parties increase, the designer's calculations get more complicated. Assuming two opposition parties with roughly the same electoral support, it might look as if the designer is better off choosing a 3-seat district. Yet, a slightly different distribution of support for the 2 opposition parties (44% and 33% respectively, for example) would leave the designer's party with no seats. Conversely, if 4 parties equally split the 79% opposition vote, the designer could do better by choosing a DM smaller than 4. Yet, if the designer sets DM at less than 4, the opposition parties will have incentives to merge and face the election as new, unified parties. Because the electoral designer cannot be certain about how many opposition parties will compete in the election,¹² by setting DM at 4, she guarantees her party at least 25% of the seats regardless of how the 79% of the opposition votes get distributed among the N number of opposition parties.

⁹ Also, for simplicity purposes, I am assuming perfect electoral preference homogeneity across all possible districts. In the next chapter I discuss how the ability to draw district boundaries helps the designer respond to electoral heterogeneity across different regions.

¹⁰ Although this assumption might seem unjustified, it portrays the worst-case scenario for the designer's party. If the opposition votes are not equally split between the 'n' opposition parties, the seat distribution outcome resembles the situation with very few opposition parties. If there are three opposition parties (49%, 15% and 15% respectively), the simulation with 1 opposition party is the one that closest resemble that situation. If there are three opposition parties splitting the vote (40%, 30% and 9% respectively), that simulation would look identical as the situation with two opposition parties splitting the vote equally.

¹¹ The basic difference between the d'Hondt, Saint-Laguë and Modified Saint-Laguë is that d'Hondt uses 1,2,3,4, etc as divisors, Saint-Laguë uses 1, 3, 5, 7, etc and Modified Saint-Laguë uses 1.4, 3, 5, 7, etc.

¹² The number of parties that compete in an election is not necessarily and exogenous variable. The larger the DM magnitude, the more likely that more parties will compete. When the DM is very small, existing parties will have incentives to form electoral coalitions. Yet, DM **does not determine** the number of parties. Therefore, it would be unwise for the electoral designer to assume that she can determine how many opposition parties will compete.

Table 4.1 Most Convenient DM for Designer's Party (assuming 21% of electoral support)

Possible Scenarios		Number of Seats in each district									
		1	2	3	4	5	6	7	8	9	10
# of Opposition Parties w/equal share of votes	Votes for each party % ¹³	Number of Seats for Designer's Party (21% of votes) (Assuming d'Hondt seat allocation formula)									
1 Opposition Party	79	0	0	0	1 (25%)	1 (20%)	1 (17%)	1 (14%)	1 (13%)	2 (22%)	2 (20%)
2	39.5	0	0	1 (33%)	1 (25%)	1 (20%)	1 (17%)	1 (14%)	2 (25%)	2 (22%)	2 (20%)
3	26.3	0	0	0	1 (25%)	1 (20%)	1 (17%)	1 (14%)	2 (25%)	2 (22%)	2 (25%)
4	19.8	1 (100)	1 (50%)	1 (33%)	1 (25%)	1 (20%)	2 (33%)	2 (29%)	2 (25%)	2 (22%)	2 (20%)
5	15.8	1 (100)	1 (50%)	1 (33%)	1 (25%)	1 (20%)	2 (33%)	2 (29%)	2 (25%)	2 (22%)	2 (20%)
6	13.2	1 (100)	1 (50%)	1 (33%)	1 (25%)	1 (20%)	1 (17%)	1 (14%)	2 (25%)	2 (22%)	2 (20%)
7	11.29	1 (100)	1 (50%)	1 (33%)	1 (25%)	1 (20%)	1 (17%)	1 (14%)	1 (13%)	2 (22%)	2 (20%)
8	9.875	1 (100)	2 (100)	1 (33%)	2 (50%)	2 (40%)	2 (33%)	2 (29%)	2 (25%)	2 (22%)	3 (30%)
9	8.778	1 (100)	2 (100)	2 (67%)	2 (50%)	2 (40%)	2 (33%)	2 (29%)	2 (25%)	2 (22%)	2 (20%)
10	7.9	1 (100)	2 (100)	2 (67%)	2 (50%)	2 (40%)	2 (33%)	2 (29%)	2 (25%)	2 (22%)	2 (20%)

The worst outcome with a 4-seat PR allocation for the designer party will still result in 25% of the seats. This is so regardless of what everyone else does. No other DM guarantees the designer 25% of the seats under any vote distribution for the opposition. Choosing a DM of 4 is a maximin strategy for the designer under the worst-case scenario. If the designer is fairly certain about her party's expected electoral support, a risk-averse designer that expects 21% of the vote for her party will choose a DM of 4.

In the case of the electoral designer in Chile, the expectation was that the electoral designer's party would obtain roughly 43% of the vote in the 1989 election, mirroring what Pinochet had obtained in the 1988 plebiscite. Table 4.2 shows the seat distribution (assuming the d'Hondt electoral allocation formula) for the designer's party given different number of opposition parties equally splitting the opposition vote. If the designer believes that the opposition will be divided equally between two parties, the most convenient DM is 1. Yet, if the designer sets DM at 1, the opposition will have incentives to face the election as a unified party. Moreover, even if the opposition parties fail to merge into a single electoral coalition, voters could successfully coordinate their opposition to the designer's party. Short of a clear electoral majority, choosing DM of 1 is all but a suicide for the electoral designer and her party.

¹³ Assuming that when there is more than 1 party, all parties will split the vote equally.

The most convenient district magnitudes for the designer's party when there is only one opposition party concentrating the 57% support for the opposition are 2, 4 or 6. With any one of those DM, the designer's party could buy 50% of the seats with her 43% of electoral support. When the number of opposition parties increase—but they continue to split the opposition vote equally among the 'n' opposition parties—the electoral designer's party is better off (or at least as good as) with a DM of 2 than with a DM of 4 or 6.¹⁴ In addition, if the electoral designer is also concerned about the number of parties that the electoral system will create incentives for, she will not be indifferent about any of those three DM. If the designer favors a system with fewer parties, she will opt for a DM of 2. If instead, the designer prefers to see more rather than fewer parties, she will select a larger DM.

In the previous chapter I argued that the designer chose not to adopt a single member district system because it wanted to increase the representation for his party and believed that his party would be in the minority. Yet, wanting to provide representation to parties other than the majority is not inconsistent with wanting to reduce the total number of parties that exist in the country. As discussed in Chapter 3, while on the one hand the designer wanted to reduce the number of parties that existed, on the other it wanted to maximize the number of seats for his party. In cases where the designer is indifferent about the number of parties that compete in the election and simply seeks to maximize the number of seats that her party's electoral representation can buy, the choice of DM of 2 is still a weakly dominant strategy for the designer. With a DM of 2, the designer will always get at least the same number of seats under DM=2 than under a DM=4 or 6.

¹⁴ By dividing the opposition vote equally among all opposition parties I make the calculations simpler. However, if one complicates the electoral breakdown for opposition parties, the relevant question remains whether the designer's party will command plurality support or whether it will be defeated in a one-to-one competition by any single opposition party. If so, the simulations will look fairly similar to that of 1 opposition party concentrating the vote. If not, the simulations will resemble those when few opposition parties equally split the vote.

Table 4.2 Most Convenient DM for Designer's Party (assuming 43% of Electoral Support)

Possible Scenarios		Number of Seats in each district									
		1	2	3	4	5	6	7	8	9	10
# Opposition Parties w/equal share of votes	Votes for each party %	Number of Seats for Designer's Party (43% of votes) (Assuming d'Hondt seat allocation formula)									
1 Opposition Party	57	0	1 (50%)	1 (33%)	2 (50%)	2 (40%)	3 (50%)	3 (43%)	3 (38%)	4 (44%)	4 (40%)
2	28.5	1 (100)	1 (50%)	1 (33%)	2 (50%)	1 (20%)	3 (50%)	3 (43%)	4 (50%)	5 (56%)	5 (50%)
3	19	1 (100)	2 (100)	2 (66%)	2 (50%)	2 (40%)	3 (50%)	4 (57%)	4 (50%)	4 (44%)	4 (40%)
4	14.25	1 (100)	2 (100)	3 (100)	3 (75%)	3 (60%)	3 (50%)	3 (43%)	4 (50%)	5 (56%)	5 (50%)
5	11.4	1 (100)	2 (100)	3 (100)	3 (75%)	3 (60%)	3 (50%)	3 (43%)	3 (38%)	5 (56%)	5 (50%)
6	9.5	1 (100)	2 (100)	3 (100)	4 (100)	4 (80%)	4 (67%)	4 (57%)	4 (50%)	4 (44%)	4 (40%)
7	8.14	1 (100)	2 (100)	3 (100)	4 (100)	5 (100)	5 (83%)	5 (71%)	5 (63%)	5 (56%)	5 (50%)
8	7.125	1 (100)	2 (100)	3 (100)	4 (100)	5 (100)	5 (83%)	5 (71%)	5 (63%)	5 (56%)	5 (50%)
9	6.33	1 (100)	2 (100)	3 (100)	4 (100)	5 (100)	6 (100)	6 (86%)	6 (75%)	6 (67%)	6 (60%)
10	5.7	1 (100)	2 (100)	3 (100)	4 (100)	5 (100)	6 (100)	7 (100)	7 (88%)	7 (78%)	7 (70%)

With the formula discussed above, the *designer* can maximize the number of seats her party can obtain in any given district given her electoral weight (percentage of votes). In Chile, the preferred M was two (2). This indicates that the *designers* expected to obtain a minority of the vote in the first elections (and presumably thereafter) but also expected his party to obtain more than 33 1/3%. If the *designer* expected to obtain less than 33 1/3%, he would have not chosen an M=2. Instead, he would have settled for a larger M. In an M=2 environment, with less than 33 1/3% support and anticipating successful coordination by the opposition (as it actually happened in 1989 and thereafter), the pro-Pinochet parties would have had no parliamentary representation in almost all districts. Valenzuela and Siavelis (1991) make precisely that point. They conclude that the electoral law in Chile is highly volatile and that falling below the 33 1/3% threshold is the kiss of death for conservative parties. Historical evidence (Cruz Coke 1984) and the results of the 1988 plebiscite indicating that the pro-Pinochet forces could safely aspire to obtain about 40% of the vote, triggered the adoption of the binomial electoral system at the end of the Pinochet regime before the 1989 presidential and parliamentary elections.

Insurance Against Opposition Majorities

The logic that informs the designer can also be understood as an insurance mechanism. If the designer is not as certain about the electoral support for her party, she might want to use her monopoly power to determine a district magnitude that would make it very difficult for any party to easily win control of a majority of seats in every district. Simply put, if the designer does not know who is going to win, she might reasonably stay away from choosing a district magnitude that will result in a win-or-lose-all game. Single member districts represent an extreme example of that trade off: you either win 100% of the seats or lose 100% of the seats. In the previous chapter I argued that the electoral designer stayed away from FPTP precisely because of the expectation that the designer's party would get fewer votes than the opposition. PR arrangements mediate the win-or-lose-all game for the designer's party. When there are many seats, you can still win some seats even if you get fewer votes than the opposition. Yet, the idea is not simply to win some votes, but to have enough seats to make you a player in parliament. Because your party needs enough votes to block legislation or to prevent constitutional changes that require super-majorities, there is a critical threshold in the number of seats that will make your party's congressional representation a player in parliament.

By choosing a DM=2, the Chilean electoral designer made it very difficult for any single party to unilaterally secure a majority control of the elected seats in each district. As Chart 4.2 and Table 4.3 show, when DM=2, a party needs to obtain $66 \frac{2}{3}\% + 1$ of the vote to secure both seats in that district regardless of what everyone else does. If there is more than 1 opposition party, the threshold goes down, as the opposition vote will be split among different parties. When the number of opposition parties and the distribution of preferences among them is unknown (or one assumes that there will be only one opposition party), a formula can be derived to identify the threshold required by the majority party to win a commanding control of the seats in one district regardless of what other parties do. If the designer expects his party to be the minority party, the formula that, assuming d'Hondt, will give the majority party a commanding majority of the seats in every district is:

$$\% \text{ Votes} < (100DM + 2) / (2DM + 2) \text{ when DM is even and } < 50\% \text{ when DM is odd}^{15}$$

DM is the number of seats in every district (district magnitude). When the number of seats is odd, a party that obtains more than half of the votes will guarantee more than half of the seat in that district regardless of how many other parties compete and how the remaining votes are split. Chart 4.2 shows the resulting values for district magnitudes varying from 1 to 30.¹⁶ When the number of seats is even, the threshold for majority control will decrease as the DM increases. The highest threshold therefore exists when DM=2. A party must obtain $66 \frac{2}{3}\% + 1$ of the votes to secure both seats—which is the only way to have majority control in that district—and not worry about what everyone else is doing. Again, if the opposition vote is split between

¹⁵ By rounding up DM/2 we can bring the DM to next integer, thus if DM/2 =3.5, we round it up to 4. For example, in a district with DM=7, 4 is the majority.

¹⁶ Again, assuming a d'Hondt electoral allocation formula. Under Saint-Laguë, as Table 4.3 shows, the threshold is 68.2% for DM=2. Given that the Saint-Laguë divisors are 1, 3, 5, 7., etc, that value is calculated with the following formula, find an X such that: $(3) X = (100 - X)$ Given that in Modified Saint-Laguë divisors are 1.4, 3, 5, 7., etc, that value is calculated with the following formula, find an X such that: $X (3) = (100 - X) (1.4)$

more 2 parties or more, the threshold goes down.¹⁷ This is precisely what the electoral designer did in Chile after the 1988 plebiscite and months before the 1989 election. Departing from the use of larger and varying district magnitudes from 1925 until 1973, the electoral designer opted for a fixed district magnitude of 2.

Some authors have focused on emphasizing the claim that the ultimate objective was to over represent conservative parties and under represent leftist parties: “The use of two-member districts was expected to create overrepresentation for the second largest electoral block. Support of 33.3% + 1 of the voters in the districts for the Right — and even less, if there was a split between the Center and the Left contestants — would have been translated into Rightist representation equal to that of the larger Center-Left block. Moreover, in this district magnitude, no representation of the third largest block — the Marxist-Left — was expected to emerge” (Rahat and Sznajder 1998: 430). Or as Oppenheim puts it, “the parties of the opposition had to work within the strange electoral rules of the Pinochet regime, which were so structured that, with one-third of the popular vote, the forces favoring Pinochet would win half of the legislative seats” (1991: 10). But by forming an alliance with the centrist PDC, the left—or at least the PS—successfully achieve significant presence in the new parliament. Moreover, in the most recent parliamentary elections (December of 1997), the Concertación obtained 57.5% of the seats in the Chamber of Deputies with slightly more than 50% of the vote, while the conservative coalition obtained 39.2% of the seats with 36.3% of the vote (this is discussed at length in Chapter 5).

Rather than seeking to exclusively over represent the conservative parties, the electoral designer chose a DM of 2 to make it more difficult for any single party to achieve majority control of the seats in every district. More than designed to over represent the right, the system seems to have been designed as an insurance mechanism against majorities. As Table 4.3 and Chart 4.3 show, a DM of 2 makes more difficult than any other district magnitude under D’Hondt—or Saint Laguë or Modified Saint-Laguë for that matter—for any party to unilaterally pass the threshold that will guarantee it a majority control of the seats in every district.

¹⁷ The threshold when there is more than one opposition party can be easily calculated. Rather than using 100 in the numerator, one should use $(100 - \hat{O} \%$ votes parties ranked 3rd or lower). Thus, the new formula becomes: $[(100 - \hat{O} \%$ votes parties ranked 3rd or lower)(N) + 2] / (2N + 2)

*******Chart 4.2 *******

Table 4.3 Votes and Seats Required to Command Majority Control of District's Parliamentary Delegation

# of seats (District Magnitude)	# of seats needed to command majority control in that district	% of seats needed to command majority control in that district	Threshold (quota) for first and every additional seats	% votes needed for majority control of seats in that district	% votes needed for majority control of seats in that district
			D'Hondt Allocation Rules		Saint Lague* Allocation Rules
(a)	(b)	(c)	(d)	(e)	(g)
1	1	100	50.00 + 1	50.0 + 1	50.0 + 1
2	2	100	33.33 + 1	66.7 + 1	68.2 + 1
3	2	66.67	25.00 + 1	50.0 + 1	50.0 + 1
4	3	75	20.00 + 1	60.0 + 1	62.5 + 1
5	3	60	16.67 + 1	50.0 + 1	50.0 + 1
6	4	66.67	14.29 + 1	57.1 + 1	58.3 + 1
7	4	57.1	12.50 + 1	50.0 + 1	50.0 + 1
8	5	62.5	11.11 + 1	55.6 + 1	56.3 + 1
9	5	55.6	10.00 + 1	50.0 + 1	50.0 + 1
10	6	60	9.09 + 1	54.6 + 1	55.0 + 1
11	6	54.5	8.33 + 1	50.0 + 1	50.0 + 1
12	7	58.3	7.69 + 1	53.9 + 1	54.2 + 1
13	7	53.8	7.14 + 1	50.0 + 1	50.0 + 1
14	8	57.1	6.67 + 1	53.3 + 1	53.6 + 1
15	8	53.3	6.25 + 1	50.0 + 1	50.0 + 1

Information Shortcut: Choosing d'Hondt over Alternative Seat Allocation Rules

Prior to 1973, Chile experienced with different DM for its senatorial and Chamber of Deputies elections, but whenever DM was greater than 1, the same seat allocation rule was used. All Chilean PR elections in the 20th century used d'Hondt as the seat allocation rule. The monopoly designer overlooked alternative seat allocations rules in the 1980 Constitution and the Organic Laws primarily because the designer used past experience as an information shortcut and failed to discuss, analyze and evaluate the effect that alternative seat allocation rules would have had. The designer, however, departed from the prior tradition of varying district magnitude across districts as the primary two motivations behind the adoption of the 2-seat across the board constituency was a maximin strategy for the designer's party and to institute a reductive effect in the number of parties competing in elections.

For the last election under the 1833 Constitution, the 37-member Senate was comprised of 23 districts. A majority of districts elected one senator. Elections were held every three years but senators served for 6-year terms. In 1924 (the last election under the 1833 Constitution), Senate elections were held in 19 districts¹⁸ for a total of 25 seats. The remaining 12 senators had

¹⁸ Atacama, Coquimbo, Aconcagua, Valparaiso (2 seats), Santiago (4 seats), Colchagua, Curicó, Talca (2 seats), Linares, Maule, Ñuble, Concepción (2 seats), Arauco, Bío-Bío, Malleco, Cautín, Valdivia, Llanquihue and Chiloé

been elected in 1921 in 11 provinces.¹⁹ Eight of the 22 provinces (Coquimbo, Aconcagua, Valparaíso, Santiago, Colchagua, Maule, Ñuble and Concepción) elected senators every three years. The remaining 16 provinces elected a Senator every six years. A majority of the provinces elected just one Senator in every election, but Valparaíso, Talca and Concepción elected two Senators in every one of the two six-year cycles. Santiago elected four and two respectively. Thus if we consider each province as a separate district for each senate election cycle, there were 30 senatorial districts before 1925, 5 of which elected more than one senator concurrently. Therefore, 83% of Chile's senatorial districts were single member units while the remaining 17 were 2-member (13%) and 4-member (3%) districts before 1925.

The pre-1925 Chamber of Deputies was comprised of 118 members representing 40 districts. Because there was a constitutional provision (article 19) in the 1833 Constitution to assign one seat in the Chamber of Deputies for every 20,000 people (and an additional seat for every fraction over 10,000 inhabitants per department), the size of the Chamber was bound to increase over time. But the increase was designed to reflect the proportional growth in the population of the different departments. The 1925 Constitution changed the composition of the Senate and the Chamber of Deputies. Contrary to the 1833 Constitution, the 1925 Constitution set a fixed number of Senators for every senatorial district and abandoned the principle of single member districts to adopt PR for Senate elections. The 1925 Constitution kept a varying district magnitude for the Chamber of Deputies. The Senate was comprised of nine 5-member districts until 1969 when a 10th 5-member district was created.

Table 4.4. Size of the Senate and Chamber of Deputies, 1830-1860

Period	1831-34	1834-37	1837-55	1855-58	1858-61
Senate	15	20	20	20	20
Chamber of Deputies	50	55	55	58	72

Source: Urzúa Valenzuela 1992: 79.

The 147 (150 after 1969) members of the Chamber of Deputies were elected representing 28 districts (29 after 1969). The number and district boundaries were determined after the 1925 Constitution was approved and were slightly modified before the 1933 and 1937 parliamentary elections, when new districts were created and others were assigned additional deputies. Those changes were mandated by constitutional article 37 that stated that there should be one deputy for every 30,000 inhabitants (or additional reminders of 15 thousand). After 1937 no new allocation of seats was made until 1969 when a new district was created in the southern province of Magallanes. However, re-allocation of seats based on provincial population changes was not made despite the constitutional mandate.

In part this was due to the Constitutional requirement that one deputy should represent every 30,000 inhabitants. Chile had 8.9 million inhabitants in 1970. That would have called for a 296-member Chamber of Deputies, almost twice as large as the one it existed then. Alternative solutions (such as increasing the number of inhabitants represented by one deputy) would have

¹⁹ Tarapacá, Antofagasta, Coquimbo, Aconcagua, Valparaíso, Santiago (2 seats), O'Higgins, Colchagua, Maule, Ñuble and Concepción

properly addressed the issue of mal apportionment. But by having passed on the need to keep up with population changes in the 1940's and 1950's, Chile made virtually to accommodate district magnitude in the Chamber of Deputies to the constitutional mandate. In 1972, President Allende, in a speech to his UP coalition, suggested that the constitution should be modified so that there should be one Deputy for every 70,000 inhabitants (with a threshold of 35,000 for additional deputies).

Table 4.5. Size of the Chamber of Deputies, 1900-2000

Period	1900-12	1912-26	1926-33	1933-37	1937-69	1969-73	1990-2000
# of Deputies	94	118	132	143	147	150	120

Source: Valencia, 1986.

The 1925 Constitution (Articles 40 and 41) established nine 5-member senatorial districts but did not specify district boundaries or the seat allocation electoral formula. Instead, the Constitution specified that those matters should be determined by a simple law, enacted by Congress and signed by the president. An accompanying law was passed in 1925 that established the boundaries of the 9 senatorial districts. Because the constitution had no provision for redistricting, the same districts were kept until the 1969 constitutional reform that created a 10th district in the south. Those 10 districts remained unmodified until 1973 military coup.

Table 4.6 shows the level of over and under representation after the 1960 and 1970 national census for senatorial districts. Senatorial District #4 (Province of Santiago) was most severely under represented in 1960 and even more so by 1970. Although Senatorial District #7 (Ñuble, Concepción and Arauco) was also slightly under represented, all other senatorial districts were over represented. The over representation was not randomly distributed among all provinces. Northern provinces (Senatorial Districts 1 and 2) and far south provinces (9 and 10) were more heavily over represented than the rest. Higher levels of mobilization and organization of northern mining workers in 1925 might help explain the over representation for northern districts. The 1925 Constitution was adopted under president Arturo Alessandri (1920-25, 32-38), a former senator from the northern province of Tarapacá (elected under the 1833 Constitution). It followed a long and enduring political battle between traditional oligarchic parties that controlled the Chilean senate and president Alessandri, who had been elected on a populist and working class oriented platform. In the end, Alessandri prevailed and a new Constitution that reflected the new balance of power was adopted (Blakemore 1993).

The creation of the 10th senatorial district in southern Chile before the 1969 elections²⁰ responded to geo-political strategic considerations rather than to improve an equal proportional representation in the senate to all the provinces. Together, the six provinces that made up old senatorial district 9 were not under represented. Politically, those provinces were a stronghold of the center and left. In the 1969 election, the 5 senators elected in district 9 and 10 represented the same parties: one from the National Party, one from the Radical Party, one from the Socialist Party and two from the Christian Democratic Party. In the 1973 elections, the Senators elected in the 10th district represented the PS, PDC (2), PC and PN. If anything, this electoral reform

²⁰ Law 16,672 enacted on October 2, 1967 modified the 1925 constitutional provision for 9 senatorial districts.

avored the parties of the left. They proportionally elected more Senators from there than from other provinces.

By 1960 demographic changes had transformed the old structure of society. The population was more urban and there was growing migration from the rural south and central Chile to the Santiago metropolitan area. In 10 years from 1960 to 1970, the under representation of Senatorial District 4 (Santiago) worsened as it went from 10 fewer seats than it should under pure proportional representation in 1960 to 11.4 fewer seats in 1970. Conversely, the remaining provinces were slightly more over represented in 1970 than they were in 1960. Yet, the 1925 Constitution did not establish true proportionality as the principle to guide districting in senate elections. Instead, the Constitution stated that districts should be drawn to reflect “the characteristics and interests of the diverse regions of the country” (Article 40).

Table 4.6. Mal Apportionment in the Senate 1960-1970

Senatorial District #	Province #	Population		Senate Seats		# of seats if assigned strictly proportional to the population		Difference between actual seats and seats under strict proportional representation rules	
		1960	1970	1960	1970	1960	1970	1960	1970
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
1	1-2	338,289	426,887	5	5	2.1	2.2	2.9	2.8
2	3-4	425,226	492,831	5	5	2.6	2.5	2.4	2.5
3	5-6	75,8053	899,598	5	5	4.7	4.6	0.3	0.4
4	7	2,439,425	3,230,790	5	5	15.0	16.4	-10.0	-11.4
5	8-9	417,909	475,386	5	5	2.6	2.4	2.4	2.6
6	10-13	563,042	619,130	5	5	3.5	3.1	1.5	1.9
7	14-16	864,620	1,059,837	5	5	5.3	5.4	-0.3	-0.4
8	17-19	737,672	793,407	5	5	4.5	4.0	0.5	1.0
9 & 10 (after 1969)	20-25	781,607	886,892	5	10	4.8	4.5	5.2	5.5
Total	25	7,325,843	8,884,758	45	50	45.0	45.0	0.0	0.0

Number of inhabitants to secure one senate seat under strict proportionality in 1960: 162,797; in 1970: 197,439. Source: Instituto Nacional de Estadística 1971, Dirección de Estadística y Censo 1964.

In many countries with bicameral legislatures, certain provinces, regions or states are over represented in one chamber for geopolitical reasons. Most federal republics and a number of Latin American countries as well, provide over representation to certain regions on historical or geopolitical grounds. The effort, however, is made to correct for the under representation of larger provinces in one chamber by enforcing strict proportional representation rules in the other Chamber. That was not the case in Chile before 1973. The 29 Chamber of Deputies districts were mostly comprised of individual provinces, except in the case of Santiago (divided in 4 districts) and Ñuble (2 different districts). Magallanes, on the other hand, was a part of District 26 until it was made an independent district in 1969 (law 16,672 enacted on October 2, 1967). Besides the creation of District 27 in 1967, no reapportionment was made between 1937 and 1973. Because of demographic changes, the fixed seat distribution in place radically altered the intended proportional representation that different provinces should have enjoyed in the Chamber of Deputies.

Table 4.7. Chilean Provinces and Chamber of Deputies Districts, 1973

Province	Tarapacá	Antofagasta	Atacama	Cochimbo	Aconcagua	Valparaíso	Santiago	Santiago	Santiago	Santiago	Ohiggins	Colchagua	Curico	Talca	Maule	Linares	Nuble	Nuble	Concepcion	Arauco	BioBio	Malleco	Cautin	Valdivia	Osorno	Llanquihue	Chiloe	Aysen	Magallanes	Total
Prov #	1	2	3	4	5	6	7	7	7	7	8	9	10	11	12	13	14	14	15	16	17	18	19	20	21	22	23	24	25	25
District #	1	2	3	4	5	6	71	72	73	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	27
# Seats	4	7	2	7	3	12	18	5	5	5	6	4	3	5	3	4	3	5	9	2	4	6	10	5	3	3	3	2	2	150

Source: Instituto Nacional de Estadística 1971, Dirección de Estadística y Censo 1964.

Not surprisingly, the Santiago Province was most negatively affected by under representation. Large migrations from rural areas to the Santiago Metropolitan Area starting in the late 50s and consolidating between 1960 and 1970 radically worsened Santiago's under representation in the Chamber of Deputies. The 4 districts in Santiago elected a combined number of 37 deputies, but its population in 1960 would have given Santiago 49 Deputies if seats were assigned strictly on proportional grounds. By 1970 the situation had worsened, under a strict proportional allocation of seats, Santiago should have been assigned 55 seats. Other rapidly growing urban areas, such as Valparaíso and Concepción were also marginally under represented. The rural southern region (Malleco and Cautín) and the mining northern provinces (Antofagasta) were the most over represented areas. Yet, the over representation of most provinces did not directly favor, as it might appear, parties that were weak in metropolitan areas and strong in rural areas (usually conservative parties). Because the over representation in most provinces meant that those provinces elected 3 or 4 deputies rather than 2 or 3, parties with a small but significant presence in those provinces benefited from having more seats assigned to provinces other than Santiago. Only 4 of the 29 districts (Atacama, Arauco, Aysén and Magallanes) had a district magnitude of 2 before 1973.²¹ Overall, the mal apportionment in the Chamber of Deputies districts hindered Santiago as that province was heavily under represented. Yet in over represented provinces, minority parties benefited from the mal apportionment, as they needed fewer votes to secure representation in the Chamber in those provinces.

Within the Province of Santiago, mal apportionment dramatically worsened throughout the 1960s. For the 1960 census, the combined four districts in the Santiago province (7.1, 7.2, 7.3 and 8) were under represented by 12 seats (they had 37 seats and should have had 49), but the under representation was not uniformly divided among all the districts. District 7.2 and 7.3 were significantly more under represented than District 8 (Santiago's rural area). In addition, District 7.1 (Santiago's downtown and older neighborhoods) was in fact over represented. Most of Santiago's under representation came at the expense of newly populated neighborhoods in Districts 7.2 and 7.3 (southern and northern metropolitan area). In particular district 7.3 suffered the most from mal apportionment.

²¹ Those districts are evidence that the distortional effect of the 2-seat electoral system was known in Chile before 1973.

Table 4.8. Mal Apportionment in the Chamber of Deputies 1960-1970

Province Number and Name	District #	Population		# of Seats		# of seats if assigned strictly proportional to the population		Difference between actual seats and seats under strict proportional representation		
		1960	1970	1960	1970	1960	1970	1960	1970	
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)
1	Tarapacá	1	123,070	174,981	4	4	2.5	3.0	1.5	1.0
2	Antofagasta	2	215,219	251,906	7	7	4.3	4.3	2.7	2.7
3	Atacama	3	116,235	152,616	2	2	2.3	2.6	-0.3	-0.6
4	Coquimbo	4	308,991	340,215	7	7	6.2	5.7	0.8	1.3
5	Aconcagua	5	140,543	161,262	3	3	2.8	2.7	0.2	0.3
6	Valparaíso	6	617,510	738,336	12	12	12.4	12.5	-0.4	-0.5
7	Santiago	7.1	771,837	724,646	18	18	15.5	12.2	2.5	5.8
7	Santiago	7.2	470,283	697,955	5	5	9.4	11.8	-4.4	-6.8
7	Santiago	7.3	930,320	1,483,021	5	5	18.7	25.0	-13.7	-20.0
7	Santiago	8	266,985	325,168	5	5	5.4	5.5	-0.4	-0.5
8	O'Higgins	9	259,400	306,870	6	6	5.2	5.2	0.8	0.8
9	Colchagua	10	158,509	168,516	4	4	3.2	2.8	0.8	1.2
10	Curico	11	105,802	114,654	3	3	2.1	1.9	0.9	1.1
11	Talca	12	206,154	232,210	5	5	4.1	3.9	0.9	1.1
12	Maule	13	79,736	82,863	3	3	1.6	1.4	1.4	1.6
13	Linares	14	171,350	189,403	4	4	3.4	3.2	0.6	0.8
14	Ñuble	15	103,225	96,553	3	3	2.1	1.6	0.9	1.4
14	Ñuble	16	132,414	220,409	5	5	2.7	3.7	2.3	1.3
15	Concepción	17	539,521	644,091	9	9	10.8	10.9	-1.8	-1.9
16	Arauco	18	89,460	98,784	2	2	1.8	1.7	0.2	0.3
17	BíoBío	19	168,718	193,508	4	4	3.4	3.3	0.6	0.7
18	Malleco	20	174,300	177,089	6	6	3.5	3.0	2.5	3.0
19	Cautín	21	394,654	422,810	10	10	7.9	7.1	2.1	2.9
20	Valdivia	22	259,794	277,934	5	5	5.2	4.7	-0.2	0.3
21	Osorno	23	144,005	160,159	3	3	2.9	2.7	0.1	0.3
22	Llanquihue	24	167,671	199,304	3	3	3.4	3.4	-0.4	-0.4
23	Chiloé	25	99,211	111,194	3	3	2.0	1.9	1.0	1.1
24	Aysén	26	37,770	48,858	1	2	0.8	0.8	0.2	1.2
25	Magallanes	26/27*	73,156	89,443	0	2	1.5	1.5	-1.5	0.5
	Total	27	7,325,843	8,884,758	147	150	147	150	0.0	0.0

Number of inhabitants to secure one seat under strict proportionality in 1960: 49836; in 1970: 59232. * A new district was created for Magallanes in 1969.

Source: Instituto Nacional de Estadística 1971, Dirección de Estadística y Censo 1964.

Under the three Constitutions used throughout the 20th century, the range of DM in congressional elections varied from a low of 1 (most senatorial elections under the 1833 Constitution) to a high of 18. However, since 1925, all PR elections used d'Hondt as the only seat allocation formula. No alternative seat allocation mechanisms were introduced or used in Chile since the 1925 Constitution was approved. In the public debate over the 1980

Constitutions—the records of the Ortúzar Commission and the Council of State—there is no evidence of alternative seat allocation rules being discussed. For all practical matters, we can safely conclude that the electoral designer used past experience as an information shortcut to select d’Hondt as the seat allocation to be used in elections. As shown previously (Chart 4.2), had the designer chosen Saint-Laguë or Modified Saint-Laguë, the objective of using the DM as an insurance mechanism against the formation of commanding majorities in the Lower and Upper Chamber would have been better served. Yet, by sticking with tradition and adopting d’Hondt as the seat allocation formula, the designer overlooked an effective tool to better achieve his objective.

While using the same seat allocation rule than in the past, the electoral designer diverted from all past electoral arrangements in adopting a fixed across-the-board district magnitude for the Senate and Chamber of Deputies. In so doing, the designer showed a capacity to be innovative. As it turns out, the decision to fix the district magnitude at 2 represented one of the most effective rules entrenched in the Organic Laws to favor the electoral chances of the designer’s party. The choice of a standard DM of 2 turned out to be better than any alternative district magnitude in transforming the electoral support for the designer’s party into seats in parliament. Yet, as I discuss in the next chapter—where I argue that a fixed-district magnitude was chosen over varying DM because the designer had the ability to gerrymander district boundaries—the districts drawn by the designer reflected serious levels of under representation for the more populated areas in both chambers.

Under all alternative DM, the electoral designer’s party would have fared worse than under a 2-seat arrangement. Table 4.9 shows a simulation using the 1989 results for the Chamber of Deputies election for the 60 districts drawn by the Pinochet dictatorship using different DM for every district, but not modifying the district boundaries. The *Concertación* candidates obtained 51.5% of the national vote, while the RN-UDI alliance obtained 34.2%. Had the designer opted for 60 1-seat districts, the *Concertación* would have won 55 of the 60 districts (91.7%). With the 2-seat district arrangement, the *Concertación* obtained 69 seats (57.5%). Although the *Concertación* obtained more seats than its share of votes would have given it in a perfect PR system, the *Concertación* obtained fewer seats under the 2-seat districts than it would have obtained under a 3, 4 or 5 seat district. The RN-UDI alliance, with 34.2% of the vote was able to secure 40% of the seats in the 120-member Chamber of Deputies. A district magnitude of 3, 4 or 5 would have given the RN-UDI alliance between 35% and 36.3% of the seats.

No other DM works better for the RN-UDI alliance than the 2-seat per district allocation. An increase in the district magnitude would have diminished the excess number of seats that the RN-UDI alliance was able to secure in 1989. In 1989, the % (*Seats / Votes*) ratio for the RN-UDI alliance was 1.18 and for the *Concertación* was 1.12. That is, every percentage point increase in electoral support meant 1.18 seats for the RN-UDI alliance, while for the *Concertación* the ‘buying power’ of every additional percentage unit of electoral support was 1.12. True, the *Concertación* was still over represented, but not as much as the RN-UDI alliance. The over-representation of the two larger coalitions came at the expense of the smaller coalitions, mainly the PAIS, an alliance of socialists and other leftist factions, which was eventually absorbed into the *Concertación* after the 1989 election.

The over representation for the RN-UDI alliance also took place in the 1989 senatorial elections. With 34.85% of the national vote, the RN-UDI alliance secured 16 of the 38 elected seats (41.1%). Simulations not shown here also indicate that the conservative alliance would have done worst under any other DM. A single-member district allocation would have been the worst outcome for the conservative coalition as the *Concertación* defeated the RN-UDI alliance in all 19 senatorial districts.

Table 4.9 Simulation with Varying District Magnitude, Chamber of Deputies Election, 1989

Political Coalition	Total votes (%)	1-seat districts	2-seat districts	3-seat districts	4-seat districts	5-seat districts
		# of seats				
Concertación	51.5%	55	69	109	144	177
Democracia y Progreso (RN-UDI)	34.2%	4	48	64	84	109
PAIS (PS factions)	5.3%	1	2	6	11	13
Independents	1.8%	0	1	1	1	1
Total	92.8% ^a	60	120	180	240	300
		% of seats				
Concertación	51.5%	91.7	57.5	60.6	60.0	59
Democracia y Progreso (RN-UDI)	34.2%	6.7	40.0	35.6	35.0	36.3
PAIS (PS factions)	5.3%	1.7	1.7	3.3	4.6	4.3
Independents	1.8%	0	0.8	0.6	0.4	0.3
Total	92.8%	100	100	100	100	100

^a The remaining 7.2% went to three other right wing alliances that failed to win seats. All simulations made using the d'Hondt method to allocate seats.

In the 1993 elections, the conservative coalition obtained 37.32% of the vote in the Senatorial elections, but secured 9 of the 18 seats. The *Concertación*, with 55.48% of the vote, obtained 50% of the seats up for election. The *Concertación* defeated the RN-UDI alliance in 8 of the 9 senatorial districts. Had a FPTP system been used, the *Concertación* would have obtained 89% of the seats with 55.48% of the vote. Again, single member districts would have been devastating for the conservative coalition. However, any district magnitude larger than 2 would have also resulted in fewer seats for the conservative coalition than those obtained using the 2-seat per district rule. In the 1993 Chamber of Deputies election, the *Concertación* obtained 55.4% of the vote and secured 70 seats (58.3%), while the RN-UDI coalition (called *Unión por el Progreso de Chile*) obtained 50 seats (41.7%) with 36.7% of the vote. Again, any other DM would have resulted in fewer seats for the conservative coalition than the 2-seat per district arrangement.

By 1997, the electoral advantage of the *Concertación* had weakened significantly. Yet, in those elections the *Concertación* still obtained more votes than the RN-UDI coalition (called *Unión por Chile* that year) in 48 of the 60 seats for the Chamber of Deputies. The *Concertación* was also the top finisher in the 10 senatorial districts up for election that year. As Table 4.8 shows, the RN-UDI coalition would have done worse with any alternative DM. With 36.2% of the votes, the conservative coalition secured 39.2% of the seats. Ironically, the *Concertación*

benefited more, as its 50.5% of the vote was transformed into 57.5% of the seats. However, any alternative DM would have been even more beneficial for the *Concertación* than the 2-seat allocation rule.

Table 4.10 Simulation with Varying District Magnitude, Chamber of Deputies Election, 1997

Political Coalition	Total votes (%)	1-seat districts	2-seat districts	3-seat districts	4-seat districts	5-seat districts
		# of seats				
Concertación	50.5%	48	69	111	140	175
Unión por Chile (RN-UDI)	36.2%	12	47	65	92	116
PC	7.4%	0	0	0	2	3
Independents	2.8%	0	4	4	6	6
Total	100%	60	120	180	240	300
		% of seats				
Concertación	50.5%	80	57.5	61.7	58.3	58.3
Unión por Chile (RN-UDI)	36.2%	20	39.2	36.1	38.3	38.6
PC	7.4%	0	0	0	0.8	1
Independents	2.8%	0	0.3	2.2	2.5	2
Total	100%	100	100	100	100	100

All simulations made using the d'Hondt method to allocate seats

No other alternative district magnitude would have allowed the conservative RN-UDI coalition to *buy* more seats in the Chamber and Senate in post Pinochet Chile than the across-the-board 2-seat arrangement adopted by the dictatorship in the appropriate organic law before leaving office in 1989. T

he repeated efforts by the *Concertación* to change the electoral rule to reduce the number of districts and increase district magnitude have faced the strong opposition of conservative legislators. Because a change in the Organic Law requires a 4/7 majority in both chambers (68 deputies and 28 senators), the *Concertación* has failed to win enough seats in the Senate to unilaterally change the Organic Law. During the 1990-1998 legislature, the 9 appointed conservative senators joined the 16 (17 after 1993) elected conservative senators to block any proposed changes to the Organic Laws. The 22 elected *Concertación* senators represented a majority of voters but constituted a minority in the upper chamber. The *Concertación* commanded a sufficient majority in the Chamber to approve the reforms there, but anticipating a Senate rejection, the reform was never submitted by the president to the Chamber. Repeated efforts failed in the Senate to muster a coalition of moderate conservatives to reform the Election Law Organic Law. After the 1997 elections, the composition of the Senate varied slightly. The *Concertación* held on to a 20-18 majority among elected senators, but the conservative coalition still commanded the support of 6 of the 9 appointed members. The 24-23 conservative majority changed with the entrance of former presidents and life-term members of the Senate in March of 1998. Former dictator Augusto Pinochet and former president Eduardo Frei changed the

composition of the Senate to a 25-24 majority for the conservative coalition.²² Pinochet's arrest in London and his impeachment by Chilean courts after his return to Chile did not modify the overall composition of the Senate for super majority considerations. The Constitution requires that 4/7 of seating senators—including impeached senators—approve a change to the Organic Law.²³

In the Chamber of Deputies, however, the *Concertación* has commanded a majority large enough to push changes to the Organic Laws without negotiating with the conservative coalition. In 1989 (72 seats),²⁴ 1993 (70 seats) and 1997 (70 seats),²⁵ well above the 69 votes required to pass the 4/7-threshold. However, since the *Concertación* lacked the votes in the Senate, its majority in the Chamber served to no avail. If we ignore the designated senators, the *Concertación* obtained a 22-16 majority in the Senate in 1989, just enough to pass the 4/7 threshold and unilaterally change the appropriate Organic Law. In 1993, the *Concertación* lost 1 seat and kept a 21-17 majority in the Senate among elected members, not enough to unilaterally change the Organic Law. In 1997, the *Concertación's* majority among elected members fell to 20-18. Therefore, in 1989, the across-the-board DM of 2 would not have been sufficient to prevent the *Concertación* from unilaterally changing the electoral laws. The presence of the designated senators was necessary to block the *Concertación's* efforts. If we understand the choice of an across-the-board 2-seat district as responding to a maximin strategy and an insurance devise to prevent anybody from winning a commanding majority of seats, the first objective was achieved but the latter failed. The conservative coalition would not have done better under any alternative across-the-board DM than it did under DM of 2. On the other hand, the *Concertación* successfully won enough 'elected' seats in the Senate in 1989 to unilaterally change the Organic Law and redraw the district boundaries and modify the district magnitude. The presence of appointed senators prevented the *Concertación* from carrying on with its original intention.

The super majority requirements mandated for a reform to the electoral law have proven impossible for the *Concertación* to meet. Because of appointed senators in 1989 and because the

²² Former president Patricio Aylwin could not take a lifetime seat in the Senate because he only served for a transitional 4-year period and the 1980 Constitution required a minimum of 6 years as president to serve in the Senate.

²³ The 1998 impeachment of conservative senator Francisco Errázuriz left the Senate tied between the *Concertación* and the *Alianza*--with a tie forcing favoring the status quo--and Pinochet's arrest in London in October of 1998 gave the *Concertación* a 1-seat majority in the upper chamber. That was sufficient to pass normal laws, but not did not change the minimum number of votes required for constitutional reforms.

²⁴ Including 2 PAIS and 1 pro-*Concertación* independent.

²⁵ Including 1 pro-*Concertación* independent.

Concertación has only been successful in clinching the two seats in just one of 19 senatorial district level elections between 1993 and 1997, the across-the-board district magnitude of 2—and the over representation of certain regions as we will see in the next chapter—have remained intact. Starting in 1993, the very distortional effect of the 2-seat per district rule has become the strongest safeguard for the conservative coalition's effort to protect those electoral rules that maximize the way in which the electoral designer's party can convert votes into seats. In this regard, the electoral designer adopted the optimal district magnitude to advance the political representation of the designer's party.

Chart 4.1. District Magnitude that Maximizes Electoral Support into Seat Share for the Designer's Party
 (Assuming d'Hondt electoral allocation rules and assuming that all remaining votes go to a single opposition party)

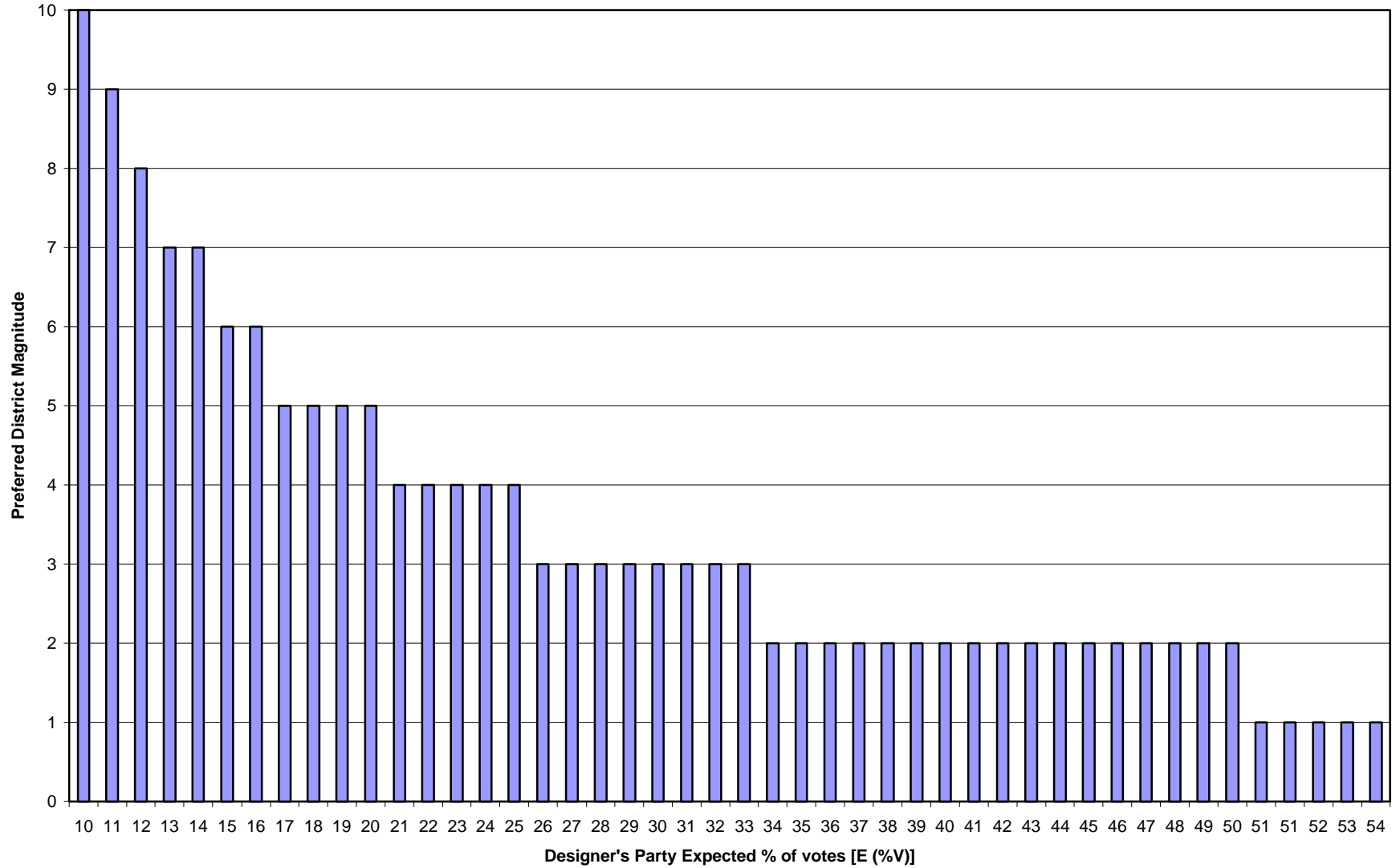


Chart 4.2 % of Votes Needed to Command Majority Control of Seats in Every District
 (assuming any distribution of votes among opposition parties)

