CHAPTER SIX

Empirical Implications
Testing the Theoretical Model

As I mentioned in chapter one, single parties are unable to command a majority of support in the legislatures of most democracies. Thus, political parties who wish to exercise executive power are typically forced to enter some form of coalition. They can either form a pre-electoral coalition prior to the election or wait to form a government coalition afterwards. The analysis conducted in chapter three took as its starting point the implicit claim in the coalition literature that pre-electoral coalitions are a simple function of electoral rules. Although the results presented in that chapter showed that the incentives to form electoral coalitions are shaped by the specific electoral rules employed in each country, they also indicated that the size of the party system mattered, as well. Specifically, the results showed that electoral coalitions are more likely to form and be successful only when a country employs disproportional electoral institutions and there are a large number of parties. The size of the party system matters because there are simply fewer opportunities or incentives to form electoral coalitions in countries where the number of parties is small. This is the case whether the electoral system is highly disproportional or not.

The problem with this initial analysis was that it took account only of the electoral incentives to form a pre-electoral coalition. It ignored the obvious costs that parties incur when they accept pre-electoral agreements. For example, parties that agree to form an electoral coalition have to make compromises on a coalition policy and a division of office benefits. Party leaders ultimately have to weigh the benefits that accrue from forming an electoral coalition against the associated costs. The costs may be so great that party leaders may well decide that they are unwilling to sign a pre-electoral agreement, even if such a coalition could win them more votes or seats. In chapter four, I presented a bargaining model that described the decision calculus facing two party leaders who are deciding whether to form an electoral coalition. Solving the model for sub-game perfect Nash equilibria revealed equilibria in which
party leaders either agreed to form an electoral coalition in the first round or decided to run independent electoral campaigns. The comparative statics generated by the model indicated that the probability of electoral coalition formation increases when:

1. the ideological distance between the potential coalition partners ($\lambda_{AB}$) decreases.
2. the probability that the coalition wins ($P_{u1}, P_{u2}$) increases.
3. the probability that the party wins after running alone ($P_{i-d}$) decreases.
4. the ideological distance between the party's policy and that of the opposition ($\lambda_{i-opp}$) increases as long as the coalition is electorally beneficial ($P_{u1} > P_{i-d}$).

In chapter five, I evaluated these implications using detailed analyses of electoral coalition history in France and South Korea. The evidence that I presented indicated that not only were the assumptions and implications of the bargaining game plausible, but that they were also informative for explaining the particular patterns of electoral coalition formation observed in these two countries. My theoretical model provided an explanation as to why electoral coalitions were more common in legislative elections as opposed to presidential elections in France, why they were more common in the second round of French legislative elections than in the first, and why they were more common at some points in time than at others. The model also helped to explain why electoral coalitions were much more common in presidential elections in South Korea compared to presidential elections in France, and why South Korean presidential candidates were willing to form electoral alliances with personal rivals and enemies.

Of course, these are but two countries, and the model that I outlined in chapter four purports to provide a general logic of pre-electoral coalition formation that applies in multiple settings. As a result, I now provide a more systematic test of the implications generated by the bargaining model using data on electoral coalitions from 20 advanced industrialized parliamentary democracies from 1946 to 1998.

6.1 Hypotheses

As I show above, the bargaining model provides clear, testable implications. The problem is that some of the variables in the model are difficult to accurately measure with real-world data. For example, how would one measure the probability of a coalition winning ($P_{u1}$) when no coalition actually forms, or the probability of a party winning on its own ($P_{i-d}$) when a coalition does form? While it is theoretically possible to calculate these probabilities through the use of survey data asking
individuals how they would vote when faced with a variety of different coalition environments, these data do not exist for the elections in my data set. Because of these difficulties, it is necessary to reformulate the model's implications into hypotheses that can actually be tested with real-world data.

The model's first implication is straightforward and can be tested directly. As is the case with government coalitions, pre-electoral coalitions should form more easily between parties with similar ideological positions (Budge & Laver 1992). This is the case because the utility loss associated with having policy set at the coalition's ideal point rather than one's own ideal point is minimized to the extent that the coalition members are ideologically similar. Moreover, a party's electorate, along with its rank-and-file members, should be more willing to support the pre-electoral coalition if there is no need to make significant policy concessions. Thus, the first hypothesis is:

**Hypothesis 1:** Pre-electoral coalitions are less likely to form when the ideological distance between potential coalition members increases.

The second implication from the model is that electoral coalitions are more likely the greater the probability that the electoral coalition is going to win. The probability that the coalition is going to be successful is clearly a function of the seat share that the coalition members eventually obtain: the larger the coalition, the greater its chance of electoral success. However, it is important to note that if the coalition becomes sufficiently large, then at least one of the coalition members may begin to think that it has a realistic chance of entering government by running independently. According to the model's third implication, parties will be less likely to form a coalition if this occurs. This line of reasoning suggests that an increase in the potential electoral coalition size should make coalition formation more likely when the coalition is small, but should make coalition formation less likely when the coalition size is large. Thus, a combination of the model's second and third implications generates the following hypothesis:

**Hypothesis 2:** The probability that an electoral coalition forms is a quadratic function of the size of the potential pre-electoral coalition. It should be increasing in the first term (size) and decreasing in the second term (size^2).

This last hypothesis suggests that electoral coalitions will be less likely to form if the coalition becomes too large, because at some point at least one of the coalition parties will start to believe that it can enter government by running independently. It naturally follows that the point at which the electoral coalition becomes 'too large' will depend on the relative size of the coalition parties. For example, imagine two potential two-party coalitions, and that each expects to win 40% of the
seats. In the first coalition, each party expects to win the same percentage of seats (20%). In the second coalition, one party expects to win 30% of the seats, while the other expects to win only 10%. It seems obvious that the larger party in this second coalition is more likely to want to compete independently than are either of the smaller parties in the first potential coalition. This is the case even though the expected size of the two coalitions is the same. In other words, potential coalitions between parties that are asymmetric in size should be less likely to form when the overall coalition size becomes sufficiently large. Thus, the third hypothesis is:

**Hypothesis 3:** If the expected coalition size is sufficiently large, then pre-electoral coalitions are less likely to form if there is an asymmetric distribution of electoral strength among the potential coalition parties.

The fourth implication of the model suggests that when parties are faced with an opposition party or coalition that is ideologically extreme relative to their own ideal point, they will be more likely to form an electoral coalition, so long as the probability of winning is larger as a coalition than running separately. This is because not entering government and being in the opposition means receiving no utility from office benefits and suffering a utility loss from having policy implemented by the government. This loss in utility might be quite significant if the government is ideologically extreme relative to one’s own ideal point. Parties will presumably want to do all that they can to keep such an ‘extreme’ government from coming to power. Parties will be likely to form a pre-electoral coalition in these circumstances if the probability of entering government is larger as a coalition than from running independently. In other words, parties will be more likely to form a pre-electoral coalition if this is the best way of keeping an ‘extreme’ government from coming to power. As I have argued in chapter three, there is strong empirical evidence to suggest that disproportional electoral institutions provide an electoral bonus to large parties or coalitions through their mechanical effect on the translation of votes into seats (Clark & Golder 2006). Thus, the probability of entering government as an electoral coalition compared to running independently should be larger the more disproportional the electoral system. While it is not possible to know the precise identity of the potential government prior to the election, parties should expect to suffer a greater utility loss from government policy when the party system is ideologically polarized. This line of reasoning generates two related hypotheses:

**Hypothesis 4:** Party system polarization increases the likelihood of pre-electoral coalitions when the electoral system is sufficiently disproportional.

**Hypothesis 5:** An increase in the disproportionality of the electoral system will
increase the probability of forming a pre-electoral coalition. This positive effect should be stronger when the party system is polarized.

Although coalition analysts have suggested for years that government coalitions are more likely to form between parties with similar policy preferences, four of the five hypotheses presented here have not appeared in the government coalition literature. To some extent, this fact should not come as a surprise. After all, the disproportionality of the electoral rules should not affect the government coalition formation process. However, one would think that party leaders who are deciding whether to form a coalition and contemplating possibly being in opposition should take account of the ideological position of other potential governments, regardless of whether this coalition bargaining process is occurring prior to the election or afterward. Nevertheless, it is rare for the government coalition literature to address the ideological positions of other potential governments.

### 6.2 Empirics

#### 6.2.1 Data and Model

The data set used in the following analysis comprises electoral coalitions in 293 legislative elections in 20 advanced industrialized parliamentary democracies between 1946 and 1998. The countries included are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, and the United Kingdom. I do not include Israel, Malta, or Greece as I did in chapter three, because data were not available for the ideological variables. The slightly shorter time frame (1946–98 rather than 1946–2002) compared to that in chapter three is also the result of limited ideological data. The data are organized in dyadic format, both to match the formal model and to reflect the fact that the majority of pre-electoral coalitions in my sample (68%) are between two parties. Therefore, each observation is a potential two-party coalition. Using a dyadic format yields 4,460 potential two-party electoral coalitions.

An example might help illustrate the data structure. In the 1983 Australian election, there were three parties, and thus three dyads: Labor Party-National Party, National Party-Liberal Party, and Liberal Party-Labor Party. If the two parties in a dyad formed a pre-electoral coalition (PEC), then the dependent variable is coded as one; it is zero otherwise. If a coalition forms among more than two parties, each of the relevant dyads can be coded accordingly as part of the coalition. For instance, if a pre-electoral coalition forms among three parties on the French
left, then the dyads Communist-Socialist, Communist-Greens, and Socialist-Greens would each be coded as one.

I follow Budge et al. (2001) and include “all the significant parties which are represented in the national assembly” in the data set, where the significance of a party is defined in terms of government coalition or blackmail potential. In effect, no parties with less than 1% of the vote are included. Of the 4,460 potential two-party electoral coalitions in the data set that could have formed, only 245 actually formed; this number is slightly more than 5%. As is often the case with dyadic data, the phenomenon of interest occurs only rarely (King & Zeng 2001). The more substantively interesting figure to note, though, is that pre-electoral coalitions competed in 37% of all the elections in the dyadic data set.

Given the dichotomous nature of the dependent variable, I use a probit model to test my hypotheses. In this model, the latent variable $PEC^*$ measures the underlying propensity of party leaders in a dyad to form a pre-electoral coalition. The propensity to form a pre-electoral coalition, $PEC^*$, is modeled as a linear function of several independent variables:

$$PEC^* = \beta_0 + \beta_1 \text{Ideological Incompatibility} + \beta_2 \text{Polarization} + \beta_3 \text{Effective Threshold} + \beta_4 \text{Polarization} \times \text{Effective Threshold} + \beta_5 \text{Coalition Size} + \beta_6 \text{Coalition Size}^2 + \beta_7 \text{Asymmetry} + \beta_8 \text{Asymmetry} \times \text{Coalition Size} + \epsilon$$

where $PEC^*$ is a latent variable that is assumed to be less than zero when we do not observe a pre-electoral coalition and greater than zero when we do.

*Ideological Incompatibility* measures the absolute ideological distance between the parties in the dyad and is a proxy for the lack of ideological compatibility in the coalition. Data on the ideological position of each party are taken from the Manifesto Research Group, which evaluates each party on a one-dimensional scale that ranges from $-100$ (extreme Left) to $+100$ (extreme Right) (Budge et al. 2001). The most ideologically incompatible electoral coalition to form occurred in the Australian elections of 1954 between the Liberal Party and the National Party. Out of a possible 200-unit difference, they were 99.1 units apart.

*Polarization* is a measure of the ideological dispersion in the party system and is calculated as the absolute ideological distance between the largest left- and right-wing parties in the party system. The most polarized party system in which a pre-electoral coalition formed was in Sweden in 1985 (80.9 units), and the least polarized party system was in Belgium in 1978 (0.79 unit). The data are again taken from the Manifesto Research Group. This particular measure of party system polarization is most appropriate because of the fact that government coalitions are almost always going to contain either the main party on the left or the
main party on the right. Thus, parties worried about an 'extreme' government (relative to their own ideological positions) coming to power will be concerned primarily with the ideological positions taken by these parties.

As in chapter three, Effective Threshold measures the effective electoral threshold (Lijphart 1994). The effective electoral threshold ranges from a low of 0.7 in the Netherlands since 1956 to a high of 35 in countries with single-member districts such as Canada and the United Kingdom. This variable acts as a proxy for the disproportionality of the electoral system: the higher the effective threshold, the larger the disproportionality. Qualitatively similar results to those presented here are found if the log of average district magnitude is used instead of the effective threshold. The interaction term Polarization × Effective Threshold is included to test the conditional nature of Hypotheses 4 and 5.

Coalition Size measures the percentage of the total seats won by the two parties in the dyad in the previous election. This variable is a proxy for the expected success of the potential coalition in the current election. The largest pre-electoral coalition to form occurred in the Austrian elections of 1959 between the People's Party and the Socialist Party. Between them, the coalition members controlled 95% of the legislative seats. In order to test the quadratic nature of Hypothesis 2, it is necessary to also include Coalition Size².

Asymmetry measures the asymmetric strength of the two parties in the potential coalition dyad and ranges from 0 to 1, with larger numbers indicating a higher level of asymmetry. It is calculated as the ratio of the seat shares of the two parties in the dyad (Party 1 and Party 2):

$$\text{Asymmetry} = \begin{cases} \frac{\text{Seatlag}_1}{\text{Seatlag}_1 + \text{Seatlag}_2} & \text{if } \frac{\text{Seatlag}_1}{\text{Seatlag}_1 + \text{Seatlag}_2} \geq 0.5 \\ 1 - \frac{\text{Seatlag}_1}{\text{Seatlag}_1 + \text{Seatlag}_2} & \text{if } \frac{\text{Seatlag}_1}{\text{Seatlag}_1 + \text{Seatlag}_2} < 0.5 \end{cases} $$

where Seatlag\(_i\) is the percentage of seats won by party \(i\) in the previous election. To make interpretation easier, this variable is then normalized to range from 0 to 1 by subtracting 0.5 and multiplying by two. The interaction term Asymmetry × Coalition Size is included to test the conditional nature of Hypothesis 3.

The predictions from the hypotheses are shown in table 6.1. The coefficient on Ideological Incompatibility (\(\beta_1\)) should be negative, since the likelihood of electoral coalition formation is expected to decline as the potential coalition partners become more ideologically incompatible. The marginal effect of party system
Table 6.1

<table>
<thead>
<tr>
<th>Variable</th>
<th>Prediction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ideological Incompatibility ($\beta_1$)</td>
<td>Negative</td>
</tr>
<tr>
<td>Effective Threshold ($\beta_2$)</td>
<td>Positive</td>
</tr>
<tr>
<td>Polarization $\times$ Effective Threshold ($\beta_3$)</td>
<td>Positive</td>
</tr>
<tr>
<td>Coalition Size ($\beta_4$)</td>
<td>Positive</td>
</tr>
<tr>
<td>Coalition Size$^2$ ($\beta_5$)</td>
<td>Negative</td>
</tr>
<tr>
<td>Asymmetry $\times$ Coalition Size ($\beta_6$)</td>
<td>Negative</td>
</tr>
<tr>
<td>$\beta_3 + \beta_4$ Polarization</td>
<td>Always positive</td>
</tr>
<tr>
<td>$\beta_3 + \beta_4$ Effective Threshold</td>
<td>Positive when Effective Threshold is high</td>
</tr>
<tr>
<td>$\beta_3 + \beta_4$ Coalition Size</td>
<td>Negative when Coalition Size is high</td>
</tr>
</tbody>
</table>

Polarization is $\beta_2 + \beta_4$ Effective Threshold. This marginal effect is expected to be positive when the electoral system is sufficiently disproportional, i.e., when Effective Threshold is high. Thus, $\beta_4$ must be positive. The marginal effect of electoral system disproportionality is $\beta_3 + \beta_4$ Polarization. This marginal effect should be positive irrespective of the level of Polarization. It follows then that $\beta_3$ should be positive. The coefficient on Coalition Size ($\beta_5$) is expected to be positive, whereas the coefficient on Coalition Size$^2$ ($\beta_6$) is expected to be negative. This is because the probability of pre-electoral coalition formation should initially increase with coalition size and then decrease. This should be the case irrespective of the level of Asymmetry. The marginal effect of Asymmetry is $\beta_7 + \beta_8$ Coalition Size. This marginal effect should be negative, since Asymmetry is expected to reduce the likelihood of pre-electoral coalition formation when the potential coalition size is sufficiently large. Thus, $\beta_8$ should be negative.

6.2.2 Results and Interpretation

The results from two models are provided in table 6.2. The first column presents results from a random effects probit model, where observations are clustered by election in order to take account of any unobserved factors specific to each election that might influence pre-electoral coalition formation. The second column reports results from a probit model with robust standard errors. The results across the two models are very similar. However, a likelihood ratio test indicates that the random-effects probit model is superior. As a result, my inferences are based on this model. Note, however, that the standard probit model with robust standard errors shows qualitatively similar results.
The results presented in Table 6.2 indicate that all of the coefficients have the predicted signs and are statistically significant where expected. However, the interpretation of these coefficients is complicated by the use of multiple interaction terms and the fact that the coefficients relate to the latent propensity to form pre-electoral coalitions rather than the actual quantity of interest—the probability of forming a pre-electoral coalition. Much more revealing and substantively meaningful information can be obtained if we explicitly examine the marginal effect of each variable on the probability of pre-electoral coalition formation.

A good way to examine the marginal effects of variables in interaction models is graphically (Brambor, Clark, & Golder 2006). Hypothesis 5 states that an increase in the disproportionality of the electoral system will increase the probability of pre-electoral coalition formation and that this positive effect should be stronger when the party system is more polarized. In Figure 6.1, I plot the marginal effect of a one-unit increase (from its mean) in the effective threshold on the probability that an electoral coalition forms across the observed range of party system polarization when all other variables are held at their means. The solid black line indicates how this marginal effect changes with party system polarization. The 95% confidence intervals around this line allow us to determine the conditions under which electoral thresholds have a statistically significant effect on the likeli-
hood of pre-electoral coalition formation. The marginal effect is statistically significant whenever both the upper and lower bounds of the confidence interval are above (or below) the zero line. Figure 6.1 clearly indicates that more disproportional electoral systems increase the probability of electoral coalition formation once the level of party system polarization is above zero. In other words, electoral system disproportionality nearly always makes pre-electoral coalitions more likely. This finding is exactly as predicted. Figure 6.1 also indicates that this positive effect increases with party system polarization. Again, this result is exactly as predicted. Overall, Hypothesis 5 is strongly confirmed by the evidence.

Hypothesis 4 states that party system polarization should increase the likelihood of pre-electoral coalitions only when the electoral system is sufficiently disproportional. In figure 6.2, I plot the marginal effect of a one-unit increase in party system polarization across the observed range of electoral system disproportionality when all other variables are held at their means. Again, the solid black line indicates how this marginal effect changes with the effective threshold when all other variables are set at their means. The dashed lines here represent 90% confidence intervals. Figure 6.2 indicates that party system polarization makes pre-electoral coalitions more likely only when the effective threshold is greater than 17. To get a sense of the substantive significance of this result, it should be noted that

Figure 6.1
Marginal Effect of a One-Unit Increase in Effective Threshold (from Its Mean)
10% of the sample has an effective threshold greater than 17.

Hypothesis 3 states that an increase in the asymmetric distribution of electoral strength among coalition partners should reduce the likelihood of electoral coalition formation when the potential coalition size is sufficiently large. I plot the marginal effect of a 0.01-unit increase in electoral coalition asymmetry across the possible range of coalition size in figure 6.3. Again, all other variables are held at their means. It is easy to see that Asymmetry makes electoral coalition formation less likely only when the potential coalition size is greater than 11% of the legislative seats. This finding is exactly as predicted and is substantively significant, since 81% of the sample observations involve potential coalitions that expect to win more than 11% of the seats. Thus, figure 6.3 provides strong support for Hypothesis 3.

Hypothesis 2 states that pre-electoral coalition formation should be a quadratic function of expected coalition size—the likelihood that a pre-electoral coalition forms should initially rise with expected coalition size and then fall. In figure 6.4, I plot the marginal effect of a one-unit increase in expected coalition size at all possible values of coalition size, and at varying levels of Asymmetry: when Asymmetry is one standard deviation below its mean (figure 6.4a), when Asymmetry is at its mean (figure 6.4b), and when Asymmetry is one standard deviation above its mean (figure 6.4c).

Consider figure 6.4a first. If the expected size of the coalition is less than 34% of the seats, then an increase in coalition size is expected to make pre-electoral
coalition formation more likely. Again, to provide some substantive meaning to this result, it should be noted that nearly 59% of the sample falls into this category. However, if the potential coalition is expected to win more than 43% of the seats, then increasing the coalition size any more is expected to make electoral coalitions less likely. Roughly 29% of the potential coalition dyads expect to win more seats than this percentage. Thus, figure 6.4a provides strong evidence that an increase in coalition size will make electoral coalitions more likely when the expected size of the coalition is small, but less likely when the expected size is large.

While figures 6.4b and 6.4c provide corroborating evidence for this hypothesis, they also allow the reader to see how increasing the asymmetry between coalition parties modifies the effect of an increase in coalition size. The point to note is that as we increase Asymmetry (move from 6.4a to 6.4b to 6.4c), the coalition size at which making the coalition any larger would reduce the probability of electoral coalition formation falls. For example, increasing coalition size makes pre-electoral coalitions less likely when the coalition is expected to win more than 43% of the seats if Asymmetry is one standard deviation below its mean. However, an increase in coalition size is expected to make electoral coalitions less likely when the coalition is expected to win just 29% of the seats if Asymmetry is one standard deviation above its mean. Overall, the evidence presented in figure 6.4 provides strong support for both Hypotheses 2 and 3.
Figure 6.4
Marginal Effect of a One-Unit Increase in Expected Coalition Seatshare

4a: Asymmetry is one standard deviation below mean

4b: Asymmetry is at its mean

4c: Asymmetry is one standard deviation above mean
Thus far, I have shown that each of the explanatory variables affects the probability of electoral coalition formation in the predicted manner. All of the hypotheses were borne out by the results. However, it is natural to ask whether these effects are substantively significant. How much more likely is a pre-electoral coalition to form if I increase one of the variables by a standard deviation? How many more (or fewer) pre-electoral coalitions would be observed in a sample of this size if I increased one of the variables by a standard deviation? This information is presented in Table 6.3.

The first column in Table 6.3 indicates the predicted probability that a pre-electoral coalition forms when the row variable is at its mean and all of the other variables are held at their means (unless otherwise specified). Thus, the predicted probability that a coalition forms when all the variables are at their means is .034, with a 95% confidence interval [.021, .050]. Similarly, the predicted probability when Effective Threshold is at its minimum observed value but all of the other variables are at their means is .018 [.009, .031].

The second column indicates the predicted probability of pre-electoral coalition formation when the row variable increases by one standard deviation above its mean, while all other variables are held at their means (again, unless otherwise specified).
specified). For instance, the predicted probability of electoral coalition formation is \(0.024 [0.013, 0.039]\) when Ideological Incompatibility is one standard deviation above its mean and all of the other variables are at their means.

The third column indicates the change in predicted probability between the first and second column. In other words, the third column captures the effect of a one-standard-deviation increase in the named variable on the predicted probability of electoral coalition formation. Thus, an increase of one standard deviation in the effective electoral threshold above its mean increases by \(0.13 [0.037, 0.198]\) the probability that an electoral coalition forms when Polarization is at its maximum observed value and the other variables are at their means.

The fourth and fifth columns provide the most substantively interesting information. The fourth column indicates the percentage change in predicted probability that arises from a one-standard-deviation increase in the named variable. This number is often referred to as the 'relative risk.' Thus, a one-standard-deviation increase in Ideological Incompatibility above its mean reduces by \(29.1\% [11.3, 45.1]\) the probability that a pre-electoral coalition will form when all of the other variables are set at their means. It should be noted that although the predicted probabilities associated with the different scenarios presented in table 6.3 appear quite small, it is clearly the case that changes in each explanatory variable can be of significant substantive importance. As King and Zeng (2001, 711) note, “relative risks are typically considered important in rare event studies if they are at least 10–20%” when we increase an explanatory variable from one standard deviation below its mean to one standard deviation above its mean. Note that here I am increasing each variable by only one standard deviation above its mean.

Finally, the fifth column indicates how many more (or fewer) electoral coalitions there would be in a sample of this size (4,460) if the named variable increased by one standard deviation above its mean. This number is calculated as the difference in predicted probability multiplied by the sample size. Thus, a one-standard-deviation increase in Ideological Incompatibility above its mean would lead to \(45 [17.8, 75.8]\) fewer electoral coalitions when all of the other variables are held at their means. If the effective threshold were increased by a standard deviation when party system polarization is at its maximum observed value, then we would expect to see an extra \(459 [165.0, 883.1]\) electoral coalitions. Given that there were only 245 pre-electoral coalitions in the data set, the numbers in this column represent quite substantial changes.

Taken together, the results presented in table 6.3 indicate that the explanatory variables not only have a statistically significant effect on pre-electoral coalition formation, but that they have a substantively meaningful effect as well. Even a small change in the effective electoral threshold (all else equal) can have a significant effect on the likelihood of pre-electoral coalition formation. If all of the countries in the sample were to move from a very low threshold of 2% (Denmark in
the 1970s) to a slightly higher threshold of 8.9% (Norway in the 1970s) while keeping all other variables at their means, then the percentage increase in the predicted probability of electoral coalition formation would be 175%, and we would expect to see an additional 64 pre-electoral coalitions. More dramatic changes to the electoral threshold would have even larger effects on pre-electoral coalition formation, particularly in countries with smaller or medium-sized parties.

6.3 Conclusion

Given that it is often infeasible for a single party to govern alone in parliamentary democracies, party leaders are faced with a strategic choice. They can either form an electoral coalition prior to the election or participate in government coalition bargaining afterwards. The fact that one regularly observes electoral coalitions across a broad range of countries suggests that they must offer some form of political advantage—at least some of the time. Since electoral coalitions do not always emerge, it must equally be true that there are costs associated with party leaders coordinating their pre-electoral strategies. As a result, I presented a simple bargaining model in chapter four, in which the decision of party leaders to form a pre-electoral coalition depended on the associated costs and benefits. These costs and benefits were modeled in terms of preferences over policy and the division of office benefits. The hypotheses generated by this model were subjected to several tests in this chapter using a data set containing information on potential coalition dyads in 20 industrialized parliamentary democracies from 1946 to 1998. The results indicate that pre-electoral coalitions are more likely to form when the expected coalition size is large, but not too large, and when the potential coalition partners are similar in size. They are also more likely to form if the party system is polarized and the electoral institutions are disproportional.

Chapter one opened with an empirical question: Why did pre-electoral coalitions form in the 2002 French legislative elections but not in the 2002 Dutch elections? The results from the statistical model presented here clearly throw light on this specific question. While France typically had the highest predicted probabilities of coalition formation in the sample, the Netherlands consistently had the lowest. The results presented in table 6.2 indicate that the proportionality of a country's electoral system plays a major role in the likelihood of electoral coalition formation. While the average district magnitude in France is one, the average district magnitude in the Netherlands is the largest in the sample (150). This situation suggests that it should not be surprising to see that pre-electoral coalitions are more likely to form in France compared to the Netherlands. Moreover, the fact that party system polarization is relatively low in the Netherlands compared to France provides a further explanation for the observed variation in coalition formation in these countries.
Appendix: The Disproportionality Hypothesis Revisited

In my initial analysis of electoral coalitions in chapter three, I found evidence in support of what I called the Disproportionality Hypothesis. Specifically, I showed that parties are more likely to be in pre-electoral coalitions, and that these coalitions are more likely to be successful, in countries that have both a disproportional electoral system and a large number of parties. At the time, I indicated that the Disproportionality Hypothesis should also apply to the actual probability of electoral coalition formation—electoral coalition formation should be more likely in countries that have disproportional electoral rules and a large party system. I can now test this hypothesis using the dyadic data set presented in this chapter.

When examining the probability of electoral coalition formation, one might think to treat each election as a single observation and distinguish between elections in which pre-electoral coalitions form and those in which they do not. The problem with this response is that such an approach treats all elections with at least one pre-electoral coalition as the same, regardless of the number of electoral coalitions that form, the electoral significance of these coalitions, and the number of parties involved in these coalitions. This approach is clearly problematic. The dyadic data set described in this chapter avoids these problems and has the advantage of being able to take account of the number of electoral coalition opportunities in a given election.

To test the Disproportionality Hypothesis as it relates to the actual likelihood of electoral coalition formation, I use the same explanatory variables as in chapter three, but I now employ a random-effects probit model, where observations are clustered by election:

\[
P_{EC}^* = \beta_0 + \beta_1 \text{Effective Threshold} + \beta_2 \text{Electoral Parties} + \beta_3 \text{Effective Threshold} \times \text{Electoral Parties} + \varepsilon
\]

(6.1)

As before, \(P_{EC}^*\) is a latent variable that is assumed to be less than zero when no pre-electoral coalition forms and greater than zero when one does; \(\text{Electoral Parties}\) measures the effective number of electoral parties in each election; and \(\text{Effective Threshold}\) measures the effective electoral threshold. If the Disproportionality Hypothesis is correct, then the coefficient on the interaction term (\(\beta_3\)) should be positive. More importantly, the marginal effect of electoral thresholds should significantly increase the probability of electoral coalition formation once the party system becomes sufficiently large.

The results from my analysis are presented in table 6.4. As predicted, the coefficient on the interaction term is both positive and significant. But does electoral system disproportionality significantly increase the probability of electoral coalition formation when the party system is sufficiently large? To see whether this is the case, I plot the marginal effect of a one-unit increase in the effective threshold.
across the observed range of party system size in figure 6.5.

As predicted, effective thresholds increase the probability of electoral coalition formation only once the party system is sufficiently large. Specifically, the party system must have more than 2.5 effective electoral parties before an increase in the effective threshold encourages party leaders to form pre-electoral coalitions. Since roughly 90% of the sample has a larger party system than this requirement, this finding indicates that electoral system disproportionality nearly always increases the probability of electoral pacts. As figure 6.5 illustrates, this effect is much stronger when the party system is large.

It is clear that effective thresholds affect the probability of electoral coalition formation in the expected manner. But is the effect substantively meaningful? If I increase the effective threshold from its mean to one standard deviation higher when holding the effective number of electoral parties at its mean, then electoral coalitions are 203.3% [160.8, 253.9] more likely to form. Again, 95% confidence intervals are shown in brackets. In a sample the size of the one analyzed here, an increase in the effective threshold by one standard deviation above its mean would be expected to produce an additional 108.1 [64.4, 164.3] pre-electoral coalitions.

### Table 6.4
Disproportionality Hypothesis Revisited

<table>
<thead>
<tr>
<th>Regressor</th>
<th>PROBIT3</th>
<th>(random effects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electoral Parties</td>
<td>-0.133***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.047)</td>
<td></td>
</tr>
<tr>
<td>Effective Threshold</td>
<td>-0.009</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.013)</td>
<td></td>
</tr>
<tr>
<td>Effective Threshold × Electoral Parties</td>
<td>0.009***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-1.63***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.24)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>4395</td>
<td></td>
</tr>
<tr>
<td>Log Likelihood</td>
<td>-816.47</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Standard errors are given in parentheses. Random effects are clustered on each election. Data come from 4,460 dyads in 20 advanced industrialized countries from 1946 to 1998.

*p < 0.10; **p < 0.05; ***p < 0.01 (two-tailed).
Remember that this is quite a significant number, given that there were only 245 observed coalitions in the data set.

In sum, the analysis conducted here confirms the Disproportionality Hypothesis and produces results remarkably similar to those presented in chapter three. Taken together, the evidence presented here and in chapter three indicates that electoral coalitions are more likely to form and be successful in countries with disproportional electoral rules and a large number of parties.

At this point, the reader might wonder why I did not simply combine the analyses conducted in chapters three and six in a single model. Why, for example, do I not just include Electoral Parties and its interaction with Effective Threshold in the model (6.1) specified in this chapter? The primary reason is that the Disproportionality Hypothesis was not explicitly generated by the bargaining model outlined in chapter four. Since my goal in this chapter was to specifically test the generalizability of the bargaining model, I did not include the additional variables necessary to test the Disproportionality Hypothesis as well. Moreover, it is arguable that the effective number of parties or party system size is already being taken into account in model (6.1) by the Coalition Size variable. While these reasons may not convince all readers that the strategy I followed was correct, I should note that the inclusion of the additional variables would not substantively change any of the inferences drawn from the results in table 6.2.