

Online Appendix A: Different Distributions for the Random Coefficients

In Table 3, we present results from three mixed logit models where the random coefficients are assumed to be distributed according to a normal, triangular, or uniform distribution. In line with previous studies (Hensher & Greene 2003, 148), the estimated mean effects and standard deviations for the coefficients have very similar substantive interpretations across the different distributions.

Table 3: Prime Ministerial Party Choice in Western Europe:
Different Distributions for the Random Coefficients

| Dependent Variable: Prime Ministerial Party (1, 0) | | | | | | |
|--|---------|-----------|------------|-----------|---------|-----------|
| Regressor | Normal | | Triangular | | Uniform | |
| | Mean | Std. dev. | Mean | Std. dev. | Mean | Std. dev. |
| <i>Party-specific variables:</i> | | | | | | |
| Largest Party | 2.11* | 4.61** | 2.31** | 11.30*** | 3.15** | 9.57*** |
| | (1.10) | (1.84) | (1.15) | (4.08) | (1.48) | (3.12) |
| Party Size | 0.14*** | 0.01 | 0.14*** | 0.02 | 0.14*** | 0.01 |
| | (0.03) | (0.03) | (0.03) | (0.07) | (0.03) | (0.05) |
| Median Party | 1.39*** | 0.22 | 1.40*** | 0.53 | 1.47*** | 0.03 |
| | (0.38) | (0.83) | (0.39) | (1.97) | (0.41) | (1.45) |
| <i>Key strategic actors:</i> | | | | | | |
| President Party | 5.25** | 0.26 | 5.47** | 0.16 | 5.71** | 0.06 |
| | (2.43) | (1.47) | (2.45) | (3.37) | (2.51) | (2.08) |
| Incumbent PM | 2.84*** | 1.70* | 2.97*** | 4.35* | 3.61*** | 0.05 |
| | (1.04) | (0.97) | (1.09) | (2.50) | (1.22) | (2.99) |
| <i>Contextual variables:</i> | | | | | | |
| President Party | -3.06 | 0.01 | -3.05 | 0.31 | -3.06 | 0.34 |
| × Investiture | (2.13) | (1.64) | (2.17) | (3.91) | (1.22) | (2.36) |
| President Party | -3.92* | 0.07 | -4.16* | 0.39 | -4.31* | 0.30 |
| × Direct Elections | (2.14) | (1.38) | (2.15) | (3.82) | (2.26) | (3.96) |
| Incumbent PM | -2.62** | 0.69 | -2.79** | 1.80 | -3.32** | 4.21 |
| × Conflict Termination | (1.26) | (1.16) | (1.30) | (3.15) | (1.47) | (2.67) |
| Incumbent PM | 0.50** | 0.30 | 0.58*** | 0.67 | 0.74** | 0.86 |
| × PM Performance | (0.20) | (0.31) | (0.22) | (0.60) | (0.29) | (0.56) |
| Incumbent PM | 0.04 | 0.17* | 0.04 | 0.44* | 0.04 | 0.41* |
| × Cabinet Performance | (0.04) | (0.09) | (0.04) | (0.24) | (0.05) | (0.21) |
| Simulated Log Likelihood | -219.35 | | -218.86 | | -217.53 | |
| Potential PM Parties | 2,039 | | 2,039 | | 2,039 | |
| Selection Opportunities | 314 | | 314 | | 314 | |

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$ (two-tailed).

Note: Results are from a mixed logit model where the random coefficients are assumed to be from normal, triangular, or uniform distributions. For each model, the 'Mean' column indicates the mean coefficient and the 'Std. dev.' column indicates the standard deviation of the coefficient. Standard errors are shown in parentheses. The results from the mixed logit model where the random coefficients are assumed to be normally distributed are the same as those presented in Model 6 in Table 1.

Online Appendix B: All Governments

Table 4: Prime Ministerial Party Choice in Western Europe

| Regressor | Dependent Variable: Prime Ministerial Party (1, 0) | | | | | | | | | | | |
|--|--|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | Model 1 | | Model 2 | | Model 3 | | Model 4 | | Model 5 | | Model 6 | |
| | Mean | Std. dev. | Mean | Std. dev. | Mean | Std. dev. | Mean | Std. dev. | Mean | Std. dev. | Mean | Std. dev. |
| <i>Party-specific variables:</i> | | | | | | | | | | | | |
| Largest Party | 0.97* (0.51) | 2.98*** (0.98) | 0.58* (0.32) | 1.89*** (0.63) | 0.76* (0.41) | 2.54*** (0.80) | 0.79* (0.45) | 2.09* (1.22) | 0.75* (0.42) | 1.86 (1.15) | 1.55* (0.87) | 3.79*** (1.47) |
| Party Size | 0.15*** (0.02) | 0.01 (0.06) | 0.12*** (0.02) | 0.002 (0.04) | 0.13*** (0.02) | 0.004 (0.04) | 0.12*** (0.02) | 0.01 (0.03) | 0.12*** (0.02) | 0.004 (0.03) | 0.14*** (0.03) | 0.02 (0.04) |
| Median Party | | | 1.04*** (0.21) | 0.16 (3.05) | 1.09*** (0.24) | 0.34 (0.97) | 1.17*** (0.29) | 0.05 (0.98) | 1.16*** (0.28) | 0.001 (1.09) | 1.46*** (0.38) | 0.15 (0.70) |
| <i>Key strategic actors:</i> | | | | | | | | | | | | |
| President Party | | | | | 0.73* (0.43) | 1.22 (0.85) | 0.75 (0.49) | 0.70 (1.37) | 3.40*** (1.35) | 0.10 (2.81) | 5.21*** (2.21) | 0.15 (1.07) |
| Incumbent PM | | | | | | | 1.14*** (0.40) | 2.61*** (0.86) | 1.03*** (0.36) | 2.40*** (0.77) | 3.22*** (1.15) | 2.01 (1.50) |
| <i>Contextual variables:</i> | | | | | | | | | | | | |
| President Party × Investiture | | | | | | | | | -2.26** (1.13) | 0.20 (1.30) | -2.82 (1.94) | 0.24 (1.42) |
| President Party × Direct Elections | | | | | | | | | -2.41** (1.18) | 0.30 (1.66) | -3.96** (1.89) | 0.19 (1.46) |
| Incumbent PM × Conflict Termination | | | | | | | | | | | -1.88 (1.15) | 1.30 (2.55) |
| Incumbent PM × PM Performance | | | | | | | | | | | 0.65*** (0.25) | 0.22 (0.37) |
| Incumbent PM × Cabinet Performance | | | | | | | | | | | 0.004 (0.05) | 0.28 (0.18) |
| Simulated Log Likelihood | -350.97 | | -309.01 | | -306.07 | | -291.63 | | -288.57 | | -241.59 | |
| Potential PM Parties | 2,856 | | 2,648 | | 2,648 | | 2,648 | | 2,648 | | 2,405 | |
| Selection Opportunities | 430 | | 400 | | 400 | | 400 | | 400 | | 364 | |

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$ (two-tailed).

Note: Results are from a mixed logit model where the random coefficients are assumed to be normally distributed. For each model, the 'Mean' column indicates the mean coefficient and the 'Std. dev.' column indicates the standard deviation of the coefficient. Standard errors are shown in parentheses. This table is equivalent to Table 1 in the main text except that the only governments that are excluded here are non-partisan and single-party majority governments. In Table 1, we had also excluded caretaker governments and governments that did not represent PM party selection opportunities.

Online Appendix C: More Substantive Results from the Mixed Logit Model

In Figure 1, we examined the substantive effect of largest party status (and party size) on the predicted probability of gaining the prime ministership. We now look at the substantive importance of other covariates. The first column in Table 5a indicates the probabilities that each of the four largest parties in the Dutch 1994 PM selection opportunity wins the prime ministership in the baseline scenario in which the independent variables take on the actual values observed in the real-world. The remaining columns indicate either predicted probabilities or changes in predicted probabilities as we transfer the identity of the median party from the CDA to one of the other three parties. Note that whenever we transfer the median party status from the CDA to another party, the recipient party always sees a statistically significant increase in its probability of gaining the prime ministership – 0.13, 0.17, 0.14 for the PvdA, VVD, and D66 respectively. Although not as large as the changes in probability associated with largest party status (and party size), the magnitude of the changes in probability linked to median party status is clearly substantively important.

Tables 5b and 5c examine the substantive importance of incumbent PM party status. The first column again represents the baseline scenario. The remaining columns indicate either predicted probabilities or changes in predicted probabilities as we transfer incumbent PM party status from the CDA to one of the other three parties (i) when the previous cabinet ended without public conflict or (ii) when the previous cabinet ended with public conflict. When we transfer the incumbent PM party status to a new party, we also transfer the incumbent PM and cabinet performances.

The first thing to note is that the predicted probability that the CDA becomes the PM party always increases when we transfer its incumbent PM party status and electoral performance to one of the other parties. In 1994, the CDA was clearly hurt by its poor electoral performance. If it could have disassociated itself from its incumbent PM status and poor electoral performance as in the counterfactual scenarios here, the CDA would have stood a substantially greater chance of becoming the PM party. Indeed, the CDA is actually estimated to be the party most likely to obtain the prime ministership if the PvdA had been the incumbent PM party.

The second thing to note is that each party's probability of winning the prime ministership is always lower when they are the incumbent PM party and the previous cabinet ends in public conflict. For example, the probability that the PvdA becomes the PM party declines by -0.26 when it is the incumbent PM party

Table 5: The Substantive Importance of Median Party Status and Incumbency (Netherlands 1994)

| (a) <i>Median Party</i> | | | | | | | |
|-------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Party | CDA | CDA→PvdA | | CDA→VVD | | CDA→D66 | |
| | Predicted Probability | Predicted Probability | Change in Probability | Predicted Probability | Change in Probability | Predicted Probability | Change in Probability |
| PvdA | 0.58 (0.10) | 0.70 (0.08) | 0.13** (0.06) | 0.54 (0.10) | -0.04 (0.03) | 0.56 (0.10) | -0.02 (0.02) |
| CDA | 0.14 (0.10) | 0.07 (0.07) | -0.07 (0.05) | 0.07 (0.07) | -0.07 (0.05) | 0.07 (0.07) | -0.07 (0.05) |
| VVD | 0.12 (0.03) | 0.10 (0.03) | -0.02 (0.02) | 0.29 (0.07) | 0.17*** (0.06) | 0.09 (0.03) | -0.03* (0.02) |
| D66 | 0.06 (0.01) | 0.05 (0.01) | -0.01 (0.01) | 0.04 (0.01) | -0.02** (0.01) | 0.21 (0.06) | 0.14*** (0.05) |

| (b) <i>Incumbent PM when Conflict Termination = 0</i> | | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Party | CDA | CDA→PvdA | | CDA→VVD | | CDA→D66 | |
| | Predicted Probability | Predicted Probability | Change in Probability | Predicted Probability | Change in Probability | Predicted Probability | Change in Probability |
| PvdA | 0.58 (0.10) | 0.31 (0.11) | -0.26* (0.14) | 0.52 (0.10) | -0.05* (0.03) | 0.52 (0.10) | -0.06 (0.04) |
| CDA | 0.14 (0.10) | 0.46 (0.10) | 0.32* (0.16) | 0.32 (0.08) | 0.18 (0.12) | 0.31 (0.07) | 0.17 (0.12) |
| VVD | 0.12 (0.03) | 0.09 (0.03) | -0.03 (0.03) | 0.06 (0.06) | -0.06 (0.08) | 0.06 (0.02) | -0.06** (0.03) |
| D66 | 0.06 (0.01) | 0.05 (0.01) | -0.01 (0.01) | 0.04 (0.01) | -0.03*** (0.02) | 0.05 (0.05) | -0.02 (0.06) |

| (c) <i>Incumbent PM when Conflict Termination = 1</i> | | | | | | | |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Party | CDA | CDA→PvdA | | CDA→VVD | | CDA→D66 | |
| | Predicted Probability | Predicted Probability | Change in Probability | Predicted Probability | Change in Probability | Predicted Probability | Change in Probability |
| PvdA | 0.59 (0.10) | 0.22 (0.09) | -0.38*** (0.15) | 0.53 (0.11) | -0.07** (0.03) | 0.52 (0.11) | -0.07** (0.03) |
| CDA | 0.10 (0.09) | 0.52 (0.10) | 0.42*** (0.16) | 0.33 (0.08) | 0.23** (0.12) | 0.32 (0.07) | 0.22** (0.11) |
| VVD | 0.14 (0.03) | 0.11 (0.03) | -0.03 (0.03) | 0.05 (0.06) | -0.09 (0.08) | 0.06 (0.02) | -0.07*** (0.03) |
| D66 | 0.07 (0.01) | 0.06 (0.02) | -0.01 (0.02) | 0.04 (0.01) | -0.03*** (0.01) | 0.04 (0.06) | -0.03 (0.06) |

Note: The results presented here are for a PM selection opportunity resembling the one that took place in the Netherlands in 1994. In each section of Table 5, the first column indicates the mixed logit predicted probabilities for each party in the baseline scenario when the independent variables take on the actual values observed in the real-world. The remaining columns indicate either predicted probabilities or changes in predicted probabilities as we transfer (i) median party status from the CDA to one of the other three parties (Table 5a), (ii) incumbent PM party status from the CDA to one of the other three parties when the previous government ended without conflict (Table 5b), and (iii) incumbent PM party status from the CDA to one of the other three parties when the previous government ended with conflict (Table 5c). Standard errors are shown in parentheses. Statistically significant changes in predicted probability are indicated: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$ (two-tailed). Estimates are based on simulations using 10,000 draws from the estimated coefficient vector and variance-covariance matrix.

and the previous cabinet ends *without conflict* but by -0.38 when it is the incumbent PM party and the previous cabinet ends *with conflict*. In general, the magnitudes of the changes in predicted probability in Table 5b and Table 5c indicate the substantive importance that incumbent PM party status, the performance of the incumbent PM party, and the manner of cabinet termination can have on the choice of PM party.

Online Appendix D: Comparing Mixed Logit and Conditional Logit Results

In Table 6, we compare our MXL results from Model 6 for Western Europe with the results we would have obtained had we employed a conditional logit. There are several things to note. First, the conditional logit provides no information about unobserved heterogeneity in the effects of the covariates on PM party choice. This is because it estimates only a single coefficient for each covariate. In contrast, the mixed logit estimates a mean coefficient for each covariate as well as the standard deviation of this coefficient. As a

Table 6: Prime Ministerial Party Choice in Western Europe:
Mixed Logit vs Conditional Logit

| Dependent Variable: Prime Ministerial Party (1, 0) | | | |
|--|-------------------|-------------------|-------------------|
| Regressor | Conditional Logit | Mixed Logit | |
| | | Mean | Std. dev. |
| <i>Party-specific variables:</i> | | | |
| Largest Party | 0.51** (0.25) | 2.11* (1.10) | 4.73*** (1.78) |
| Party Size | 0.09*** (0.01) | 0.14*** (0.03) | 0.01 (0.04) |
| Median Party | 0.80*** (0.19) | 1.39*** (0.38) | 0.14 (0.98) |
| <i>Key strategic actors:</i> | | | |
| President Party | 2.34*** (0.86) | 5.25** (2.43) | 0.27 (1.28) |
| Incumbent PM | 0.96*** (0.25) | 2.84*** (1.04) | 1.90* (1.05) |
| <i>Contextual variables:</i> | | | |
| President Party × Investiture | -1.81** (0.72) | -3.06 (2.13) | 0.42 (1.59) |
| President Party × Direct Elections | -1.94** (0.78) | -3.92* (2.14) | 0.59 (1.45) |
| Incumbent PM × Conflict Termination | -0.74** (0.35) | -2.62** (1.26) | 0.13 (2.77) |
| Incumbent PM × PM Performance | 0.16*** (0.04) | 0.50** (0.20) | 0.11 (0.21) |
| Incumbent PM × Cabinet Performance | 0.01 (0.01) | 0.04 (0.04) | 0.15* (0.09) |
| Simulated Log Likelihood | -229.12 | -219.35 | |
| Potential PM Parties | 2,039 | 2,039 | |
| Selection Opportunities | 314 | 314 | |

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$ (two-tailed).

Note: The first column presents results from a CL model. Standard errors are shown in parentheses. The next two columns present results from an MXL model where the random coefficients are assumed to be normally distributed. The ‘Mean’ column indicates the mean coefficient and the ‘Std. dev.’ column indicates the standard deviation of the coefficient. Standard errors are again shown in parentheses. The results from the MXL model are the same as those presented in Model 6 in Table 1.

result, the MXL provides valuable substantive information about how the effects of the covariates vary from one setting to another that is simply not available from the CL model. Moreover, the CL's inability to recognize unobserved heterogeneity leads researchers to draw incorrect inferences about the determinants of PM party choice. As an example, the CL model implies that the largest party is *always* advantaged when it comes to winning the prime ministership, while the MXL reveals that there is actually considerable unobserved heterogeneity, and in some cases the largest party can be at a disadvantage.

Second, several of the standard deviations from the mixed logit in Table 6 are statistically significant. Note that the presence of statistically significant standard deviations indicates the presence of unobserved heterogeneity, a violation of the CL assumption that the error term is IID. Given that the IID assumption is the basis for the IIA assumption, statistically significant standard deviations also indicate a violation of the CL assumption of IIA. To confirm this, we estimated 100 Hausman-McFadden tests (1984) after estimating our CL model, with each test randomly dropping 10% of our observations (but never a party that actually gained the prime ministership). We found clear IIA violations in 24 of these tests. Even when we employ a Bonferroni correction to account for the fact that some IIA violations are likely to appear by chance given the large number of tests, we find IIA violations in 14 of these tests. That is, we found clear evidence that some potential PM parties were perceived as substitutes for unobserved reasons and, therefore, that the CL model is inappropriate here. This is important because violations of the IID and IIA assumptions in the CL model result in inconsistent coefficient estimates.

Third, the inconsistent estimates from the CL model produce misleading predicted probabilities. This can be observed in Table 7. In the first two columns, we present the CL and MXL predicted probabilities that each of the four largest parties in the 1994 Dutch elections gains the prime ministership in the baseline scenario where the covariates take on the actual values observed in the real-world. Note that the CL predicted probabilities are in some cases quite different from the MXL probabilities. For example, the CL model under-estimates the probability that the PvdA would gain the prime ministership by about a third, and over-estimates the probability that the D66 would gain the prime ministership by nearly 60%.

Fourth, the CL model produces incorrect substitution patterns. The last six columns in Table 7 indicate how the predicted probability that each of the four largest parties in the 1994 Dutch elections gains the prime ministership changes as we transfer the largest party status (and party size) from the PvdA to one of

Table 7: The Substantive Importance of Being the Largest Party (Netherlands 1994)
Mixed Logit vs Conditional Logit

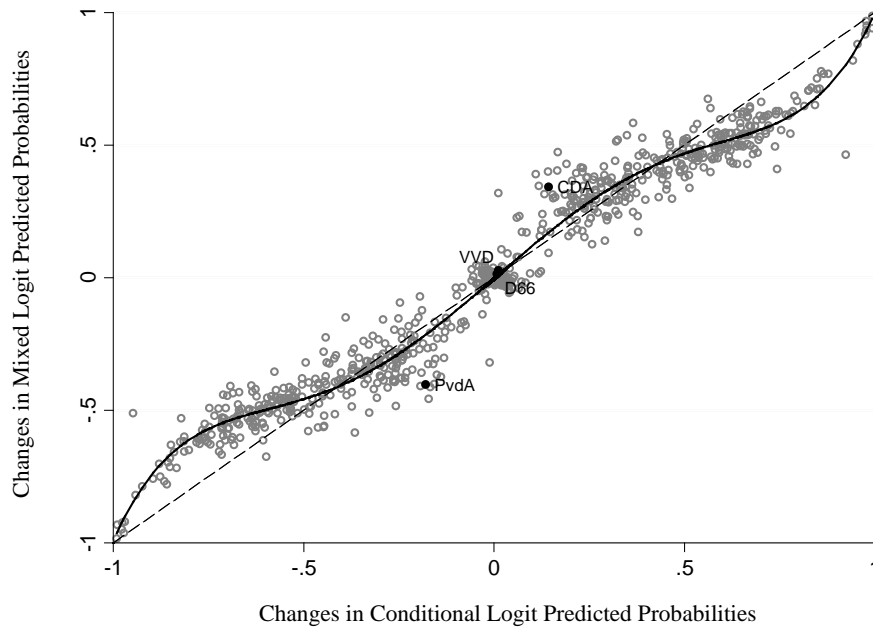
| Party | Baseline Scenario | | Largest Party and Party Size | | | | | | |
|-------|--|---|--------------------------------|--------------------------------|---------------------------------|--------------------------------|---------------------------------|--------------------------------|---------------------------------|
| | PvdA CL Predicted Probability | PvdA MXL Predicted Probability | % Difference in Probability | PvdA → CDA | | PvdA → VVD | | PvdA → D66 | |
| | | | | CL Change in Probability | MXL Change in Probability | CL Change in Probability | MXL Change in Probability | CL Change in Probability | MXL Change in Probability |
| PvdA | 0.38 (0.05) | 0.58 (0.10) | -34.5% | -0.18*** (0.06) | -0.37*** (0.10) | -0.22*** (0.06) | -0.45*** (0.11) | -0.28*** (0.06) | -0.51*** (0.11) |
| CDA | 0.14 (0.07) | 0.14 (0.10) | -4.3% | 0.14** (0.06) | 0.30*** (0.10) | 0.00 (—) | 0.00 (—) | 0.00 (—) | 0.00 (—) |
| VVD | 0.16 (0.02) | 0.12 (0.03) | 27.4% | 0.01 (0.01) | 0.03 (0.02) | 0.22*** (0.06) | 0.45*** (0.11) | 0.00 (—) | 0.00 (—) |
| D66 | 0.10 (0.01) | 0.06 (0.01) | 58.7% | 0.01 (0.01) | 0.02 (0.01) | 0.00 (—) | 0.00 (—) | 0.28*** (0.06) | 0.51*** (0.11) |

Note: The results presented here are for a PM selection opportunity resembling the one that took place in the Netherlands in 1994. The first two columns indicate the conditional logit (CL) and mixed logit (MXL) predicted probabilities respectively for each party in the baseline scenario when the independent variables take on the actual values observed in the real-world. The third column indicates the percentage difference between the conditional logit and mixed logit predicted probabilities in the baseline scenario. The remaining columns indicate the changes in predicted probabilities associated with the conditional logit and mixed logit models alternately as we transfer the party size and largest party status from the PvdA to one of the other three parties. Standard errors are shown in parentheses. Statistically significant changes in predicted probability are indicated: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$ (two-tailed). “—” indicates that there was no change in predicted probability and, hence, no estimated standard error. Estimates are based on simulations using 10,000 draws from the estimated coefficient vector and variance-covariance matrix.

the other three parties based on the CL and MXL models alternately. The changes in predicted probability according to the CL model are quite different from those according to the MXL model. For example, the change in predicted probabilities that the PvdA and the CDA gain the prime ministership when the largest party status and seatshare is transferred from the PvdA to the CDA is estimated as -0.24 and 0.45 respectively by the CL model but -0.37 and 0.30 by the MXL model.

An examination of this type of substitution pattern across our entire dataset is presented in Figure 2. This figure plots the predicted change in probability for each party in our data set if we switch largest party status and seat shares between the largest and second largest parties in each selection opportunity. The changes in probability estimated by the CL model are plotted on the horizontal axis, while the changes for the MXL model are plotted on the vertical axis. The probability changes would line up along the dashed 45 degree line if the CL and MXL models produced the same estimated changes in probabilities in this

Figure 2: Comparing Changes in Mixed Logit and Conditional Logit Predicted Probabilities (Whole Sample)



Note: Figure 2 plots the predicted change in probability for each party in our data set if we switch largest party status and seat shares between the largest and second largest parties in each selection opportunity. The changes in probability estimated by the CL model are plotted on the horizontal axis, while the changes for the MXL model are plotted on the vertical axis. The probability changes would line up along the dashed 45 degree line if the CL and MXL models produced the same estimated changes in probabilities for this hypothetical scenario. The solid black line (a polynomial of degree five) summarizes the actual relationship between the CL and MXL probabilities. The CL and MXL changes in probabilities for the four parties considered in the first counterfactual scenario shown in Table 7 (switching seat shares and largest party status between the PvdA and the CDA) are indicated with the named solid black dots.

hypothetical scenario. The thicker solid black line (a polynomial of degree five) shows the actual relationship between the CL and MXL probabilities, demonstrating that the CL model tends to overestimate large changes in probability while underestimating smaller changes. The CL and MXL changes in probabilities for the four parties considered in the first counterfactual scenario shown in Table 7 (switching seat shares and largest party status between the PvdA and the CDA) are indicated with solid black dots. Note that some of the probability changes for the other counterfactuals shown in Table 7 are larger in magnitude than the probabilities presented in Figure 2. This is because these counterfactuals involve switching seat shares and largest party status between the largest party and parties smaller than the second largest party, producing larger swings in probabilities for these parties.

In sum, our decision to employ a mixed logit rather than a conditional logit is not only driven by methodological concerns but also substantive ones. By taking account of unobserved heterogeneity, the mixed logit provides additional substantive information that cannot be gleaned from a CL model. Moreover, the methodological problems with the conditional logit mean that the substantive information that it does provide is misleading.