Table & Model Specs

Michael Li

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$$logit(P(Y \leq j)) = \frac{P(Y \leq j)}{P(Y > j)} = \alpha_j + \beta x, \ for \ j = 1, \ 2 \ ... \ J-1$$

$$\begin{aligned} logit(P(Government\ Response \leq j)) = {} & \beta_{0j} + \beta_1 I(GeoScope_i = Regional) \\ & + \beta_2 I(GeoScope_i = National) + \beta_3 I(GeoScope_i = International\ Regional) \\ & + \beta_4 I(GeoScope_i = Global) + \beta_5 I(ActorID_i = International) \\ & + \beta_6 I(ActorID_i = Non-State) + \beta_7 I(CampGoals_i = Institutional\ Reform) \\ & + \beta_8 I(CampGoals_i = Policy\ Change) + \beta_9 I(CampGoals_i = Territorial\ Secession) \\ & + \beta_{10} I(CampGoals_i = Autonomy) + \beta_{11} I(CampGoals_i = Unknown) \\ & + \beta_{12} I(Tactics_i = Mixed) + \beta_{13} I(Tactics_i = Violent) \\ & + \beta_{14} I(Region_i = Americas) + \beta_{15} I(Region_i = Asia) \\ & + \beta_{16} I(Region_i = Europe) + \beta_{17} I(Region_i = Middle\ East) \\ & for \ j = 1, \ 2, \ 3, \ 4, \ 5, \ 6, \ 7 \end{aligned}$$

We can use the values in this table to help us assess whether the proportional odds assumption is reasonable for our model. (Note, the table is reproduced below, as well as above.) For example, when pared is equal to "no" the difference between the predicted value for apply greater than or equal to two and apply greater than or equal to three is roughly 2 (-0.378 – -2.440 = 2.062). For pared equal to "yes" the difference in predicted values for apply greater than or equal to two and apply greater than or equal to three is also roughly 2 (0.765 – -1.347 = 2.112). This suggests that the parallel slopes assumption is reasonable (these differences are what graph below are plotting). Turning our attention to the predictions with public as a predictor variable, we see that when public is set to "no" the difference in predictions for apply greater than or equal to two, versus apply greater than or equal to three is about 2.14 (-0.204 – -2.345 = 2.141). When public is set to "yes" the difference between the coefficients is about 1.37 (-0.175 – -1.547 = 1.372). The differences in the distance between the two sets of coefficients (2.14 vs. 1.37) may suggest that the parallel slopes assumption does not hold for the predictor public. That would indicate that the effect of attending a public versus private school is different for the transition from "unlikely" to "somewhat likely" and "somewhat likely" to "very likely."

The plot command below tells R that the object we wish to plot is s. The command which=1:3 is a list of values indicating levels of y should be included in the plot. If your dependent variable had more than three levels you would need to change the 3 to the number of categories (e.g., 4 for a four category variable, even if it is numbered 0, 1, 2, 3). The command pch=1:3 selects the markers to use, and is optional, as are xlab='logit' which labels the x-axis, and main='' which sets the main label for the graph to blank. If the proportional odds assumption holds, for each predictor variable, distance between the symbols for each set of categories of the dependent variable, should remain similar. If the proportional odds assumption holds, for each predictor variable, distance between the symbols for each set of categories of the dependent variable, should remain similar.

Term	Estimate	Standard Error	p.value	95% CI
Geographic Scope = Regional	0.717	0.056	<0.001	0.607 to 0.827
Geographic Scope = National	-0.425	0.070	<0.001	-0.563 to -0.287
Geographic Scope = International	0.448	0.163	0.006	0.128 to 0.767
Geographic Scope = Global	0.001	0.135	0.994	-0.264 to 0.266
Actor ID = International	0.403	0.342	0.239	-0.268 to 1.073
Actor ID = Non-State	1.539	0.254	0.506	-0.328 to 0.666
Campaign Goals = Institutional Reform	-0.654	0.079	<0.001	-0.808 to -0.499
Campaign Goals = Policy Change	-1.236	0.064	<0.001	-1.361 to -1.111
Campaign Goals = Territorial Secession	-1.161	0.085	<0.001	-1.328 to -0.993
Campaign Goals = Autonomy	-1.255	0.094	<0.001	-1.439 to -1.071
Campaign Goals = Unknown	-1.412	0.071	<0.001	-1.552 to -1.272
Tactical Choice = Mixed	2.147	0.042	<0.001	2.066 to 2.229
Tactical Choice = Violent	-0.232	0.061	<0.001	-0.351 to -0.112
Region = Americas	0.177	0.087	0.040	0.008 to 0.347
Region = Asia	0.170	0.055	0.002	0.063 to 0.277
Region = Europe	-0.786	0.134	<0.001	-1.049 to -0.523
Region = Middle East	0.872	0.054	<0.001	-0.766 to 0.978

$$WCE(u) = \sum_{t \leq u} w(u-t)X(t)$$

$$X(t) = Tactics_k \text{ at time t}$$

$$\lambda_i(t_{ik}) = \lambda_{i,0}(t) exp[\beta_{WCE} WCE_i(t_{ik}) + \sum_{s=1}^{p} (\beta_s Z_{s,ik}) + \epsilon_{ik}]$$

$$\begin{aligned}\lambda_i(t_{ik}) = \lambda_{i,0}(t) exp[&\beta_{WCE} WCE_i(t_{ik}) \\ &+ \beta_1 GeographicScope_{ik} + \beta_2 Damage_{ik} \\ &+ \beta_3 EconomicImpact_{ik} + \beta_4 FatalCasualties_{ik} \\ &+ \beta_5 Injuries_{ik} + \beta_6 DailyProtestCount_{ik} + \epsilon_{ik}]\end{aligned}$$

Comparison	Hazard Ratio
Daily Non-Violent Protests vs. Mixed Protests	33.926
Daily Non-Violent Protests vs. Violent Protests	1150.949
Daily Mixed Protests vs. Violent Protests	33.926

Term	Estimate	Standard Error	p.value	95% CI
Geographic Scope	1.002	0.089	<0.001	0.828 to 1.176
Damage	1.766	0.223	<0.001	1.329 to 2.203
Economic Impact	0.628	0.155	<0.001	0.324 to 0.932
Fatal Casalties	-1.661	0.443	<0.001	-2.530 to -0.792
Injuries	-0.097	0.063	0.1225	-0.220 to 0.0262
Daily Protest Count	0.727	0.121	<0.001	0.490 to 0.964

Chilling Effect

Term	Estimate	Standard Error	p.value	95% CI
Timing = Prior	-0.004	2.696	0.818	-0.034 to 0.027
Region = Americas	-0.099	0.040	0.014	-0.178 to -0.020
Region = Asia	0.244	0.023	<0.001	0.198 to 0.289
Region = Europe	-0.637	0.080	<0.001	-0.795 to -0.480
Region = Middle East	0.582	0.021	<0.001	0.541 to 0.622
Geographic Scope = Regional	-0.090	0.024	<0.001	-0.138 to -0.042
Geographic Scope = National	0.055	0.034	0.108	-0.012 to 0.121
Geographic Scope = International	0.139	0.080	0.081	-0.017 to 0.296
Geographic Scope = Global	0.224	0.107	0.036	0.015 to 0.433
Actor ID = Non-State	-0.041	0.138	0.767	-0.311 to 0.229
Actor ID = International	-0.468	0.179	0.009	-0.311 to 0.229
Actor ID = Non-Aligned	-1.035	0.585	0.077	-2.181 to 0.111
Campaign Goals = Institutional Reform	-0.764	0.030	<0.001	-0.823 to -0.706
Campaign Goals = Policy Change	-0.767	0.026	<0.001	-0.819 to -0.715
Campaign Goals = Territorial Secession	-0.474	0.032	<0.001	-0.537 to -0.411
Campaign Goals = Autonomy	-1.063	0.032	<0.001	-1.126 to -1.000
Campaign Goals = Anti-Occupation	-0.833	0.256	0.001	-1.335 to -0.330
Campaign Goals = Unknown	-0.672	0.025	<0.001	-0.772 to -0.622
Tactics = Mixed	-0.013	0.030	0.658	-0.072 to -0.046
Tactics = Violent	-0.072	0.023	0.002	-0.117 to -0.027
Government Response = Short of Killings	0.152	0.022	<0.001	0.109 to 0.194
Government Response = Intended to Kill	0.052	0.016	0.001	0.021 to 0.083
Year	0.085	0.001	<0.001	0.082 to 0.087

$$
\begin{aligned}
log(\mu_i) = {} & \beta_0 + \beta_1 I(Timing_i = Prior) + \beta_2 I(Region_i = Americas) \\
& + \beta_3 I(Region_i = Asia) + \beta_4 I(Region_i = Europe) + \beta_5 I(Region_i = Middle\ East) \\
& + \beta_6 I(GeographicScope_i = Regional) + \beta_7 I(GeographicScope_i = National) \\
& + \beta_8 I(GeographicScope_i = International) + \beta_9 I(GeographicScope_i = Global) \\
& + \beta_{10} I(ActorID_i = Non - State) + \beta_{11} I(ActorID_i = International) \\
& + \beta_{12} I(ActorID_i = Non - Aligned) + \beta_{13} I(CampaignGoals_i = Institutional\ Reform) \\
& + \beta_{14} I(CampaignGoals_i = Policy\ Change) + \beta_{15} I(CampaignGoals_i = Territorial\ Secession) \\
& + \beta_{16} I(CampaignGoals_i = Autonomy) + \beta_{17} I(CampaignGoals_i = Anti - Occupation) \\
& + \beta_{18} I(CampaignGoals_i = Unknown) + \beta_{19} I(Tactics_i = Mixed) \\
& + \beta_{20} I(Tactics_i = Violent) + \beta_{21} I(GovernmentResponse_i = Short\ of\ Killings) \\
& + \beta_{22} I(GovernmentResponse_i = Intended\ to\ Kill) + \beta_{23} Year_i + \epsilon_i
\end{aligned}
$$

$$
\Pr(Y = y_i | \mu_i, \alpha) = \frac{\Gamma(y_i + \alpha^{-1})}{\Gamma(\alpha^{-1})\Gamma(y_i + 1)} \left(\frac{1}{1 + \alpha\mu_i} \right)^{\alpha^{-1}} \left(\frac{\alpha\mu_i}{1 + \alpha\mu_i} \right)^{y_i}
$$