**Appendix 1**

**Table A1 Eight Policy Components of State DUI Policy**

|  |  |
| --- | --- |
| **Policy Components** | **Variable Name** |
| Presence of a law that sets a mandatory minimum fine for first time DUI offenders | Minimum fine  |
| Presence of a law that establishes a legal blood alcohol concentration (BAC) limit for underage drivers that is lower than the BAC limit for adult drivers | Zero tolerance  |
| Presence of a law that mandates prison time for first time DUI offenders | Minimum prison  |
| Presence of a law that prohibits open containers of alcohol, including beer, wine, and distilled spirits, in the passenger compartments of noncommercial motor vehicles | Open container  |
| Presence of a law that sets BAC limits for adult drivers (21 years and older) of motor vehicles at 0.08 grams per deciliter (g/dL). | 0.08 BAC per se |
| Presence of a law that mandates community service after 1st or 2nd conviction  | Community service |
| Presence of a law that requires license suspension for first-time, pre-conviction DUI offenders | Pre-conviction license suspension |
| Presence of a law that requires license suspension for first-time, post-conviction DUI offenders | Post-conviction license suspension |

Source: Macinko, James, Diana Silver, Jin Y. Bae, Geronimo Jimenez, Maggie Paul, and Ashley Mueller. The State Health Policy Research Dataset (SHEPRD): 1980-2010. ICPSR34789-v2. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2013-12-16.

**Appendix 2**

We estimate the model with a linear fixed-effect panel model. An alternative is to use a panel poisson or panel negative binomial, or a zero-inflated poisson. Our modelling choice is based on the following considerations.

The panel poisson and panel negative binomial differ only in one parameter, the dispersion parameter of the negative binomial, which is the ratio of the variance of the underlying count variable to the mean, minus one. Both can either converge to estimates or fail to do so. Given the present data and problem, no convergence is possible. Both models use Maximum Likelihood Estimation, which eliminates all groups of data with all values being zero. This happens because the fixed or random effect is set to negative infinity, or just a very large value, making all of the values of zero nonstochastic with probability one. That is illogical for modelling but it is how MLE must work. The same problem, called perfect classification, also interferes with conditional logit and panel probit and logit models.

For groups with some variation, the estimation attempts to fit a large number of fixed or random effects in a likelihood function. That is a much harder numerical problem than estimating means, and flat regions of the likelihood often lead to failure of the estimation.

We attempted all combinations of estimators, poisson and negative binomial and fixed and random effects (even though they are potentially problematic because of the random effects independence assumption), but none of the models converged to estimates.

That leaves regression. Linear regression does not estimate the underlying structure and is considered to be biased relative to any theoretical structure, other than the highly unlikely linear structure. Linear regression does estimate the marginal impacts of explanatory variables on the expected value of the count variable. Those are valid policy impacts or effect sizes, but they do not constitute a theory of the process. Linear regression can accommodate without problems the fixed effects. Groups with values of zero have fixed effects that make small values likely, but not perfectly predictable.

In sum, MLE fails because it estimates the probability of the count data values, and if all are zero, then MLE fits that exactly. Regression succeeds because it estimates the expected value of the dependent variable, which is finite. For the count data in this research, only regression produces estimates.

**Appendix 3**

**Table A2 Summary Statistics**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) | (5) |
| VARIABLES | N | mean | S.D. | min | max |
|  |  |  |  |  |  |
| Policy comprehensiveness | 33,674 | 0.131 | 0.376 | 0 | 4 |
| Total fatality rate | 33,674 | 0.318 | 0.072 | 0.120 | 0.550 |
| Driver fatality rate | 33,674 | 0.040 | 0.018 | 0.002 | 0.112 |
| MADD | 33,674 | 4.750 | 4.479 | 0 | 21 |
| Evangelical Protestant | 18,393 | 0.278 | 0.144 | 0.041 | 0.777 |
| Citizen liberalism | 33,674 | 48.56 | 14.94 | 9.250 | 93.91 |
| Legislative professionalism | 33,674 | 0.210 | 0.133 | 0.034 | 0.659 |
| Partisan control | 32,948 | 0.126 | 0.643 | -1 | 1 |
| Alcohol tax per capita | 33,674 | 18.96 | 12.64 | 0 | 150.6 |
| Alcohol consumption per capita | 33,674 | 1.914 | 0.433 | 0.910 | 4.220 |
| Ln of highway mileage | 33,674 | 17.86 | 0.917 | 15.20 | 19.54 |
| Ln of miles of travel per capita | 33,674 | 9.107 | 0.183 | 8.469 | 9.722 |
| State GDP per capita | 33,674 | 0.034 | 0.015 | 0.01 | 0.091 |
| Ideological difference | 33,674 | 13.21 | 9.712 | 0 | 49.79 |
| Difference of population size | 33,674 | 5.073 | 5.760 | 0 | 33.26 |
| Year | 33,674 |  |  | 1983 | 2000 |
|  |  |  |  |  |  |

**Appendix 4**

**Table A3 Lobbying, Policy Success, and Policy Comprehensiveness: No Interactions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | (1) | (2) | (3) | (4) |
| VARIABLES | model 1 | model 2 | model 3 | model 4 |
| ***Learning: Policy Success in State B*** |  |  |  |  |
| Total fatality rate | 0.300\*\*\* | 0.039 |  |  |
|  | (0.068) | (0.079) |  |  |
| Driver fatality rate |  |  | 0.202 | 0.134 |
|  |  |  | (0.197) | (0.261) |
| ***Lobbying*** |  |  |  |  |
| MADD | 0.000 | -0.002 | 0.001 | -0.002 |
|  | (0.001) | (0.001) | (0.001) | (0.001) |
| ***Internal Factors of State A*** |  |  |  |  |
| Evangelical Protestant |  | 0.055 |  | 0.072\* |
|  |  | (0.037) |  | (0.038) |
| Citizen liberalism | -0.030 | -0.177\*\*\* | -0.022 | -0.175\*\*\* |
|  | (0.047) | (0.059) | (0.047) | (0.060) |
| Partisan control | 0.022\*\*\* | 0.019\*\*\* | 0.018\*\*\* | 0.011\* |
|  | (0.004) | (0.005) | (0.005) | (0.006) |
| Legislative professionalism | -0.161\*\*\* | -0.419\*\*\* | -0.161\*\*\* | -0.427\*\*\* |
|  | (0.044) | (0.057) | (0.044) | (0.056) |
| Total fatality rate | 0.534\*\*\* | 1.094\*\*\* |  |  |
|  | (0.057) | (0.098) |  |  |
| Driver fatality rate |  |  | 0.747\*\*\* | 1.344\*\*\* |
|  |  |  | (0.235) | (0.373) |
| Ln of highway mileage | -0.202\*\*\* | -0.419\*\*\* | -0.197\*\*\* | -0.393\*\*\* |
|  | (0.041) | (0.057) | (0.042) | (0.058) |
| Ln of miles of travel per capita | 0.227\*\*\* | 0.343\*\*\* | 0.250\*\*\* | 0.367\*\*\* |
|  | (0.036) | (0.047) | (0.036) | (0.047) |
| Alcohol consumption per capita | 0.010 | 0.142\*\*\* | 0.012 | 0.171\*\*\* |
|  | (0.023) | (0.028) | (0.024) | (0.029) |
| Alcohol tax per capita | 0.002\*\*\* | 0.002\*\*\* | 0.002\*\*\* | 0.002\*\*\* |
|  | (0.000) | (0.000) | (0.000) | (0.000) |
| GDP per capita | -1.387\*\* | 1.752\* | -1.065\* | 1.225 |
|  | (0.592) | (0.898) | (0.596) | (0.923) |
| ***Relationship between States A and B*** |  |  |  |  |
| Ideological difference | -0.042 | -0.026 | -0.037 | -0.022 |
|  | (0.027) | (0.030) | (0.027) | (0.031) |
| Difference of population size | 0.011\*\*\* | 0.005 | 0.012\*\*\* | 0.007\* |
|  | (0.003) | (0.004) | (0.003) | (0.004) |
| ***State B as leaders*** |  |  |  |  |
| GDP per capita | 0.424 | -0.125 | 0.693 | -0.109 |
|  | (0.736) | (0.835) | (0.738) | (0.857) |
| Constant | 2.135\*\*\* | 4.609\*\*\* | 1.511\* | 3.542\*\*\* |
|  | (0.824) | (1.082) | (0.851) | (1.099) |
| Dyad fixed effects | Yes | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes | Yes |
| Observations | 32,948 | 17,986 | 32,948 | 17,986 |
| R-squared | 0.065 | 0.052 | 0.062 | 0.043 |
| Number of dyads | 2,342 | 2,235 | 2,342 | 2,235 |

Robust standard errors in parentheses, clustered by dyads of states

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1