

# Advanced Quantitative Methods

## Lab 9: Limited Dependent Variables

Johan A. Elkink  
jos.elkink@ucd.ie

13–20 April 2018

- Using the `asiabaro.dta` data set, estimate a logistic regression explaining abstention in elections by trust in the government, satisfaction with democracy, gender, urbanisation, and preference for democracy.
  - What is the slope of the regression line with respect to preference for democracy at  $\hat{\pi} = .5$ ?
  - Calculate first differences for urban vs rural and female vs male.
  - Plot predicted probabilities as a function of preference for democracy.
  - Calculate the AUC score for this model.
- Repeat the previous estimation using probit instead of logit.
  - Plot predicted probabilities with respect to preference for democracy.
  - Evaluate the predictive performance of this model.
  - Add `suitdemoc` as an independent variable to the model. Does the predictive performance improve?
- Using the `asiabaro.dta` data set, estimate a model explaining interest in politics by gender, education, and reliance on fate.
  - Perform  $z$ -tests for each of the independent variables.  
Use: `se <- sqrt(diag(vcov(m)))`
  - Check the standard errors of the  $\tau$  values—are the categories clearly separated?
  - Calculate the predicted probability for males and females of the respondent being very interested in politics.
- Using data set `asiabaro.dta`, selecting only data from Taiwan, explain party choice by urbanisation, gender, age, and trust in the police. Estimate a multinomial model and interpret the results.
- Open dataset `quine` which is part of the MASS library in R. Estimate / interpret / check both poisson and negative binomial:  
 $Days \sim Eth + Sex + Age + Lrn$ 

<b>Eth</b>	Ethnicity: aboriginal or not
<b>Sex</b>	Sex of respondent
<b>Age</b>	Age group
<b>Lrn</b>	Average or slow learner
<b>Days</b>	Days absent from school in a year
- Open the `taoisigh.dta` data file.
  - Estimate a baseline survival model, using an exponential hazard function, for the duration of cabinets.
  - Extend the model to see whether coalitions have a lower survival probability.

- (c) Estimate the model using a proportional hazard function.
- (d) Estimate the model with a frailty term for party.
- (e) What do you conclude about the impact of coalitions on the survival chances of Irish governments?