

PO31Q-15 Political Analysis with Maximum Likelihood Estimation

26/27

Department

Politics & International Studies

Level

Undergraduate Level 3

Module leader

Andreas Murr

Credit value

15

Module duration

10 weeks

Assessment

100% coursework

Study location

University of Warwick main campus, Coventry

Description

Introductory description

Why does one citizen strongly support a new policy while their neighbour strongly opposes it — and a third sits somewhere in between? What shapes whether people back a policy at all, which of several alternatives they prefer, or how warmly they endorse it? Standard regression can't always answer these questions, because its assumptions quietly break down when outcomes aren't continuous. This module introduces the family of regression-based methods political scientists use to tackle exactly these kinds of problems, covering continuous, binary, nominal, and ordered outcomes.

Module aims

This module puts maximum likelihood estimation in your hands as a working tool for political analysis. You'll learn how to fit models to real research questions, interpret what the numbers actually mean, and present your findings in ways that persuade. Just as importantly, you'll develop the critical eye to spot what quantitative work in political science does well — and where it claims more than it should.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

1. Introduction to maximum likelihood
2. Models of continuous outcomes (1/2)
3. Models of continuous outcomes (2/2)
4. Models of binary outcomes (1/2)
5. Models of binary outcomes (2/2)
6. Reading week
7. Model interpretation, evaluation, and selection
8. Models of ordinal outcomes
9. Models of nominal outcomes
10. Recap

Learning outcomes

By the end of the module, students should be able to:

- Understand how maximum likelihood models can be used to answer research questions.
- Identify which parametric model best fits their research question and the underlying data-generating process.
- Interpret a variety of maximum likelihood models and present the results using prediction, substantive interpretation, marginal effects, and simulation.
- Apply maximum likelihood estimation to their own research.

Indicative reading list

[Reading lists can be found in Talis](#)

[Specific reading list for the module](#)

Research element

Students will be conducting their own research using the techniques learned in the module and write it up in their technical report.

International

Examples will be taken from across the world.

Subject specific skills

- Have an increased understanding of the technical and theoretical/conceptual dimensions of

maximum likelihood estimation in quantitative data analysis.

- Develop substantial competency in identifying the statistical modules suited to the nature data and in using these models to answer a research question.
- Understand the value and gain practical experience in applying maximum likelihood estimation to political science data sets.
- Present and interpret the results of quantitative statistical analyses appropriately when using maximum likelihood estimation to fit models to data.

Transferable skills

- Understand the impact of the ways in which quantitative data are generated, manipulated and analysed on the validity and usefulness of research findings.
 - Manipulate and analyse existing data and present the results of these analyses appropriately using statistical software
 - Produce original empirical research and develop skills in written communication.
 - Interpret and critique published quantitative research more accurately.
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Study

Study time

Type	Required
Lectures	9 sessions of 1 hour (6%)
Seminars	9 sessions of 2 hours (12%)
Private study	73 hours (49%)
Assessment	50 hours (33%)
Total	150 hours

Private study description

Directed and independent reading; homework

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Students can register for this module without taking any assessment.

Assessment group A1

	Weighting	Study time	Eligible for self-certification
Assessment component			
Final Technical Report	100%	50 hours	Yes (extension)
Students apply the techniques covered in class to a social science data set to evaluate an argument or describe a political phenomenon			

Reassessment component is the same

Feedback on assessment

Detailed feedback will be provided regularly throughout the module.

Formative verbal feedback will be provided at relevant work in classes and lab sessions throughout the term. In addition, student student participation will be strongly encouraged -- this will include students giving each other peer feedback during classes on their own work as well as working in groups during lab sessions.

Summative written feedback will be provided on the assessment.

In addition, students will be invited to Advice and Feedback hours to receive additional verbal feedback (formative or summative), should they wish to do so.

Availability

Pre-requisites

To take this module, you must have passed:

- All of
 - [PO11Q-15 Quantitative Political Analysis: From Measurement to Inference](#)
 - [PO12Q-15 Quantitative Political Analysis: Uncovering Relationships](#)

Courses

This module is Core optional for:

- Year 4 of UHIA-VM16 Undergraduate History and Politics (with Intercolated Year and a term in Venice)

- Year 4 of UHIA-VM14 Undergraduate History and Politics (with Year Abroad and a term in Venice)
- Year 3 of UHIA-VM13 Undergraduate History and Politics (with a term in Venice)

This module is Optional for:

- Year 3 of UPOA-M102 Undergraduate Global Politics (with Integrated Year Abroad at Brussels School of Governance, VUB)
- Year 3 of UPOA-M100 Undergraduate Politics
- Year 4 of UPOA-M101 Undergraduate Politics (with Intercalated Year)
- Year 4 of UPOA-M168 Undergraduate Politics and International Studies with Chinese
- Year 3 of UPOA-M164 Undergraduate Politics, International Studies and German
- Year 4 of UPOA-M165 Undergraduate Politics, International Studies and Italian
- Year 3 of UPHA-V7MW Undergraduate Politics, Philosophy and Law
- Year 4 of UPHA-V7MX Undergraduate Politics, Philosophy and Law (with Intercalated Year)

This module is Option list A for:

- Year 3 of UPOA-M16A Undergraduate Politics and International Studies
- Year 4 of UPOA-M16B Undergraduate Politics and International Studies (with Intercalated Year)
- Year 3 of UPOA-ML13 Undergraduate Politics and Sociology
- Year 4 of UPOA-ML14 Undergraduate Politics and Sociology (with Intercalated year)
- Year 4 of UPOA-M163 Undergraduate Politics, International Studies and French
- Year 4 of UPOA-M164 Undergraduate Politics, International Studies and German
- Year 3 of UPOA-M16D Undergraduate Politics, International Studies and German (3 year degree)
- Year 4 of UPOA-M166 Undergraduate Politics, International Studies and Hispanic Studies

This module is Option list B for:

- Year 4 of UHIA-VM15 Undergraduate History and Politics (with Intercalated Year)
- Year 3 of UPHA-V5L2 Undergraduate Philosophy and Politics

This module is Option list C for:

- UPHA-V7ML Undergraduate Philosophy, Politics and Economics
 - Year 3 of V7MP Philosophy, Politics and Economics (Bipartite)
 - Year 3 of V7ML Philosophy, Politics and Economics (Tripartite)
- UPHA-V7MM Undergraduate Philosophy, Politics and Economics (with Intercalated year)
 - Year 4 of V7MS Philosophy, Politics and Economics (Bipartite with Economics Major) (with Intercalated Year)
 - Year 4 of V7MQ Philosophy, Politics and Economics (Bipartite) with Intercalated Year
 - Year 4 of V7MM Philosophy, Politics and Economics (Tripartite) (with Intercalated year)

This module is Option list D for:

- Year 3 of UHIA-VM11 Undergraduate History and Politics
- Year 4 of UHIA-VM12 Undergraduate History and Politics (with Year Abroad)

- Year 3 of UPHA-V7ML Undergraduate Philosophy, Politics and Economics