

# PO22Q-15 Introduction to Causal Inference in Quantitative Political Analysis

**23/24**

**Department**

Politics & International Studies

**Level**

Undergraduate Level 2

**Module leader**

Vincenzo Bove

**Credit value**

15

**Module duration**

10 weeks

**Assessment**

100% coursework

**Study location**

University of Warwick main campus, Coventry

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## Description

### Introductory description

Social scientists constantly make or evaluate arguments about institutions, public policies, laws and individual behaviours. Such arguments depend on underlying facts. “Democratic institutions lead to economic development”. Gun control reduces crime.” “Raising the minimum wage increases unemployment.” “Politicians benefit financially from office”. “Social media increase political polarization’.

How do we know whether these claims are true? In addition to sound theoretical arguments, rigorous empirical analysis is a powerful way to get at such facts. This module offers an accessible introduction to the topic of causal inference in quantitative analysis and its practice. The module strives to minimize technical notation by providing a largely nontechnical overview of the newest methods for causal inference along with practical guidelines for designing and implementing research projects aimed at establishing causal relationships. These techniques are not only used by national governments and international organizations to set and track targets, but they are increasingly applied by managers in the private sector to determine budget allocations and guide decisions.

## Module aims

The aim of this module is to provide an accessible introduction to the topic of causal inference in social science. Students will learn the newest empirical techniques to study cause-and-effect relationships regarding real world events and discover the pitfalls when working with data. The statistical concepts are illustrated using data and examples primarily from the fields of political science, but also from law, economics and sociology.

## 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. Cause-and-effect questions and Counterfactuals
2. Impact Evaluation for Policy Decisions
3. Randomized Experiments
4. Instrumental Variables
5. Regression Discontinuity Design
6. (Reading Week)
7. Difference-in-Differences Method
8. Matching
9. Determining Which Method to Use for a Given Question
10. How to Produce a Policy Research Report

## Learning outcomes

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

- - Assess the quality of published research with the aim of showing how the process of knowledge creation through research does or does not lead to clear conclusions regarding causal effects
- - Critically evaluate how research is presented in the public domain (e.g., media) to be a better consumer of reported findings
- - Learn the five basic empirical techniques - random assignment, regression, instrumental variables, regression discontinuity, and differences-in-differences – using Stata
- - Conduct meaningful and creative empirical work that investigates causal relationships

## Indicative reading list

Gertler, Paul J., Sebastian Martinez, Patrick Premand, Laura B. Rawlings, and Christel MJ Vermeersch. (2016). Impact evaluation in practice. Second Edition. The World Bank. Available online: <https://openknowledge.worldbank.org/handle/10986/25030>

Angrist, Joshua D., and Jörn-Steffen Pischke. Mastering'metrics: The path from cause to effect. Princeton University Press, 2014.

## Research element

Evaluation of existing research with respect to causal inference.

## **International**

Examples from across Political Science / International Relations will be used.

## **Subject specific skills**

Have an increased understanding of the technical and theoretical/conceptual dimensions of causal inference in quantitative data analysis

Develop substantial competency in the cutting-edge statistical techniques to study cause-and-effect relationships

Understand the value and practical experience of applying statistical methods for causal inference and learn both their merits and limitations

Present and interpret the results of quantitative statistical analyses appropriately when the aim is establishing causal relations

## **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**

<b>Type</b>	<b>Required</b>
Lectures	9 sessions of 1 hour (9%)
Seminars	9 sessions of 2 hours (18%)
Private study	73 hours (73%)
Total	100 hours

### **Private study description**

Directed and independent reading, weekly homework.

## Costs

No further costs have been identified for this module.

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## Assessment

You must pass all assessment components to pass the module.

### Assessment group A

	<b>Weighting</b>	<b>Study time</b>
Final Technical Report	100%	50 hours
1 x 3,000 words final project (100%) where students use the techniques covered in class to evaluate an argument or describe a political phenomenon		

### Feedback on assessment

Detailed and regular feedback will be provided throughout the module.

#### FORMATIVE

Verbal feedback on work will be provided at relevant points in the seminars and workshops throughout the term. In addition, student participation will be strongly encouraged and 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

Detailed written feedback will be provided on summative assessments.

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## Availability

### Courses

This module is Optional for:

- UPHA-V7ML Undergraduate Philosophy, Politics and Economics
  - Year 2 of V7ML Philosophy, Politics and Economics (Tripartite)
  - Year 2 of V7ML Philosophy, Politics and Economics (Tripartite)
  - Year 2 of V7ML Philosophy, Politics and Economics (Tripartite)
- Year 2 of UPOA-M100 Undergraduate Politics
- UPOA-M16A Undergraduate Politics and International Studies
  - Year 2 of M16A Politics and International Studies
  - Year 2 of M16A Politics and International Studies

- Year 2 of M16A Politics and International Studies
- UPHA-V7MW Undergraduate Politics, Philosophy and Law
  - Year 2 of V7MW Politics, Philosophy and Law
  - Year 2 of V7MW Politics, Philosophy and Law

This module is Unusual option for:

- UPHA-V7ML Undergraduate Philosophy, Politics and Economics
  - Year 2 of V7MR Philosophy, Politics and Economics (Bipartite with Economics Major)
  - Year 2 of V7MP Philosophy, Politics and Economics (Bipartite)
  - Year 2 of V7MP Philosophy, Politics and Economics (Bipartite)
  - Year 2 of V7ML Philosophy, Politics and Economics (Tripartite)
  - Year 2 of V7ML Philosophy, Politics and Economics (Tripartite)
  - Year 2 of V7ML Philosophy, Politics and Economics (Tripartite)
- UPHA-V7MW Undergraduate Politics, Philosophy and Law
  - Year 2 of V7MW Politics, Philosophy and Law
  - Year 2 of V7MW Politics, Philosophy and Law

This module is Option list A for:

- Year 2 of UPOA-M169 Undergraduate Politics and International Studies with Chinese (3 year)
- Year 2 of UPOA-ML13 Undergraduate Politics and Sociology
- UPOA-M163 Undergraduate Politics, International Studies and French
  - Year 2 of M163 Politics, International Studies and French
  - Year 3 of M163 Politics, International Studies and French
- Year 2 of UPOA-M166 Undergraduate Politics, International Studies and Hispanic Studies
- Year 2 of UPOA-M165 Undergraduate Politics, International Studies and Italian

This module is Option list B for:

- UPHA-V7ML Undergraduate Philosophy, Politics and Economics
  - Year 2 of V7MP Philosophy, Politics and Economics (Bipartite)
  - Year 2 of V7MP Philosophy, Politics and Economics (Bipartite)

This module is Option list C for:

- UHIA-VM11 Undergraduate History and Politics
  - Year 2 of VM11 History and Politics
  - Year 2 of VM11 History and Politics
  - Year 2 of VM11 History and Politics

This module is Option list D for:

- UHIA-VM11 Undergraduate History and Politics
  - Year 2 of VM11 History and Politics
  - Year 2 of VM11 History and Politics
  - Year 2 of VM11 History and Politics
- Year 2 of UHIA-VM13 Undergraduate History and Politics (with a term in Venice)

- Year 2 of UPHA-V7ML Undergraduate Philosophy, Politics and Economics