

**Course: CAUSAL INFERENCE IN MICROECONOMETRICS WITH APPLICATIONS TO PROGRAM EVALUATION**

Reference	X000173	
Taught in	Doctoral School of Social and Behavioural Sciences and Belgian Graduate School in Economics	
Theory	(A)	40.0
Exercises	(B)	
Training and projects	(C)	
Studytime	(D)	240.0
Studypoints	(E)	8
Level	specialist	
Credit contract? (one mark)	<input type="checkbox"/> Unrestricted Access: student takes into consideration the conditions mentioned in Starting Competences <input checked="" type="checkbox"/> Access is determined after successful competences assessment	
Examination contract? (one mark)	<input type="checkbox"/> Unrestricted Access: student takes into consideration the conditions mentioned in Starting Competences <input checked="" type="checkbox"/> Access is determined after successful competences assessment <input type="checkbox"/> This course can not be taken through an exam contract Motivation:	
Credit contract mandatory if Exam contract?	Course included in exam contract	
Retake possible?	Yes	
Teaching Language	English	
Lecturer	Bart Cockx	
Department	EB21	
Co-lecturers	William Parienté (Université catholique de Louvain)	

**Key Words**

Microeconometrics, evaluation methods, causal inference, natural experiments, social experiments (randomized controlled trials), matching, instrumental variables, discontinuity design, causal machine learning methods.

**Position of the Course**

The identification and estimation of causal relationships are central objectives of researchers in any field of research. In the last two decades, much econometric and statistical research has been done on the identification and the estimation of causal effects. The objective of the

course is to introduce the student to the "state of the art" of causal inference in micro-econometrics.

Much of the research on causal inference has been developed in the program evaluation literature, mostly evaluating social or employment programs. We often illustrate the methods covered in this course by examples from this field. However, the covered methods are increasingly applied to other fields, and are therefore useful to any empirical researcher who is interested in the identification and estimation of causal effects.

### **Contents**

The lectures will take place each **Friday** from October 4 to December 20, 2024 (**no lecture on November 1**) between 10:00 and 12:00, and 13:00 and 15:00. The date of the exam is scheduled in January 2025, **exact date to be determined**.

The course covers methods that have recently become popular in the literature: natural and social experiments, matching, new interpretations of instrumental variable methods, discontinuity design, and causal machine learning methods. The heterogeneity of causal effects will be a specific focus.

Special attention will be paid to the practical aspects of an evaluation: access to relevant data, identifying assumptions, estimation and interpretation of results. The course will concentrate more on the use of econometric methods than on their statistical properties, presumed to be known. It will also rather be focused on intuitions, than on proofs.

### **Starting Competences**

Final competences in the course "Advanced Econometrics: Nonlinear Methods" (FHECON01000016) or equivalent. Knowledge of "classical" evaluation methods, such as Heckman selection correction models, standard interpretations of instrumental variables or GMM estimators and fixed effect estimators are prerequisites.

### **Final Competences**

At the end of this course the PhD student should have acquired the most recent insights in the evaluation methods and causal inference. This should allow him/her to apply these methods in his/her empirical research and/or to contribute to the scientific literature in this field.

### **Teaching and Learning Material**

The course material will consist of slides, scientific articles and will make use of the software Stata® (version 13 or later).

### **References**

The following article provides an overview of the covered topics:

Blundell, R. and M. Costa Dias (2009), "Alternative Approaches to Evaluation in Empirical Microeconomics", The Journal of Human Resources, 44 (3), 565-640.

A detailed reading list will be provided during the course.

### Study Coaching

The teachers and assistant will be available for questions regarding the course. Didactical material (slides, scientific articles, exercises, computerprograms and datasets) will be posted on the digital learning platform Ufora (<https://elosp.ugent.be/welcome>)

### Teaching Methods

Lectures, reading and group discussions of scientific articles, computer exercises.

### Evaluation Methods (one mark)

- end-of-term evaluation
- permanent evaluation
- combined evaluation:
  - , end-of-term evaluation 75 %
  - , permanent evaluation 25 %

### Examination Methods

Permanently: active participation in the discussion and evaluation of home assignments.

End-of-term: Take home written exam consisting in a critical analysis of a scientific article that hasn't been discussed during the lectures or presentation of empirical research within the student's doctoral project in which one of the methods that are discussed in the lectures are used. This written exam is complemented by an oral defense and subjected to a discussion with co-students.

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<sup>1</sup> **Situering:** met inbegrip van de relatie met en de bijdrage tot de doelstelling van de opleiding.

<sup>2</sup> **Inhoud:** beschrijving van de leerstof waarmee de overspanning tussen de beginsituatie en de eindsituatie zal gerealiseerd worden.

<sup>3</sup> **Begincompetenties:** de competenties nodig om het opleidingsonderdeel aan te vatten; deze kunnen worden geformuleerd als eindcompetenties van voorafgaande opleidingsonderdelen. Deze gegevens zijn bijzonder belangrijk voor het vaststellen van de volgtijdelijkheid van het opleidingsonderdeel m.b.t. b.v. het vastleggen van een geïndividualiseerd traject.

<sup>4</sup> **Eindcompetenties:** de competenties die gerealiseerd zijn bij het succesvol beëindigen van het opleidingsonderdeel.

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<sup>5</sup> **Leermateriaal en prijs:** neerslag van de leerstof en de prijs ervan. Het leermateriaal kan in een andere taal dan het Nederlands worden aangeboden. Indien dit het geval is, dient dit in deze rubriek worden vermeld.

<sup>6</sup> **Referenties** van wetenschappelijke publicaties waarvan de lectuur wordt aanbevolen.

<sup>7</sup> **Studiebegeleiding:** aangeboden om de studenten te ondersteunen bij de functionele verwerking van de leerstof en het bereiken van de eindcompetenties.

<sup>8</sup> **Didactische werkvormen:** nodig en nuttig om de eindcompetenties te bereiken.

<sup>9</sup> **Evaluatievormen:** het systeem van evaluatie van de studiestatistiek in het kader van de examens en de eventuele bijzondere voorwaarden om te slagen; bij niet-periodegebonden evaluatie dienen de frequentie en de vorm uitdrukkelijk vermeld te worden. Zo het examencijfer functie is van de beoordelingen (zowel via periodegebonden als niet-periodegebonden evaluatie), wordt tevens vermeld welke berekeningswijze er wordt toegepast.

<sup>10</sup> **Periodegebonden evaluatie:** evaluatie van de studiestatistiek van een student tijdens de examenperiode, zoals vastgelegd in de academisch kalender.

<sup>11</sup> **Niet-periodegebonden evaluatie:** (meestal meerdere) evaluatie(s) van de studiestatistiek van de student binnen en buiten de examenperiodes, maar buiten de vakantieperiodes, zoals vastgelegd in de academische kalender.

<sup>12</sup> **Ondervragingsvormen:** de examenvormen en -inhouden en hun relatie met de eindcompetenties: mondeling, schriftelijk, open boek, multiple choice, ...

**Algemene informatie over de rubrieken in de studiefiche is terug te vinden in het onderwijs- en examenreglement: <http://www.opleidingen.ugent.be/studiegids/2009/NL/GENERAL/OER.PDF>**

**General information about the elements in the study fiche can be found in the education and examination code: <http://www.opleidingen.ugent.be/studiegids/2009/EN/GENERAL/OERE.PDF>**