Introduction to Bayesian Inference in the Social Sciences

Speaker: Luis E. Rojas, EUI
Sponsor: F. Bernardi
Organiser: Macarena Ares Abalde
Dates:
15 May 2015 (Emeroteca)
18 May 2015 (Seminar Room 4)
19 May 2015 (Seminar Room 3)

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Outline and Motivation

Bayesian analysis has come to be a widespread approach for empirical research in social sciences. The increased interest in Bayesian techniques can be attributed to three elements: decreasing implementability cost, conceptual appeal and practical appeal. Bayesian analysis tends to be computationally demanding and thus costly to implement; nevertheless, ever-increasing computer performance and the development of new techniques have been reducing these costs over the last decades.

The conceptual appeal comes from the formal framework that Bayesian analysis provides, which allows to incorporate non-sample information or judgement into the empirical analysis. The notion that data is not the main source of information for hypothesis testing but rather, that it is used to update rationally prior beliefs has proven to be a compelling argument in social sciences. On top of this, by highlighting the key philosophical differences of the Bayesian and the frequentist approach to statistics, some authors (see Western and Jackman (1994) for example) have pushed forward the idea that Bayesian statistics are more suitable to the empirical study of social sciences.
The practical appeal of Bayesian analysis stems directly from a challenge commonly faced by researchers: highly imprecise estimates due to small samples, or more generally, lack of highly informative quantitative information. In this situation, hypothesis testing tends to be unfeasible. Here, the appeal of Bayesian analysis is that the inclusion of prior information leads to more precise estimates facilitating hypothesis testing. This practice replaces the practical challenge with a conceptual one, how to interpret the rejection of a hypothesis based on prior information?

The workshop will focus mainly on the conceptual appeal and secondary on the practical appeal. Implementability is not going to be discussed. The aim of the workshop is twofold: First, to build the basic knowledge that a social scientist needs to understand and read critically a paper that uses Bayesian techniques. Second, to lay the basis for the participants to discuss critically the use of Bayesian techniques as a research methodology in the social sciences.

The workshop will consist mainly of lectures where the basic concepts of Bayesian analysis are presented and studied using simple examples and applications in political science and economics. There will be a minor section where the participants will build on these basic notions to discuss from a rhetoric perspective the arguments that the profession has posed to establish Bayesian analysis as a key methodology in applied research.

**Schedule**

- 15 May: 9:00-12:00, (see the preparation for the workshop section)
- 18 May: 9:00-13:00, (read chapter 1 Jackman )
- 19 May: 14:00-17:00, (read chapter 2 Jackman )

**Main references:**


Jackman, Simon. Bayesian analysis for the social sciences (Chapters 1 & 2). 2009

**Preparation for the workshop:**

Read the paper "Bayesian Inference for Comparative Research" by Western and Jackman and

1) Review the concepts of probability and statistics that are unfamiliar to you.

2) Evaluate critically the arguments given by the authors to use Bayesian analysis in the social sciences.