1. GENERAL OVERVIEW OF THE COURSE

The course deals with Meta-Analysis and Meta-Regression Analysis, which are modern statistical tools to synthesize research findings. In the case where research results are mixed or controversial, a coherent understanding empirical evidence is especially crucial. Meta-Regression Analysis (MRA) may be used to: test the validity of an economic theory, integrate widely diverse findings and to explain the variation among these results. When the effect varies greatly from one study to the next, MRA can be used to identify the reason for this variation. Clearly, the validity of a hypothesis cannot be based on the results of any single study. Meta-Analyses are statistical methods to combing evidence from multiple studies. It gives a systematic and comprehensive review of all comparable econometric findings. MRA identifies the effects of different econometric specifications, models multiple sources of potential bias and systematic variation, thereby explaining the excess variation ubiquitous in economics research.

The aim of this course is to provide theoretical and empirical knowledge of meta-analysis and meta-regression. Furtherer more it can help the participants to be familiar with the meta-analysis and meta-regression techniques. The participants will learn how can they can use the econometric – statistical package STATA to apply meta-analysis and meta-regression analysis.

2. CONTENTS OF THE COURSE

The course consists of a number of lectures based on theoretical issues concerning the topic of meta-analysis and meta-regression analysis which will take place during the mornings and empirical applications of the theoretical issues taught in the morning. The empirical applications will take place during the afternoon sessions.

2.1. Theoretical lectures

The first lecture will focus on the history of meta-analysis and offers a framework that can be used to summarize and qualifying estimates of policy-relevant parameters. It offers strategies for identifying and coding empirical economics and business research. This lecture will focus on the collection of the data that defines meta-analysis and more specifically it will discuss where to collect data and what information to collect. In other words we will discuss how to search and code research for a meta-analysis.
The second lecture discusses simple statistics and graphs that have been found useful in summarizing research. Furthermore, it introduces meta-regression methods that identify and correct publication selection bias. It focuses on the description of these data, presenting alternative ways of summarizing research findings. Furthermore, this lecture will also discuss the publication bias and how we can correct it.

The third lecture shows how multiple meta-regression analysis is often employed to explain economic research and its excess heterogeneity. It will discuss the heterogeneity and the existed variation in any area of economic research. In this lecture, we will show how to accommodate and explain this excess research variation using “multivariate” meta-regression analysis.

The fourth lecture offers a theory of meta-regression analysis and a rigorous demonstration that study quality need not affect the findings of a MRA. It more deeply explores MRA models for within-study dependence and publication selection. The purpose of this lecture is to delve bit deeper into the statistical foundation of MRA. We will present a theory of MRA directly derived from econometric and statistical theory. We will show how MRA results are entirely unaffected by issues of observed and unobservable study quality when properly modeled.

The fifth lecture describes alternative objectives for performance systematic reviews and how they shape the way MRAs are conducted or applied. It also considers additional complexities to the structure of empirical research and how to model them statistically. The purpose of this lecture is to explore some of the alternative applications of MRA in economics. We discuss the choices of MRA variables when there are more variables than observations. Then we discuss the use of MRA for identifying exclusion restrictions, we look at the forecasting performance of MRA in both time and space. Finally, we will investigate the treatment of effect sizes that involve MRA models with interaction and non-linear terms.


The econometric and statistical package STATA will be used in the practical sessions.

2.2. Empirics – Laboratories

First day
The Course will start with an introduction in the meta-analysis definition, its purpose, its use and applications to various fields of study in economics, business and other sciences. The participants will learn the historical roots of meta-analysis, its advantages in modern science and the problems that tackle regarding the publication bias, problems related to the statistical approach and problems arising from agenda-driven bias. During this first section, the participants will acquaint themselves with the first steps in meta-analysis with practical examples.

Second day
Then it will proceed to the appropriate protocols of the searching process and the identification of the meta-analysis data. The identification of the studies which constitute the meta-sample is a very important step in the meta-analysis and the participants will learn the protocols: a) of the inclusion of a study and b) the exclusion rules. Moreover, the coding of the studies, which is the most time-consuming step in the meta-analysis, will be analyzed in every detail, using EXCEL and STATA.

Third day
The third part regards the application of the statistical tools and econometric methods which are necessary when we conduct a meta-analysis and participants will learn how to use the appropriate commands in STATA. They include the FAT-PET-PEESE approach to deal with publication selection bias and meta-regression econometric models and methods (such as FE, RE, WLS and others) which are used in the meta-regression analysis.

Fourth day
The fourth part will provide various aspects of a robustness analysis as it will be demanded by the reviewers and editors in order to ensure that the central findings of a meta-analysis are robust to the model variations. Furthermore, in this session common problems in meta-analysis will be presented and in which ways we can deal with them. There will be practical examples with all the necessary tools using STATA.

Fifth day
The Course will finish by showing how the meta-analysis techniques can be used for policy analysis using existing meta-studies as examples. The participants will have the opportunity to replicate published studies, learn the instruments and apply econometric techniques in STATA to conduct their research on their own. They will have the chance to replicate existing studies and see the published econometric results. In this way they will obtain the background in STATA to conduct their meta-analysis in their field of interest.
3. **BASIC OUTLINE**

The course will be based on instruction, over a week. Each day there will be instruction on the main methods that we will cover for a total of 15 hours of instruction. There will also be additional 15 hours of hands on empirical applications of the methods covered using data that will be provided by the instructor. **The main headings of the topics that will be covered are as follows:**

1. Identifying and coding meta-analysis data
2. Publication Bias
3. Explaining Economics Research
4. Econometric Theory and meta-regression analysis
5. Further topics in meta-regression analysis

**The main headings of the topics which will be covered in the afternoon classes are as follows:**

1. Introduction and First Steps in Meta-Analysis
2. The Search and Coding Strategy
3. The Meta-Regression Methodology
4. Robustness Analysis
5. “Learning by Doing” – Replications of previous Meta-Studies