### Module 4
**Data analysis and territorial statistics**

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<tr>
<th>Location</th>
<th>University of Regensburg</th>
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<tr>
<td>Date</td>
<td>March - May 2014</td>
</tr>
<tr>
<td>Coordinator</td>
<td>Prof. Joachim Möller, University of Regensburg</td>
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#### Module Description

In standard micro-/macro models, the economy is mostly considered to be a punctual entity. An important aspect of the reality, namely space, is neglected. First, this module show how to capture these spatial interactions by statistical measures. A solid base of econometric techniques and further statistics will enable the student not only to understand quantitative analysis, but also to conduct their own study. As more and more regional data becomes available, the ability to apply econometric techniques is key for the further academic and professional career. Motivated by economic theories of regional economics the next topic of this module will provide a starting point to empirical research in the field of regional science. Another focus of the module will be the empirical of entrepreneurship.

#### Goal of the Module

This module will introduce the students to data analysis and territorial statistics as part of regional science in economics. Beside theoretical concepts and theories, the module mainly provides practical applications.

#### Content

- (Big) Data Analysis: A Start from Scratch
- Introduction to inferential statistics
- Regional Dynamics - Theory and Quantitative Analysis
- Entrepreneurship in Global Perspective

#### Part 1

16 h

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<tr>
<th>Pelzel (Regensburg)</th>
<th>Linder (Bozen/Bolzano)</th>
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<td>04.03.2016</td>
<td>05.03.2016</td>
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**Content**

The aim of this introductory course is to provide a hands–on understanding of the basics and the important aspects of (Big) Data Analysis / Statistics. This embraces basic concepts of statistical thinking / reasoning as well as discussing the opportunities, pitfalls and threats of a more data-driven society / decision making.

The lecture covers the following steps taken in an empirical analysis:

- formulating the right research questions,
- generating / collecting data,
- describing and visualizing data,
- concepts and pitfalls of analyzing data,
- deriving recommendations for actions based on the results.

The theoretical concepts are underpinned/supported/completed with real-world examples. To implement the contents in practice, a very powerful statistical software called “R” is introduced. While working through the basics of the R language and programming in general, the focus lies on handling, visualizing and analyzing data. Examples are introduced on an accessible level and applied to real-world datasets.

Please note: You will have to hand in homework about the handling of R.

**Readings**

Are provided during the lecture, no prior knowledge of statistics required.

#### Part 2

10 h

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<th>Lozar-Manfreda (Ljubljana)</th>
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<td>10.03.2016</td>
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<td>11.03.2016</td>
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**Content**

Inferential statistics deals with making inferences based on relations found in the sample to relations in the population. The Introduction to inferential statistics includes basic principles and covers the following topics:

- Basics of probability sampling.
- Sampling distributions.
- Methods of statistical inference: confidence interval for population mean, hypothesis testing for population mean, mean difference and Pearson correlation coefficient (including p-value, significance level, power and type I and type II errors).

The methods of statistic inference will be illustrated using Eurostat official statistic data on NUTS regions. Student will enhance ability to develop hypotheses and use common statistical tests to validate their claims.

**Readings**


#### Part 3

12 h

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**Content**

The course offers a deeper insight in recent models of Regional Economics and empirical research. Its theoretical focus lies in the core-periphery-model that is derived formally. From the empirical perspective progress in the measurement and assessment of spatial patterns of specialisation are presented. In standard micro-/macro models, the economy is mostly considered to be a punctual entity. An important aspect of the reality, namely
space, is neglected. This lecture captures the consequences for economic theory when one includes spatial interactions. With the help of simple models, the optimal choice of price and location for firms in a spatial economy is formalised. In doing so it becomes clear that for many economic problems it is essential to take into consideration distance and transportation costs. In the empiric context, this lecture shows how one can estimate regional market potentials and the influence of economic distance on trade. Recent findings in the field of regional labour market research are presented as well.

The lecture will give answer to the following questions:

- Regional Disparities? Why?
- What causes a favorable local development?
- What are the effects of regional policy?
- Regional specialization, good or bad for development?
- Effects of “culture” on regional development?
- Agglomeration: Advantage or disadvantage?
- Convergence or divergence?
- Regional economic structures, how to describe?
- Is migration causes brain drain or brain gain?

**Structure**

1. Basic Questions and Basic Facts
2. Example of an Economic “Miracle”
3. Fundamentals of Regional Economics
   a. Market Potential
   b. Gravity Model
4. Fundamentals of New Economic Geography
   a. The Krugman Model
5. Structural Change and Economic Development
6. Regional Labor Markets

**Readings**


**Part 4 10 h**

**Entrepreneurship in Global Perspective**

**Content**

The module will use an interdisciplinary approach to examine the role of entrepreneurship in local development and to deal with specific problems that are important in this perspective. The presentations distinguish different kinds of enterprises and different types and roles of entrepreneurship and pay particular attention to the role of institutions in determining which features prevail. Different measures of entrepreneurial activities are presented and critically scrutinised. Moreover, policies towards fostering entrepreneurial activities are introduced and discussed before the background of different goals in accordance with a nation’s level of economic development.

**Readings**

Global reports of the ‘Global Entrepreneurship Monitor (GEM) for different years available from:
www.gemconsortium.org


The Standard textbook in this field is:
Parker, Simon (2012): The Economics of Entrepreneurship. Cambridge, UK.

More information on the Global Entrepreneurship Monitor (i.e. addresses of national teams) and the Global Reports for every year: www.gemconsortium.org

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<th>Exam</th>
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<td>It will take place in May. The exact date will be announced in advance.</td>
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