Registration

- The participation in this seminar is free of charge. The seminar costs will be covered by the Institute of Business Economics and Industrial Sociology as well as the Faculty of Mechanical Engineering and Economic Sciences of TU Graz.
- **Registration** is open from now until November 30th, 2021.
- The number of on-site participants is limited to the max. of 12 persons. The „first registration - first serve“ principle will be applied, as long as the participants fit into the target group.
- **Registration** is managed by Rudolf Grünbichler, BA, MA.
  E-mail: rudolf.gruenbichler(at)tugraz.at

Venue

The seminar will take place in a hybrid form. When registering, include information whether you would like to participate online (via Webex) or on site (a 3-G certificate is required).
Graz University of Technology, Room HS01030
Inffeldgasse 18, 1st floor
8010 Graz, Austria
A notebook is required. The freeware gretl must be installed on it.

Organisation

Graz University of Technology
Institute of Business Economics and Industrial Sociology

For any questions regarding the seminar please do not hesitate and contact
Prof. Dr. Bernd M. Zunk
E-Mail: bernd.zunk(at)tugraz.at

Techno-Economic Research Methods

Methods are considered crucial to every scientific discipline as they ensure rationality and verifiability of scientific findings.

At a glance, the following figure illustrates a selection of the key methods within Business Economics (and, thus, of Techno-Economics and Management Science).
Of course, in Business Economics/Techno Economics/Management Science not only abstract methods but also models that reproduce complex economic realities in a simplified way are indispensable.

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**Methods to gain knowledge in the research field “Techno-Economics“ (exemplarily)**

<table>
<thead>
<tr>
<th>Method</th>
<th>Inductive</th>
<th>Deductive</th>
<th>Generic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Enhancement of the limited gain of knowledge deduced within the scope of the descriptive method about the abstraction of generally valid explanations.</td>
<td>Reverse to the inductive method by arguing from the general to the particular.</td>
<td>Gain of knowledge considering the time factor, including necessary explorations of the thus resulting changes.</td>
</tr>
<tr>
<td>Axiomatic-deductive method</td>
<td>Does not apply to the gain of knowledge in business economics as it is non-existent, i.e. sentences that cannot be proven or that do not require evidence, that provide the basis for the gain of knowledge in this field.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypothetical-deductive method</td>
<td>Initial point for gain of knowledge that needs to be deduced is formed by hypothesis in terms of model images of the objective reality that have to be maintained until they are disproved.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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This might give you a short impression on why this research seminar could be useful for your future research career.
Goal of this Seminar

This seminar delivers knowledge and skills that are necessary for performing a detailed and systematic econometric analysis successfully. The workshop includes theoretical lectures as well as hands-on exercises by using real data and econometric software. The participants will be able to develop regression models for different purposes like forecasting or classification and hypothesis testing. Furthermore, they will be aware of limitations and assumptions of different methods. The participants will learn how to deal with situations where data is limited, or where large amounts of data is available ("big data problems").

Target Group

The seminar is designed for master students/PhD students/early stage researchers who are planning to use regression models in their research projects. The participants should be familiar with basic statistical theory and matrix algebra. Note: No prior knowledge of econometric software is required!

This seminar is an initiative on an European level in cooperation with EPIEM - European Professors of Industrial Engineering and Management (www.epiem.org).

Schedule

Day 1: Monday, December 13th 2021

Session 1 (10am to noon)
- First steps in economic modelling
- Basic statistical concepts
- Data types and how to handle different problems regarding data
- OLS method, properties, and assumptions

Session 2 (2pm to 4pm)
- "Goodness of fit measures"
- Statistical inference: Estimation and Hypothesis Testing
- Model selection – criteria and tests

Day 2: Tuesday, December 14th 2021

Session 3 (10am to noon)
- Normal distribution
- Multicollinearity
- Heteroscedasticity
- Autocorrelation

Session 4 (2pm to 4pm)
- Practical examples of modelling
- What is next?
- Q&A

Lecturer

Prof. Timotej Jagric is a full professor of applied economics, econometrics and finance and the Head of the Institute for Finance and Banking at the University of Maribor. Prof. Jagric was visiting researcher at the Humboldt University of Berlin, the chairmen of the supervisory board of the largest re-insurance company in Slovenia, member of the strategic council of the government of the Republic of Slovenia, and advisor for many governmental and other public institutions in the CEE region. In addition, he is a consultant in the field of risk management and artificial intelligence, member of the steering committee of the Slovenian risk association and an active expert for the World Health Organization.

Teaching Experience

Timotej Jagric teaches courses such as Econometrics, Risk Management, Risk Management in Financial Institutions, Corporate Finance, Financial Markets, Financial Management of Insurance Companies, Monetary Economics and Quantitative Finance.