Doctoral School of Business and Management
Operations and Decisions (O&D) Program

Research Week
08.02.2024

Andrea Gelei, Program Director
Institutional structure behind the doctoral O&D program

- Institute of Operations and Decision Sciences
  - Department of Operations Research and Actuarial Sciences
  - Department of Decision Sciences
  - Department of Supply Chain Management
Methodological variety

QUALITATIVE:

- Interview based research with content analysis,
- Case study research,
- Participatory methods,
- Horizon scanning.

QUANTITATIVE:

- Survey, or other database-driven analysis with multivariate statistics,
- Modelling and optimization,
- Bayesian thinking,
- Simulations,
- Mechanism design,
- Assignment and matching techniques,
- Risk analysis,
- Network analysis,
- IO methods,
- MCDM,
- Game theory,
- Cost allocation solutions.
Program-specific courses

**COMPULSORY:**

Management Sciences and Decisions – Sándor Bozóki and Richárd Szántó

Complex Systems – Andrea Gelei and Alexandra Köves

**ELECTIVE:**

Supply Chain Management – Krisztina Demeter and Tibor Illés

Participatory Decision Making – Gabriella Kiss and Judit Gáspár
Next program:

Workshop on uncertainty and ambiguity in business and management

13.03.2024, from 14.00

- Invited speakers:
  - Tamás Jónás, Research and Development Manager at Flex
  - From the Institution:
    - Kolos Ágoston
    - Richárd Szántó and Borbála Szüle
    - Marieke Külpmann-Pahlke
For the 2024/2025 academic year, we specifically welcome applications related to the following ongoing research projects:

- Coopetition in the hydrogen supply chain led by **Sofía De León Almaraz**
- Degrowth doughnut optimisation led by **Alexandra Köves**
- Horizon scanning for postgrowth futures led by **Judit Gáspár**
- Participatory decision processes for post-growth models led by **Gabriella Kiss**
- Innovative ranking methods in network science led by **Balázs Sziklai**
- Engineering economics in matching markets led by **Péter Bíró**
- Firm competitiveness research at the Competitiveness Research Center led by **Dávid Losonci**
- Industry 4.0 and digitalization in firms and supply chains led by **Krisztina Demeter**
- Resilient supply chain – focus on critical infrastructure led by **Judit Nagy**

*The list is not exclusive.*
Coopetition in the hydrogen supply chain (HSC)*
Sofía De León Almaraz (Department of Supply Chain Management)

Context
- Green hydrogen is a promising alternative in the energy transition
- Cooperation is needed to allow the successful implementation of new hydrogen technologies along the supply chain
- Many actors are implicated in the development of the HSCs

What are the effects of cooperation, competition and coopetition in the deployment of the HSC?

Keywords:
- Hydrogen Economy
- Supply Chain Management
- Qualitative and quantitative research
- Cooperation – Competition – Coopetition
- Game Theory
- Multi-objective optimization

*Part of an OTKA project

https://ec.europa.eu/
Degrowth Doughnut Optimisation

Alexandra Köves

- What type of indicators should we follow on the different societal and organisational levels to manage sustainability transitions?
- What are the priorities?
- How can we have a holistic understanding of the narratives that emerge?
Horizon scanning on beyond-growth scenarios

Judit Gáspár

- within the Models, Assessment and Policies for Sustainability (MAPS) Horizon project
- draw up different economic, technological, and societal futures using a combination of horizon scanning and scenario-building
- identify trends, tendencies, weak signals, wildcards, and hypes that may influence the future based on both desk-based research and participatory workshops involving a wide range of expert stakeholders
Participatory decision-making processes for improved beyond-growth models

Gabriella Kiss

- within the Models, Assessment and Policies for Sustainability (MAPS) Horizon project
- use participatory processes such as systems mapping, backcasting, and citizens’ juries in Hungary and Finland to test the acceptability of different policy options modelled within the project
Innovative ranking methods in network science

Balázs R. Sziklai
Co-sponsorship networks in the European Parliament

Paolo Borghia (ITA), Christophe Grudler (FRA), Marisa Matias (POR), Henna Virkkunen (FIN), Carlos Zorrinho (POR)

% of all committee members

Expertise level (1-α)

EPP
S&D
RE
ECR
Greens/EFA
GUE/NGL
ID
NI

Experts

α = 0.00
Possible research topics

- Diffusion of innovation in industrial and social networks
- Identifying key groups in various networks (e.g. influencers, innovators, trolls, experts)
- Evaluating the strengths of links (e.g. the impact of a gas pipeline)
Engineering Economics in matching markets
Péter Biró (CUB/OR department, and HUN-REN/KRTK/Institute of Economics)

Applications:
• University admissions in Hungary
• Secondary school choice in Hungary
• CEMS Business project allocation
• Course allocation in universities
• Kidney exchange programmes in Europe
• Clearance of financial obligations / portfolio compression

Interdisciplinary research fields:
• Algorithmic Game Theory
• Aégorithmic Mechanism Design
• Computational Social Choice
• Engineering Economics
Engineering Economics in matching markets
Péter Biró (CUB/OR department, and HUN-REN/KRTK/Institute of Economics)

Conference on Mechanism and Institution Design
Corvinus University of Budapest, July 8-12, 2024
The conference will also celebrate
Vincent Crawford's 75th birthday

Keynote speakers:
• Paul Milgrom (Stanford University)
• Roger Myerson (University of Chicago)
• Al Roth (Stanford University)
• Eva Tardos (Cornell University)

Website: https://www.uni-corvinus.hu/ind/cmid/
The mission of the Centre is to be an internationally recognized center for academic research on competitiveness, especially on firm competitiveness.

The Competitiveness Research Center (CCR), a research center of Corvinus University of Budapest, has been carrying out research since 1995.

- Firm competitiveness is embedded into the national competitiveness (Chikán 2008, 24–25).
- Firm competitiveness and its assessment by an index (Chikán et al., 2022)
- Focus: firm competitiveness and functional areas

Further details on our website and in the Budapest Management Review (HUN).
Focus is on the Firm

Internal topics and embeddedness of the firm into domestic and global context

Domestic forces shaping the business context
- Knowledge, competence, human capital, best practices
- National economic governance
- Productivity
  - Upgrading, global value chain position

Global trends shaping business context
- Globalisation/ Deglobalisation
- Digitalisation
- Sustainability
- Resilience

Further elements of the business context
(Institutions)

Competitiveness

Strategy

Innovation

- Operations, logistics, SCM
- Marketing, sales
- Organisation
  - Performance man., finance

IT, technology, infrastructure

HR, Work Organisation, Leadership
<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title</th>
<th>Journal</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gelei Andrea, Keneséi Zsófia</td>
<td>Leveraging the potential of a technologically heterogeneous suppliers – a dynamic approach</td>
<td>JOURNAL OF MANUFACTURING TECHNOLOGY MANAGEMENT</td>
<td><a href="https://doi.org/10.1108/JMTE-09-2021-0377">https://doi.org/10.1108/JMTE-09-2021-0377</a></td>
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<tr>
<td>Kárpáti Zoltán, Ferincz Adrienn, Felsmann Balázs</td>
<td>Relationship between different resource and capability configurations and competitiveness – comparative study of Hungarian family and nonfamily firms</td>
<td>JOURNAL OF FAMILY BUSINESS MANAGEMENT</td>
<td><a href="https://doi.org/10.1108/JFBB-06-2023-0145">https://doi.org/10.1108/JFBB-06-2023-0145</a></td>
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<tr>
<td>Stocker Miklós, Várkonyi Lídia</td>
<td>Impact of market orientation on competitiveness: Analysis of internationalized medium-sized and large enterprises</td>
<td>ENTREPRENEURIAL BUSINESS AND ECONOMICS REVIEW</td>
<td><a href="https://doi.org/10.15678/EBBER.2022.100106">https://doi.org/10.15678/EBBER.2022.100106</a></td>
</tr>
<tr>
<td>Szántó Richárd</td>
<td>Intuitive decision-making and firm performance</td>
<td>JOURNAL OF DECISION SYSTEMS</td>
<td><a href="https://doi.org/10.1080/12460125.2022.2080796">https://doi.org/10.1080/12460125.2022.2080796</a></td>
</tr>
<tr>
<td>Szukits Ágnes</td>
<td>The illusion of data-driven decision making</td>
<td>JOURNAL OF MANAGEMENT CONTROL</td>
<td><a href="https://doi.org/10.1007/s00187-022-00343-w">https://doi.org/10.1007/s00187-022-00343-w</a></td>
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<tr>
<td>Kiss János, Kazainé Ánodí Annamária</td>
<td>What factors influence the innovation activity of companies - the case of Hungary</td>
<td>INT. J. of TECHNOLOGICAL LEARNING, INNOVATION AND DEVELOPMENT</td>
<td><a href="https://doi.org/10.1504/IUTLJD.2023.132866">https://doi.org/10.1504/IUTLJD.2023.132866</a></td>
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Barriers of digitalisation in Central and Eastern Europe

Krisztina Demeter

- Find barriers at multiple levels (individual, firm, supply chain, company)
- Search for best practices to overcome the barriers
- Use various methodologies to find the relevant variables, antecedents and effects (big databases, case studies, text mining, surveys)
Resilience in the supply chain

Judit Nagy

- Food Supply Chain Research group
- Importance of the topic:
  - Fragile supply chains
  - Disruptions in the supply chains thanks to natural disaster and geopolitical reasons
  - Rethinking processes and complexity
- Possible research topics
  - Importance of (ISO) standards in building resilience
  - Role of digitalization in increasing resilience
  - Food industry as part of the critical infrastructure

Thank you for your attention!