



## **Available research topics of the Doctoral School of Business and Management of BME**

**Academic Year 2024/25**

### **Application**

The BME Doctoral School of Business and Management provides doctoral training in the field of social sciences and in the discipline of business and management. The current research topics and supervisors available for supervision in English language can be found in this document.

**The Doctoral School accepts proposals only in the below given topics.**

For submitting a valid application to the Stipendium Hungaricum Scholarship Programme, the applicants are NOT required to provide a statement from the future supervisor, but they have to indicate their future research topic. The Doctoral School does not make pre-selection or evaluation during the application process, the application will be examined only during the admission process.

The applicants are strongly advised to contact the **Doctoral School Office** ([gtk.phd@gtk.bme.hu](mailto:gtk.phd@gtk.bme.hu)) with their questions. The Doctoral School Office will answer the questions and provide the applicants with all the necessary information regarding the application and admission process.

The application for the Stipendium Hungaricum Scholarship Programme has not been opened yet, it is expected to be opened around 16<sup>th</sup> November 2023. The **deadline for submitting the complete application is** 15 January 2024 – 23.59 (CET). The online application system can be reached through <https://apply.stipendiumhungaricum.hu/>

**Please carefully read the website of the Stipendium Hungaricum scholarship programme for more information.**

### **Admission**

After the application deadline, Tempus Public Foundation and the sending partners will make a pre-selection. **Only applicants nominated by their sending partner will be assessed by the universities.**

As a first step of this process, the uploaded materials will be checked by our faculty to see if they meet the requirements. The relevant supervisors will thoroughly evaluate the uploaded materials. After that the applicants have to take an **on-line entrance examination**, consisting of two parts. **Firstly**, an entry assignment will have to be completed and submitted in writing electronically, which needs to be reviewed before the second part of the entrance exam. **Secondly**, an interview will be conducted on-line: the interview inspects the applicant's



motivation and aptitude for research. At the interview, the committee examines the proficiency of the Applicant in the research field, the feasibility of the research plan, and the commitment of the Applicant to the research.

The decision on admission will be based on the overall assessment of the Applicants, as well as on the number of vacancies in the related area.

Budapest, 10 October 2023

**Dr. Tamás Koltai**  
Head of Doctoral School of Business and Management  
Budapest University of Technology and Economics



## Quantitative Analysis in Management and Business Economics

**Dr Imre Dobos, professor**  
**Department of Economics**

### **Linear models in production theory and production planning**

The aim of the research project is to introduce doctoral students to the linear models and methods that can be applied in management and economics. Such models include Koopmans' linear activity analysis, which is also a theoretical basis for Data Envelopment Analysis (DEA), and Leontief's input-output model. These production theory models can then be applied to production planning.

**Dr Imre Dobos, professor**  
**Department of Economics**

### **Modeling issue of dynamic economics**

Dynamic economics examines the time evolution of economic processes, mainly using mathematical methods. The questions that arise are aimed at finding the possible trajectories of the economies, as well as their qualitative examination. The main known dynamic models are the Ramsey growth model or the dynamic Leontief model. The research topic assumes that the doctoral student is aware of continuous-time differential equations or discrete-time difference equations.

**Dr Károly Hercegi, associate professor**  
**Department of Ergonomics and Psychology**

### **User centered product management of software**

Studying the appearance, applications, benefits, and efficiency of the human centered (primarily user centered) methods and approaches in development processes (as practice of product and quality management) of software, web, and other smart products. The research aims to map the variability of organizational practice or studying values and positions of particular methods from management perspectives. (Excepted prior knowledge and experience of candidate cover software development processes and/or agile project management techniques and/or user experience methods).

**Dr Károly Hercegi, associate professor**  
**Department of Ergonomics and Psychology**

### **Empirical usability evaluation methods in product management**

Application of usability evaluation methods assessing real product-user interactions (usability testing) in product development processes. Studying the applicability and expected effects of new methods. Studying other user centered methods based on empirical usability testing techniques completing management of product development: from user experience assessment to studying user (or customer) behavior. (Excepted prior knowledge and



experience of candidate cover (1) theoretical background of Human-Computer Interaction or Human Factors / Ergonomics and (2) practice in application of any usability evaluation method).

**Dr Tamás Koltai, professor**

**Department of Management and Business Economics**

**Efficiency analysis of production and service operations**

To increase the efficiency of production and service system is a continuing effort of management. Objective methods are required to explore the sources of inefficiencies, and to provide directions about improvement possibilities. Data Envelopment Analysis can provide an aggregate measure, which incorporates several input resources and output objectives. The method is widely used for the analysis of manufacturing and service operations in the private and public sector as well. The objective of the research is to develop efficiency models, which can take advantage of the possibilities of advanced info-communication technologies and of big data methods.

**Dr Tamás Koltai, professor**

**Department of Management and Business Economics**

**Supporting production and operations management decisions with optimization methods**

In most cases, the objective of production and operations management decisions is to allocate limited amount of resources considering several decision criteria. This type of problems can generally be described by mathematical programming models. The objective of the research is to explore new areas of application in production, service, and administration areas furthermore to solve the emerging theoretical and implementation problems. A further objective is to incorporate the models in management information systems (MIS) and to provide sensitivity and robustness information of the results for the decision maker.

**Dr Zoltán Sebestyén, associate professor**

**Department of Management and Business Economics**

**Interdisciplinary study of project management decisions**

The research's primary goal is to explore areas that are closely related to project management and that are integrated into project management but forming self-sufficient disciplines and exploring the synergies between them. The research addresses the project management aspect of these independent disciplines. The Ph.D. aspirant can focus on any project management topic already under research (e.g., risk, success, portfolio) and any topic not yet studied, employing the necessary quantitative methods (operation research or statistics depending on the topic).



## **Business Models and Innovation Methods in Management and Business Economics**

**Dr Petra Benedek, assistant professor**  
**Department of Management and Business Economics**

### **Development of business processes**

Business process management aims to improve performance continuously. The research focuses on how an organization's processes are designed, managed effectively, and improved to achieve better performance. The research aims to study process management's role, advantages, and challenges in a specific sector or organization. Quantitative or statistical methods can be used in many situations during management, including in the operation of quality systems, and in analyzing and developing economic processes. The methods can include statistical process control techniques (e.g., control cards, process capability analyses) and quantitative analysis of data collected related to customer focus. The research covers the empirical analysis of process management methods, efficiency, and effectiveness, as well as the examination of how the quality expected by customers can be achieved in a process.

**Dr Petra Benedek, assistant professor**  
**Department of Management and Business Economics**

### **The challenges of compliance in the XXI. century**

Corporate operations and business processes must comply with various regulatory requirements, the violation of which may result in legal sanctions and economic consequences, such as loss of competitive advantage or market share. The research aims to reveal how business processes are affected by regulations and which models and methods support compliance management in a chosen sector (e.g. financial services, trade). Furthermore, the research aims to reveal the compliance risks typical of the sector and to examine the tools supporting compliance decisions.

**Dr András Bethlendi, associate professor**  
**Department of Finance**

### **Financial Markets with Central- and Eastern Europe focus**

The structure of financial intermediation in the region is characterised by bank-based rather than market-based financial systems, low level of intermediation and market capitalization and the lack of market-based banking. Research topics:

- Post GFC banking and/or capital market regulatory and institutional changes.
- Critical evaluation of Covid pandemic related regulatory measures.
- Structure of financial intermediation and its real economy effects.
- The role of foreign ownership in banking and capital market firms, government policies towards foreign ownership.



- What are the barriers to the spread of securitization in the CEE region?
- Evaluation of venture capital in financing innovation.
- The growing share of ESG investments products, its implications.
- Digitalisation in banking and Fintech challenges.

**Dr Anikó Kelemen-Erdős, associate professor**  
**Department of Management and Business Economics**

#### **Marketing and efficiency in the supply chain**

The framework of commercial activity is based on legal regulation, and the interconnectedness of individual companies, thus networks, which essentially determine the scope of traders. At the same time, the supply chain members participate in value creation processes in different ways and have different perceptions of the main methods and means of efficiency. From a scientific point of view, modelling the different pathways can contribute to the development of constructs that highlight the various strategies of traders and can contribute to improving traders' efficiency. The main aim of the research is to identify the factors that determine the efficiency of traders, to identify critical points and barriers to progress, and formulate proposals for further innovation.

**Dr Anikó Kelemen-Erdős, associate professor**  
**Department of Management and Business Economics**

#### **Service development and modelling**

The contribution of the tertiary sector to the performance and development of the economy is significant. The performance of service providers is directly determined by the nature of the service process. However, service management and marketing, and through them, consumer perception, satisfaction, and loyalty have also a significant impact. The aim of this research is to model the service process and highlight the cornerstones and factors that influence service performance. Many basic models in this area are widespread in both academic and practical implications. The candidate will analyse the potential for further development of these models and develop a new theoretical and practical model.

**Dr Emma Lógó, associate professor**  
**Department of Ergonomics and Psychology**

#### **Product Experience**

The research topic is the psychological, psychosocial, and physical aspects of Product Experience. Related to the topic is the Design Thinking approach and methodologies of Experience Design.



**Dr Emma Lógó, associate professor**  
**Department of Ergonomics and Psychology**

**Shopping Experience**

The research topic is the Shopping Experience in different forms of commerce (traditional „bricks and mortar” and online). Design and development of customer experience using Design Thinking methodologies.

**Dr András Nemeslaki, professor**  
**Department of Management and Business Economics**

**Business model innovation as a result of digital transformation**

This stream of research explores how ICT driven innovation - especially the complex phenomenon which is called the fourth industrial revolution - impacts industries, business functions, managerial areas and value creation.

**Dr Zsuzsanna Novák, associate professor**  
**Department of Finance**

**Monetary policy theories and the operational framework of central banks**

The recent crises made it especially reasonable to reinterpret the scope and instruments of monetary policy. The theme proposal covers the following topics at a time:

- overview of monetary policy theories;
- confronting theoretical approaches to monetary rules and/or their investigation on practical examples;
- survey of the historical development and the current use of central bank instruments;
- evaluation of various crisis management solutions;
- examination of the application of macroprudential indicators, exchange rate policy and the relationship between the central bank and public finances and the securities markets.

**Dr Beatrix Séllei, assistant professor**  
**Department of Ergonomics and Psychology**

**Psychological characteristics behind performance**

The research topic aims to investigate the effects of positive psychological characteristics behind successful performance using mathematical methods. The primary area of research is the examination of predictions using machine learning methodology to filter out human attributes that influence performance. This kind of modeling of success enables optimal organizational human resource planning and development. The research area combines the results of the humanities with the field of data sciences using mathematical tools.



**Dr Beatrix Séllei, assistant professor**  
**Department of Ergonomics and Psychology**

**Emotional intelligence at workplaces**

This research topic is about the usefulness of emotions and emotional intelligence in an organizational context. Leaders' and teams' emotional intelligence play a key role in organizational success, and the research is about the know-how. What emotions are useful, how can managers influence emotional cycles of a group, what are the methods of development of workplace-related EI competencies.

**Dr Róbert Somogyi, assistant professor**  
**Department of Finance**

**Digital two-sided platforms and their applications in finance**

In the past decade, digital platforms have become widespread in the economy in general, and in finance in particular. These intermediaries connect two distinct groups of agents (e.g., buyers and sellers), taking advantage of the positive cross-group externalities between them. For instance, Visa grew to be one of the largest financial-services firms by connecting the merchants to cardholders.

Many policy-relevant questions arise about the optimal pricing structure of such firms, how they differ from traditional players in their sector, how their practices affect social welfare, and whether and how authorities should regulate them.

**Dr Róbert Somogyi, assistant professor**  
**Department of Finance**

**Deceptive pricing practices in the financial sector**

Deceptive pricing practices are ubiquitous in the economy in general, and in finance in particular. Examples include pressure selling tactics, hiding additional fees by drip pricing, and using very complicated contracts that make the comparison of offers hard. For instance, credit card contracts are notoriously complex. Competition authorities and consumer protection agencies around the world seem to be increasingly concerned by these practices. Game theory and industrial economics offer a toolbox that is very well adapted to studying such regulatory questions.

**Dr Vivien Surman, assistant professor**  
**Department of Management and Business Economics**

**Quality management aspects in higher education**

Higher education serves as both a direct and indirect catalyst for fostering improvements and innovations. It not only augments the knowledge base of its stakeholders but also cultivates their cognitive frameworks, enabling them to adeptly navigate risk and embrace lifelong learning. The judicious integration of artificial intelligence holds the potential to support the improvement of the quality and sustainability of institutional processes. The focal objective of this research endeavor lies in the meticulous exploration of the conceivable applications,





attendant challenges, as well as the facets of quality and sustainability intrinsic to artificial intelligence within higher education. In addition, the research covers the identification of higher education-specific artificial intelligence-driven solutions that can define areas in need of improvement, optimize resource allocation, and promote sustainability initiatives in higher education institutions. Ultimately, the overarching goal is to enhance the overall educational quality and process efficiency, thereby fostering progress in the field.

**Dr Vivien Surman, assistant professor**  
**Department of Management and Business Economics**

**Challenges of service quality management**

In the rapid-paced and ever-evolving business dynamics, the implementation and operation of efficient management processes to uphold service quality stand as an imperative prerequisite for sustaining competitiveness and perpetually ensuring customer satisfaction. The principal objective of this research is to develop a comprehensive overview elucidating the intricacies inherent to the preservation of service quality, modeling the information network guiding the strategic decisions. This research not only elucidates the multifaceted challenges associated with the preservation of service quality but also endeavors to craft a systematic model that encapsulates the complex decision-making processes underpinning these challenges. Ultimately, the overarching goal is the investigation of the contemporary relevance and enduring validity of state-of-the-art service quality models, all while remaining acutely attuned to the shiftings of 21st-century consumer behaviors and habits.

**Dr Zsuzsanna Szalkai, associate professor**  
**Department of Management and Business Economics**

**B2B marketing: Analysing business relationships from interactive network approach**

This topic deals with the challenges of business relationships from interactive, network perspectives of B2B marketing. Such major challenges that have effects on business relationships nowadays are digitalization and Industry 4.0. However, most of the researches dealing with these challenges are company-centric. This research topic analysis among others the relationship between digitalization and business relationships in specific industries or in specific contexts. The topic has high relevance on international and also on domestic level.

**Dr Zsuzsanna Szalkai, associate professor**  
**Department of Management and Business Economics**

**Resource interaction and combination from the aspect of B2B marketing**

Based on the approach of the Industrial Marketing and Purchasing (IMP) Group business relationships are emerged and maintained by the interactions between actors. Through the interactions between various organizations – and thereby in business networks – not only the existing resources are exchanged, but they are combined and new resources are developed.



The focus of this research topic is a deeper understanding of this resource combination, especially the analysis of knowledge as a resource both on conceptual and on empirical level.

## Social Aspects of Management and Business Economics

**Dr Gábor István Bíró, assistant professor**  
**Department of Philosophy and History of Science**

### **Big data, the new economics?**

The aim is to analyze the theoretical, methodological and technical components of *big data* to find out whether and to what extent big data has started to become a discipline, and perhaps a new kind of economics. The topic covers making inquiries into the explicit and implicit philosophical commitments of big data and offers a comparative sociological study of big data using communities and scientific communities in general. The topic can be approached by using the *boundary work* concept of science and technology studies (STS).

**Dr István Danka, associate professor**  
**Department of Philosophy and History of Science**

### **Methodological and Philosophical Presuppositions of Mainstream Economics**

Critiques of mainstream economics theories claim the 2008 economic crisis to be an indicator of the deficiencies of those theories because the crisis could not be foreseen, managed, and even explained in the traditional conceptual and methodological framework. The project aims at investigating the philosophical presuppositions and methodological commitments (incl. idealisation, rational agents, transitive preferences, etc.) of rational choice theory as a background theory for mainstream economics, in order to explore the problems and develop a response to the criticism.

**Dr Zsolt Gilányi, associate professor**  
**Department of Economics**

### **Economic aspects of sustainable growth**

Market economies produced outstanding economic development with its positive and negative effects. Many theorists see a clear relationship between economic growth and negative effects. Ecologists questioned the sustainability of the system. They believe that even the present resource consumption is unsustainable, therefore zero growth would be necessary after a transitory degrowth period. This ecological problem induced by physical boundedness generated a theoretical debate in economic science: may market economic system exist with zero growth?



**Dr Mihály Héder, habil. associate professor**  
**Department of Philosophy and History of Science**

**Management decisions about R+D projects**

Management decisions about R+D projects rely on assessing how far a given concept is from an actual product. The most common gauge is the Technology Readiness Level (Héder 2017), adopted by various important organisations, most notably the European Commission. The PhD topic involves analysing the TRL scale and exploring better alternatives based on more plausible epistemic assumptions. Héder, M. (2017). From NASA to EU: the evolution of the TRL scale in Public Sector Innovation. *The Innovation Journal*, 22(2), 1-23.

**Dr Judit Kapás, associate professor**  
**Department of Economics**

**Institutions and economic development Supervisor**

The view that "institutions matter" in economic development is based on a consensus among economists. Accordingly, the various lines of research within institutional economics center on the question of "how institutions matter". This broad research question allows us to formulate specific theoretical and/or empirical questions concerning how the various economic, political, legal, and regulatory institutions affect long-run economic performance (long-run income, productivity, innovativeness) of an economy. Besides the above-mentioned formal institutions, research into the impact of informal institutions (e.g. trust, culture, values) may be given special emphasis.

**Dr Judit Kapás, associate professor**  
**Department of Economics**

**The evolution of the firm in the knowledge economy**

Various new phenomena that characterize today's firms, such as outsourcing, franchising, flattening of organizational structure, virtual firms or intrapreneurship cannot be fully explained in the framework of the mainstream contractual theories of the firm which have developed by following Coase (1937). These phenomena indicate that the "nature" of the firm has to be understood in a more nuanced way. It is possible to formulate - within the theory of the firm - more specific theoretical and/or empirical questions to better explain the firm in the knowledge economy.

**Dr Judit Kapás, associate professor**  
**Department of Economics**

**Globalizations and institutions**

Economic globalization is intertwined with institutional changes, at two levels. On the one hand, globalization may require institutional changes at national level, and at the same time it may lead to institutional changes. On the other hand, globalization may result in building new institutions at international level. This broad topic allows us to formulate various specific theoretical and empirical research questions in the field of the interplay between FDI,



international trade and international labour movements on one hand, and economic, political, legal and regulatory institutions, on the other. Special emphasis might be given to the role of informal institutions (culture, values) in the process of globalization.

**Dr Annamária Orbán, associate professor**  
**Department of Sociology and Communication**

**Socio-cultural innovations, sustainable local/urban development and regional branding**

We study the role of socio-cultural innovations in sustainable urban/local development, their relation to social economy, social capital, their impact on citizens' quality of life and well-being; their role in regional and/or city branding. Cities are "social laboratories", where these innovations can be tested, as many cities today are unhealthy living habitats both in physical and metaphysical sense. The aim is to find those 'healing solutions', which make our cities more sustainable and the citizens more satisfied with their life.

**Dr Annamária Orbán, associate professor**  
**Department of Sociology and Communication**

**Smart cities, smart villages, smart communities. Urban-rural coexistence from a regional policy perspective**

Despite the fast urbanization process globally, the future of rurality, development of rural areas should be among the prioritized development goals world wide. There cannot be smart cities without smart villages, where "smartness" means future conscious strategic thinking and devoted attachment of the community to their living place. The future of agriculture and culture of food – a very important dimension of sustaining local culture - depend on smart urban-rural co-existence, planned and regulated on regional level. Therefore, regional policy and innovative regional governance initiatives, structures play a crucial role in the future.

**Dr Mária Szalmáné Csete, habil. associate professor**  
**Department of Environmental Economics and Sustainability**

**Challenge-based planning and sustainable development: adaptation in different sectors and regions**

The expected impacts of climate change are difficult to forecast with total certainty, creating challenges for the analysis of the capacity and willingness to adapt in different social and economic systems. Adaptation and sustainability are closely interconnected and reinforce each other. Innovating for sustainability and climate change can play pivotal role on global and local levels as well especially in the era of IoT. Globalization, urbanization processes lead to the development of more frequent and intense bottom-up approaches in several communities worldwide also related to climate issues especially focusing on smart urban, rural and sectoral solutions. The possible impacts of climate change make the transition towards sustainability more complicated especially in the preparation for expected impacts, prevention, management and recovery. Climate change related consequences can also have significant influence on different sectors in a given area for instance related to the quality of



life, innovation potential, competitiveness income, health etc., which can make up the basis for regional sustainability.

**Dr Zsolt Ziegler, assistant professor**  
**Department of Philosophy and History of Science**

**Newcomb's Dilemma**

Newcomb's dilemma is a mathematical, philosophical, and decision-theoretical paradox, which aims to show that the two leading theories of rational choice are contradictory because, in the case of the dilemma, evidential decision theory and causal decision theory prescribe different actions to be rational. Macroeconomic and microeconomic theories rely heavily on the notion of the rational actor. The project aims to explore these theoretical links between rational decision theory models and micro- and/or macroeconomic theories.

**Dr Zsolt Ziegler, assistant professor**  
**Department of Philosophy and History of Science**

**Internalist and externalist interpretations of marketing value creation**

Consumerism is a social phenomenon in which people's lives are driven by consumption and material goods, with individuals' happiness and social status measured by the quantity of purchases they make. A general approach to marketing fits neatly into a consumerist society, according to which the purpose of marketing is to create value for consumers, in return for which the provider receives value in return. Anything can be of value to the consumer if the consumer believes that the service or product in question satisfies his or her needs. However, we can also think of values and preferences determining action in terms that something can only have value if it is truly valuable, traceable to facts understood in economic terms. We seek to critique the process of value formation from this externalist position.