



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

Academic Year 2023/24

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 Program, the Applicants are NOT required to provide a statement from the future supervisor. 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 **International Student Office** (iso@gtk.bme.hu) with their questions. The International Student Office will answer the questions and provide the applicants with all the necessary information regarding the application and admission process.

The **deadline for submitting the complete application is** 15 January 2023 – 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 program 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, 15 November 2022

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 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 direction 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.

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

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 marketbased financial systems, low level of intermediation and market capitalization and the lack of marketbased 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.

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

Under the theme proposal the objective is to give an overview of monetary policy theories, to confront theoretical approaches to monetary rules and/or their investigation on practical examples. Beyond monetary policy theories the historical development and current use of central bank instruments, crisis management are also part of the eligible subjects. The theme furthermore expands to the issues of macroprudential indicators, exchange rate policy and the relationship between the central bank and public finances and 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.

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.

Dr László Vértesy, habil. associate professor
Department of Finance

Banking: Transactions and Prudency

The banking sector transformed in the last two decades, transactions, services develop increasingly complex in line with the digital requirements and are closely intertwined with the insurance and capital markets. The micro- and macroprudential operation involve customers, banks and the financial system as a whole. The government and the supervision play an important role in this at a national, EU and international level. The topic can be further extended to consumer protection, ethical banking, artificial intelligence and green finance.

Dr László Vértesy, habil. associate professor
Department of Finance

Insurance: Products and Solvency

The insurance sector has transformed recently, more and more life and non-life products are emerging, flexibly adapting to households' and corporations' economic and social challenges: individual and behavioral premiums, on-demand insurance; involving the banking and capital markets. Micro- and macroprudential affects customers and insurers; but the government and supervision also play an important role in this at national and EU level. The topic can be further expanded to consumer protection, risk management and ethical insurance.

Dr László Vértesy, habil. associate professor
Department of Finance

Financial, Economic Governance

Recent changes in the globalized financial and economic system have posed a number of challenges for market participants and governments. Research can be approached from several directions: (i) a single state, group of countries, or economic organization; (ii) an institution (central bank, tax authority, supervisory, international organizations) or sector (SME, MNCs); (iii) a particular topic (fiscal or monetary policy, financial sector, globalized economy); (iv) new trends (Basel, Solvency, FinTech, sustainable economic development).



Social Aspects of Management and Business Economics

Dr István Ambrus, associate professor
Department of Business Law

Compliance activities against corporate wrongdoings

The operation of companies in accordance with legislation can be considered social, economic and also as a state interest. However achieving this goal requires an extremely complex approach.

At the same time, it is important to ensure that the operation of companies will be sustainable and profitable. The purpose of compliance activities (just like whistleblowing or internal investigation) is to prevent and detect corporate wrongdoings, which can strengthen a company's reputation.

Dr Róza Emília Barna, associate professor
Department of Sociology and Communication

The platformisation of cultural production

The aim of the research is the analysis, through a selected case, of the role played by digital platformisation in the cultural industries, such as the music industry, the film industry, gaming, or the fashion industry. A potential focus is the emergence, and gaining power, of major “tech” companies such as Google, Apple, Amazon, or Facebook, or smaller new entrants, in cultural production, distribution, and consumption, as well as their role in shaping practices of cultural intermediation and gatekeeping, or in cultural labour.

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

Development of business processes

Business process management aims to improve an organization's 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 the role, advantages and challenges of process management in a specific sector or organization. In addition, 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 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

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

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

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

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 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, modeling 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 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 Zsolt Péter Szabó, associate professor
Department of Ergonomics and Psychology

Leadership as identity and meaning creation

Studies on leadership both in management sciences and in work and organizational psychology (and in social psychology) changed their earlier approach that leadership is about the leader's traits, behaviors, or the fit between the leader's style and the characteristics of the situation. Now, they suggest that leadership is about leaders as in-group prototypes, in-group champions, and most importantly entrepreneurs and embedders of identity. To explain the success of leaders, anthropological analysis of organizational and leadership dynamics (e.g., analysis of spontaneous language products, natural observations, dilemmas) can focus on the understanding of processes instead of one-time pictures.

Dr Tamás Szádeczky, associate professor
Department of Management and Business Economics

Information and security management aspects of Industry 4.0

Industry 4.0 links the information generated during production processes and possibly the production process itself with corporate information systems and traditional IT systems. This can significantly increase the business value of industrial processes, the transparency, the instant usability of data, and the quality of the process. On the other hand, every new technology brings new security threats. Thus these technologies need to be implemented with appropriate risk management and mitigating controls.

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 Gyula Zilahy, professor

Department of Environmental Economics and Sustainability, university professor

Business and sustainable development: the environmental and social aspects of business organisations

Businesses increasingly have to consider the environmental and social implications of their activities and adjust their strategies and business models to changing expectations. Research topics in business sustainability include the management aspects of internal operations, as well the whole supply chain; the CSR activities of companies; the strategies towards climate change and the business models of innovative businesses such as the sharing economy. The topic also includes the policy aspects of sustainability as well as issues relating to sustainable consumption.

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.