



# **Research Programmes at the Faculty of Economics, Technical University of Liberec**

**2022–2030**

## Research programmes (RP) at the Faculty of Economics, Technical University of Liberec

The following research programmes (RP) have been specified within the Strategy of Science, Research and Innovation of the Faculty of Economics, Technical University of Liberec (EF TUL) to 2025 with a perspective to 2030, discussed at the Scientific Council of the Faculty on October 20, 2022 and approved by the Academic Senate of the Faculty on October 18, 2022.

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## RP1: Inter-organizational cooperation and networking: Implications for performance

### ANNOTATION:

For more than 15 years, we have been researching the creation and functioning of clusters (in the broad sense of the word and in all their forms – from industrial districts in the concept of Alfred Marshall, through Porterian natural clusters to institutionalized clusters based on state cluster initiatives) and their effect on the financial and non-financial performance of enterprises. During this period, we have created a database of cluster organizations in the Czech Republic, which includes a membership base. Each year we collect data from the financial statements of enterprises and evaluate trends in their performance in relation to the type of cluster. We also periodically monitor changes in the innovative behaviour of enterprises in individual sectors in connection with the TI survey on innovation activities of enterprises (CZSO, Eurostat). In addition to clusters, there is a potential to extend research to technology platforms. Research results can serve innovation and industrial policy makers in evaluating the effectiveness of cluster policy. Cooperation with the CzechInvest agency, which is preparing a system for benchmarking clusters in the Czech Republic, is currently being developed in this respect. The topic also offers potential for foreign cooperation, as cluster policy is part of the mainstream of European innovation policy.

### KEYWORDS:

Innovation management, knowledge spill-over, business networking, clusters, innovation performance, finance performance.

### RESEARCH ACTIVITIES:

- Updating the database of clusters in the Czech Republic, possibly expanding it to include technology platforms.
- Monitoring trends in the financial performance of enterprises in relation to cluster membership (by cluster type) and by industry.
- Assessment of changes in the innovative behaviour of enterprises in different industries.
- Comparison of the performance of Czech and foreign clusters.

## RP2: Automation and content monetization in e-commerce and online marketing

### ANNOTATION:

Since 1993, the Department of Informatics has been striving for the connection of basic and applied research, which is essential for the field of e-business and e-commerce due to the rapid development this field is undergoing. Currently, research activities focus on the implementation of hard evidence data from analytical online applications and advertising systems (Google Ads, Meta Ads, Google Analytics, Brand Collaboration Centers). Thanks to extensive cooperation with the commercial sector, the Department has the opportunity to collect this data from real conditions and thus is not limited only to a laboratory test environment. Research activities to date have led to the creation of the e-podnikani.cz platform providing online courses focused on tools from the Meta, Google and Adobe companies. The platform was created as one of the outputs of the TACR project TJ02000206 Development of skills necessary for the digital transformation of business. The outputs of basic research in the form of several scientific monographs and articles in high-impact journals are gaining a growing international response not only in the form of scientific citations, but also in the form of patent citations.

### KEYWORDS:

Online advertising, website analytics, consumer online tracking, influencer marketing, lead management, e-business, e-commerce, Google Ads, Meta Ads, multimedia content creation.

### RESEARCH ACTIVITIES:

- Design of automation mechanisms for e-commerce and online marketing (automatic content posting on social networks, use of HTML feeds for automatic creation and optimization of online ads).
- Study of behavioural patterns of online users based on data from web, mobile and advertising analytics.
- Research of new and adaptable models in e-commerce and e-business.
- Research of new trends in the field of multimedia creation with a focus on content monetization and influencer marketing (data collection using Google AdSense, YouTube analytics, Meta Collaboration Center).





## RP3: Specific forms of business

### ANNOTATION:

The current business environment must address the issues of employment and economic performance of the entire society with the irreplaceable role of small and medium-sized enterprises, which represent more than 1 million economic entities and employ almost 60 % of employees. Other problems are related to the generational change in business, which is taking place in a society without experience since the economic change in 1989. In connection with technological development from the perspective of the Industry 4.0 concept, it also deals with the problems of automation and cyber security, economic disparities of economic entities in remote rural areas. Another phenomenon related to the development of the business environment is the rapid development of start-ups, which are increasingly developing and becoming an increasingly important part of the innovative and shared economy. The development of information and communication technologies, which enable the emergence of new business models and opportunities, contributes to this. At EF TUL, we see the mentioned topics of small and medium-sized business, start-up and spin-off business, e-business, family business as closely related, which is why they are included in one topic “specific forms of business”.

### KEYWORDS:

Family business, small and medium-sized enterprises, social entrepreneurship, innovative entrepreneurship, start-ups, spin-off, digital business.

### RESEARCH ACTIVITIES:

- Monitoring business model trends in relation to specific forms and levels of business.
- Assessment of risk factors in business continuity management, risk management and disaster recovery plan.
- Global survey of student entrepreneurship and university entrepreneurial spirit.
- Evaluation of the quality of family business management and family governance (legal, managerial and financial areas).
- Nascent business and succession of family businesses – research of factors at the individual, family and institutional level that influence the given processes.

## RP4: Managing human resources in digital and diverse environment

### ANNOTATION:

Human resources are essential for the successful functioning of organizations. In recent years, their management and care have been influenced by the development of the labor market in the Czech Republic, digitization or the transition to hybrid forms of cooperation. This places great demands on organizations and investments in employees. The topic has been researched for a long time at the Department of Business Economics and Management EF TUL in the context of small and medium-sized businesses, but also large corporations and in international contexts. Trends in the setting of personnel processes and the implementation of suitable tools are solved in cooperation with the corporate sphere.

### KEYWORDS:

Human resources, human capital, agile management, HR 4.0, hybrid world of work, digitization, gender, ethics.

### RESEARCH ACTIVITIES:

- Monitoring trends in human resource management and human capital in selected personnel processes.
- Agile approaches to team management.
- Knowledge management in relation to HR 4.0.
- Digitization from the perspective of human resources and digital competencies.
- Investment in human capital from the perspective of corporate education.
- Gender and ethics from the perspective of human resource management.



## RP5: Institutional factors and their application in contemporary theories of socio-economic growth

### ANNOTATION:

The Department of Economics has long researched the critical economic prosperity and long-term growth determinants. While mainstream growth theories point to growth factors such as innovation, economies of scale, and capital accumulation, they no longer explain why innovation or accumulation occurs in some countries while it does not work in others. Alternative approaches, referred to as socio-economic approaches to growth theory, pay attention to economic and non-economic factors, emphasizing institutional aspects. These approaches are usually close to the new institutional economics (NIE). Since at least formal institutions are considered endogenous by the NIE, its aim is not only to describe their impact on the economy or make cross-country comparisons but also to make recommendations for economic policy on improving institutions. In the past, the Department of Economics successfully conducted a primary research project (GACR) on lobbying regulation. It proposed a new methodological procedure for assessing the transparency of the decision-making process. The current research focuses on identifying measures (institutions) that could lead to a reduction in information asymmetry, a reduction in rent extraction and inequality, and, conversely, an increase in the effectiveness of economic policies and welfare growth. The impact of the global environment on institutional change is then reflected through integration processes.

### KEYWORDS:

Institutions, economic growth, path dependency, integration, welfare, public goods, regulation, information asymmetries, economic policy.

### RESEARCH ACTIVITIES:

- Determinants of the benefits of discretionary economic policy.
- Economic information theory – implications for economic policy.
- Regulation and its institutional context.
- Information asymmetries, negative externalities and the optimal quantity of public goods provided.
- The formulation of institutional change in the context of integration processes.

## RP6: Regional welfare: Cost of living, price and income inequalities in the small areas

### ANNOTATION:

EFTUL has developed unique certified methodologies ([Nmet2015](#) a [NmetS2021](#)) that determine a repeatable and traceable procedure for estimating regional price levels; and nominal and real monetary incomes of residents of small areas (municipalities with extended scope, authorized municipalities, municipalities). The results of the application of the methodology are the basis for the analysis and evaluation of small areas in terms of price development in various segments according to CZ COICOP and real estate prices, as well as the monetary income of the population (wages, insurance and non-insurance social benefits, business income, etc.). The results have application potential for monitoring, defining and evaluating the needs and problems of specific regions. They are important for more precise targeting of regional policy instruments, not only in the creation of strategic regional development documents, but also in the planning and implementation of specific measures and their subsequent evaluation. The net monetary income of the population in nominal and real value (regional purchasing power parity) can also be one of the assessed indicators of the justification of socio-economic interventions in economically or socially weak areas.

### KEYWORDS:

Regional welfare, regional price levels, housing prices, nominal income differences, real income differences.

### RESEARCH ACTIVITIES:

- Increasing the reliability of estimates of regional price levels for small areas.
- Research on the determinants of the development of regional price levels and incomes.
- International comparison of price levels in small areas.
- Research on the impact of economic and political measures on regional well-being (prices, incomes).
- Determinants of the development of real estate prices in small areas.
- Determinants of the development of wages in small areas.

## RP7: Cultural and creative industries as a source of economic diversification

### ANNOTATION:

EF TUL has long been devoted to the topic of economic diversification in relation to the sectoral structure of the economy in the region within the framework of research into sectoral groupings and clusters, see RP1. Appropriate diversification of the industry portfolio reduces the risk of total loss, albeit temporarily at the cost of lower profitability. The topic is examined at EF TUL from the point of view of spatial economy and its influence on the economy of economic entities in the region. The traditional view of the division of sectors (and monitoring the development of the share of individual sectors in total employment and economic performance) from an “agricultural” to an “industrial” economy is shifting to a modern economy associated with a dominant share of services and interdisciplinary cooperation. This is how cultural and creative industries can be defined. Expanding the view of the structure of the economy to include the cultural and creative sectors is important from the point of view of the development of technology and, as a result, of the development of society. According to the [“Metro – Dynamics” report \(2020\)](#), four areas can be identified in which the cultural sector influences the creative industries and the wider economy: innovation, education, collaboration and clustering. Culturally creative industries represent an interconnected ecosystem based on mutual collaboration and inspiration. According to CZSO (2019), cultural and creative industries (hereafter also KKO) are divided into the following groups, which are specified by specific activities according to CZ-NACE: Cultural and artistic core (sector of traditional artistic industries, including arts and crafts); Cultural sector (audiovisual and media sector); Cultural sector and administrative activities (creative sector); Information and communication activities; Recreational activity, printing and reproduction of recorded media. The Faculty of Economics focuses more precisely on the field of arts and crafts, which includes, e.g. glassmaking, jewelry, clothing, footwear, woodworking, metalworking, etc.

### KEYWORDS:

Cultural and creative industries, economic diversification, arts and crafts, innovation, cooperation, sectoral clustering.

## RESEARCH ACTIVITIES:

- Assessing the impact of arts and crafts on the local economy (assessing the economic contribution of existing clusters and networks to the creative ecosystem of arts and crafts).
- Tracking the changes and trends that are shaping the arts and crafts industry.
- Identification of parameters that define the specifics of individual arts and crafts, enabling subsequent comparison with other sectors of the economy.
- Assessing the potential of arts and crafts to accelerate transformational change in the context of sectoral diversification of regional economic development.



## RP8: Tourism destination potential in the context of sustainability

### ANNOTATION:

Tourism is an integral part of the economy, and its importance began to be discussed more precisely during the COVID-19 pandemic, when many restrictions caused losses both economically and socio-culturally. The potential of the topic lies mainly in the fact that, unlike other European countries, destination management in the Czech Republic is still developing. In addition, the research can be extended to the topic of innovative marketing in the context of tourism. Destinations are constantly focused on their development. However, if the aspect of sustainability is not taken into account, we cannot talk about effective development, which can have negative effects on all elements of the tourism system (businesses, municipalities, residents, visitors, etc.). EF TUL cooperates closely with various levels of destination management in the Czech Republic and has already carried out several contractual researches in this direction. The Department of Marketing also has many years of experience with research in the field of innovative marketing and has published several articles and monographs. The research results can serve not only destination management organizations at various levels of management, but also other entities involved in the tourism system.

### KEYWORDS:

Destination management organization, innovative marketing, potential, SME, sustainability, tourism destination.

### RESEARCH ACTIVITIES:

- New trends in innovative marketing in tourism.
- Destination potential – analysis and proposal of evaluation methodology.
- Evaluation of the impacts of tourism development.
- Marketing concepts in the context of tourism.
- Destination sustainability, overtourism.

## RP9: Internationalization and innovation trends within the EU (state/company's level)

### ANNOTATION:

The internationalization and innovation activities are crucial topics in the field of international trade. It is primarily caused by the close interdependence of national economies. However, this influence manifests itself differently within the EU, in the context of the historical development of individual Member States, i.e. regions. Another factor contributing to internationalization is the negotiation of new generation free trade agreements by the EU, which have a significantly wider range of topics than just the original agreements, focused on the international exchange of goods.

### KEYWORDS:

Internationalization (product, process, HR), innovation activities, the EU, international business, impact assessment, free trade agreement, computable general equilibrium model.

### RESEARCH ACTIVITIES:

- Internationalization and innovation trends on international business in the EU.
- Comparison of the impact of new generation free trade agreements on the border regions of the Czech Republic, Germany, Austria.
- Assessment studies of impacts of free trade agreements on national economies.





## RP10: Current trends and approaches in the field of valuation and financial performance of companies

### ANNOTATION:

At EF TUL, we have been dealing with the issue of the financial performance of companies from various points of view for many years. The financial performance of the company was examined in the context of complex models determining the financial health of companies applied to the Czech economic environment. Later, the phenomenon of financial performance was examined from the point of view of factors influencing the reporting ability of financial reporting, costing approaches, and the creation of costing systems in the company, financial management, and tax legislation. The current challenges facing the economy of the entire European area bring new questions in the topics of the financial performance of the companies and determining their value. It is necessary not only to permanently discuss the current results of research published by renowned foreign and domestic authors but also to identify new determinants of financial performance and analyze their significance.

### KEYWORDS:

Valuation of assets, financial health of companies, financial reporting, intangible assets, research and development, corporate taxes, value of companies, cost of ownership, energy crisis.

### RESEARCH ACTIVITIES:

- Monitoring of current trends in the field of companies' valuation;
- Determinants of the financial performance of companies in the current economic environment;
- Intangible assets, their valuation, recognition and impact on the financial performance of companies in the European area;
- A reflection of the energy crisis in the financial performance and valuation of enterprises;
- The impact of changes in accounting and tax legislation on business entities and their financial performance.

# RP11: Data-oriented and knowledge-based decision-making for business development through operational resilience

## ANNOTATION:

Multiple societal, political, economic, human-made and environmental issues are constantly pressing private companies and public organizations to prepare for the unexpected and formulate business strategies that rely on operational resilience. The recent COVID-19 pandemic, the ongoing war in Ukraine, the dramatic climate changes are some representative examples. Members of the Department of Informatics (KIN) have published multiple research results related to the use of big data and business intelligence tools for ensuring operational resilience using proactive business intelligence techniques. The results can be found in prestigious publishing houses such as IEEE, Springer and WOS impact factor or SCOPUS – indexed journals and conference proceedings. So far, the proposed data-supported and knowledge-based decision-making tools have been tested with success using business continuity data collected from public universities and companies in the agrarian sector. Both sectors have experienced the severe consequences of the aforementioned facts. The research is ongoing and will be further developed via collaboration with business partners of the Faculty in the agrarian sector as well as academic institutions (e.g. CZU, VSEM). The research can be further promoted by formulating project proposals for receiving funding from TACR, GACR, Ministry of Agriculture or other funding institutions under the framework of this collaboration. The developed tools will initially help agricultural companies minimize risks and increase operational resilience and sustainability. The research results will be later on tested in other sectors and industries.

## KEYWORDS:

Business continuity, business intelligence, knowledge-based decisions, resilience, risk assessment, sustainability, agriculture.

## RESEARCH ACTIVITIES:

- Business continuity data collection for multiple companies with emphasis on agribusiness (but not limited to) through active collaboration.
- Design and development of a business intelligence web database solution that can be used by agronomists as a proactive process recovery and risk assessment tool.

- Propose a maturity model (similar to the other maturity models found in the literature) which focuses on the ideal recovery timeframe suggestion, process recovery prioritization and the ideal business continuity investment in modern companies and organization.
- Development of software tools that use the above described collected data to develop risk assessment and process availability patterns that will combine business process modelling and machine learning.
- Selection of key sectors to propose and test the developed tools and methodologies (focus on health, industry, ICT companies).



## RP12: Next generation of discrete-event simulation

### ANNOTATION:

Discrete event simulation (DES) as a practice has been in existence for more than 50 years. Often seen and used as a standalone tool for the offline modelling of industrial and service-based environments. With a particular focus on manufacturing the rise of a new generation of interactive technologies over the past decade, characterized by movements such as Industry 4.0 and the industrial internet. Increasingly the recognition of workers in the modern manufacturing organization has led to the proposal of Industry 5.0, putting forward, as a major research strand, the notion of human centric production of personalized products with empowered and interactive roles for shop floor and supervisory employees. A prominent technology featured in the digital manufacturing discussion is that of the internet of things. The opportunity now exists to connect traditionally offline simulations and models to live data streams emanating from factory production lines to provide real time understanding of current production status. There are many reasons why such a live simulation facility could be advantageous to both the manager and the production line worker. One particular framing of this advantage is provided by the digital twin concept. Digital twin has been defined as the linking of a physical entity with a digital representation for the entirety of the physical entity's lifespan. Different levels of the digital twin in a manufacturing context such as supervisory which communicates the live state of a monitored asset; interactive representing automatic adjustment of parameters of a monitored asset and predictive where prediction is made based on data provided by a monitored asset to inform recommendations that are either automatically enacted or relayed to a human supervisor. DES models could empower and enable human in the loop roles within the concept of digital twin; providing this concept with the ability to fulfil the predictive capability, in combination with machine learning approaches, and provide detailed scenarios for potential future actions based on live streamed data.

### KEYWORDS:

Discrete event simulation, agent-based simulation, digital twin concept, industrial internet of things, human in the loop, extended reality, explainable artificial intelligence.

### RESEARCH ACTIVITIES:

- DES and extended reality integration to simplify two-way communication between the production process and decision-makers.
- Development of hybrid and agent-based simulation to provide access to specific machine learning algorithms.
- Development of human in the loop scenarios and the applications.

