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Faculty of Engineering Economics and Management

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ENTREPRENEURSHIP SCEE'2025**

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Sustainable and Secure Future in the Digital Age"**

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**“BUSINESS FINANCE, ECONOMICS AND
MANAGEMENT”**

ADVANCING CYBERSECURITY AWARENESS IN SMES: HUMAN FACTOR CHALLENGES AND STRATEGIC SOLUTIONS

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Abstract. In the context of accelerating digital transformation, small and medium-sized enterprises (SMEs) remain particularly vulnerable to cyber threats due to limited resources and underdeveloped human-centric defense mechanisms. In their previous studies, the authors have examined critical factors influencing SME cyber resilience, developed a conceptual model of resilience, and introduced a matrix-based approach to align critical assets with specific types of cyber risks. However, the role of the human factor in ensuring cyber resilience has received comparatively little attention, despite being arguably the most underestimated yet fundamentally important component.

This paper explores the pivotal role of cybersecurity awareness and continuous entrepreneurial human capital development in enhancing SMEs' capacity to anticipate, withstand, and recover from cyber incidents.

The authors identify key awareness gaps within current SME practices and analyze strategic approaches that empower both employees and managerial staff. Drawing on relevant literature and practice-based insights, the study demonstrates how targeted digital skills training, cybersecurity education, and leadership development can shift human vulnerability into a foundation for resilience.

Furthermore, the paper advocates for the integration of cyber resilience principles into entrepreneurship training and SME management curricula. Policy implications are discussed, emphasizing the need for coordinated institutional support to foster a proactive and resilient cyber risk culture. This research contributes to the broader discourse on innovation ecosystems and positions awareness as a catalyst for sustainable cyber resilience, collaboration, and long-term competitiveness within the SME sector.

Keywords: *Cyber resilience, Small and medium enterprises, Cybersecurity awareness, Human capital development, Digital skills training, Organizational learning, Innovation ecosystems*

JEL Classification: L26, M15, J24, I25

THE ECONOMIC SUSTAINABILITY OF STATE-OWNED COMPANIES IN THE CONTEXT OF CORPORATE GOVERNANCE CHANGES

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Abstract. State-owned enterprises (SOEs) are pivotal to public value creation, yet their economic sustainability can be destabilized by governance changes and leadership turnover. This study examines the contingency mechanisms of government owned companies during governance fluctuations. The management pillars - ownership policy, board independence and governance standards, transparency and performance monitoring— are researched here to find the way they support sustainable financial outcomes of SOEs. The question going under researched in the paper is following: *Which governance changes most consistently align with the economic sustainability of SOEs?* Innovation of the research: this research contributes to ensuring the continuity of financial management and the associated sustainability in state-owned enterprises, whose operations must be ensured by its management not only in the context of shareholder expectations, but also in the light of the interests of society and political thought. At the same time, ensuring the fulfillment of the basic obligations of a state-owned enterprise and the achievement of the set financial goals. A qualitative content analysis carried out synthesized academic and policy sources coded in an accompanying workbook and research memo. During content analysis there were reviewed approximately 35 documents produced thematic categories and frequency counts, followed by interpretive synthesis linking governance mechanisms to sustainability proxies (profitability, efficiency of resource allocation, leverage/liability risk, and resilience). The analysis privileges practices relevant to the Latvian SOEs context, however, the majority of sources refers to the top European and international practices in state company's management. The most frequently supported mechanisms described in the literature pieces were starting from financial control strengthening principles - clear financial targets tied to board/executive remuneration, consistent ownership policy, SOE governance frameworks clarifying roles and accountability, and board professionalization/independence. Implemented content analysis also highlighted risk signals - poor performance/contingent liabilities and overreliance on expected government support that undermine sustainability. Collectively, these governance changes were associated with improved profitability/efficiency and lower risk exposure, with heterogeneity implied by sector and ownership intensity. Aligning incentives with measurable financial targets, codifying ownership policy, and professionalizing boards appear to strengthen capital allocation discipline, reduce fiscal risk, and enhance resilience—mechanisms central to SOE economic sustainability. External validity is strongest for contexts similar to Latvia's governance architecture. Findings derive from content analysis along with literature review. In following process causal estimates will be negotiated with company representatives *tet a tet* interview approach. The findings indicate - the owners and regulators should formalize incentive-linked oversight, publish aggregate SOE performance targets, and empower the finance ministry to set and monitor sustainability metrics during governance transitions.

Keywords: *State-owned enterprises, Corporate governance, Ownership policy, Board professionalization, Financial targets, Economic sustainability*

JEL Classification: G31, L32

ASSESSING FACTORS OF POSITIVE FINANCIAL PERFORMANCE IN DIGITAL BUSINESS MODELS

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Abstract. The aim of this research is to identify the factors that influence the positive financial performance of commercial activities in the digital age, as well as to assess the impact of profit management on different business areas. Based on a systematic literature review and qualitative content analysis, 33 factors were identified and classified into three groups: non-financial digital, non-financial non-digital, and financial. To assess the importance of the selected factors in relation to a company's profit generation, the identified factors are analysed through the business model framework dimension: value proposition, value creation, and value capture. Their impact is determined across three different areas of business activity:

1) Electronic commerce as a stable revenue stream channel. Summarizing the information on the changes in revenue growth of Latvian companies, it can be concluded that the positive impact of e-commerce is more effective when combined with other sales channels to ensure sustainable business development.

2) The impact of disruptive innovation on information product development and revenue retention. In conclusion, sellers of information products have a strategic task to promptly identify and replace the decline in revenue from historical products with new digital products.

3) The digitisation of delivery and communication networks, which enhances service quality and reduces costs through real-time data flows between physical and digital worlds. In a rapidly changing business environment, it is advisable to periodically re-evaluate the identified factors and continue researching their impact on various business models. This research development would provide guidelines for small business entrepreneurs in Latvia.

Keywords: *Digital transformation, Disruptive innovation, Service-dominant logic, Service platform, Profitable business model*

JEL Classification: G30

INTEGRATING CUSTOMER EXPERIENCE AND KNOWLEDGE MANAGEMENT: A SELF-ASSESSMENT TOOL FOR PERSONALIZATION READINESS

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Abstract. Personalized customer experience (CX) initiatives frequently underperform because front-stage experience design (journeys, co-creation, transparency) is not adequately aligned with back-stage organizational capabilities (data, technology, analytics, knowledge processes, and governance). Building on a framework that explicitly links front-stage elements with back-stage enablers, this research presents a self-assessment instrument that translates the matrix into a practical diagnostic for personalization readiness. The instrument operationalizes each matrix cell with targeted items and a five-level maturity scale (Basic → Leading). Methodologically, the instrument was developed via literature synthesis (CEM, CKM, service design/SDL, behavioral economics) and expert validation (semi-structured interviews across CX, IT/data, process, and leadership roles; plus, a Delphi on implementation barriers). Preliminary results from expert evaluations indicate strong content/face validity of the coverage and alignment logic; reviewers emphasized (i) cross-functional completion to avoid silo bias, (ii) brief definitional anchors per item for rating consistency, (iii) the value of segmented views (e.g., by function/market), and (iv) direct linkage from “red” cells to scan-cards and a phased roadmap. Practitioners described the instrument as a low-threshold way to prioritize work while maintaining strategic alignment and trust/ethics considerations. The paper contributes (1) a scientifically grounded self-assessment for personalization readiness; (2) a scoring and visualization approach that exposes front/back misalignments; and (3) practical guidance for integrating results into improvement planning.

Keywords: *Customer Experience (CEM), Customer Knowledge Management (CKM), Personalization, Readiness assessment, Service-dominant logic, Behavioral economics, Service design*

JEL Classification: M31

DETERMINANTS OF PUBLIC INSTITUTIONS' COMPETITIVENESS IN THE LATVIAN CONTEXT

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Abstract. This study presents an analysis of the determinants of public institutions' competitiveness by analyzing the existing frameworks. The research objective is to expand earlier frameworks by examining competitiveness as the outcome of interest and by identifying its main determinants. The methods lie in the analysis of 30 articles, which provides theoretical assessment and a basis for the following empirical testing. The competitiveness is defined as the dependent variable, while a set of core determinants is identified through various studies with the notable importance of bureaucracy reduction and intra-organizational communication, followed by other factors such as strategic management and digitalization. Moreover, the study also introduces adaptability and innovation capacity as additional determinants.

The findings show that while traditional determinants such as strategic management and digitalization provide positive support for competitiveness, adaptability and innovation capacity strengthen the resilience, but the absence of effective bureaucracy reduction remains a barrier for competitiveness. The study is limited by a restricted base of articles published in the last ten years which narrows the scope of generalization of the findings.

As a result, the framework of Bîrcă, Sandu, and Matveiciuc (2019) crystallizes as the reference model that is extended by adding adaptability, innovation capacity and competitiveness itself and is to be piloted through a survey based on the developed questionnaire. The practical implication for policymakers and public administration leaders is the recognition that enhancing competitiveness requires reducing bureaucracy, strengthening intra-organizational communication and integrating adaptability and innovation capacity into the governance framework.

Keywords: *Adaptability, Bureaucracy reduction, Competitiveness, Innovation capacity, Public institutions*

JEL Classification: H11, H83, O38, O43

FINTECH AS A DRIVER OF GROWTH AND ACCESSIBILITY IN INVESTMENT SERVICES

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Abstract. Financial technologies (FinTech) solutions have significantly changed the barriers to entry into the investment environment, especially for younger and less experienced investors. Digital platforms such as Mintos, Debitum Investments, Lande and Viainvest offer user-friendly access to capital markets with low or no commissions, which has facilitated the influx of private investors into the market. New trends are expanding the scope of financial inclusion and transforming traditional patterns of investment behavior. This paper examines the role of FinTech as a driver of growth and accessibility in investment services, focusing on its potential to democratize investment opportunities, as well as their impact on quality of the investors' decision-making and choice of investment portfolio strategies. The author combines comparative analysis of digital platforms with a review of recent empirical studies. Results indicate that FinTech enhances accessibility and market efficiency, but investor decision quality often depends on financial literacy. The research concludes that while FinTech democratizes investments, it also increases exposure to risks from limited knowledge and information asymmetry. Recommendations include strengthening financial education, fostering adaptive regulation, and promoting responsible innovation to ensure sustainable and inclusive investment growth.

Keywords: *Crowdfunding, Decision-making, Digital platforms, Financial technologies (FinTech), Innovation, Investment services, Private investors*

JEL Classification: G11, G23, G40

HYBRID BANKING INNOVATION: ISLAMIC–CONVENTIONAL COLLABORATION IN LATVIA

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Abstract. This study examines how innovative collaboration between Islamic and conventional banking (IB–CB) can help address the challenges faced by IB within the Latvian banking. The research aims to design, evaluate, and refine hybrid IB–CB products that integrate Shariah-compliant and conventional financial principles to promote inclusivity and innovation.

Three hybrid IB–CB financial products, the Collaborative SME Financing Solution, the Combined Green Bond and Sukuk, and the Education Empowerment Co-Funding, were developed based on an extensive literature review and professional experience. These product concepts were presented to SEB Bank specialists, and their feedback was analyzed using both qualitative and quantitative analysis to assess feasibility and to identify potential regulatory, legislative, and operational barriers.

The key differences and challenges between IB & CB practices informed the design of an international expert panel discussion. The study identifies both opportunities and constraints in integrating Islamic finance principles into Latvia’s banking environment. Expert insights highlight the potential of hybrid financial products to enhance financial inclusion and sustainability, while emphasizing the need for regulatory harmonization and institutional support.

Overall, the research advances the understanding of hybrid financial innovation and provides practical recommendations for integrating IB principles into Latvian banking through collaborative and adaptive approaches.

Keywords: *Islamic banking, Conventional banking, Hybrid financial products, Financial innovation, Regulatory challenges*

JEL Classification: G21, G28, O31

EXPANDED FRAMEWORK FOR CRITICAL RAW MATERIALS ASSESSMENT

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Abstract. Critical Raw Materials (CRMs) are fundamental to the functioning of renewable energy, digital technologies, strategic industrial production, and advanced manufacturing sectors. However, their supply chains are increasingly exposed to geopolitical, environmental, and technological vulnerabilities. This study develops an expanded framework for CRM assessment that incorporates lifecycle, circularity, social, regulatory, and technological dimensions to overcome the limitations of earlier, extraction-focused models. Through targeted literature analysis of 986 Scopus-indexed publications and bibliometric mapping, the research highlights the interdisciplinary nature of CRM governance and its economic implications. The proposed framework integrates new categories such as circularity potential, technology readiness, regulatory quality, and human development indicators, aligning with the EU Critical Raw Materials Act (2024) and global sustainability objectives. The framework provides policymakers, industry, and researchers with a comprehensive and adaptive tool to evaluate material risks, strengthen economic resilience, and guide sustainable resource management in a low-carbon, resource-efficient economy.

Keywords: *Critical raw materials (CRMs), Environmental, Resilience, Supply restriction, Sustainability*

JEL Classification: Q32, Q34, Q56

THE ROLE OF ENTREPRENEURIAL SELF-EFFICACY IN PERSONALITY– ENTREPRENEURIAL INTENTION LINKAGES: EVIDENCE FROM CENTRAL AND EASTERN EUROPE

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Abstract. Understanding the psychological antecedents of entrepreneurial intention (EI) is essential for fostering entrepreneurship in national economies. This study explores how Big Five personality traits relate to EI through the mediating role of Entrepreneurial Self-Efficacy (ESE) across three countries in Central and Eastern Europe: Poland, Ukraine, and Latvia. Using a comparative quantitative design, the authors examine both direct and indirect effects of Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness to Experience on EI. A structured questionnaire as well as structural equation modeling (SEM) was applied as research methodology and measurement tool. The survey was conducted among 825 students from three technical universities. The findings reveal notable cross-country differences in how personality traits and ESE interact to shape entrepreneurial intentions. In all three countries, ESE consistently emerges as a significant predictor of EI and a key mediator in the personality–intention relationship. However, the strength and structure of these pathways vary across national contexts. In interpreting the results, the authors also investigate how personal traits relate to cultural values, highlighting how cultural context conditions the personality–ESE–EI pathways. These results contribute to a more nuanced understanding of entrepreneurial cognition in emerging European economies and suggest that policy and education programs aiming to enhance entrepreneurship should consider both psychological and contextual factors, including national differences in personality–ESE–EI pathways.

Keywords: *Entrepreneurial intention, Entrepreneurial self-efficacy, Big five personality traits, Cultural values, Transitional economies*

JEL Classification: D91, E71, L26, O52, P20

TOP MANAGEMENT BELIEFS AND VALUES AND CORPORATE FINANCIAL DECISION-MAKING

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Abstract. Authors strive to find concepts of how top management team (TMT) values and beliefs shape corporate financial decision-making, integrating three foundational theoretical perspectives: Upper Echelons Theory (Hambrick & Mason, 1984), the Resource-Based View (Wernerfelt, 1984; Barney, 1991), and Agency Theory (Jensen & Meckling, 1976). Using a conceptual literature review, the study examines the interlinkage between strategic management, behavioural finance, and corporate governance to understand how leadership attitudes toward risk, ethics, and organizational sustainability influence key financial choices, including financing, investment, and others. While some research reports conflicting findings or contextual limitations—such as cultural differences or measurement challenges—the overall literature supports a strong link between leadership values and financial outcomes. This article is one of the stages in a larger research project dedicated to translating Upper Echelons Theory into practical decision-making tools to increase the financial performance of enterprises in Latvia. The objective of the bigger research is to develop a mathematical model that strengthens links between the components of Upper Echelons Theory applied in Top Management Teams. The model will provide a systematic framework for implementing systemic diversity management practices, allowing organizations to align leadership characteristics with strategic and financial goals. Integrating behavioural insights with quantitative analysis, the proposed approach will offer both researchers and practitioners a method for predicting and enhancing firm performance through informed executive selection, formation and the development of the (TMT).

Keywords: *Upper echelons theory, Agency theory, Resource-based view (RBV), Financial decision-making, Sustainability, Top management team (TMT)*

JEL Classification: M5

WHEN DIGITAL TRUST REDUCES RISK: ICT THIRD-PARTY MANAGEMENT IN THE FINANCIAL SECTOR

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Abstract. ICT third parties increasingly create risks for financial institutions. They hold customer data and support critical operations, which makes organisations dependent on their reliability and security. Recent breaches show that failures at the third-party level can quickly escalate into systemic problems. As a response, the Digital Operational Resilience Act (DORA) introduces stricter oversight of ICT third parties in the European Union. This creates the need to better understand how to manage third-party risks and what the potential role of digital trust is in this process.

This paper examines the link between digital trust and third-party risk in the Baltic banking industry. A mixed-methods approach was used. Quantitative data were collected from a survey of 138 employees involved in ICT third-party cooperation and analysed with PLS-SEM. The results were further explained through thirteen expert interviews.

The findings show that higher digital trust is linked to lower assessed risk in ten out of twelve categories, especially concentration, contingency planning, financial, and strategic risks. No significant effect was found for vendor and supply-chain cybersecurity or partner-specific risks. Experts explained this by the external nature of cyberattacks, the governance focus of trust assessments, and the limits of self-reported or contractual assurances.

The study shows that digital trust assessment is a complementary tool in third-party risk management, offering governance and strategic value, while its role in reducing cybersecurity risk is limited.

Keywords: *Banking, digital trust, DORA, risk management, third-party risk*

JEL Classification: M15, G32, L86

REGULATORY NETS AND THE RISE OF FINTECH: MAPPING EU FRAMEWORKS AGAINST ROGERS' INNOVATION DIFFUSION THEORY

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Abstract. The rapid expansion of FinTech has reshaped financial systems globally, particularly in the EU, where regulatory efforts like MiCA, DORA, and PSD2 aim to balance innovation and stability. This paper examines how these frameworks function as regulatory "nets" that either enable or restrict the diffusion of FinTech innovations. Using Rogers' Innovation Diffusion Theory (IDT), we analyze how key regulatory instruments impact the five core diffusion attributes—compatibility, observability, relative advantage, trialability, and complexity. Drawing on insights from the Latvian FinTech ecosystem and broader EU regulatory practices, we identify strategic regulatory bottlenecks and enablers, offering a typology of regulation-innovation alignment. Our findings suggest that despite recent progress, EU regulation still faces fragmentation and complexity challenges that can undermine FinTech scalability, especially for SMEs and cross-border actors.

Keywords: *Digital finance ecosystem, FinTech regulation, Innovation diffusion theory (IDT), MiCA, Regulatory governance, Regulatory nets, Small-market economies*

JEL Classification: F36, G21, G28, L51, O31, O33

REVIEW OF STUDIES ON STATE SUPPORT AND ENTREPRENEURSHIP. SUPPORT TYPES, OBJECTIVES, AND ELIGIBILITY CRITERIA

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Abstract. The review synthesizes evidence on the role of state support in fostering innovation, digitalisation, and export performance among European firms. Web of Science Core Collection was used to identify the studies spanning public support instruments with an EU and entrepreneurship focus. From 100 records (1991–2025) after exclusions we retained 31 studies for in-depth analysis. Results indicate that state support generally has a positive, though often moderate, direct effect on innovation inputs/outputs, digital maturity, and export intensity. Effectiveness increases when support objectives are well-targeted to specific firm types and complement their existing capabilities. Ecosystem interventions and knowledge spillovers justify sustained investment even when short-term effects are small. Countries deploy varied in intensity mixes of support instruments: direct (grants, subsidised loans, guaranties, investments), indirect (tax incentives), ecosystem (incubators, networks, training), and demand-side tools (public procurement). Impacts are heterogeneous by region, sector, firm size, financial constraints, and absorptive capacity. We find no evidence for a universally superior model - reliance on a single instrument is unlikely to be optimal. Policy recommendations include multi-year, predictable schemes; innovation-oriented public procurement; support for non-R&D innovation costs; eligibility criteria signalling absorptive capacity; human-capital development co-financing; size-contingent thresholds; streamlined tracks for high-growth and new technology-based firms; and rigorous monitoring using additionality-focused KPIs.

Keywords: *Government support, Entrepreneurship policy, Eligibility criteria, European Union, Literature review*

JEL Classification: H25, H81, L26

SECTION

“INNOVATION, CONSUMER BEHAVIOUR, AND DIGITAL TRANSFORMATION”

DIGITAL MANAGERIAL COMPETENCIES FOR SUSTAINABLE ENTREPRENEURSHIP IN SMES: EVIDENCE FROM ONGOING PHD RESEARCH IN KOSOVO

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Abstract. This paper is derived from the author's ongoing doctoral research, which has a broader scope focusing on managerial competencies and their potential effects on SME performance in Kosovo. While the PhD study addresses a wide range of managerial competencies, this conference paper narrows the focus to digital managerial competencies, aligning with the theme of entrepreneurship and education in the digital age.

Digital competencies are measured using the validated instrument of Kowal et al. (2022), consisting of five Likert-scale items assessing managers' ability to integrate digital technologies into managerial processes, adopt and use new digital tools, apply automation and analytics for decision-making, ensure cybersecurity awareness, and promote digital innovation. The dependent variables analyzed are business performance (Munawar et al., 2023), measured through financial indicators such as sales growth, profitability, and return on investment, and business proactivity (Anwar & Shah, 2020), which reflects the firm's ability to anticipate and act upon emerging market opportunities.

Data collection is currently in progress among SME managers in Kosovo. The analysis will employ Confirmatory Factor Analysis (CFA) to validate the measurement model, followed by Structural Equation Modelling (SEM) to test the hypothesized relationships. It is expected that digital managerial competencies will positively affect both business performance and proactivity by enhancing innovation, efficiency, and adaptability. By focusing specifically on digital competencies, this paper provides targeted insights into how managerial education and training can contribute to sustainable entrepreneurship and secure growth in the digital era.

Keywords: *Business performance, Business proactivity, Digital competencies, Managerial skills, SMEs, Sustainable entrepreneurship*

JEL Classification: M12, M15, O32, L26

ASSESSING ORGANIZATIONAL INNOVATION CAPABILITY MATURITY FOR INNOVATION ECOSYSTEM ENGAGEMENT: AN AI-READINESS PERSPECTIVE IN THE CONTEXT OF THE DIGITAL ERA

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Abstract. In the context of digital transformation and growing interdependence within innovation ecosystems, organizations face increasing pressure to evolve beyond isolated innovation initiatives. Their readiness to engage effectively in open, collaborative innovation networks depends largely on the maturity of their internal innovation capabilities. This paper proposes an approach for assessing organizational innovation capability maturity, applying an AI-readiness lens to understand both internal innovation potential and ecosystem engagement fit.

Drawing on capability maturity theory, organizational learning models, and system thinking rooted in complex adaptive systems (CAS), the proposed assessment framework synthesizes insights from established innovation maturity models with emerging AI maturity roadmaps. It evaluates how organizations progress from fragmented, ad hoc innovation efforts toward systematic, strategic, and ultimately pioneering innovation behaviour. The model examines key dimensions such as governance, digital infrastructure, data practices, cross-functional alignment, and external collaboration.

Within this framework, the paper explores how the role of ecosystem intermediaries like Bridge Makers must dynamically adapt to the organization's maturity level. Early-stage organizations may require connectors who provide access to knowledge networks. Mid-stage organizations benefit from facilitators who help align strategic direction, resources, and governance structures. Mature and pioneering organizations need integrators capable of co-designing and orchestrating shared innovation outcomes across complex stakeholder environments. The study contributes both conceptually and practically by offering a roadmap that links internal innovation development with external ecosystem participation. It further addresses the role of AI readiness as a contemporary indicator of innovation maturity, particularly in data-driven, digitally enabled ecosystems.

The paper concludes by discussing implications for innovation policy, capability development, and the strategic design of ecosystem support mechanisms. It also provides directions for incorporating maturity assessment tools into innovation and entrepreneurship education, enhancing organizational foresight and resilience in the digital age.

Keywords: *Innovation capability maturity; Innovation ecosystems; AI readiness; Organizational assessment; Ecosystem intermediaries; Open innovation*

JEL Classification: O31; O33; O32; M15; L26

BEYOND POINTS AND BADGES: A CRITICAL ANALYSIS OF ADVANCED GAMIFICATION MECHANICS AND THEIR LINK TO USER BEHAVIOR

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Abstract. The evolution of gamification reflects a shift from traditional notions of play toward the integration of game elements in non-game contexts to influence behavior and enhance engagement. This paper traces the history of gamification, highlighting its early conceptual roots in playfulness and the serious game movement, which sought to harness the motivational and experiential power of games for educational, training, and organizational development purposes. By examining milestones in both theory and practice, the study positions gamification as a continuation of a broader trajectory where play and purposeful activity intersect. Central to this analysis is the role of motivation theories in shaping the design of gamification. Self-Determination Theory, Flow Theory, and Behaviorist reinforcement models are explored as key frameworks that explain why and how game-inspired mechanics can sustain user engagement. Through this historical and theoretical lens, the paper underscores the dual nature of gamification: rooted in playfulness yet oriented toward serious outcomes. By linking its evolution to motivational psychology, the study provides a critical foundation for understanding gamification as both a cultural phenomenon and a practical tool for shaping human behavior across various domains, including education, health, and business.

Keywords: *Gamification, Motivation, User behavior, Playfulness, Serious game*

JEL Classification: M31

NOVEL INTEGRATED TECHNOLOGY ABSORPTION AND DEPLOYMENT MODEL FOR DIGITAL TRANSFORMATION: MANAGERIAL FRAMEWORK FOR PRODUCTION COMPANIES

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Abstract. Digital transformation at the macro level has been evolving for several decades, with significant acceleration driven by the internet, smartphones, the COVID-19 pandemic, and the emergence of Generative Artificial Intelligence. This raises the question of whether, and to what extent, transformation is taking place at the firm level. While some changes can be implemented using internal resources, successful digital transformation often requires acquiring new technologies and knowledge from external sources.

This study addresses the research question: How can technology adoption be effectively managed to support digital transformation? It proposes a conceptual framework for technology adoption in manufacturing companies by synthesizing existing models. A qualitative study, comprising a literature review and expert interviews, identifies key managerial practices across various stages of technology acquisition. These practices are then evaluated using the Analytic Hierarchy Process (AHP) to determine their relative importance.

The framework is validated through a survey of manufacturing firms, leading to the development of a readiness assessment method that evaluates companies' preparedness for technology adoption in the context of digital transformation. The results contribute to a clearer conceptualization of digital transformation at the firm level and offer practical guidance for managers and policymakers aiming to foster effective technology integration in industrial settings.

Keywords: *Digital transformation, Managerial practices, Production, Technology absorption, Technology acquisition, Technology adoption*

JEL Classification: M10

DIGITAL MIRRORS: CONSUMER IDENTITY TRANSFORMATION AND MARKET DYNAMICS IN VIRTUAL ENVIRONMENTS (EVIDENCE FROM LATVIA, 2019–2022)

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Abstract. The rapid expansion of digital platforms has created new forms of consumer engagement where identity itself becomes a site of transformation. Virtual environments act as “digital mirrors,” offering curated reflections that influence how individuals perceive themselves and interact with markets. This paper presents empirical evidence from a three-year nationally representative survey study in Latvia (2019–2022, $n = 1007$, population aged 18–74). Findings indicate that consumers increasingly treat their digital personas as consumable objects, engaging in self-branding, performative practices, and continuous adaptation to algorithmic visibility. Over time, these identity negotiations reshape perceptions of authenticity, shift trust thresholds, and reconfigure consumer–brand relationships. Moreover, the data highlight key market dynamics: consumers’ self-representation practices influence purchasing decisions, brand engagement strategies, and the valuation of digital goods and services. By combining empirical evidence with theoretical insights, the study demonstrates how virtual environments transform not only consumer identity but also the structural dynamics of markets in the era of digital transformation.

Keywords: *Digital identity, Consumer behavior, Virtual environments, Virtual consumers, Market dynamics*

JEL Classification: D91, D12, L86

FROM MORAL NEGATION TO MARKET CONSEQUENCES: THE SOCIO-ECONOMIC IMPACT OF SYMBOLIC CONTROVERSIAL ADVERTISING

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Abstract. Controversial advertising in the digital age poses thoughtful challenges to sustainable business behaviour, corporate responsibility, and managerial awareness. Although much research has focused on consumer identity, the broader social and economic consequences of provocative symbols remain understudied. This research examines how consumers and managers respond to ethically controversial advertising and how these interactions affect market trust and long-term brand resilience. Based on the constructivist grounded theory (CGT) method, qualitative interviews with Lithuanian religious consumers and marketing managers reveal two interrelated dynamics. In one hand, the results revealed, that consumers engage in moral negotiations, reconciling religious values with market decisions, which typically leads to avoidance, resistance, or conditional acceptance. In another, while managers consciously risk brand trust or fail to recognize the symbolic implications of their decisions. Consequently, this dispersion reveals a lack of understanding among managers, which calls for a change in attitude towards management studies and business activities. As result, the study introduces the concept of managerial equilibrium to explain how ethical responsibility (or lack thereof) outlines sustainable and secure markets. By linking moral negotiations with social and economic consequences, the author of the research emphasizes the importance of moral sensitivity in preparing entrepreneurs and managers for responsible leadership in the digital age.

Keywords: *Controversial advertising, Symbolism, Sustainability, Managerial responsibility, Market trust*

JEL Classification: M14; M31; M37

CUSTOMER LOYALTY AND SATISFACTION IN FINTECH INDUSTRY: CASE OF LATVIA

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Abstract. This paper investigates the correlation between customer satisfaction and loyalty in the FinTech industry, with a particular focus on the Latvian market. The primary aim is to evaluate how satisfaction influences loyalty and to provide actionable recommendations for FinTech companies. The study employs a theoretical framework based on the SERVQUAL model, which assesses service quality across five dimensions: reliability, assurance, tangibles, empathy, and responsiveness. These dimensions help identify gaps between customer expectations and actual service experiences, making SERVQUAL a valuable tool for managing satisfaction. The paper also incorporates Oliver's four-phase loyalty model—cognitive, affective, conative, and action loyalty—which outlines how customer loyalty evolves over time through distinct psychological stages. Findings from empirical studies in various sectors such as retail, banking, and education confirm the effectiveness of both models in enhancing customer satisfaction and loyalty. The research concludes that loyalty in FinTech is driven by consistently positive service experiences, trust, and personalized offers. Recommendations emphasize the importance of service quality management, emotional engagement, and data-driven personalization strategies for long-term competitiveness and customer retention.

Keywords: *Artificial Intelligence (AI), Customer experience, Customer loyalty, Customer satisfaction, Digital transformation, Emotional connection, FinTech, Latvia, Personalization*

JEL Classification: G41, M31, O33

LANGUAGE BARRIER AS A FACTOR INFLUENCING INTERGENERATIONAL INTERPERSONAL CONFLICTS IN THE WORKPLACE: THE CASE OF LATVIA

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Abstract. This study analyzes the language barrier as a significant psychosocial and organizational factor influencing intergenerational interpersonal relationships and conflict dynamics in Latvian workplaces. Focusing on Latvia's historical and sociolinguistic context, the study highlights how linguistic fragmentation among employees representing different generations can become a major obstacle to effective professional interaction. In Latvia, there are still individuals or groups from the older generation whose main language of communication is Russian, alongside younger generations who predominantly use Latvian and English. This situation acts as a factor contributing to intergenerational conflicts in the workplace, fostering emotional tension, stereotyping, and psychological distance within work teams.

Theoretically, the study is grounded in approaches from intercultural communication, social and organizational psychology, and sociolinguistics. The empirical part is based on a mixed research design, including a quantitative employee survey and qualitative interviews with managers at different levels. The results indicate that language barriers hinder mutual trust and impede knowledge transfer between generations, while also creating a sense of isolation and the risk of marginalization, particularly among younger employees.

The article concludes with theoretical recommendations for organizations on how to address these challenges, such as introducing mentoring systems, implementing language training programs, creating mixed-generation work groups, and utilizing flexible communication platforms. The findings confirm that a systematic approach to language and generational integration significantly fosters the development of an inclusive, collaboration-based organizational culture in the Latvian work environment.

Keywords: *Language barrier, Generational conflict, Workplace communication, Workplace conflict, Causes of conflict*

JEL Classification: J21, J24, J81, M12

TRANSFORMING ENTREPRENEURSHIP AND EDUCATION FOR A SUSTAINABLE AND SECURE FUTURE IN DIGITAL AGE

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Abstract. Artificial Intelligence (AI) is being rapidly deployed in universities and other knowledge-based workplaces to streamline workflows and monitor performance. However, this drive for efficiency has created tension between technological progress and human-centric values in academia. Recent studies indicate that AI adoption can be a double-edged sword: while it may boost productivity, it also introduces new pressures that undermine employee well-being (Ramel, 2025). In many cases, “AI technostress” is contributing to burnout and work-life conflict as staff feel an implicit expectation to always do more. In higher education, where intrinsic motivation and creativity are paramount, such pressures can be particularly damaging. There is growing recognition that the next generation of AI tools must support – not surveil – educators and researchers, aligning with human psychological needs and ethical design principles. This paper explores the pitfalls of AI-driven surveillance in academic settings and proposes a shift toward human-centric AI grounded in Self-Determination Theory and empathy-driven design.

Keywords: *Digital transformation, Cyber resilience, Small and medium – sized enterprises, Cybersecurity, Sustainability*

JEL Classification: O33, L26, L25

TYOLOGIES OF GREEN INNOVATION IN CORPORATE VENTURING

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Abstract. Corporate venturing (CV) is a critical means for established corporations or incumbents to access, develop, and scale green innovation. This study synthesizes recent research to provide typologies of Green innovation (GI) within the CV context and to integrate dispersed insights into a coherent analytical scheme. The framework reveals that GI spans technological and non-technological forms from environmental and eco-innovations to cleantech, sustainability-oriented innovation, and sustainable business model innovation, and that the successful outcome depends on such antecedents as resource availability, organizational capabilities, multi-actor collaboration, and enabling policy regimes. As a result, the scope of impact can range from incremental to radical, disruptive, and transformative, and result in organizational, market-level system-building, and policy and institutional outcomes. The framework offers a structured outcome for scholars and a framework for practitioners to align innovation types with underlying factors to arrive at a desired outcome. The findings confirm that GI emerges not from isolated technological breakthroughs but through the complex interplay of internal capabilities, external collaborations, strategic alignment, and supportive institutional environments. Finally, the study lays a foundation for future empirical and theoretical research.

Keywords: *Sustainable innovations, Green innovations, Corporate venturing, Analytical framework*

JEL Classification: G24, L1, L21, L26, M10

DETERMINANTS OF CONSUMER TRUST IN GREEN FINTECH PLATFORMS

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Abstract. The rapid growth of financial technology (FinTech) has created new opportunities to promote environmentally responsible consumption. Yet, little is known about the factors that shape consumer trust in green FinTech platforms, which is crucial for their adoption and long-term impact. This study develops and tests a partial least squares structural equation model (PLS-SEM) integrating sustainability and technology determinants of trust. Survey data from 240 consumers were analyzed. Results show that green transparency, platform security and privacy, and ease of use significantly enhance perceived credibility, while social influence and perceived environmental responsibility increase green perceived value. In turn, perceived credibility reduces perceived risk and directly promotes trust. Trust is also strengthened by environmental responsibility, green perceived value, and platform innovativeness, but weakened by perceived risk. The findings highlight the importance of credible sustainability communication, robust security, and social endorsement in building trust for green FinTech services.

Keywords: *Consumer trust, Fintech, Sustainability, Sustainable development*

JEL Classification: O33, L26, M15

SECTION

“INTERNAL SECURITY AND LOGISTICS”

TRANSFORMING LAND TRANSPORT: REGIONAL TECHNOLOGICAL CONVERGENCE AND ECONOMIC, POLICY, AND SECURITY EFFECTS

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Abstract. The study aims to assess the economic impact on other industries resulting from the adoption of more advanced and environmentally friendly land transport technologies in Latvia, focusing on land transport (H49). The analysis applies input-output modelling to simulate technology substitution effects, using a demand-driven approach while holding other technologies constant. The Latvian economy is disaggregated into 64 activities at the NACE Rev.2 2-digit level. Three comparative-static scenarios are developed and modelled industry-level effects and regional effects on regions in Latvia. The study highlights how regional technological convergence in the Baltic Sea region can foster economic synergies, support integrated transport and energy policy development, and enhance internal security. Modeling intensive technological convergence scenario, the service sectors are more sensitive to technological shifts in land transport, with several experiencing negative effects, particularly in manufacturing-related services and vehicle production, due to structural adjustments and reduced demand linked to environmental transitions. The results show that Latvia's regions, Riga, Vidzeme, Kurzeme, Zemgale, and Latgale, are affected differently. Regions with stronger production capacities benefit more, while those relying on supplies from other regions or imported results in negative effects, highlighting the need for regionally sensitive policy planning. The findings are relevant for industries considering diversification or market reorientation, for policymakers integrating intersectoral linkages and security considerations into strategic planning, and for scientific communities exploring regional innovation and policy alignment.

Keywords: *Land transport, Industrial development, Business demography, Technology convergence, Input-Output, Security, Environmental policy*

JEL Classification: C54, C67, F52, O18, O20

BORDER SECURITY LEVEL ASSESSMENT SOLUTIONS

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Abstract. The border has always been an important concept in society. It is used both in geographical and other senses, taking into account the processes taking place in the country and society. Nowadays, there is a tendency for borders to retreat or even disappear due to processes such as globalization and integration, tolerating liberal views in various areas of life. However, at the same time, we attach increasing importance to the concept of security, which often becomes a guarantee of quality of life.

To a large extent, security can be ensured precisely thanks to borders and their effective management. When studying issues related to border security, we have to face various challenges. It is not easy to define this concept, taking into account its complex nature. In the context of border security, we face diverse risks and threats. A large number of stakeholders are involved in border security and border management, there is not always a clear division of competence, and the role and influence of society and business are insufficiently assessed.

In order to ensure high-quality and effective border security, it is necessary to find solutions for assessing the current situation, impact, and changes. The study reveals the basic elements of evaluation solutions, measurable results and indicators, potential evaluation criteria, studies existing national and international instruments for assessing border security, and outlines the role and significance of the evaluation system for strengthening border security.

Keywords: *Border security, Border management, Key Performances Indicators*

JEL Classification: H11

METHODOLOGICAL SOLUTIONS FOR COMMON SECURITY RISK MANAGEMENT AT THE EXTERNAL BORDER

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Abstract. Modern geopolitical and economic conditions, including increasing globalization, the mobility of people and goods, as well as the emergence of new security threats, require a capable and coordinated response from states in managing their external borders. States are faced with increasingly diverse and complex threats – illegal migration, terrorist and organized crime activities, trafficking in people and drugs, illicit arms circulation, environmental and public health threats, cyberattacks on critical infrastructure, as well as supply chain disruptions due to climate change or pandemics.

These threats are often interconnected and exploit vulnerabilities in the same system, making traditional, separate approaches to border management insufficient. Several state institutions are involved in border security management, including border guards, customs services, immigration services, veterinary and phytosanitary supervision, as well as other institutions whose areas of responsibility overlap at border control points. The different subordinations (Ministry of Interior, Finance, Agriculture, Health, Transport, and Foreign Affairs) and objectives create difficulties in coordinating actions; therefore, it is important to develop a unified management approach.

Although international organizations have developed several border management models based on cooperation and information exchange and have established clear principles for the coordination of border management institutions, joint risk management, and the harmonization of procedures and IT systems, it has not yet been possible to ensure that the services involved in ensuring border security use a unified and comprehensive approach to border security risk management. This is also clearly demonstrated by the fact that this study found that out of the 27 EU Member States, only a few Member States have a comprehensive and integrated approach to risk management at external borders. Most countries still use sectoral systems with varying degrees of cooperation.

The study provides recommendations for the common improvement of border security risk management at the tactical (one-year) level, based on an analysis of scientific literature and practical work experience of the services, surveys, and empirical considerations.

Keywords: *Joint risk management, Border security, Customs services*

JEL Classification: H11

EFFECTIVE MANAGEMENT OF PRODUCTION RESOURCES IN CATERING COMPANIES

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Abstract. This research examines the effective management of production resources in catering companies, focusing on the interaction between human resources and material-technical resources. The research addresses the increasing role of technology in the catering industry, accelerated by the pandemic and subsequent economic pressures.

The empirical part of the research was conducted through structured interviews with nine managers of open-type catering companies in Riga. The research found that the efficiency of technological innovations strongly depends on correct maintenance and on aligning equipment use with company size and operational needs. Managers highlighted that while new technologies reduce human workload and can increase productivity, they also require significant financial investment and ongoing monitoring.

The research concludes that catering companies should balance the use of human and material resources by implementing resource optimization strategies, extending equipment lifespan, and ensuring effective staff training. Such measures contribute to improved competitiveness and sustainable growth in the catering sector.

Keywords: *Catering companies, Human resources, Management of production resources, Material resources, Production resources, Technology*

JEL Classification: L83, M11, M54, O33

HYDROGEN FUEL-CELL TRUCK ADOPTION IN SMALL STATES INFORMED BY CNG LESSONS

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Abstract. Freight truck fleets in Europe have already completed a notable fuel switch from diesel to compressed natural gas in specific segments, which required new stations and vehicle adaptations. The temperature controlled cold chain is especially informative. High uptime, back to base depot operations, and strict temperature integrity service levels concentrated compressed natural gas uptake in a few geographies and use cases. This experience is used as a near term learning case to inform the next switch to hydrogen fuel cell trucks. EUROSTAT data on lorries by motor energy shows that compressed natural gas (CNG) remains small at the European level and geographically clustered. This pattern supports corridor first rather than nationwide build outs. Building on the adoption framework, the analysis shows that lessons generalize only where operational fit is comparable. Depot centric and repeatable routes align with infrastructure first strategies, while long haul corridors require cross border coordination and service level guarantees. Distance segmented results prioritize hydrogen for N3 long haul above 250 kilometres, with battery electric vehicles suited to short and medium haul. For the cold chain, hydrogen aligns with long haul, payload sensitive flows and rapid refuelling, while battery electric vehicles fit urban and regional refrigerated distribution with depot charging and zero emission transport refrigeration units. A threshold-based sequencing rule reduces public outlays by about 35 percent in modelled scenarios and reaches about 58 percent alternative drivetrain penetration by 2035. A Framework for Multi-Objective Decision-Making layer shows that credible constraints on internal combustion engine availability shift value for money toward hydrogen.

Keywords: *Adoption thresholds, Cold chain logistics, Compressed natural gas (CNG), Corridor strategy, Heavy duty decarbonization, Hydrogen, Hydrogen fuel cell trucks (HFCT), Small and medium sized enterprises (SMEs)*

JEL Classification: O33, Q55

CITY TAX AS A GOVERNANCE INSTRUMENT FOR SUSTAINABLE TOURISM DEVELOPMENT: INSIGHTS FROM RIGA AND EUROPE

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Abstract. City tax (CT) is a governance instrument used in European cities to provide additional funding for infrastructure development, tourism promotion, and urban image enhancement. In Latvia, CT has been introduced only in Riga, where revenues are allocated to tourism marketing, infrastructure projects, and international recognition. Practical implementation reveals challenges related to regulatory clarity, inconsistent application among accommodation providers, and limited transparency in fund allocation.

This study assesses the role of CT as a governance instrument in sustainable tourism by analyzing Riga's experience and comparing it with selected European cities. The methodology includes analysis of legal acts, municipal regulations, publicly available financial data, and comparative case studies.

Results show that CT supports sustainable tourism development and resource management. Effective application requires clearer regulations, standardized guidelines for accommodation providers, and transparent use of funds.

The study clarifies the legal framework and establishes rules for practices that ensure fairness and transparency in CT implementation.

The study is based on publicly available documents and regulations, however operational challenges faced by accommodation providers or local authorities may not be fully captured. Therefore, future research could include stakeholder interviews and quantitative data for a more comprehensive assessment of CT implementation and impact.

Keywords: *City tax, Public governance, Regulatory clarity, Sustainable tourism*

JEL Classification: H71, H76, Q56

TAX POLICY TRANSFORMATION UNDER ENVIRONMENTAL, SOCIAL AND GOVERNANCE PRINCIPLES: ENSURING FISCAL STABILITY IN THE DIGITAL AGE

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Abstract. Since the adoption of the UN 2030 Agenda and the 17 Sustainable Development Goals (SDGs), the global business environment has increasingly emphasized environmental, social, and governance (ESG) criteria. Companies are now required to consider not only economic performance but also their societal impact, level of digitalization, process transparency, and compliance with ethical standards. ESG is becoming the new standard in investment and regulation. At the same time, digital transformation is fundamentally changing the architecture of tax administration, allowing states to simultaneously promote sustainable development principles and improve fiscal efficiency. This paper examines the potential of tax policy as a tool for ESG transformation in European Union countries. Based on an analyzes of academic publications, OECD and EU reports, and legislative initiatives, it analyzes how modern digital solutions in tax administration (such as artificial intelligence and automated reporting) contribute to the integration of the ESG agenda in EU countries. The study aims to identify the key mechanisms through which the synergy between digitalization and tax policy ensures the achievement of sustainable development goals and strengthens fiscal stability in the face of current economic and climate challenges.

Keywords: *Digital transformation, Tax policy, ESG performance, Fiscal stability, Tax administration, Sustainable Development Goals*

JEL Classification: Q56, H26, O33

ASSESSMENT OF HIDDEN FLOWS IN THE SHADOW ECONOMY OF THE CONSTRUCTION INDUSTRY

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Abstract. The construction sector in Latvia is notably vulnerable to shadow economy activities, where undeclared financial flows undermine tax compliance. This study applies a data-driven approach using Stochastic Frontier Analysis (SFA) to estimate hidden turnover and tax shortfalls in three construction subsectors: building construction (F41), civil engineering (F42), and specialized construction activities (F43). Based on official financial and tax data from 2020–2023, two modeling approaches were used: financial flow models linking resource inputs to revenue, and capital accessibility models assessing turnover potential from investment levels. Findings reveal that approximately 25% of companies exhibit signs of undeclared turnover, with an average gap of 35%. Estimated annual VAT shortfalls range from €24.0–25.5 million (financial flow models) to €65.0 million (capital models), while corporate income tax (CIT) gaps range from €5.0–5.8 million, or up to €12.3 million depending on methodology. The study confirms the effectiveness of stochastic frontier-based modeling in quantifying tax gaps and supports policy development for shadow economy mitigation. Conducted by Riga Technical University in collaboration with the Ministry of Finance and the State Revenue Service, the research offers a scalable framework for improving transparency and resilience in economic governance.

Keywords: *Shadow economy, Construction industry, Tax gap, Stochastic frontier analysis, Data-driven approach*

JEL Classification: H26, O17

THE EVOLUTION OF ECONOMIC GROWTH THEORIES AND THE TRANSFORMATION OF GROWTH DETERMINANTS IN THE 21ST CENTURY

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Abstract. The research examines the evolution of economic growth theories and the transformation of their determinants in the 21st century providing historical overview of classical, exogenous, and endogenous growth models, identifying their assumptions, contributions, and limitations. Using a comparative theoretical analysis, it synthesizes the insights of key scholars, the research aims to assess how growth theories have progressed from emphasizing capital accumulation and labour to highlighting knowledge, innovation, and institutions. The results show that traditional approaches largely viewed growth as driven by physical resources and exogenous technological change, while modern theories stress the endogenous role of human capital, research and development, and institutional quality. The study concludes that sustainable economic growth in the 21st century depends on a complex interplay of multiple factors, with particular importance attached to knowledge, innovation, and institutional frameworks valuable for policymaking.

Keywords: *Economic growth models, Globalization, Human capital, Research and development (R&D), Sustainability*

JEL Classification: O40, O41, O43

INTEGRATING SUSTAINABILITY AND INNOVATION IN BUSINESS: FUZZY AHP-TOPSIS-BASED PRIORITIZATION IN LATVIA'S LOGISTICS SECTOR

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Abstract. As climate change accelerates and environmental challenges intensify, businesses are compelled to undertake the complex task of transitioning towards sustainability while embracing digital transformation. This paper examines the evolving role of entrepreneurship, emphasizing its active contribution to shaping a sustainable and digitally connected future. The search primarily aims to identify and prioritize strategic tools that help businesses, particularly in Latvia's transport and storage sector, strike a balance between environmental stewardship and digital progress. This paper aims to highlight the need for a decision support framework that enables companies and policymakers to evaluate these tools based on multiple, often conflicting, criteria under uncertain conditions.

The research of the paper tackles this issue by exploiting a hybrid multi-criteria decision-making framework that combines the Fuzzy Analytic Hierarchy Process with the Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS). Fuzzy AHP is used to determine the relative weights of the evaluation criteria by using linguistic assessments, which are then transformed into fuzzy numbers to address the uncertainty and subjectivity present in expert opinions. The TOPSIS method is subsequently applied to rank a set of strategic tools by assessing their proximity to the ideal solution across all specified criteria. The empirical basis of the study is grounded in expert evaluations provided by a panel comprising academic experts and industry professionals from Latvia's logistics and transport sector.

This research contributes to academic discourse by bridging green and digital business transformations within a formalized, expert-driven MCDM approach. It also provides practical guidance for decision-makers seeking to allocate resources effectively, prioritize investments, and align their strategies with both environmental goals and technological imperatives.

Keywords: *Sustainability, digital transformation, multi-criteria decision-making, fuzzy AHP-TOPSIS*

JEL Classification: R42

A FRAMEWORK FOR IDENTIFYING VULNERABLE TRANSPORT USERS IN MUNICIPALITIES

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Abstract. This paper proposes a practical framework for Latvian municipalities and planning regions to identify transport poverty and mobility vulnerability in line with the European Union’s Social Climate Fund (SCF). Drawing on EU guidance, Sustainable Urban Mobility Planning (SUMP) monitoring practices and the WHO toolkit for walking and cycling, the framework integrates new Latvian municipal-level data on car ownership, bus service provision and pedestrian/cycle infrastructure. Three per-capita indicators: cars per 1 000 residents, daily bus trips per 1 000 residents and pedestrian/cycle road kilometres per 1 000 residents are combined to create a typology of vulnerability. Municipalities with high car ownership, low bus service and low active-mobility supply are identified as “triple-vulnerable,” reflecting forced car dependence and high transport costs. Conversely, municipalities with low car ownership and strong public transport and active-mobility networks demonstrate how coordinated investment can contain car dependence. The study concludes that structural infrastructure and service gaps, rather than individual socio-economic status, are the main drivers of transport vulnerability and provides clear policy recommendations for SCF investments and monitoring.

Keywords: *Active mobility, Latvia, Social Climate Fund (SCF), Sustainable Urban Mobility Plan (SUMP), Transport poverty, Transport vulnerability*

JEL Classification: R41, R42, Q01

SECTION

“LEARNING AND RESEARCH IN HIGHER EDUCATION FOR DEMOCRACY AND ENTREPRENEURSHIP”

PHILANTHROPY AS A RESOURCE FOR STRENGTHENING HIGHER EDUCATION: INSIGHTS FROM LATVIAN NGOS

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Abstract. The culture of giving in Latvia is still evolving and largely depends on public trust in NGOs and their ability to demonstrate impact. Meanwhile, higher education is recognised as a key driver of competitiveness, innovation, and social progress. However, insufficient public funding limits both quality and accessibility. These challenges highlight the importance of alternative financing, with philanthropy and a culture of donations providing ways for NGOs and universities to build trust and encourage society to support education as a public good.

To gain a deeper understanding of the challenges and opportunities in this area, a study was conducted that included interviews with NGO representatives and a review of relevant documents. The interviews aimed to determine how organisations perceive the public's willingness to donate, the mechanisms they use to attract funds, and their opinion on the potential role of a culture of giving in supporting higher education and research. The purpose of the document analysis was to determine the outcomes of NGOs' activities in education.

This study employs public benefit theory to view higher education as a public good whose benefits extend beyond the individual to positively impact society, for example, through increased productivity, innovation, and social cohesion. Applying this theory emphasises the importance of donations as an investment in society's overall development and helps us to critically analyse challenges, such as when individuals expect to benefit from education as a public good but are not motivated to support its provision financially.

The results show that the culture of donating to higher education in Latvia remains underdeveloped, with limited public willingness to give due to low trust in NGOs and educational institutions. Fundraising is fragmented, relying mainly on short-term campaigns or international projects rather than long-term strategies. Still, positive signs emerge as younger audiences and graduate initiatives show growing interest, especially when the impact of donations is clearly visible, such as scholarships or new learning resources. These findings suggest that Latvia has the potential to enhance its donation culture by promoting transparency and fostering public trust.

Keywords: *Donation culture, Philanthropy, Non-Governmental Organizations (NGOs)*

JEL Classification: L31, Z19, I22

STEWARDSHIP IN GOVERNANCE EDUCATION

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Abstract. Stewardship, traditionally linked to environmental and corporate governance, offers a valuable blueprint for redefining higher education in the context of democracy and entrepreneurship. This paper explores three research questions: RQ1 – How can stewardship be conceptualized as a learning outcome in higher education? RQ2 – What pedagogical approaches support stewardship for democratic citizenship and entrepreneurial responsibility? RQ3 – What lessons from environmental and corporate stewardship can inform educational practices? The study employs a narrative review of academic and institutional literature, supported by case studies. Findings suggest stewardship emphasizes responsibility, long-term thinking, and ethical obligation—values aligned with democratic engagement and sustainable entrepreneurship. Experiential, service, and social learning emerge as effective strategies for embedding stewardship within curricula.

Stewardship also marks a cultural shift toward personal responsibility for the long-term well-being of society and future generations. It goes beyond managerial functions and is realized through relationship-oriented leadership that prioritizes collective over individual interests. This paper examines how stewardship is enacted through relational, motivational, and contextual forces that shape both individual action and institutional performance. By analyzing psychological processes and structural conditions underlying stewardship behaviors, the study offers insights into sustaining the symbiotic integrity of business and society. Special attention is given to leadership behaviors that cultivate a sense of responsibility while balancing the needs of internal and external stakeholders.

Keywords: *Stewardship, Higher education, Democratic citizenship, Entrepreneurship*

JEL Classification: I23, L26, M14

EPISTEMIC AGENCY OF STUDENTS VS. GEN AI IN HIGHER EDUCATION

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Abstract. The positive influence of Generative AI (GenAI) on educational dynamics is well-documented, with studies showing it can significantly boost learning efficiency, improve outcomes, and adapt to individual student needs. However, this increased efficiency presents a significant challenge related to the erosion of epistemic agency - learner's power to question, justify and responsibly claim knowledge instead of accepting it passively. This issue is distinct from academic dishonesty. Students may offload cognitive tasks to AI, treating it not as a tool but as an epistemic authority responsible for knowledge creation. This fosters a dynamic where learning, which requires effort and rigor, is substituted with the mere efficient completion of tasks, creating an illusion of educational attainment. The qualitative content analysis of a survey which we organised with RTU Master's students (N=235) on their use of GenAI confirmed this trend. The vast majority of respondents (93%) described changes in their learning approach using language that is consistent with diminished epistemic agency characterised by lowered role in creating understanding, even while they perceived their output as a product of learning. These results indicate that a primary threat to education from GenAI may not be intentional cheating, but the unintentional replacement of genuine learning with task submission. In light of these findings, we suggest reconsideration of educator's role which ought to be crucial in designing curricula that leverage the strengths of GenAI while intentionally fostering epistemic agency by students and discouraging mechanical task completion.

Keywords: *Generative AI, Learning, Epistemic agency, Higher education*

JEL Classification: A2

FACTORS THAT IMPACT THE PROFESSIONAL COMPETENCE OF SCHOOL CAREER COUNSELORS

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Abstract. The profession of school career counselor in Latvia is relatively new and remains insufficiently researched. The absence of a unified professional standard has led to a fragmented understanding of the scope and structure of required competencies. Since the quality of career guidance is directly tied to counselors' professional competence, it is essential to investigate the factors that shape its development to ensure high-quality support for students aligned with the demands of the modern labor market and technological change. This study combined a review of scientific literature with qualitative content analysis to identify potential factors influencing professional competence. The initial results were subsequently refined, consolidated, and expanded through a survey of practitioners.

The analysis revealed 14 key factors: education and initial professional preparation; professional experience; personal characteristics and self-efficacy; continuous professional development and willingness to learn; adaptation to technological advancement; support from colleagues and school administration; availability of resources; supervision and mentoring; collaboration with students, parents, and colleagues; professional networks and exchange of good practices; self-reflection and professional identity; time constraints and workload; school administration's understanding of the counselor's role; and insecurity about the necessity of the profession in a changing environment.

These findings provide a basis for developing a scientifically grounded model of competence enhancement and targeted professional development mechanisms. Such measures would strengthen the role of school career counselors within the education system and improve its capacity to adapt to social and technological transformations, thereby ensuring effective support for students' career decision-making.

Keywords: *School career counselor, Professional competence, Impacting factors, Latvia*

JEL Classification: I29

USE OF GENERATIVE ARTIFICIAL INTELLIGENCE TOOLS IN BUSINESS EDUCATION

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Abstract. This paper investigates the current adoption and pedagogical impact of generative Artificial Intelligence (AI) tools within business education curricula. Utilizing a mixed-methods approach that incorporates a literature review and exploratory case studies of institutional practice.

Our findings indicate that the deployment of generative AI in business education is still in its nascent stage, heavily reliant on the pioneering efforts of individual faculty enthusiasts rather than structured departmental or institutional mandates. Current utilization predominantly involves enhancing existing methods: specifically, AI is employed for efficient teaching material preparation, facilitating the assessment of student work, and instructing students on AI application in information gathering and case study analysis. Critically, the study reveals a significant gap in the exploration and implementation of new, transformative, AI-native pedagogical methods.

We conclude that the full potential of generative AI to redefine learning in business remains largely unrealized due to a lack of formalized strategy. Recommendations emphasize the urgent need for institutional support, the development of clear ethical and pedagogical guidelines, and dedicated research to move beyond enhancement toward truly novel AI-driven teaching models.

Keywords: *Artificial Intelligence (AI), Assessment, Business education, Case studies, Generative AI, Institutional support, Pedagogy, Teaching models*

JEL Classification: I29

ADDRESSING THE CHALLENGES OF STEM MATURE-AGED STUDENTS: FACULTY ROLE IN PROMOTING WELL-BEING IN HIGHER EDUCATION

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Abstract. The growing demand for STEM (Science, Technology, Engineering, and Mathematics) graduates, coupled with the evolution of the education system to accommodate mature-aged students, presents unique challenges for higher education institutions and, in particular, for faculty who directly affect the well-being of these students. At the same time, involvement of mature-aged students into education has great potential in addressing the sustainability concept by promoting lifelong learning, fostering social inclusion, and enhancing workforce adaptability. This paper aims to analyse the specific challenges faced by mature-aged students in STEM programmes and examine the critical role that faculty plays in addressing these challenges by promoting well-being. Drawing on existing literature and empirical data, the research examines how faculty in STEM programmes can support mature-aged students by providing tailored support, fostering inclusive learning environments, and promoting well-being initiatives. By integrating student well-being into organisational cultures, this study emphasises the potential for higher education to contribute to Sustainable Development Goal 3: Good Health and Well-being, and Sustainable Development Goal 4: Quality Education. The paper concludes with recommendations for faculty on how to develop and implement support structures that better serve mature-aged students, ensuring their success in STEM programmes and promoting an inclusive, sustainable academic environment.

Keywords: *Faculty, Higher education, Mature-aged students, STEM, Well-being*

JEL Classification: I23, I28, I39

MUTUAL LISTENING, PERSPECTIVE TAKING, AND OPENNESS TO OTHERNESS: PATHWAYS TO DEMOCRACY AND PROSPERITY

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Abstract. This study employed Participatory Action Research (PAR) as part of the Horizon Europe project *AECED: Transforming Education for Democracy through Aesthetic and Embodied Learning, Responsive Pedagogies and Democracy-as-Becoming*. The research was carried out in three secondary schools in Latvia between January and December 2024. Within the project, drama sketching and collage creation were integrated into the teaching of Biology, Literature, Mathematics, IT and Programming, and Languages. These aesthetic and embodied practices reshaped the classroom atmosphere, fostering a more engaging learning environment and strengthening both students' and teachers' capacity for mutual listening and perspective taking – understood as the ability to grasp one another's standpoint accurately and fairly.

Data collection included students' and teachers' written reflections, interviews, and post-trial discussions with teachers. Qualitative content analysis and thematic analysis revealed participants' growing openness to new aspects of themselves and to previously unrecognized qualities in others.

These findings highlight three interrelated dimensions – mutual listening, perspective taking, and openness – that are central to democracy. They cultivate the ability to recognize and value others in a more just and favorable light, laying the groundwork for cooperation, respect, and shared growth. By nurturing these qualities in educational settings, schools contribute not only to democratic development but also to the broader social prosperity that emerges when harmony and peaceful collaboration are made possible through mutual acceptance and respect.

Keywords: *Mutual listening, Perspective taking, Openness to otherness, Democracy, Latvia*

JEL Classification: I21, I29

TRANSFORMING COLLABORATION IN EUROPEAN HIGHER EDUCATION: THE ROLE OF OPENNESS IN UNIVERSITY ALLIANCES

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Abstract. The European Universities initiative reflects the ambition to create a more cohesive European Higher Education Area, one that not only strengthens institutional competitiveness but also fosters the dissemination of shared values and identity. Beyond structural cooperation, alliances are expected to cultivate a culture of openness that bridges education, research, and innovation. Central to this process is the dual role of universities as both producers of scientific knowledge and active contributors to societal and economic transformation. The promotion of open science and open innovation within alliances offers opportunities to reconfigure relationships between academia, industry, and society, but also exposes tensions related to governance, intellectual property, and institutional autonomy. This paper examines how alliances interpret the notion of openness in practice and explores the strategies they employ to align transnational cooperation with local and European objectives. Methodologically, the study combines a literature review with qualitative content analysis, aiming to provide a nuanced understanding of how openness is negotiated as both a strategic priority and a practical challenge.

Keywords: *Higher education, Openness, University alliances, Collaboration*

JEL Classification: I23

THE IMPACT OF UPPER SECONDARY EDUCATION ON HUMAN CAPITAL DEVELOPMENT: A PERSPECTIVE ON COMMUNICATION AND LEADERSHIP COMPETENCIES

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Abstract. The quality of human capital is a key factor for sustainable development and individual competitiveness in the labor market. Among its essential components are communication and leadership skills, the foundations of which are formed during upper secondary education. Yet these competencies are often developed only fragmentarily, without a coherent strategy. This raises the question of the actual contribution of schools to human capital development.

The theoretical framework builds on the human capital approach, which views education as an investment in skills and knowledge that enhance productivity and growth. Communication theories emphasize the role of information exchange and collaboration in learning, while leadership research highlights that competencies are strengthened through practice, cooperation, and reflection. This positions upper secondary education not only as knowledge transfer but also as an environment where human capital is shaped.

The study used a mixed-methods design. A survey of university graduates assessed how they perceived the role of upper secondary school in shaping communication and leadership competencies. In parallel, a focus group with teachers explored pedagogical practices and challenges in fostering these skills.

The results show that participation in student companies, project-based learning, and extracurricular activities supports collaboration, problem-solving, and motivational skills. Teachers stressed the importance of granting trust and responsibility, recognizing mistakes as part of learning, and using inspirational role models.

The study contributes theoretically and practically by clarifying the role of upper secondary education in human capital development and offering recommendations for strengthening leadership potential in future generations.

Keywords: *Communication, Education, Human capital, Knowledge transfer, Leadership*

JEL Classification: I25, J24, O15

DIMENSIONS OF STUDENT WELL-BEING IN HIGHER EDUCATION IN STEM FIELDS: ANALYSIS OF SEMI-STRUCTURED INTERVIEWS

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Abstract. In the context of higher education, student well-being is multifaceted, encompassing academic, financial, physical, relational, and psychological dimensions. The aim of this study is to explore how mature-aged students (over 30 years old) establish and maintain well-being during their studies, with particular attention given to diversity factors such as life situations and the burdens of work and family responsibilities. The analysis is based on six semi-structured interviews with STEM program students, using a thematic coding approach. This study examines the multidimensionality of the well-being of mature-aged students. The data from the semi-structured interviews focuses on challenges, coping strategies, and the role of the university in supporting students, with the goal of developing recommendations for enhancing education policy. The structuring of the data into five dimensions of well-being allows for the identification of significant problems and potential solutions. The analysis is based on a qualitative approach, identifying challenges and solutions. In the academic dimension, challenges related to transitioning between different study areas, structural changes, and age differences were identified. The quality of academic experience by was influenced by the professional competence and availability of academic staff; the ability to balance study, work, and personal time; and the flexibility provided by the university, promoting an inclusive study process. In the financial well-being dimension, social inequality regarding the distribution of income and expenses was emphasized; the impact of full-time studies on employment; family financial support; and the availability of scholarships. In the physical well-being dimension, the influence of the university, self-organized physical activities, and the impact of remote learning on the well-being of students were highlighted. In the relational well-being dimension, age differences, the support of academic staff, and collaboration with fellow students were prominent. In the psychological well-being dimension, stress management strategies that rely on both internal resources and social support were predominant, revealing systemic barriers to access mental health support. The study concludes that the well-being of mature-aged students is influenced by the ability of the university to provide an inclusive environment and accessible support mechanisms. The study contributes to the discussion on the needs of mature-aged students in higher education STEM programs in the context of diversity.

Keywords: *Student well-being, Higher education, STEM, Mature-aged students, Qualitative analysis*

JEL Classification: I23, I28, I39

EDUCATIONAL SIMULATION AS A METHOD OF INCREASING PROFESSIONAL COMPETENCE IN HIGHER EDUCATION

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Abstract. While theoretical training is traditionally the most important characteristic of higher education, successful professional practice also requires students to develop advanced practical skills. However, financial, organizational, and safety constraints often limit students' opportunities to practice these skills in real-world settings. This research project LIEPPROTECT examined the potential of virtual simulations as an effective supplement to traditional teaching methods in higher and vocational education. Based on a literature review and case study methods, the study highlights the advantages of simulation technologies as interactive learning tools. Educational simulations not only reproduce professional scenarios with reduced costs and risks but also provide objective assessment and even professional certification. Moreover, the simulations are generated based on open data from existing buildings, which enhances realism and relevance by reflecting real-world architectures, systems, and constraints. From the pedagogical point of view, they enable a shift from teacher-centered to student-centered learning, providing students with the opportunity to practice, make mistakes, correct them, and draw meaningful conclusions. The study examined various types of simulations, their didactic functions, and their role in enhancing motivation and developing competencies. An illustrative example of a simulation scenario for firefighters responding to lithium battery fires demonstrates the practical value of such tools for developing technical skills, strategic thinking, and rapid response capabilities in high-risk environments. The study's findings demonstrate that simulation technologies significantly enhance training quality and provide an optimal solution for integrating theory and practice.

Keywords: *Competence development, Higher education, Interactive learning, Open data, Professional skills, Simulation-based learning, Student-centered learning, Virtual simulators*

JEL Classification: I23, I29, A22, O33, J24

SECTION

“SOCIAL AND ORGANISATIONAL SECURITY, AND SUSTAINABILITY IN ACTION”

FROM ALARM TO ACTION: PREPAREDNESS FOR THE X HOUR

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Abstract. Considering the current geopolitical developments and the impact of climate change, it is increasingly evident that societal preparedness for potential crisis situations is of strategic importance. The concept of the “X hour” refers not only to possible military threats, but also to various types of natural disasters, power outages, floods, and other emergencies. The level of public preparedness is difficult to quantify mathematically; however, it becomes most apparent during actual crises. This was also demonstrated during the Covid-19 pandemic, when the activation of volunteer movements played a significant role. At present, the involvement of non-governmental organizations in civil protection and emergency response is recognized as one of the essential mechanisms that can complement and support the capacities of state and municipal institutions. Public education in this context is a critical prerequisite, as an informed and prepared society not only enhances overall resilience but also alleviates the institutional burden during emergency situations.

Keywords: *Civil protection, Preparedness, X hour, Education*

JEL Classification: J28

ASSESSMENT OF THE EFFICIENCY OF THE SPRAYER OF AUTOMATIC FIRE-EXTINGUISHING SPRINKLER SYSTEMS

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Abstract. With the increasing pace of urbanization and the development of industrial infrastructure, the demand for safe and efficient fire protection technologies is significantly growing. In the context of modern construction, fire protection systems play an increasingly important role, as they ensure the protection of human lives and significantly reduce potential material losses in the event of a fire. Autonomous fire extinguishing systems are capable of quickly identifying and responding to ignition incidents even in the absence of people, thereby effectively limiting the spread of fire and reducing associated risks and damages. The study analyzes the importance of automatic water fire sprinkler systems in ensuring building fire safety, with special attention paid to the operational reliability of these systems. Within the work, international experience regarding the effectiveness of sprinkler systems and their spray nozzles has been evaluated, and an experimental study was conducted analyzing variations in sprinkler nozzle activation times depending on their year of manufacture. Based on the obtained experimental results, recommendations were developed to improve the operational efficiency of sprinkler systems, with particular emphasis on the importance of regular technical inspections and maintenance to ensure continuous and safe system operation.

Keywords: *Fire, Fire sprinkler system, Firefighting, Operating time, Operational efficiency*

JEL Classification: K32, L74

BUTTER THROUGH GUNS? MOBILIZING INNOVATION FOR DEFENCE IN THE EURO-ATLANTIC AREA

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Abstract. With rising geopolitical tensions and rapid technological change, NATO states pledged 5% of GDP for defence by 2035, spurring major growth in defence innovation investment. This paper investigates the discursive strategies used to justify such investments by applying qualitative content analysis (QCA) to 100 text fragments from government documents, academic publications, intergovernmental reports, and contributions by civil society. The study identifies five dominant meta-categories of investment rationales: Strategic Technological Advantage, Economic and Industrial Policy, Security and Sovereignty, International Relations, and Environmental and Social Responsibility. While technological and economic arguments dominate, security-based rationales also play a substantial role, whereas international relations and societal responsibility arguments remain marginal. The findings reveal clear alliance-specific differences: EU discourse prioritises economic and industrial policy alongside technological advantage, while NATO emphasises security and sovereignty in tandem with technological considerations. A temporal analysis further shows that justifications intensified sharply after the 2022 Russian invasion of Ukraine, particularly in technological, economic, and security dimensions. Framed within an interpretivist paradigm, the results demonstrate that defence innovation is constructed not only as a reaction to immediate threats but as a proactive instrument for resilience, competitiveness, and institutional legitimacy. This paper contributes to innovation and security studies by offering a comparative framework for analysing justification narratives across document types and alliance affiliations, while also highlighting avenues for further research on their normative and institutional dimensions.

Keywords: *Open innovation, Defence innovation, Dual-use technologies, Innovation ecosystems, Public investment, Strategic technological advantage, Innovation policy, Security and sovereignty*

JEL Classification: H56, O31, O38, F52

THE IMPACT OF LEGISLATIVE CHANGES ON THE MANAGEMENT IN INCIDENTS INVOLVING HAZARDOUS SUBSTANCES

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Abstract. Nowadays, not only technologies but also their methodologies and regulatory frameworks are developing very rapidly. This study analyses the impact of legislative changes in the Republic of Latvia on the management of rescue operations, with particular attention to the amendments of the Cabinet of Ministers Instruction No. 4 of 10 June 2025, titled “Instruction on the actions of responsible institutions upon finding an unknown-origin substance or object when there is suspicion of the presence of explosive, radioactive, or hazardous chemical substances or biological agents, as well as when signs of a terrorist act are detected.” Empirical methods were used in the study, including analysis of legislative acts and literature sources, as well as a survey method. Integrating the study results into the training process of the State Fire and Rescue Service personnel will enable more effective and safer organization of rescue operations at incidents involving hazardous substances, thereby contributing to increased public safety and reduced risks of potential environmental pollution. The main conclusion highlights the need to incorporate legislative changes into training content as quickly as possible and to ensure their interpretation so that rescue operation managers are prepared for practical changes in the organization of rescue work. The authors have developed recommendations whose implementation in the training process will enhance the efficiency of rescue operation management in incidents involving hazardous substances.

Keywords: *Civil protection, Cooperation with special services, Hazardous substances, Rescue operations.*

JEL Classification: Q01

MARKET SURVEILLANCE AS A COMPONENT OF SOCIETAL SAFETY

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Abstract. The concept of societal safety was first articulated in scientific literature in 2007 and has since become a key framework for maintaining crucial societal functions and ensuring the continuity of governance and public welfare. This research explores the relationship between societal safety and market surveillance as a regulatory and supervisory mechanism. Market surveillance plays an essential role in ensuring compliance with regulations, promoting safety and compliance, and preventing risks within different industries. The study aims to identify the main elements of societal safety and to examine whether market surveillance can be considered a component of this broader framework. Furthermore, it investigates which elements of the market surveillance process correspond to the main pillars of societal safety. The research applies qualitative content analysis and literature review methods to analyse conceptual and regulatory sources. The findings contribute to understanding how public supervision processes can strengthen societal safety and provide insights for developing a methodological framework for effective and sustainable market surveillance.

Keywords: *Market surveillance, Safety, Societal safety, Supervision*

JEL Classification: H83, H11

INTEGRATED MODELS OF STAKEHOLDER INTERESTS FOR GLOBAL SUSTAINABILITY IN THE CONTEMPORARY TOURISM SECTOR

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Abstract. This research investigates stakeholder-driven models for achieving global sustainability in contemporary tourism services. Grounded in stakeholder theory and sustainable tourism frameworks, it examines how the interests of diverse actors (local communities, industry, government, and tourists) can be aligned to meet environmental, social, and economic objectives. Objectives include synthesizing theoretical and empirical evidence on stakeholder engagement and articulating principles for effective collaborative governance. The study employs a systematic literature review as its methodology, integrating interdisciplinary findings to construct a comprehensive understanding of best practices and gaps. Outcomes include a consolidated framework of stakeholder-driven strategies, identification of common success factors and barriers, and policy-relevant recommendations. Contributions include a conceptual model linking stakeholder collaboration to sustainability outcomes and practical guidelines for implementation. This research advances knowledge by clarifying how stakeholder-driven governance models can promote long-term sustainability in global tourism services and by offering evidence-based recommendations for industry and policymakers.

Keywords: *Circular economy, Stakeholder engagement, Stakeholder theory, Sustainable development goals (SDGs), Sustainable tourism, Tourism services*

JEL Classification: L83, Q56

HOW TECHNICAL PARAMETERS AND MANAGERIAL CHOICES INFLUENCE THE EFFICIENT USE OF OPERATIONAL RESOURCES IN FIREFIGHTING VEHICLES

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Abstract. Public safety organisations must ensure operational readiness while managing limited resources responsibly. Firefighting vehicles are among the most resource-intensive assets, combining high acquisition and maintenance costs with direct influence on service performance. This study examines how technical parameters, such as fuel efficiency, water pump capacity, and maintenance requirements, interact with managerial choices in budgeting, fleet planning, and sustainability strategies. The findings show that when technical assessments are systematically integrated into management processes, organisations achieve more efficient resource use, greater cost stability, and improved continuity of emergency services. The research highlights the value of bridging engineering analysis with managerial decision-making to strengthen organisational resilience and ensure sustainable public safety operations.

Keywords: *Organisational security, Firefighting vehicles, Resource efficiency, Managerial decision-making, Sustainability*

JEL Classification: H12

PRACTICE-DRIVEN ADOPTION OF MANUFACTURING SIMULATIONS

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Abstract. The aim of this research is to analyse whether five established manufacturing practices are associated with the adoption and use of simulation technologies for product design and for production processes, and to explain why these technologies matter for manufacturers in terms of safer decision-making, more reliable delivery and quality, and shorter development cycles.

Using data from the 2022 European Manufacturing Survey for Latvia, Lithuania, Slovakia, and Spain, the links between the use of five manufacturing practices and the adoption of two simulation technologies were tested with logistic regression, controlling for company size, industry technological intensity, and country effects.

Use of simulation technologies for production processes was more frequent in companies where flow-control routines (pull production) were applied. Adoption of product-design simulation technologies was positively associated with setup-time reduction methods, visual management, and pull production. These associations remained robust after controlling for company size, industry technological intensity and country.

A practice-centred explanation of simulation adoption in manufacturing is advanced. For practitioners, the results indicate which organisational routines are more strongly linked to the actual use of simulation technologies, guiding capability-building and reducing the risk of pilot-only projects. For scholars, the study contributes to research on technology adoption by showing that established operations-management routines beyond resources or general digital readiness are associated with the uptake of simulation technologies across countries accounting for company size, industry intensity and national context.

Keywords: *Manufacturing practices; Simulation for product design; Simulation for production processes; Technology adoption*

JEL Classification: M11

USE OF UNMANNED AUTONOMOUS SYSTEMS (UAS) BY CRIMINAL APPLICATION: PATTERNS, RISK DYNAMICS, AND COUNTERMEASURES FOR PUBLIC SAFETY AND PROTECTION

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Abstract. The fast proliferation of Unmanned Autonomous Systems (UAS) presents both transformative capabilities for legitimate applications and growing risks when exploited by criminals. This paper synthesizes current evidence on patterns of criminal use, dynamics of risk, and practical countermeasures to safeguard public safety. We identify common adversarial modalities—surveillance and reconnaissance, illicit deliveries, weaponization, swarming and coordinated attacks, evasion of law enforcement, and misuse in terrorism and non-state actor activities. Through a framework that integrates capability, opportunity, and intent, we map how criminal UAS behavior evolves in response to technological advancements, regulatory environments, and enforcement practices. Risk dynamics are analyzed across three temporal lenses: near-term, where incidents reveal vulnerabilities in critical infrastructure and crowd management; mid-term, where economic and logistic considerations shape adoption and adaptation; and long-term, where emergent technologies (AI-guided autonomy, sensor fusion, and swarming) redefine threat horizons. Purpose of this paper is evaluation of current public safety and protection measures—regulatory controls, detection and deterrence technologies, response protocols, civil-medical collaboration, and resilience planning—highlighting gaps, trade-offs, and implementation challenges. Case studies illustrate practical scenarios from transportation ecosystems, mass gathering events, and border security. We propose a multi-layered countermeasure architecture that combines prevention (policy alignment, targeted licensing, and geofencing), detection (multi-sensor surveillance and anomaly detection), interdiction (lawful interception and rapid response), and resilience (redundant communications, emergency planning, and public awareness). Used methodology is literature review: conduct a comprehensive review of existing research, reports, and publications related to UAS technology and criminal applications. Identifying trends, gaps, and advancements in UAS technology relevant to criminal use through academic papers and industry reports. Finally, the paper outlines research priorities, standardization needs, and policy recommendations to balance innovation with public safety, emphasizing ethical considerations, equity, and privacy. The synthesis aims to inform researchers, policymakers, law enforcement, and industry stakeholders seeking robust, scalable, and adaptable strategies to mitigate criminal use of UAS while enabling beneficial applications.

Keywords: *Unmanned Systems, Autonomous technology, Social development, Public safety and security, Unlegal use of UAS*

JEL Classification: O3

ASSESSMENT OF EXPLOSIVE ATMOSPHERE RISKS AND SAFETY SOLUTIONS

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Abstract. In Latvia, the risk of gas explosions is 0.5 cases per 100,000 inhabitants, which is significantly higher than in other countries worldwide, where the risk is 0.03 cases per 100,000 inhabitants (as an example in Great Britain). Studies show that there is a general lack of understanding in Latvia regarding the risks posed by explosive atmospheres. This is associated with significant inaccuracies and contradictions in regulations, as evidenced by the discrepancies observed in facilities where explosive atmospheres are present.

A work environment is considered explosive if there is or may arise a mixture of flammable, easily flammable, or extremely flammable substances and products in the form of gases, vapors, mists, or dusts with air, in which, under normal atmospheric conditions, combustion can spread throughout the entire volume of the mixture after ignition.

In this study, a systematic literature review, qualitative content analysis, and the United Kingdom's IGM/G/7 - Risk Assessment Techniques guidelines for gas infrastructure were used to determine the risks posed by explosive atmospheres. Based on these, risk mitigation methods and a set of preventive measures were developed to reduce the risks of explosive atmospheres and mitigate the consequences of explosions.

By amending legislative acts, for example, replacing the term "Explosive rooms" with "Explosive atmospheres," introducing standardized methods for determining the effectiveness of ventilation and zoning of explosive atmospheres at the level of industry standards and Latvian National regulations, and mandating the transition from deep well valve systems and conical valves to ball valves in building gas systems, it is possible to reduce the risk of explosive environments and the consequences of explosions by at least 30%.

Keywords: *Explosiveness, Safety, Hazards, Environmental risk assessment, Safety, Risk reduction*

JEL Classification: K32

THEORETICAL FRAMEWORK OF QUALITY ASSESSMENT CRITERIA FOR OUTSOURCED ACCOUNTING

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Abstract. This study develops a theoretical framework for assessing the quality of outsourced accounting services, emphasizing the growing importance of performance evaluation in competitive business environment. The assessment of outsourced service quality has become particularly important following the introduction of licensing in Latvia in order to receive the highest quality services in this regulated sector.

The aim of this study is to determine whether it is possible to assess the quality of outsourced accounting service providers by using existing quality evaluation methods. The research focuses on different quality measurement methods currently used, like SERVPERF, GAP, SERVQUAL and other common methods, to evaluate quality of different services, systemizing different criteria- such as accuracy, timeliness, compliance, cost- effectiveness, based on existing literature and quality management standards.

The main conclusion is that currently, there is no existing methodology to externally evaluate the quality of outsourced accounting service providers before the service is received. Further research will focus on developing a survey for industry experts, service providers, and service recipients to identify the key criteria for assessing the quality of outsourced accounting services and to design a tool for objectively measuring these criteria. Criteria will exclude parameters that can only be obtained from within the company and eliminating subjective criteria.

The methods used in the study are the Systematic Literature Review, Theoretical Analysis and Comparative Analysis.

Keywords: *Accounting, Bookkeeping, Outsourced accounting, Performance evaluation, Quality, Quality methodology*

JEL Classification: M40, M41

EVALUATING RISK REGISTERS ACCORDING TO MATURITY MODELS

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Abstract. The risk register is one of the risk management documents that is used at all stages of the risk management process, in risk identification, risk analysis, risk management planning and risk management. The compliance of the risk register with the organization's risk management maturity level is one of the conditions for the effectiveness of risk management. The study used 75 publicly available risk registers on the internet. The search was conducted in July 2025. The study analyzed risk registers using qualitative research methods and assessed the relevance of risk registers to maturity models. Using multiple maturity models can provide higher confidence in conclusions. In addition, the author selected several artificial intelligence tools, conducted queries on risk registers and maturity models, and compared the responses generated by artificial intelligence with the results of qualitative research.

Keywords: *Risk Management, Risk, Risk register, Maturity, Maturity models, Qualitative research*

JEL Classification: A10, B40, H10

VIEWS EXPRESSED IN STUDIES ON THE IMPACT AND ASSESSMENT OF ELECTROMAGNETIC FIELDS IN THE WORKING ENVIRONMENT

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Abstract. Modern technologies and digitalization contribute to the increasing prevalence of electromagnetic fields (EMFs). Whether static or time-varying, each of them has physical properties that cause specific interactions with biological organisms: plants, animals, and humans. EMFs exposure is a complex multidisciplinary topic that considers interactions with biological systems, involving physics, biology, medicine, and metrology. (Staebler, 2017). Some argue that the impact of EMF on humans is becoming an ever-increasing problem due to the constant expansion of technology use (Jiang et al., 2019; Gurusiddesh et al., 2018; Gong et al., 2018; Biao et al., 2018), which is why protection has become increasingly relevant in recent decades (Blachowicz et al., 2023). High-intensity electromagnetic fields can have various effects not only on living organisms, but can also affect the operation of other electronic devices, for example, causing fluctuations in the operation of other equipment. (Duc & Bilik 2023; Li et al., 2018). Scientific studies have different perspectives on occupational exposure limits for EMFs. (Ramirez-Vazquez et al., 2024). EMF safety measures in the work environment are a complex process, as the risk reduction measures may vary depending on the frequencies emitted by the source, and EMF sources can generate different frequencies.

The aim of this study is to systematically evaluate the perspectives expressed in studies on the effects of EMFs, safety measures, assessment methods, and safety guidelines using the PRISMA approach. The selection criteria included studies on the effects of EMFs, exposure limits, and safety guidelines for protection against EMFs; unscientific studies and non-peer-reviewed publications were excluded.

Keywords: *Biological effects, Electromagnetic fields (EMFs), Exposure limits, Occupational health*

JEL Classification: J28, I18

SECTION

**“TERRITORIAL AND REGIONAL DEVELOPMENT,
REAL ESTATE MANAGEMENT”**

PUBLIC-PRIVATE PARTNERSHIPS IN DEVELOPMENT OF INDUSTRIAL PARKS IN LATVIA

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Abstract. The development of industrial parks has become a critical element in fostering regional competitiveness and attracting investment in Latvia. However, challenges such as insufficient infrastructure, weak logistics connectivity, limited innovation capacity, and low investor confidence hinder their growth. This study examines the integration of Public-Private Partnerships (PPP) as a strategic model for enhancing industrial parks' development. The research analyses industrial parks in Latvia, identifying structural shortcomings and assessing the potential of PPP to provide long – term solutions through shared financing, infrastructure modernization, and innovation -driven clusters. The integrated model – combining industrial parks, logistics clusters and PPP financing – offers a comprehensive framework for sustainable regional growth. Methodologically the study applied monographic analysis, document analysis, and synthesis using data from 2016-2024. The results show that applying the PPP model can reduce financial burdens, strengthen cooperation between public institutions and private investors, and accelerate the development of industrial zones. The paper concludes with proposals for strengthening PPP regulations, fostering cooperation between business cluster and educational institutions and establishing a national monitoring system for industrial parks.

Keywords: *Logistics clusters, Industrial parks, Public-Private Partnerships (PPP), Regional development*

JEL Classification: A100

THE ROLE OF CIVIC ENGAGEMENT IN PROMOTING URBAN SUSTAINABILITY: BIBLIOMETRIC ANALYSIS

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Abstract. Civic engagement is one of the most important aspects for ensuring sustainable development in urban environments. The research focuses on exploring the role of civic engagement in fostering a sustainable urban environment by doing a bibliometric analysis and answering the following questions:

1. Which countries' authors are leading in publications on the topic?
2. Who are the most cited authors?
3. What are the publication trends over time?
4. How has the research on the role of civic engagement in different sustainable urban environment dimensions evolved?
5. Which SDG 11 targets and urban sustainability dimensions are most frequently linked with civic engagement?

The study's limitation is the use of two databases – Scopus and Web of Science – and its focus on publications in English from 2005 to 2024. The literature review followed the PRISMA 2020 statement. 66 full-text publications were analysed.

The results revealed a strong link between civic engagement and several Sustainable Development Goals, identifying the most frequently associated dimensions of urban sustainability: social, economic, cultural, and environmental. Governance, technology, education, and civic engagement are essential preconditions for achieving sustainable development goals. It is essential to involve all segments of society in civic engagement activities; however, youth participation holds particular importance.

Keywords: *Civic engagement, Sustainable development, Sustainability dimensions, Urban environment*

JEL Classification: R11, R58, Q01, Q58, H70

CRITICAL TRADE-OFFS IN SUSTAINABLE INFRASTRUCTURE PLANNING AND MANAGEMENT

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Abstract. Sustainability is a healthy balance between environmental, social, and economic aspects (Elkington, 2004), sometimes complemented by technical aspects (Petersen et al., 2025). This balance is even more important in urban ecosystems (del Cerro Santamaria, 2022). Public infrastructure, such as transport, energy, water management, waste management and other infrastructure has a considerably higher effect on the society's sustainability than smaller businesses or organisations, as they exhibit a multiplier effect (Malley, Philippopoulos, 2023; Kovalov, 2024).

Research on sustainable infrastructure criteria (Kustova et al., 2025) identifies 18 consolidated sustainable infrastructure criteria infrastructure companies may use to increase their positive effects in medium- to long-term. However, these criteria sometimes demonstrate conflicting nature against short-term considerations (such as operational efficiency and/or limited costs) and, in some cases, even contradict among themselves. For example, transitioning to renewable energy resources may be positive for climate but increase costs of infrastructure use and thus specific services may become less accessible, in particular, for economically vulnerable social groups. Another effect – increased use of renewables may also undermine the reliability and resilience of energy network services, making it more vulnerable to energy outage risks. Thus, in applying sustainable infrastructure criteria, infrastructure managers must consider trade-offs between them and allocate weights to their decision-making protocols.

Some of these trade-offs become crucial in the light of current political and military turbulences around the world which put safety, security, and resilience towards external disruptions at the top of the agenda for critical infrastructure managers. Considering that, safety, security, and resilience is not one of the possible sustainable infrastructure criteria anymore but a fundamental prerequisite for infrastructure planning and management decisions.

An example is railway infrastructure, which is interconnected with other countries, thus improving connectivity but also being more exposed to potential external threats. In addition, the railway managers' commitment to digitise infrastructure maintenance and operations and use more smart technologies may expose the companies towards cybersecurity risks which, consequently, may undermine the infrastructure safety. These trade-offs and risk appetite need to be considered when taking infrastructure development decisions in railway sector.

Keywords: *Railway infrastructure, Resilience, Safety and security, Sustainable development, Sustainable infrastructure*

JEL Classification: O18, O21, Q01, Q58

EVALUATING CIRCULAR ECONOMY PRINCIPLES FOR SUSTAINABLE BUILDING PERFORMANCE: A SYSTEMATIC LITERATURE REVIEW OF THE SRI LANKAN CONSTRUCTION INDUSTRY

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Abstract. The 18th century Industrial Revolution initiated a shift from manual labour to mechanized production, accompanied by economic transformations driven by a linear economic paradigm, characterized by resource extraction, product creation, and eventual disposal as waste or emissions. Construction industry utilises approximately 40% of global raw materials, produces 40% of waste, and contributes to around 39% of CO₂ emissions, ranking it among the least sustainable sectors globally. In Sri Lanka, the construction sector plays a pivotal role, encompassing outputs from housing to large-scale infrastructure such as roads and industrial facilities. Consistent with global trends, Sri Lanka's construction sector is significantly resource-intensive, and impending large-scale projects are anticipated to escalate the demand for raw materials. Hence, the study aims to assess the application of circular economy strategies in enhancing sustainable building performance within the Sri Lankan construction industry. The study employed a qualitative approach through a systematic literature review to achieve its main aim. As revealed through the systematic literature review, the absence of appropriate material selection criteria in Sri Lanka's construction industry contributes significantly to material waste, highlighting material and waste minimization as the main benefit of circular economy adoption, followed by energy efficiency and extended building life cycles. It is recommended that Sri Lanka's construction sector adhere to sustainability regulations, such as those from the Urban Development Authority and Green Building Council, supported by a 10R framework integrating circular economy strategies to reduce material waste and improve sustainability of construction industry.

Keywords: *Circular economy, Construction industry, Linear economy, Sustainability*

JEL Classification: L74

THE OPEN BALKAN INITIATIVE AS A NEXUS FOR REGIONAL COOPERATION AND INTEGRATION: NORTH MACEDONIA'S STRATEGIC ROLE

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Abstract. The Open Balkan initiative represents a significant step toward enhanced regional cooperation and economic integration among Western Balkan countries. Also known as "Mini-Schengen," the initiative was launched by North Macedonia, Albania, and Serbia to promote the free movement of people, goods, services, and capital. This objective is supported by several key agreements, including the Memorandum of Understanding and Cooperation on free access to the labor market, the Agreement on the Conditions for Free Access to the Labor Market, and its Implementation Protocol. The initiative aligns with the broader aim of meeting European Union (EU) standards and policies, while also accelerating the EU accession process.

As a founding member, North Macedonia positions itself as a proactive regional actor, viewing Open Balkan as both an opportunity for deeper economic cooperation and a mechanism for improving governance, institutional infrastructure, and labor mobility. It supports regional stability, reduces trade barriers, lowers roaming service costs, and encourages institutional alignment with the neighboring countries and EU.

Despite its potential, the initiative faces notable challenges, particularly limited participation from other Western Balkan countries. Nevertheless, for North Macedonia, Open Balkan remains a strategic platform for advancing national development goals and strengthening its position within the European integration process.

This research uses a qualitative, desktop-based methodology, analyzing policy documents, regional agreements, and academic literature related to the Open Balkan initiative. Special attention is given to North Macedonia's strategic positioning through a comparative assessment of its political and economic engagement within the initiative.

Keywords: *"Open Balkan", Regional integration, Regional cooperation, Reduction*

JEL Classification: K2

BARRIERS AND CHALLENGES TO BUILDING INFORMATION MODELLING (BIM) IMPLEMENTATION IN CONSTRUCTION PROJECTS: A QUALITATIVE REVIEW OF GLOBAL LESSONS LEARNED

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Abstract. This study examines the barriers and challenges associated with implementing Building Information Modelling (BIM) in construction projects using a qualitative systematic literature review and interpretive synthesis. Employing a critical-realist ontological stance and an interpretivist epistemological orientation, the research analyzes the interplay of technical, organizational, financial, legal, and cultural factors that constrain BIM diffusion. Data was sourced from peer-reviewed journals and international conference proceedings published in the past decade and analyzed through inductive thematic coding. The synthesis reveals six primary dimensions of barriers: financial and economic constraints, technical interoperability and data-quality issues, managerial and process misalignment, organizational resistance and skill shortages, legal and contractual uncertainty, and insufficient governmental and institutional support. The findings indicate that resistance to change, fragmented data governance, and the lack of standardized frameworks are persistent impediments. A conceptual roadmap is proposed for incremental BIM adoption, emphasizing knowledge development, governance standardization, and collaborative procurement models. These results offer actionable guidance for policymakers and project stakeholders aiming to advance BIM maturity and integration within the construction industry, especially in environments characterized by low digital readiness.

Keywords: *Barriers, Building Information Modelling (BIM), Construction management, Governance, Interoperability, Knowledge development, Qualitative analysis, Standardization, Sustainability*

JEL Classification: L74, O33, M11, Q01

STEADY-STATE MODELLING COMPARISON WITH DYNAMIC MODELS IN URBAN ENVIRONMENT MODELLING

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Abstract. Comparing steady-state models and dynamic models for the urban environment development is decision basis for evaluating city development plans to indicate long-term trends versus short-term fluctuations or evolving conditions. Studies for urban development modelling are focused on particular aspects of the development phase or a subsystem being analysed and are limited in scope with the risk to miss identify critical decision aspects. Analysis studies theoretical models and provides an assessment of the cases of specific cities and employed modelling approach assessment as a particular representation with the defined modelling goal.

Research focus is on modelling approach assessment for urban development analysis, comparing Steady-state versus Dynamic models.

Research methods used: Literature overview, modelling, case analysis.

Steady-State modelling are viable for the baseline analysis or feasibility studies. Steady-state models are efficient for analysis with data sets are sufficient data samples and with predictable trends, Steady-state models fit when analysed system rarely changes or changes very slowly.

Dynamic models are better for modelling human behaviour, policy changes and impact, or technological adoption. Dynamic models are critical for event assessment and response planning where time is critical (samples: Incident or disaster response planning, private and public transit shift). Dynamic models assume internal feedback loop, what can be indicated in model boundary conditions for model mapping and aggregations, and cases of need for high-preciseness forecasting or real-time optimization modelling.

Keywords: *Case analysis, Dynamic model, Life Cycle Efficiency (LCA), Modelling methodology assessment, Predictive urban analytics, Steady-State model, Urban development modelling*

JEL Classification: R58, C63, O21, R11, C61