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Contents

Contents

1.

Sizing HPC Opportunities in Montenegro: Market insights, best practices and use cases

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Luka Filipović, PhD, Assistant professor
Milica Vukotić, PhD Full Professor
Sandra Tinaj, PhD, Assistant professor
Tomo Popović, PhD, Associate professor

Sizing HPC opportunities in Montenegro: Market insights, best practices and use cases

Sanja Nikolić[1], Luka Filipović[2], Milica Vukotić[3], Sandra Tinaj[4], Tomo Popović[5]

[1]University of Donja Gorica
sanja.nikolic@udg.edu.me

[2]University of Donja Gorica
luka.filipovic@udg.edu.me

[3]University of Donja Gorica
milica.vukotic@udg.edu.me

[4]University of Donja Gorica
sandra.tinaj@udg.edu.me

[5]University of Donja Gorica
tomo.popovic@udg.edu.me

ABSTRACT:

Given the computational power of processing extensive data volumes, performing complex and critical simulations, and powering advanced AI models, High-Performance Computing (HPC) systems rapidly gained prominence as an essential technology for facing numerical societal, scientific, and industrial challenges. Supercomputing increasingly affects industries and businesses by enabling the innovative product design, optimization of workflow and workloads and data-driven decision-making. HPC infrastructure, Cloud services and AI applications play pivotal roles in accelerating digital transformation across industries and enhancing SME business development and competitiveness.
Based on market insights, the primary challenges in the Montenegrin HPC ecosystem include a shortage of HPC expertise, insufficient critical HPC performance, data security and IPR concerns. Conversely, significant opportunities are identified in innovative product development, positive business expectations, and the high adoption of cloud solutions. The HPC National Competence Centre Montenegro, established with the support of the EuroCC project, has introduced HPC/HPDA/AI-related academic programs and developed professional training courses to enhance HPC knowledge and skills on the national market. Best practices to improve industry interaction and tailored service portfolio to support supercomputing access and business adoption, have also been established. Consequently, with the support of national expertise and international supercomputers, successful industry use cases have been developed in areas such as smart agriculture, precise weather forecasting, and the FinTech industry.

Keywords: HPC, AI, Cloud, National Competence Centre, Industry Interaction

1. INTRODUCTION

Technology plays a crucial role in driving digital disruption by reshaping industries and reinventing business models (developing new products and services), enhancing efficiency and productivity (optimizing production cycles and business processes), enhancing customer experience (personalized, seamless and omni-chanell experience), facilitating collaboration and connectivity (reaching and resonating with a wider and diverse audience) and supporting open innovation and sustainable development. Technology is an enabler and catalyst of economic growth and a sustainable future (Robertsone & Lapina, 2023).

Companies that embrace cutting-edge technologies, boost digital transformation, and employ innovative business models, strategically position themselves to safeguard competitive edge and focus on smart growth in a rapidly- and ever-changing market and industry environment. Advanced digital infrastructure, whose components are HPC, Big Data, IoT, and AI/ML/DL are becoming an indispensable element of the innovative ecosystem and socio-economic progress.

In the digital era, characterized by surge in data generation, conventional computing methods are becoming progressively insufficient. High-performance computing (HPC) addresses these challenges by offering powerful infrastructure for real-time analysis of extensive data inputs,

extraction of valuable insights, and production of actionable outcomes. Government institutions, universities, and large corporations were the first candidates in line for HPC transformations. On the other hand, the digital transformation of SMEs is a key factor driving demand for HPC Cloud-based services. HPC computational performance empowers businesses with faster data analytics, advanced research intelligence, sophisticated risk analysis, improved product development and personalized customer engagement. These capabilities enable businesses to make data-driven decisions, optimize workloads and workflows, innovate faster, and outperform their competition. By leveraging on HPC computational power, engineers are adopting advanced computational methods to drive technology advancements and innovations across diverse industries. (Min Lee & Jeong Seok, 2020).

HPC plays a pivotal role in enhancing the business and competitiveness of SMEs across various industry sectors. To increase HPC uptake among industry representatives, some key challenges need to be addressed: awareness of HPC business opportunities and benefits, access to HPC infrastructure, availability of technical expertise, and anxiety around data security and protection. Acceleration of HPC industry adoption is possible with quality interaction and join efforts of academia and business, through research centres, competence centres, technology providers, business associations and proactive companies, including the institutional support or funding initiatives, to optimize high-end investments in the robust supercomputing infrastructure.

2. HPC TECHNOLOGIES AND APPLICATION

2.1. HPC technical aspects and convergence trends

The basic characteristics of HPC systems or supercomputers are the ability of high-volume, high-speed, and high–accuracy data processing to solve complex and critical problems in science, industry, and the public sector. HPC system represents clusters of computers or networks of processors, which use ultra-high bandwidth, low-latency networks and parallel programming to perform advanced simulations, modelling and data analytics. Tasks that would normally take months or weeks on desktop computers can be completed in hours or minutes on supercomputers. HPC systems are performing quadrillions (10^{15}) of calculations per second and it is already going towards exascale performance (10^{18}) (AMD, 2019).

Parallel programming is a technique within software development to be applied in the HPC operating environment for executing complex tasks by ''division of work'' and exchange of results across multicore processors, which simultaneously perform computations of large datasets. The possibilities of applying parallel processing depend on the scalability of the software, the volume of input data, and the complexity of the problem. HPC systems to support it require very fast memories, big storage capacities, low-latency and high-bandwidth network communication systems (> 100GB/s) (Medium, 2020).

Computer simulations are parallel programs designed for research in cases where physical experiments are unacceptably expensive, dangerous, or impossible. Computer simulations represent the process of mathematical modelling of natural or social phenomena, structures, and processes to predict their behaviour and outcomes. Leveraging parallel programming techniques within the HPC environment enables the execution of large-scale and complex simulations. With computer modelling and simulations, complex systems can be presented in a research-adequate and cost-effective manner, their behaviours can be examined, patterns, outcomes, and relations can be recognized and predicted, such as molecular/atomic interactions, aerodynamic flight simulation, car crash testing or construction operations.

The basic characteristics of Big Data technologies are the extreme amount of data (Volume), a wide range of different types of data (Variety) and the speed at which the data must be processed and analyzed (Velocity), which is enabled by powerful computing capabilities and advanced software solutions to extract valuable insights. (Elgendy & Elragal, 2014). The value of Big Data does not lie in the collection and interpretation of massive amounts of data (e.g. from websites, social media, mobile applications, scientific experiments, IoT sensors and devices), but from activities and decisions that are taken after analysis that transforms unstructured data into actionable patterns, relations, and results. Technical and commercial requirements that affect the exponential development of Big Data and advanced configurations of HPC systems for their storage and analytics,

led to the convergent technology known as High-Performance Data Analytics (HPDA) (Intel, 2021).

Artificial Intelligence (AI) refers to the simulation of human intelligence and cognitive functions processed by computer systems, including learning, reasoning, self-correction, problem solving and decision-making (Russell, 2016) . AI collects analyses and processes huge amounts of data from sensors, transactions and experiments, extracts valuable insights, and makes decisions and predictions, imitating human intelligence. AI applications can be found in many areas such as digital assistants (Siri, Alexa, Chatbots...), search engines and suggestion algorithms (Google, Amazon, Spotify, Netflix...), autonomous vehicles, vessels, drones, aircrafts (Nadikattu, 2016).

Machine Learning (ML) and Deep Learning (DL) are integral components of AI. They provide the tools and techniques necessary for AI systems to learn, adapt, and perform intelligent tasks. Machine Learning is a method for training AI systems to learn from data and experience with minimal human intervention. Deep Learning, a subset of Machine Learning, utilizes neural networks to mimic the learning processes of the human brain, significantly reducing the need for human intervention and achieving remarkable success in areas such as computer vision, natural language processing, and speech recognition. (Goodfellow, Bengio, & Courville, 2016).

Cloud Computing provides virtual access to computing, network and storage resources, available from a remote infrastructure provider. Cloud Computing provides significant cost reduction; the transition from CAPEX to OPEX cost structure (savings on location, infrastructure, equipment, maintenance, and IT staff); flexibility of providing services on-demand and pay-per-use; greater scalability, agility, and mobility of business; as well as global collaboration (Chen, 2023). Cloud HPC is the delivery of HPC services via Internet resources, instead of purchasing and using expensive and robust HPC infrastructure. For many companies, especially SMEs "Cloud-first" solution is an optimal choice, because it enables technically feasible and financially affordable access to HPC infrastructure resources. Companies can pay for Cloud-based HPC resources only when and how much they use it, without the costly and time-consuming investment in building, operationalizing and maintaining own HPC infrastructure.

2.2. HPC powering national polices, academic excellence, and industry digitalization

Given the possibility of processing large amounts of data, performing complex and critical simulations, and powering advanced AI models, HPC systems rapidly gained prominence as an essential technology for facing numerical societal, scientific, and industrial challenges.

HPC is an essential tool for policymakers to address major societal challenges, from demographic changes and economic well-being, over smart city planning, sustainable agriculture, and clean energy, to crisis prevention and effective management. Supercomputers were our allies in the fight against the COVID-19 virus, demonstrating how HPC combined with Big Data and AI can provide critical support in accelerating the vaccine's discovery, predicting virus spread, planning limited medical resources, and anticipating the effectiveness of containment measures. (EuropeanComission, 2020).

The exponential increase in economic losses associated with cybercrime creates a need to develop secure applications and infrastructure that can predict and quickly respond to growing threats. Supercomputers are particularly important and necessary for national security, defense, protection of critical infrastructure, as well as technological autonomy. HPC facilitates intelligent and innovative models for reducing time to identify, respond and resolve a potential and emerging cyber-threats and cyber-attacks (Ching Li, Sukhija, Bautista, & Gaudiot, 2022).

Academic institutions use HPC for simulations and modelling in volume and time scales that were recently almost impossible, accelerating theoretical knowledge, methodological research and scientific breakthroughs. Nobel Prize in Physics, won for the successful detection of gravitational waves in 2017, based on research to which 32 million processing hours of the MareNostrum supercomputer at the HPC Centre in Barcelona were dedicated (Barcelona Supercomputing Center, 2017).

HPC has become an indispensable tool across diverse scientific disciplines: precise healthcare and molecular biology (genome sequencing, protein-folding simulations, drug testing, and personalized medicine); materials

science (discovering and developing next-generation materials); fundamental physics and space exploration (simulations of astrophysical phenomena).

Advanced technologies like HPC, AI, ML, and IoT can provide actionable and timely insights for precise agriculture and livestock management. Precision agriculture improves agricultural productivity and farming techniques by optimizing decisions regarding irrigation, fertilization and pest management, by using data from sensors, drones, satellites and weather stations to make intelligent decisions and monitor soil health and crop performance. Efficient livestock management driven by HPC-powered AI applications can analyze large datasets related to animal health, growth, and behavior, assist in optimizing feed and nutrition, predict and control disease outbreaks leading to the production of high-quality food and sustainable farming management. (Victor, et al., 2024) (Sandhya Devi, Suvarna Kumar, Mani, Anitha, & Dhanalaxmi, 2023).
With more extreme weather phenomena expected due to global warming, HPC will play an important role in weather forecasting, atmospheric modelling and proactive responding. Researchers and engineers at the University Texas, Austin, have used the Frontera Supercomputer to develop the Advanced Circulation (ADCIRC) storm surge model based on simulations of tides, ocean flows, and storm surge alongside six-hourly updated forecast data from the National Hurricane Centre and being able, to predict storms days ahead. (HPC_Wire, 2022).

Today, HPC represents a mainstream technology for the digitization of industry. HPC and AI-powered industrial innovation and commercial applications are generating new revenues, savings or jobs.
Digital design and engineering enable faster, cheaper, safer development of new products by conducting advanced computing simulations for designing and testing product features, reducing the need for physical experiments and prototypes, and accelerating the innovation cycle. HPC is powering Computational Fluid Dynamics (CFD) simulations to make aircraft lighter, quieter, and more fuel-efficient.
HPC provides critical support in elevating maintenance and monitoring in manufacturing processes and industrial plants, optimizing logistics, inventory management and supply chain processes. Predictive maintenance offers several key benefits: cost reduction, an extension of the lifespan of machinery, minimized downtime indicating potential equipment failures before they occur, optimized resource allocation based on criticality and urgency, and improved safety and equipment performance (Tatineni, 2020).

HPC supports various use cases in the FinTech industry related to enhanced risk management (stress testing to evaluate financial performance in different market conditions), fraud detection algorithms (for identifying suspicious transactions and loss prevention), investment portfolio optimization (data-driven simulations of investment strategies) high-frequency trading (fast execution of sophisticated trading algorithms when every millisecond counts) and improved regulatory compliance.

HPC empowers Large Language Models (LLMs) and Natural Language Processing (NLP) systems to support domain-specific corporate functions related to financial services, legal contexts or public administration in performing precise tasks like summarizing documents, Q&A reviews, classifying legal contracts, or determining sentiment from business reports.

The explosion of customer data has also revolutionized the retail industry. Every touchpoint in a customer's journey – from devices, platforms, website visits, online purchases, in-store interactions, loyalty programs, or social media activity – generates valuable data. HPC enables the development of advanced AI/ML forecasting models that predict product demand based on customer demographics, transactions and interactions, omni-channel shopping behaviour, or social media trends. HPC enables harnessing the power of big data for anticipating customer needs, providing personalized recommendations, optimizing supply chains, and implementing profitable CRM strategies (Shankar, 2019).

In the rapidly evolving digital landscape, HPC will remain at the forefront of technological innovation, by empowering advancements in science, engineering, and business applications, thereby transforming industries and driving economic growth.

3. DEVELOPING HPC ECOSYSTEM IN MONTENEGRO

3.1. Democratizing access to supercomputers by EU-supported initiatives

HPC is increasingly influencing industries, and businesses by providing infrastructure support to reduce production cycles, optimize workflows, and workloads, increase resource utilization, minimize costs and time, and improve data-informed decision-making. Small and medium-sized enterprises (SME) can use HPC systems to improve their industry competitiveness and innovative potential. However, for SMEs, access to supercomputers can be technically limited (access to infrastructure, lack of internal expertise, software parallelization, code scalability) and financially challenging (high and risky investments). Today, within the framework of EU programs, there are many initiatives to support SME companies and to democratize access to HPC capacities, applications, and services to encourage their innovation, growth and competitiveness.

The European HPC Joint Undertaking (EuroHPC JU) is a funding entity, created 2018 "to lead the way in European supercomputing". It is a joint initiative established between the European Commission, EU Member states, Associated Countries and private partners (ETP4HPC, BDVA QuIC) with dedicated €7 billion in funding, including support from Digital Europe Program, Horizon Europe and Connecting Europe Facility. The main goals of EuroHPCJU are: the development of EU world-leading supercomputing, quantum computing, and data infrastructure; providing access to supercomputing infrastructure to public and private users; and support for the development of HPC skills for European science and industry (EuroHPC, Promoting HPC to boost digital skills, jobs and industrial competitiveness in Europe, 2023).

To date, EuroHPCJU has acquired 8 petascale supercomputers located across Europe: LUMI in Finland (#1 in Europe, #5 globally), LEONARDO in Italy, MARENOSTRUM 5 in Barcelona, MELUXINA in Luxembourg, KAROLINA in the Czech Republic, DISCOVERER in Bulgaria, VEGA in Slovenia, and DEUCALION in Portugal and it is building first exascale computer JUPITER in Germany (EuroHPC, Our supercomputers, 2024). EuroHPCJU is funding EuroCC (2020-2022) and EuroCC2 (2023-2025) projects to create 33 National Competence Centres (NCC) across Europe for HPC and related technologies HPDA and AI, to support research activities and industry innovations for public and private entities (with focus on SME). The National Competence Centre is the reference point of HPC/HPDA/AI competence development, capacity building, and productive collaboration with key national stakeholders. NCC's mission is to analyse, implement, and coordinate all necessary HPC activities and to offer HPC services (access to HPC expertise, resources, services) to end users (academic community, public administration, and industrial sector).

Within the EuroCC (Horizon 2020) and EuroCC2 (Digital Europe Program) projects, EuroCC HPC NCC Montenegro was established in September 2021. NCC team of academic researchers and industry professionals is focusing on HPC/HPDA/AI competence development, capacity building, research excellence, technical expertise, infrastructure access, international collaboration and use-cases support for HPC and AI users from industry and public sectors. Key activities are related to the promotion of HPC benefits, training portfolio, user services, and infrastructure.

3.2. Tapping into HPC market potential

Industrial users face numerous challenges and often have special requirements regarding the use of supercomputer resources, such as critical time and level of sophistication of computer simulations, consideration of cost-effective cloud solutions, reliable access to HPC infrastructure, data confidentiality, and intellectual rights protection, especially when developing and designing new industrial products and capacities. Key challenges in adopting advanced HPC technologies for industry users, especially SMEs, are demanding capital investments and skills development. Companies will be encouraged to invest in HPC driven by digital transformation trends, cost-effective cloud technologies, and competitive business innovations.

Within the scope of the EuroCC project, NCC Montenegro conducted an HPC market survey in the period June-Dec 2021 on an industry-diversified market sample of more than 50 Montenegrin companies, including 81% of private companies, 75% of SMEs, and 36% of IT companies (EUROCC_

Montenegro, HPC market research in Montenegro, 2022). Based on quantitative and contextual analyses main opportunities and challenges were identified concerning HPC awareness, capacities, competencies and cloud- and computationally-intensive performance.

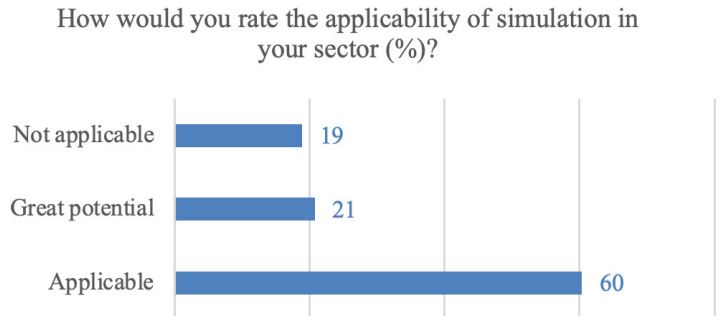

Figure 1. *Applicability of computer simulation*

Regarding opportunities for conducting simulations in their respective sectors, 60% of surveyed companies considered it applicable, and 21% of companies anticipated their great potential, Figure 1. Moreover, 8 out 10 companies are persuaded that there is a possible (66%) and crucial (15%) impact of computer simulations on new product development, Figure 2.

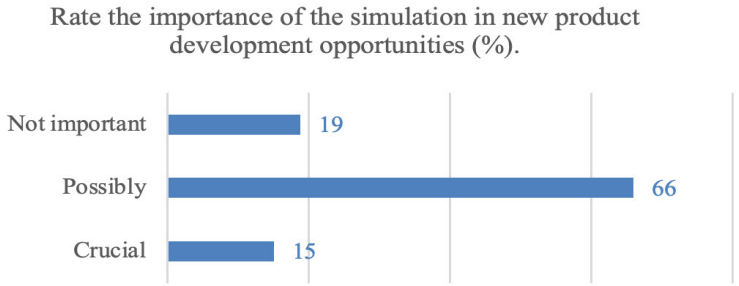

Figure 2. *Importance for new product development*

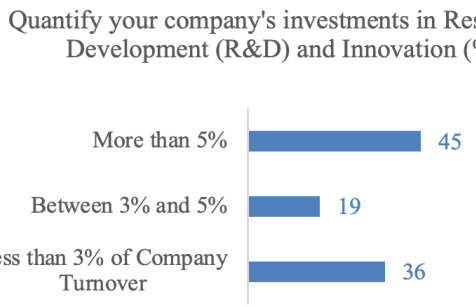

Figure 3. *Investments in R&D&I*

Concerning investments in research, development, and innovations, Figure 3 shows that 64% of companies allocated more than 3% of annual revenues and 45% even more than 5%.

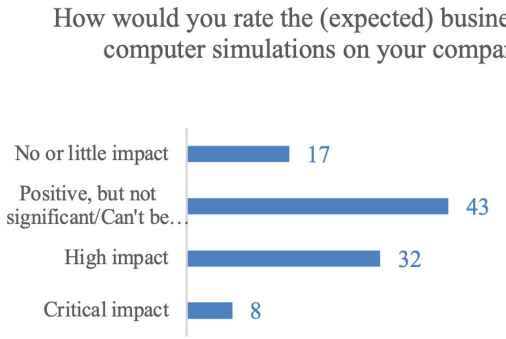

Figure 4. *Expected business impact*

Similarly, 83% of companies believed in the positive business effects of the adoption of simulations, although almost half of them were not sure about its estimation (Figure 4). Positive business impact has been aligned with research results related to the perception of the marketing and financial implications, where only 1/5 of companies thought there would be no marketing effect if their customers were aware of the usage of simulation techniques and tools. The same, low level of expectations (21%) was related to negative ROI.

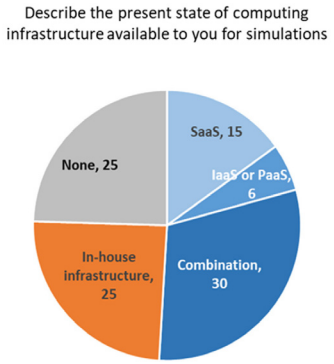

Figure 5. *Overview of computing infrastructure*

Figure 5 shows that 50% of companies used some form of remote access to computing infrastructure managed by a third party, i.e. combined their own and external infrastructure resources including Cloud technology and service models (SaaS, PaaS and IaaS).

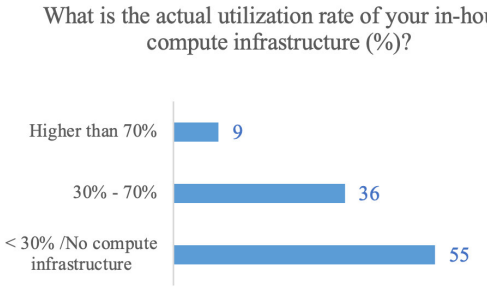

Figure 6. *Utilization of computing infrastructure*

Figure 6 shows that 55% of companies utilized less than 30% of internal computing infrastructure to perform simulations or had no infrastructure. There is potential to upgrade infrastructure capacities with Cloud HPC opportunities to be able to process larger amounts of data or run more compute-intensive simulations. For organizations burdened with legacy infrastructure, cloud-based HPC resources offer a cost-effective and time-efficient solution to access advanced computing options. Market research results also evidence Cloud HPC opportunities related to the attitude of 70% of surveyed companies, considered possible (32%) and very likely (38%) to rent hardware and software solutions instead of buying it.

When it comes to challenges, the first relevant market insights are related to the significant lack of internal (53%) and external (43%) expertise in developing HPC simulations and techniques as it can be seen in Figure 7 and 8.

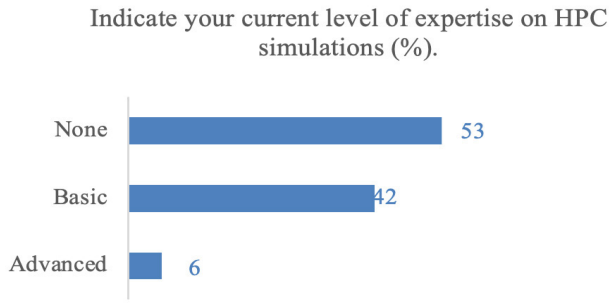

Figure 7. *Internal expertise availability*

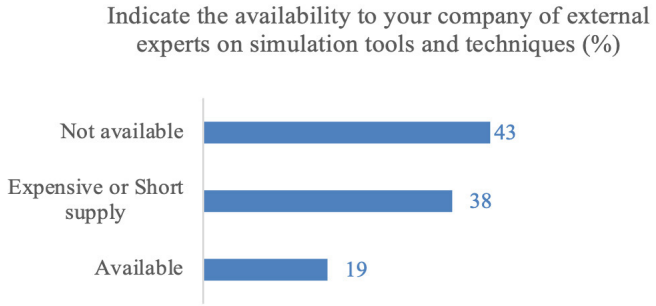

Figure 8. *External expertise availability*

Furthermore, research results show that only 1 out of 10 companies in Montenegro assess that they have advanced knowledge of HPC infrastructure, parallel programming, and simulation tools and techniques.

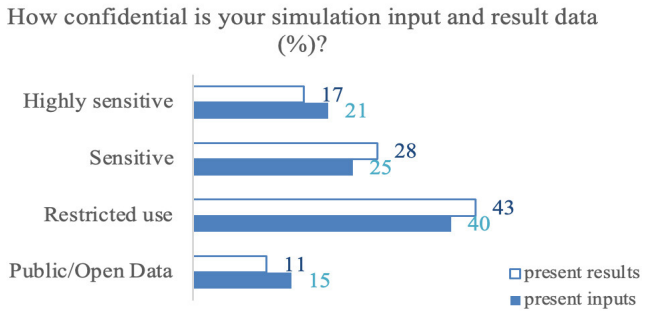

***Figure 9**. Confidentiality of I/O data*

Figure 9 shows that around 40% of companies in Montenegro hadrestrictive treatment of input data and simulation results (protected access and subject of internal management approval), while 17%-21% have had very sensitive I/O data treatment (highest level of confidentiality e.g. design solutions, algorithms, personal data, user data).

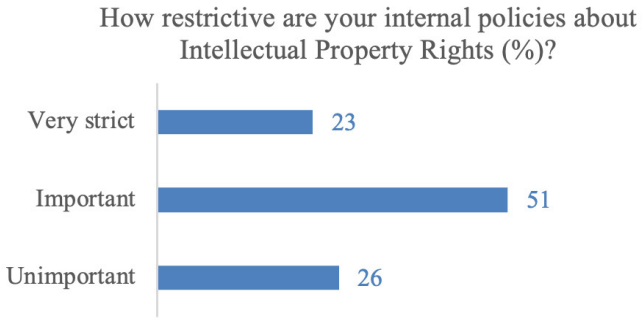

***Figure 10.** Restrictiveness of IPR policies*

Figure 10 demonstrates that companies had strong standpoints regarding internal policies (over 70% considered it important or even very strict) on the protection of intellectual property rights and the classification of rights of data access, usually following industry standards, business jurisdiction or competition concerns.

The biggest challenge for further HPC industry uptake in Montenegro is also low level of HPC simulation usage. HPC infrastructure typically supports computation-intensive simulation problems, utilising parallel processing software and multi-core processors.

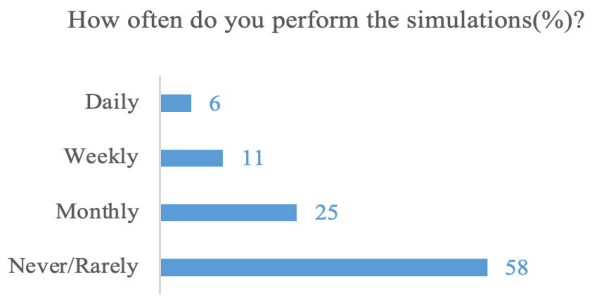

***Figure 11.** Performance of simulations*

Over half (58%) of the surveyed companies rarely or never performed computer simulations, as has been shown in Figure 11. Potential HPC users would have to run simulations on a daily or at least weekly level.

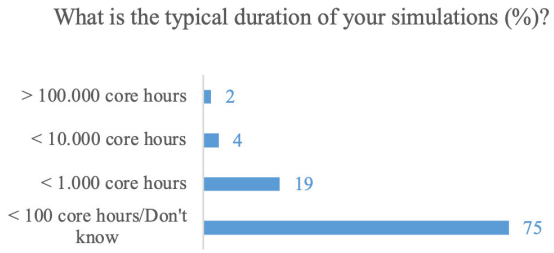

***Figure 12.** Duration of simulations*

Moreover, 75% of companies use less than 100 Core hours or are not familiar with the simulation performance expressed in Core hours as it has been shown in Figure 12. In addition, according to the survey results every second company expected a normal duration of the simulation - up to 8 hours, which is not HPC critical, like applications related to financial markets modelling, where timely results (measured even in milliseconds) determine actionable decisions.

Based on the research results, surveyed companies demonstrated a high level of interest and positive expectations in using HPC and Cloud services, but relatively low level of HPC expertise and performance, as

well as concerns about data security and IPR protection. To stimulate HPC industry adoption, NCC Montenegro further focused on strengthening competencies, capacities, and collaboration within the MNE HPC ecosystem.

3.3. Addressing HPC challenges and accelerating industry adoption

HPC ecosystem development in Montenegro has been mainly driven by EuroCC NCC activities, aligned with the governmental digital agenda and smart specialization strategy, applied academic research and innovative business performance.

The main goals of NCC Montenegro are the development of HPC education, training, and skills, as well as provision of national expertise and international supercomputers to companies across various industry sectors.

Deficiency in internal and external HPC expertise in Montenegro was evident, and therefore it was necessary to develop appropriate programs and courses in academic curricula and within training portfolio in order to generate local and future-proof HPC expertise (HPC, HPDA, AI). To further develop HPC knowledge and skills, NCC Montenegro focused on developing and providing HPC/HPDA/AI study programs and training courses:

- Summer schools focused on HPC and AI to inspire high school students to pursue academic programs in these fields. (i.e. "Open Mind Academy" (EuroCC_Montenegro, 2024))

- BSc, MSc and PhD academic programs and courses at NCC hosted University Donja Gorica (UDG) - Faculty for Information Systems and Technologies (FIST), including the first nationally accredited AI master program.

- Professional training courses for industry participants providing in-demand HPC/AI knowledge, technical upskilling, and supercomputing hands-on sessions.

NCC training portfolio covers technology-specifics (HPC system architecture and applications, Parallel Programming, Python Programming, AI/Machine Learning/Deep Learning, Edge IoT, Computer Vision, Natural Language Processing, and Quantum Computing) as well as industry-specific domains prioritized by Smart Specialization Strategy of Montenegro (energy, health, tourism, agriculture, ICT) (Government of Montenegro, 2019). NCC Montenegro is also fully utilizing conjoint training opportunities with other EuroCC NCCs to capitalize on HPC maturity and expertise of the pan-European NCC network (Germany, Spain, Netherlands, Cyprus, Romania, Slovenia, Turkey etc).

NCC Montenegro is further focusing on industrial uptake and business partnerships to build a viable and self-sustained HPC ecosystem in Montenegro. Cooperation with the industry is based on a domain-targeted, service-customized, and user-centric approach. SME/industry engagement model follows a "funnelling approach" from mass communication outreach, over targeted industry communities to one-to-one meetings with HPC-prospective big industries, SMEs, and innovative companies. NCC service interaction with targeted companies is illustrated in Figure 13.

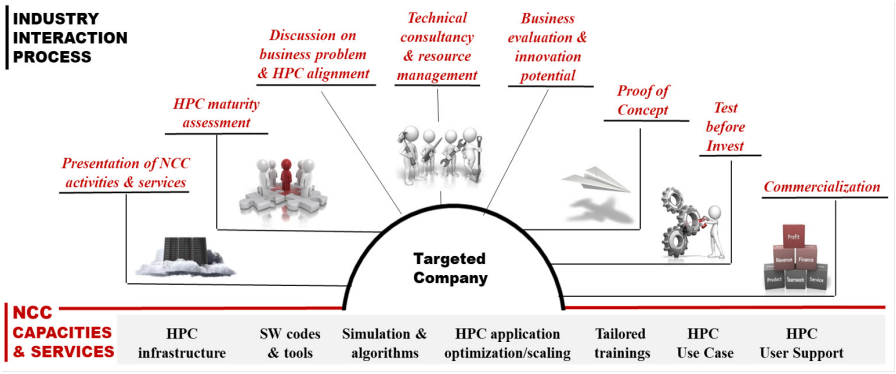

Figure 13. *HPC NCC Montenegro - industry interaction developed process*

NCC Montenegro is driving productive industry connections and strategic partnerships, acting as a one-stop shop for HPC/HPDA/AI activities intended for the private and public sectors. Main activities are related to the service provision including the development of software codes,

simulation algorithms, application experiments, study cases, use cases and proofs-of-concept, as well as project consultancy, business development, and end-user support. NCCs service portfolio is illustrated in Figure 14.

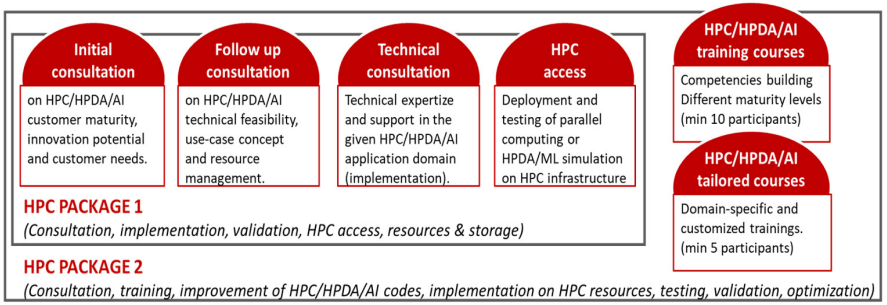

Figure 14. *NCC Montenegro service portfolio*

Montenegrin companies are mainly interested in technical consultations to assess data availability, parallelization possibilities, and scaling to HPC critical performance, as well as in professional training courses to enhance their HPC and AI-related skills. Furthermore, expert support in software solutions development and in providing efficient access to European supercomputers are the most in-demand services of NCC Montenegro by industry representatives.

3.4. HPC-powered use cases in Montenegro

Based on the comprehensive assessment utilizing competence mapping, market surveys, and a more in-depth approach involving business discussions, expert interviews, and technical consultations, NCC is identifying potential candidates to help them integrate innovative supercomputing technologies and applications into their business models. NCC Montenegro effectively deployed national expertise and international supercomputing access in developing prominent industry use cases and success stories.

Companies DunavNET (DunavNET, 2024) and DigitalSmart (DigitalSmart, 2024) collaborated to develop computer vision software modules to be integrated into smart agriculture solutions for chicken farms. This was achieved by using cameras installed at chicken farms and edge AI devices equipped with integrated ML prediction models, powered by HPC infrastructure (FF4EuroHPC, 2024) (Cakic, et al., 2023). AI and ML algorithms were employed in counting chickens, detecting dead ones, and estimating their weight and size, which could indicate the appearance of certain diseases (Cakic, et al., 2023). This technique produced precision agriculture sensors that use cameras, edge computing, and an IoT platform to enable next-generation poultry farms. With NCC Montenegro support, HPC efficiently trained and calibrated prediction models using deep learning. In this case, HPC reduced development time of custom prediction model by over 10-fold and achieved over 90% chicken detection and segmentation accuracy (FF4EuroHPC, 2024). In addition, it could save hundreds of thousands of Euros by reducing manual labour and chicken mortality by 10% (FF4EuroHPC, 2024).

High Resolutions Weather Forecast in Montenegro is a project that recognizes the challenges associated with mesoscale weather forecasting in Montenegrin's complex terrain, characterized by the Adriatic Sea exposure, high mountain systems and diverse climate types (Zečević, Filipović, & Marčev, Verification of temperature, wind and precipitation fields for the high-resolution WRF NMM model over the complex terrain of Montenegro, 2023). The Institute for Hydrometeorology and Seismology (IHMS) of Montenegro (IHMS, 2024), along with NCC Montenegro, tested the Weather Research and Forecasting (WRF) model with Non-Hydrostatic Mesoscale Model (NMM) core, aiming to improve its accuracy and resolution by using a powerful HPC cluster. The model was verified against measured values for temperature, wind, and precipitation data collected over five years at six Montenegrin weather stations (Zečević, Filipović, & Marčev, Verification of temperature, wind and precipitation fields for the high-resolution WRF NMM model over the complex terrain of Montenegro, 2023). Utilizing powerful computational resources will allow for more localized and accurate forecasts, especially in case of severe weather events. It could further improve decision-making in sectors affected by weather conditions (smart agriculture, green energy, safe transportation, and tourism activities planning).

The Faculty of Information Systems and Technologies UDG and the

Montenegrin company Fleka collaborated on the "Personalized Banking Software Solutions" project (EUROCC_Montenegro, Personalized banking software solutions, 2024). Previously, Fleka developed the SKEN mobile application that enables users to monitor personal expenditures through the capturing of fiscal receipts (Fleka, 2024). The new solution manages to categorize each transaction automatically by using vast dataset collected by the SKEN app and publically available information. NCC Montenegro experts developed an ML classification algorithm based on Natural Language Processing (NLP). The algorithm analyses collected data and classifies them into predefined categories (food, drinks, services etc.) based on annotated datasets. (EUROCC_Montenegro, Personalized banking software solutions, 2024).Generated reports provide a detailed overview of expenses by itemized categories, customers, and companies (EUROCC_Montenegro, Personalized banking software solutions, 2024).
Integrating an HPC-powered and optimized machine learning model into banking software enhances the personalization of banking and payment services. Clients, with automated and precise categorisation of transactions, can improved their financial choices, disciplines and planning. Companies, with categorised and analysed client's data can get valuable insights into customer behaviour and spending preferences.

4. CONCLUSION

HPC computational power increases the speed, scale, and scalability of complex and critical simulations, providing valuable data intelligence, faster discovery, and more accurate predictions. HPC applications include, among others, scientific visualizations and simulations, financial services analytics, atmospheric phenomena and energy sourcing modelling, personalized medicine, precise agriculture, predictive maintenance, industrial product design, and computational fluid dynamics.

Several trends are shaping HPC industry uptake: exponential growth in data volumes; new processing possibilities fuelling intelligent and predictive analytics; the convergence of HPC with AI and ML, and the adoption of cloud-based HPC solutions, offering scalability, flexibility, and cost-efficiency to organizations of all sizes.

National Competence Centre of Montenegro in the area of HPC, HPDA, and AI technologies was established with the support of EuroCC and EuroCC2 projects, to facilitate the development of the HPC national ecosystem in Montenegro, promote HPC benefits and skills, and widen the usage of innovative supercomputing technologies and applications among industry, academia and public users. Based on industry-diversified market research in Montenegro, HPC opportunities can be leveraged on innovative product development, positive business effects, and cloud infrastructure solutions, while key challenges are related to insufficient HPC skills and lack of critical HPC performance. To capture opportunities and address challenges in the national HPC ecosystem, NCC successfully developed study programs and training courses to cultivate next-generation HPC/AI experts, and implement a service portfolio aligning on effective industry interaction and SME-customized onboarding models, resulting in HPC-use cases related to precise weather forecast, AgTech and FinTech industry.

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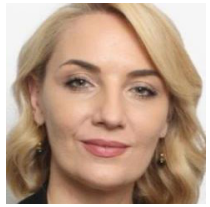


Sanja Nikolić, MSc
EuroCC NCC Montenegro
Faculty for Culture and Tourism
University of Donja Gorica
81000 Podgorica, Montenegro
E-mail:sanja.nikolic@udg.edu.me

Luka Filipović, PhD
EuroCC NCC Montenegro
Faculty for Information Systems and Technology
University of Donja Gorica
81000 Podgorica, Montenegro
E-mail: luka.filipovic@udg.edu.me

Milica Vukotić, PhD, Full professor
EuroCC NCC Montenegro
Faculty of International Economics, Finance and Business
University of Donja Gorica
81000 Podgorica, Montenegro
E-mail: milica.vukotic@udg.edu.me

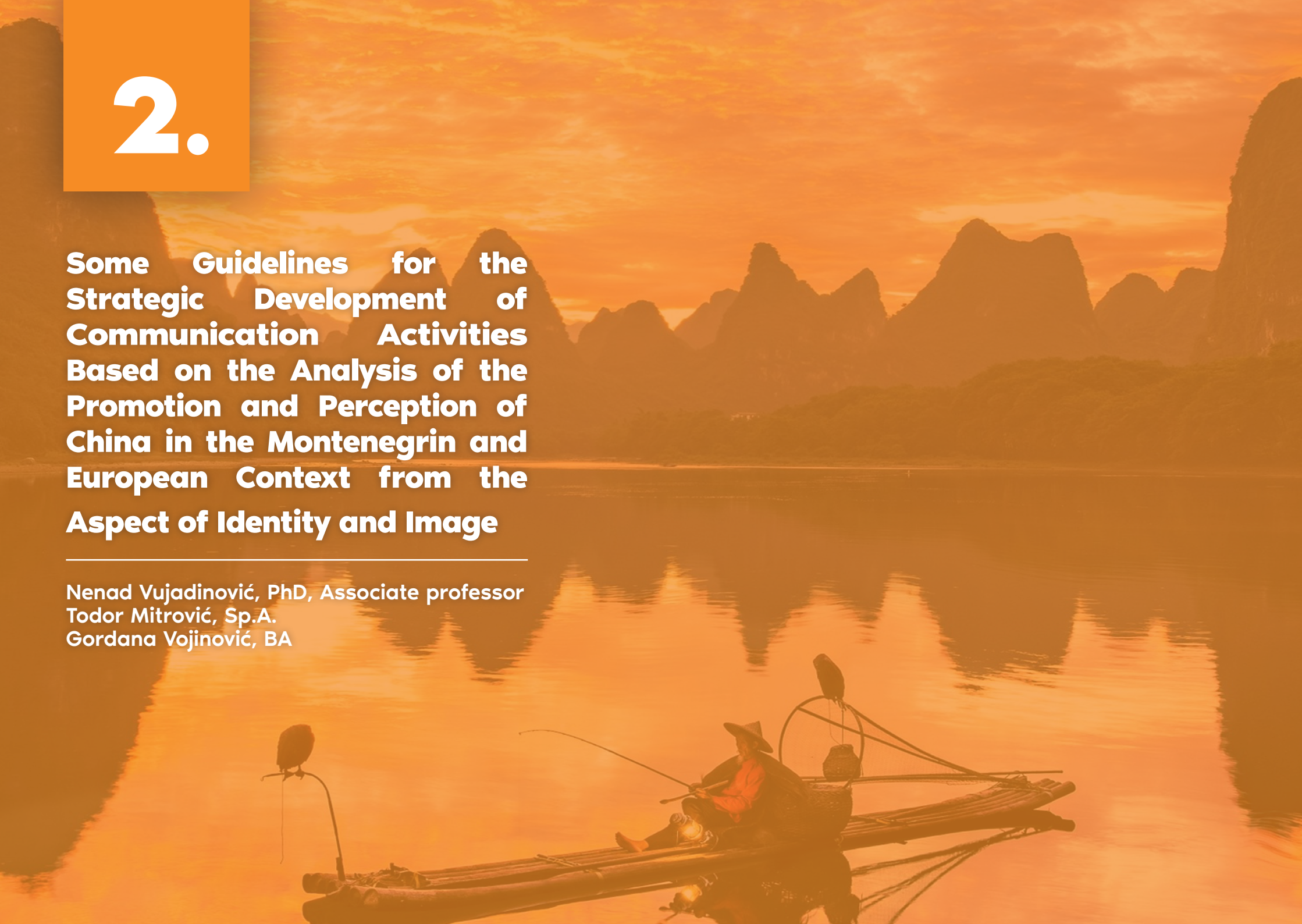
Sandra Tinaj, PhD, Assistant professor
EuroCC NCC Montenegro
Faculty of Culture and Tourism
University of Donja Gorica
81000 Podgorica, Montenegro
E-mail: sandra.tinaj@udg.edu.me

Tomo Popović, PhD, Associate professor
EuroCC NCC Montenegro
Faculty for Information Systems and Technology
University of Donja Gorica
81000 Podgorica, Montenegro
E-mail: tomo.popovic@udg.edu.me

2.

Some Guidelines for the Strategic Development of Communication Activities Based on the Analysis of the Promotion and Perception of China in the Montenegrin and European Context from the Aspect of Identity and Image

Nenad Vujadinović, PhD, Associate professor
Todor Mitrović, Sp.A.
Gordana Vojinović, BA



Some Guidelines for the Strategic Development of Communication Activities Based on the Analysis of the Promotion and Perception of China in the Montenegrin and European Context from the Aspect of Identity and Image

Nenad Vujadinović[1], Todor Mitrović[2], Gordana Vojinović[3]

[1]Ph.D., Professor, Faculty of Arts, University of Donja Gorica,
nenad.vujadinovic@udg.edu.me

[2]Faculty of Arts, University of Donja Gorica,
todor.mitrovic@udg.edu.me

[3]Faculty of Design and Multimedia, University of Donja Gorica,
gordana.vojinovic@udg.edu.me

ABSTRACT:

In recent years, China has established itself as a country that, with its economic investments, especially on the example of countries in transition, contributes to accelerated progress in various fields (technology, green economy, infrastructure etc). However, precisely from the perspective of Europe and its insufficient understanding of the connection of Chinese cultural codes with the modern socio-economic and diplomatic tendencies of this country, there are still adverse perceptions of China's role in global trends and its readiness to establish more comprehensive cooperation on a larger level. This paper, by pointing to the relevant academic literature that deals with the issue of the current perception of China, tries primarily to point out positive examples of its role within problematic areas, and tries to give guidelines for further improvement of the promotion of China in Montenegro, relying on the role University of Donja Gorica already has in that regard.

Keywords: China, Montenegro, perception, promotion, image, identity

1. INTRODUCTION

A segment that from the very beginning clearly stands out in every attempt to analyze the perception of China in Europe, including Montenegro, is that this country has established itself as an economic superpower in the last few decades, whose bilateral cooperation with many European countries, especially in the southeast and central part, is expanding more and more and is even on the threshold of institutionalization.

Chinese investment is increasingly perceived as an opportunity for accelerated economic growth progress that enables development in those areas where it is deeply needed, especially in countries in transition. However, in addition to the positive implications of China's cooperation with the countries of the Region and Europe, there are still adverse perceptions about this country that are particularly reflected in existing stereotypes, and therefore there is more than enough room for their improvement, especially in the domain of greater understanding of Chinese culture and the impact it has on contemporary trends in the socio-economic and diplomatic sense.

First of all, the problem of unaffirmative perception of China is reflected in the way Europeans typically perceive China, but also all countries that are not close enough to them in terms of their cultural code. For a long time, Europeans generally approached their evaluation of China using their own system of values, religion and traditional social patterns, which resulted in them entering into every form of communication with its values with certain prejudices. As one of the main causes of such a relationship, and this is indicated by the consulted academic literature, is the fact that today's Europe increasingly departs from a thorough understanding of its own spiritual roots, that is, it lacks a deeper ethical and philosophical concept on which to base its contemporary development.

On the other hand, China still maintains a more than active relationship with its past, using ancient spiritual-philosophical teachings as the foundation of its modernity. An example of this is the fact that in one of its major economic reforms it used the concepts of Taoism as a basis. Moreover, Chinese domestic and international policy is based on the idea of a ***harmonious society*** or a harmonious world, which rests on the

general concept of harmony, developed in the musical art of the ancient Chinese period, and about which Confucius made theoretical assumptions. The concept of a harmonious society aims at abolishing socio-economic differences and establishing a general social balance; while in the context of international politics, it also expands with Mencius' idea that every war is fundamentally unjust. Bypassing a more concrete understanding of the close connection of these traditional concepts with the development of modern Chinese socio-economic policies, Europeans have for a long time, and to a large extent still do so today (which is partly the case in Montenegro), perceived the efforts of this country to establish adequate communication with the rest of the world, as an act of market competition and establishment of geopolitical power, with hidden pretensions (Kaspars Klavins, 2021).

When it comes to understanding of national cultures in perspective of Montenegro and China, and especially the roots of some of the prejudices towards China, the other important theoretical approach should be that of Geert Hofstede's cultural dimensions first presented in the book *Culture's Consequences* (1980). At the beginning, Hofstede defined four key dimensions that can help us perceive the national culture's identity and compare it with others. Those dimensions have expanded in time and today there are six of them: power distance, individualism, masculinity, uncertainty avoidance, long-term orientation and indulgence. All of these key segments are explained in detail in Hofstede's study and can be seen through a graph with individualized data for all countries including Montenegro and China. Comparing Montenegro in China there are a lot of similarities following Hofstede's theory which can be explained in the way both countries are still oriented to traditional values. The key segments show that despite larger power distance and tendency towards group thinking, these countries also have low rate of aggressiveness and high tendency for long term orientation.[1]

In the countries of Southeast Europe which, like Montenegro, are in the process of European integration, non-governmental organizations have previously questioned the greater impact of foreign Chinese investments in relation to the standards prescribed as permitted by the European Union, especially in relation to infrastructure investments and the implications of debt, to the total GDP, which according to the proposals of the European Union is standardized at 3 percent (Wouter Zweers, et al., 2020). However, in Europe and in Montenegro, China had a very positive influence on the energy sector in the former years, investing in renewable energy resources. Certainly, in this sense, the example of its investments in the energy network of Portugal, which is an active member of the European Union, and where China has supported all the laws of this country related to the field of sustainable energy, is also significant, and suggests that when investing in strengthening of the green economy, China greatly respects the position of the partner country in relation to its member status (Wise and Hall, 2019). It is precisely these segments of China's investment that represent major steps towards solving the issue of its engagement in environmental protection, which is often problematized, especially in Montenegro. On the other hand, China's growing investments in the technology of smaller European Union member states certainly cause the European administration's fears, especially in terms of taking over primacy in the global market (Maria do Céu Pinto Arena, 2022).

The area in which, based on the researched practices, there is room for significant progress when it comes to cooperation between Montenegro and China, is certainly technology. By investing in technological progress, as indicated, China has invested significantly in the European research network by opening development centres in countries such as the United Kingdom and Germany, as one of the leading members of the European Union. In this sense, China was actively involved in the development of 5G infrastructure in many European countries, as well as in the modernization of existing technological resources. Some Chinese companies such as Huawei are indeed commercially present in Montenegro, however, there are no significant indicators of the initiatives of the scientific and technological community in Montenegro for more diverse cooperation with China in terms of improving existing research in the field of technology (Wouter Zweers, et al., 2020).

Essentially, when we talk about the positioning of China in relation to the space of our Region, one gets the impression that its perception by the general public, despite the existence of distrust in the processes in which it is involved, is mostly positive (there are not only opposing or only validating attitudes). To a large extent, China is perceived as a partner whose investments contribute significantly to the economic development

[1] See also: https://geerthofstede.com/country-comparison-graphs/

of the country, however, on the other hand, there is still room for progress, especially when it comes to the aforementioned key categories of investment transparency, open interaction with the values of Chinese cultural traditions, and the establishment of more direct links in the fields of scientific and technological progress and environmental protection. In these areas, the University of Donja Gorica already has significant results when it comes to cooperation with China, but with its capacities it can certainly help to a greater extent in further improvement of China's image as a partner country.

2. LITERATURE OVERVIEW

Um and Crompton (1990) point out that image should be perceived as a holistic construct that arises from attitudes towards certain characteristics, which in case of this paper means that positive perception of a particular country should be built through adequate promotion of its values. As consulted literature suggests, it often happens that people are insufficiently or inadequately informed about the specifics of a destination that they have not previously visited, which is in part reflected in the prejudices they hold against it. A large number of studies in the field of tourism also indicate that intercultural differences significantly influence the behaviour of tourists from different countries (Yuksel et al., 2006). Therefore, an adequate presentation of specifics is key to creating an appropriate image of a country, regardless of whether the image being created is entirely realistic or not. By promoting specificity, the brand of a certain nation stands out, which sets it apart from others. Of course, political, economic and social issues, as well as existing stereotypes, also significantly influence the creation of a country's image and can often be a decisive factor in its perception by other countries.

Another important segment that referenced studies focus on is that positive perception of a country can also greatly influence the improvement of its economy, i.e. encourage positive branding of a wider chain of services. Pappu and Quester (2010) emphasize that individuals' attitudes about specific countries develop on two levels: ***macro*** (associations and beliefs about a specific country) and ***micro*** (associations and beliefs about its products). The strong connection between macro and micro categories, i.e. product categories and the country itself as a brand, also indicates its stronger positioning. Raising awareness of all these categories is the first prerequisite for any successful branding, including the one related to the promotion of the country.

Sources that offer information about certain places, which Gartner (1993) defines as ***image-forming agents,*** greatly influence the formation of perceptions about whether a certain country is attractive or not. At the same time, the given sources are divided according to the classification, among others Beerli and Martin (2004) into: ***primary*** (personal experiences) and ***secondary*** (information obtained before the particular place was visited).

Relevant literature, and above all the studies by O'Shaughnessy and O'Shaughnessy (2000), especially emphasizes ***stereotyping*** as one of the most important sources of national image perception, i.e. the need to classify certain nations and their people into certain categories at the very beginning - often with invalidating perspectives. According to the conclusion of the group of authors who worked on the study *Country image as a nation-branding tool* (2013), the development of an effective national brand should start from stereotypes, opposing all those attitudes that can harm, and supporting positive perspectives. The reshaping of the secondary sources in terms of their positive impact can greatly benefit a perception of a country even before someone gets to know it more deeply.

Wheeler (2009) points out that clearly defined identity helps differentiate a certain brand from the other (including a nation), projecting everything that the brand can further develop on in the future. Through the comparison of several studies on branding in the study *Brand identity development* (2020), the conclusion is reached that ***brand identity***, among other things reflects the unique characteristics that motivate the respective target groups and most importantly it is what forms and defines the image of the brand that is further represented through promotional activities (both through traditional and digital media).

The consulted literature on the topic of relation between brand identity and image, further defines the following key set of questions:

1. At the very beginning, what should be defined is what the current position of a brand is?

2. Than, it should be asked where does the brand want to be?

3. What should be done for the brand to reach that goal?

4. And in the end, what can prevent a brand from reaching its goals?

Although the relationship between image and brand identity is often perceived as opposites, it is important for a brand to strive to establish a balance between these categories, especially in the context of the positioning of a country.

When it comes to the public perspective it is important to note that some authors point out that ***Intercultural communication***, as a form of interaction intended for the exchange of information between different cultures and social groups, has its main prerequisite in ***intercultural sensitivity***, that is, the ability to accept the specificities of different cultures. The development of intercultural sensitivity has its own stages that differ from ***ethnocentrism*** to ***ethnorelationship. Ethnocentrism***, by definition, is based on the use of one's own standards and customs in evaluating all people, often unconsciously. The next stage is ***denial,*** which is reflected in the fact that members of a certain community either know nothing about the cultural codes of members of another culture or know very little - only for example that someone is a "foreigner" or "African". The fact that people at this stage have a very limited knowledge of the cultural codes of the other, drives them to generalize the members of a certain community by placing them in certain categories, and in the worst cases completely dehumanizing them. The ***defense*** phase is the one in which the members of a certain community are at a higher level of knowledge about the cultural specifics of others, but despite this they still want to keep their stable view of the world and are afraid to change it. As a result, they perceive members of other cultures through stereotypical images, often using the terms "developed" or "underdeveloped" culture. People who are in the defense phase have the need to constantly protect their indigenous culture from the influx of "underdeveloped" or "less developed" values of another culture. The next phase is the phase of ***reduction*** when certain groups already understand the differences of the other and even suppress any attempt to challenge different cultural values. However, they still maintain an ethnocentric view of the world by associating all people with general universal values - e.g. Americans may assume that we are all inclined to individual freedoms and openness as fundamental needs; while religious people may consider the need of all people to be closer to God. The next phase is the phase of ***acceptance***, when ultimately members of a certain community develop a high level of tolerance towards members of another culture, which ultimately does not mean that they have to agree with all their values. From this phase comes the ***adaptation*** phase, when a certain group of people adopts the values of other cultures in order to communicate with them more easily; while in the extreme there is complete ***integration*** where there are no longer clear constructs of national cultures and where the individual understands that all ideas exist as common constructs, which in its essence is interculturalism or multiculturalism (ed. Bennett 1998). The focus of intercultural communication, especially in the case of a country's image is certainly to obtain higher levels of ethnorelationship.

Clearly developed strategies of ***intercultural education,*** which acquired their institutional character relatively late in Europe, are key to the acceleration of this process. Due to the influx of migrants in industrialized countries after the Second World War, there was pressure on institutions to put more effort into the development of intercultural education strategies due to the change in general demographics, which was done especially during the 60s and 70s of the last century, due to the growing presence of migrants in Western European countries. Today, the need for intercultural education to be included among the key segments of the development of educational policies and practices is increasingly developing due to the process of internationalization and globalization (Elena Basarab, 2015).

Intercultural communication can have multiple forms and benefits in the future, as a form of economic, political, sociological, organizational or cultural communication between different groups, which contributes to overall progress and understanding. Clear definition of a brand's identity and a development of clear promotional strategies that can be extended

in the future are the key points of improving the country's image and its better understanding from the perspective of others.

3. METHODOLOGY OF THE RESEARCH

The conducted research consists of two parts.
First, desk research was conducted by collecting data based on a comparison of relevant literature in the field of cultural promotion and studies dealing with the issue of China's position in Europe and the region of Southeast Europe. Based on the desk research, a research question was defined - *What communication solutions can be used to improve the existing perception of China in Montenegro and contribute to its more adequate promotion?*

Then we researched the promotional practices in relation to China that have already been implemented in Europe, in order to single out positive strategies that contribute to the understanding and improvement of its perception on the European market through activities such as annual festivals, conferences, workshops and other, despite existing prejudices.

On the basis of a desk research (theoretical basis and the first phase) and analysis of existing practices (practical basis and the second phase), appropriate suggestions of communication solutions applicable in digital and traditional media were developed, which focus on the promotion of cultural specificities of China, as well as mutual cooperation, primarily between the University of Donja Gorica and its Confucius classroom and Chinese partners. In the future, there is certainly enough space for conducting additional and concrete qualitative and quantitative research, which will evaluate the proposed solutions and further improve them.

4. RESULTS AND DISCUSSIONS

The first significant opportunity for further strategic development of relations with China, following the existing prejudices directed towards it, is reflected in greater intercultural cooperation and promotion of the deeper understanding of its philosophical and cultural concepts with contemporary trends, which is particularly significant for Montenegro, where throughout history, cultural codes of older times were also largely maintained. During desk research, we came across an interesting piece of information that already in the 16th and 17th centuries there were Jesuit colonies in China that translated and edited the texts of ancient Chinese philosophers and introduced Europeans to Chinese culture; while on the other hand numerous technological innovations were introduced in China, which existed only in Europe at that time (Kaspars Klavins, 2021). Intercultural cooperation should take place at that level, through greater mutual cooperation in the field of ***cultural promotion***, which would improve the perception of China, not only as an economic superpower, but also (primarily) as an ancient culture.

In this regard, the University of Donja Gorica has proven that it can be an adequate partner in Montenegro, and also in the area of Southeastern Europe, bearing in mind that in the past years it has implemented a large number of different projects based on the promotion of Chinese culture and intercultural cooperation through: academic exchanges, the establishment of the Confucius Classroom and the accreditation of the study program of Chinese Studies; and the organization of a series of interactive workshops, panels and other activities, which are already held annually at our University. Certainly, there is enough space to expand cooperation in this sense, so that by promoting the values of Chinese culture, a deeper understanding of its spiritual roots, which are still present today, will be enabled.

When it comes to concrete promotional activities related to cooperation between China and Montenegro, we see the biggest opportunity in the use of ***digital marketing*** tools. The reason for this is also the practices that China already has in Europe, where through various digital marketing campaigns (via online platforms, social media channels and with the use of other digital tools) they try to motivate the European audience to greater interaction with Chinese culture, travel, exchange of experiences. In this sense, the ***crowdsourcing*** mechanism is also used, where users of social networks and applications directly influence the experience of other users of the same communication channels with their experiences (for example, on the TikTok platform one of the most generated hashtags is ***#DiscoverChina***, which includes tourist tours, virtual tours of important

cultural and historical locations, following cultural events such as the Lunar New Year, etc.). Also, great value in crowdsourcing strategies should be put into the use of interest groups such as Facebook groups, forums and LinkedIn groups in order to define the target groups of people who will share their experiences with interested public.

Moreover, the active participation of influencers and influential media personalities in the promotion of China is increasingly represented in Europe, through the exchange of their own experiences and discoveries, and highlighting the specificities of various Chinese destinations. In this way, certain target groups that have confidence in these personalities additionally improve their own impressions of China, which gradually establishes its greater credibility through the system of ***merging communication circles.***

At the root of these practices, and in the context of joint efforts in the promotion of China in Montenegro, it would also be significant to additionally improve the cooperation of marketing teams in the two environments, and to define the prerequisites for the development of multi-year marketing strategies in order to further improve the level of mutual promotion.

Promotional activities that are already a practice in Europe, and do not refer exclusively to digital marketing, are encouraging the public through competitions, quizzes, interactive blogs and workshops. In previous years there were multiple festivals planned on an annual basis in Europe (Chinese cultural years), and in a larger degree they were organized in Western European countries such as France, Germany and Italy (Christina Maags, 2014). A large part of activities of this type have already been implemented or are being implemented at the University of Donja Gorica, which indicates the existence of initiatives to expand cooperation in this area, as well as in relation to digital marketing tools, even more.

Most of the activities realized at the University of Donja Gorica with goal of promotion of Chinese cultural values have been implemented through the Confucius classroom, founded in 2019, built on the basis of cooperation between UDG and BUU (Beijing Union University). The focus of this cooperation is concerned around educational elements like learning of langugages, intercultural communication and the process of building different competences and research skills. Bearing in mind that UDG is a part of the *Belt and the Road Initiative* it participates in all activities regarding its promotion, especially when it comes to the exchange and cooperation in tourism management. During previous years many activities regarding the organization of traditional Chinese festivals and lectures about Chinese culture have been organized at UDG; also, many editions of summer camps and workshops. Yearly, two creative concourses for all students on different topics of chinese cultural heritage are organized by the Confucius classroom with goal of promoting student authorship not only at UDG but also internationally. About 60 to 100 works are presented on every occasion and the best are awarded and exhibited at the University.

An important aspect of UDG's openness towards partnership with China is the continuing exchange of academic staff and students that has been realized between UDG and BUU. Nevertheless, UDG has developed an active educational cooperation with different chinese universities such as Xidian University; Changsha University of Science and Technology; Communication University in China; Capital Normal University; Jincheng College of Sichuan University; Beijing International Studies University; Zhejiang Gongshang University. More than 100 members of academic staff and students from Montenegro have in some degree been participants of exchange programs with China, and the similar number of students from China has participated in summer camps in Montenegro. That number is continually expanding every year with about 35 scholarship been offered to students of UDG in 2024, in different fields of economy, information technologies, design, polytechnics and tourism. Also, the specificity of UDG's attempts to strengthen the cooperation with China is the founding of the study program of Chinese studies at Faculty of Culture and Tourism. Also, more than 35 students every year actively studies chinese language at UDG, which also shows signs of expansion in the future. Chinese language is an obligatory subject at the Vatel study program and students from other study programs also have the opportunity to learn about chinese culture through various modules.

Bearing all this in mind, further guidelines for the development of promotion should be developed through the creation of messages whose

primary goal in digital, but also in traditional media, would be aimed at the promotion of these activities of Confucius classroom but also even closer contact with China and its values, and therefore also towards overcoming prejudices that still exist in some degree in Montenegro. The suggested messages are also focused on the promotion of China as a destination worth visiting, with special focus on its natural scenery and cultural specificities. Having in mind that the presented suggestions of visuals are focused on those aspects of China which perceive it at a macro level, the plan is to further develop other communication strategies promoting China as an emerging economic power and a country willing to cooperate with others in terms of scientific development, connecting the micro and macro elements.

At the end of this paper, we offered a possible direction of development of communication messages that could be opposed to existing prejudices about China which speak of China as a (at least) strange country, with a certain amount of distance and mistrust and also promote it in an adequate way. Focusing on the emotional aspect of branding that has in mind the making of specific strong messages that change the perception of public we have defined the main question - how can someone who has never been to China and has not tried to understand the values of its culture say that it is strange? The essence of the communication messages that should be sent in this sense is to motivate the general public to truly know and experience all the values of China in the modern context.

Strange? Outlandish? Unreal? Unbelievable? Intriguing? Fascinating? Mystic place?

China

Look closer and talk

Photo 1. *An example of the suggested application of a communication solution on a city light*

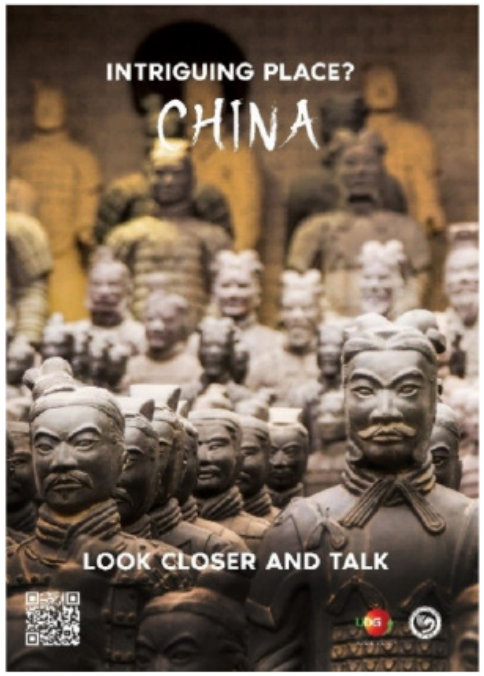


Photo 2. *An example of the suggested application of a communication solution on a poster with a QR code*

It is important to note that these communication solutions are just suggestions that will be developed even further. In this phase they are planned to be used for the activities of the Confucius classroom at University of Donja Gorica with definite room for further expansion in use. Therefore the QR code represented on the suggested poster should lead to the website and social media platforms of the Confucius classroom where all important information about its activities should be published, as well as of those activities concerned with the partnership of China and UDG. The focus on that regard will especially be on the activities based on cultural diplomacy and different festivals and workshops organized at UDG with the goal of promoting China's values.

Since the suggested communication strategies are at their very beginning, there are not clearly defined events that should follow the proposed visuals but, continuing upon some presented models from other European countries, the annual festivals concerned with China's culture and shared values, as well as the use of digital marketing tools and platforms of influencers to promote those events, should be the starting points of a larger campaign that could be realized in the future.

Following the example of ***#DiscoverChina*** campaign suggested visuals will also be accompanied by our own hashtag ***#ChinaLookCloserandTalk***, which will be mainly focused on digital media and promoting activities of Confucius classroom and other projects UDG will be planning in the future regarding the promotion of China in Montenegro. In that regard proposed communication solutions at this moment consist of visual representations (billboard and poster examples) that consist of QR code that will lead general public to the websites and digital platforms of Confucius classroom; but also a proposed hashtag that will be shared on social media following the example of previous campaigns realized on European level. When it comes to the language used in the campaign, since the UDG has an active role in the promotion of multilingual approach there will be content in Montenegrin, English and Chinese, with the goal of expanding furthermore.

5. RESEARCH LIMITATIONS

Bearing in mind that until now, research into the positioning of China in Europe was mainly based on socio-economic analyses and implications for the foreign policy of countries in the process of European integration, we did not have many reference studies that dealt with the issue of China's perception outside these frameworks. As indicated by the literature that we have largely referred to, the studies that dealt in depth with the problem of the perception of China, and concerned efforts to establish a more adequate understanding of its cultural codes, are mostly foreign editions. As a result, we used a comparison of the literature that studies the problem of the perception of China in the wider area of Europe, comparing it with the reports of European institutions and non-governmental organizations that cover the general perception of the public about cooperation with China within our region.

Therefore, we believe that in the future it would be important to conduct qualitative and quantitative research that would include studies of the perception of China on a much wider scale (not only when it comes to socio-economic implications, but also when it comes to the level of knowledge of Chinese culture and understanding its connection with contemporary global trends).

6. CONCLUSION

In the last few years, China's positioning on the global market has been frequently viewed with a sense of mistrust. In addition to problematizing its infrastructure investments and concern for areas such as environmental protection, its influence on the process of European integration is highlighted, through investments that often do not comply with prescribed standards. However, stereotyping of China and insufficient understanding of its cultural codes and their connection with modern processes are often at the root of this mistrust. Therefore, all initiatives launched by this country are viewed from the perspective of a geopolitical game, rather than the establishment of more adequate intercultural communication. Studies dealing with the perception of China are mainly focused on that segment of its presence in Europe. The efforts of this paper to offer proposals for communication strategies that will promote relations with China from the perspective of intercultural understanding and cooperation are attempts to point out the importance of a different perception of Chinese influence in these areas. These solutions are primarily intended to promote the cooperation of the University of Donja Gorica and the Confucius Classroom with Chinese academic institutions and partners, with the aim of further strengthening the activities that the University is already carrying out in order to promote Montenegrin-Chinese partnership relations, but also strive to achieve a more comprehensive understanding of Chinese culture and its values on a wider scale.

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CORRESPONDANCE:

Nenad Vujadinović, PhD, Associate professor
University of Donja Gorica
Faculty of Arts
Oktoih 1
81000 Podgorica, Montenegro
E-mail: nenad.vujadinovic@udg.edu.me

Todor Mitrović, Sp.A., Teaching assistant
University of Donja Gorica
Faculty of Arts
Oktoih 1
81000 Podgorica, Montenegro
E-mail: todor.mitrovic@udg.edu.me

Gordana Vojinović, BA, Teaching assistant
University of Donja Gorica
Faculty of Design and Multimedia
Oktoih 1
81000 Podgorica, Montenegro
E-mail: gordana.vojinovic@udg.edu.me

3.

Publishing authors from Montenegro in WoS vs. smart specialization strategy priorities

Đuro Kutlača, PhD, Full professor
Sandra Tinaj, PhD, Assistant professor
Bojana Mališić, PhD student

Publishing authors from Montenegro in WoS vs. smart specialization strategy priorities

Prof Dr Đuro Kutlača[1], Doc. dr Sandra Tinaj[2], Mr Bojana Mališić[3]

[1]kutlacadjuro@gmail.com

[2]University of Donja Gorica, Sandra.tinaj@udg.edu.me

[3]University of Donja Gorica, bojana.malisic@udg.edu.me

ABSTRACT:

BACKGROUND: *One of the most important activities of the scientific research community is the writing of scientific papers. Publication of scientific papers in journals referenced in WoS databases is a key criterion for advancement in a scientific and academic career in Montenegro.*
OBJECTIVE: *This paper contains an analysis of the scientific productvity of researchers in Montenegro with the aim of identifying the scientific disciplines with the largest number of scientific papers published in WoS refereed journals, and then comparing the results of that analysis with the priorities of the Smart Specialization Strategy of Montenegro.*
METHOD: *In this research paper, the method of comparison was used by providing an analysis of the scientific productivity of researchers in Montenegro in the period from 2010 to 2024 in comparison with the priorities of the Smart Specialization Strategy of Montenegro.*
RESULT: *The most productive scientific disciplines in Montenegro were identified. The number of scientific papers published in journals referred to in WoS was used as a measure of productivity. A comparison of those disciplines with the priorities of the Smart Specialization Strategy of Montenegro was made.*
CONCLUSION: *For the successful implementation of the Smart Specialization Strategy of Montenegro, a more significant engagement of the scientific research community in the priority areas of science and technology defined by S3 of Montenegro is necessary.*

Keywords: smart specialization strategy, Montenegro, science, technology, WoS database

1. INTRODUCTION

Comparing the scientific and academic community by the number and citations of scientific papers in journals referenced in WoS (The Web of Science) databases is a traditional method of comparing individuals, teams, institutions, scientific fields, and even countries. The comparison method is also used by the authors of this paper for various purposes: for the analysis of the transition processes of the countries of Central and Eastern Europe (Radošević and Kutlača, 1999), for the analysis of qualitative and quantitative indicators of the results of scientific work in the selected countries of Southeastern Europe (Kutlača et al, 2014; Babić et al, 2015), up to the analysis of the scientific and innovation infrastructure of the economies of the Western Balkans (Kutlača and Živković, 2022).

The paper first presents the results of research on the scientific productivity of scientists from Montenegro. The number of scientific papers published in journals referred to in WoS was used as a measure of productivity. Then, secondly, the results of the comparison of scientific productivity with the priorities of the Smart Specialization Strategy of Montenegro (S3 – Smart Specialization Strategy) were presented. This comparison should indicate the areas of science and technology in which researchers in Montenegro are most engaged, observing whether it is in the priority areas defined by document S3.

The reason for choosing this topic is the importance of the publication of scientific papers in journals referenced in WoS databases for career development of scientists in Montenegro. At the same time, the realization of the Smart Specialization Strategy of Montenegro, adopted by the Government in 2019[1], relies heavily on the scientific community. That is why it was a challenge for the authors of this paper to compare scientific productivity with S3 priorities and analyze the engagement of scientists in relation to the priorities of economic and social development based on

[1] The Government of Montenegro adopted the Smart Specialization Strategy of Montenegro 2019 - 2024 at the session held on June 20, 2019

research and innovation, defined in S3.

1.1. Monitoring scientific productivity in Montenegro

In Montenegro, in accordance with certain international practice, the conditions and criteria for elections to academic titles were defined at the national level, which were adopted by the Council for Higher Education in 2019 and have been in force since then. Persons who meet the conditions and criteria prescribed by the Law on Higher Education[2] and these *Conditions and criteria for selection into positions*[3] may be elected to academic positions. They are applied at the level of all institutions of higher education in Montenegro. The academic positions for which elections are held, in accordance with the conditions prescribed by the Law, are: professor, associate professor, assistant professor, college professor and college teacher. A person who is elected to an academic title in the appropriate scientific fields should satisfy the following qualitative criteria: "*The scientific and research results of the candidate have been published in journals that are on the citation lists, i.e. databases of scientific works SCI/SCIE/SSCI/A&HCI*". These scientific papers are divided into categories Q1, Q2, Q3 and Q4, which can be seen in detail in attachment 1 of the mentioned document.[4] Please note that until 2016, the conditions for the promotion to academic titles were regulated at the level of the institution, however, since 2016 the Council for Higher Education has adopted the Criteria for the conditions and criteria for the promotion to academic titles, meaning that the rules were unified for the first time, and they include conditions related to WoS.

When it comes to the rules of doctoral studies at the national level, they are not uniform. In the part of natural and technical-technological sciences, within the framework of all the rules of doctoral studies, it is required that before the defense of the dissertation, a paper has been published with the results from the dissertations on the citation lists, that is, the bases of scientific works of SCI/SCIE. Certain rules also require that the PhD student be the first author. Analyzing the regulations in social sciences and humanities, we find both practices, i.e. we find practice in the rules in which it is required to have a work published with the results of the dissertation on the citation lists, i.e. databases of scientific works

[2] Law on Higher Education Montenegro (Zakon o visokom obrazovanju | Crna Gora | Paragraf Lex)
[3] Conditions and criteria forpromotion to academic titles (Uslovi i kriterijumi za izbor u akademska zvanja (www.gov.me)
[4] Conditions and criteria forpromotion to academic titles (Uslovi i kriterijumi za izbor u akademska zvanja (www.gov.me)

SCI/SCIE/SSCI or A&HCI. In no case is it required that the PhD student should be the first author.

The publication of papers, in addition to being encouraged by academic advancement, at the level of Montenegro, is also encouraged by certain evaluations and rewards. A certain number of higher education institutions provide support to academic staff in the form of funds required for publication within WoS, as well as for participation in conferences. Also, at the University of Montenegro, there is a *Rulebook on the procedure, conditions of evaluation and method of rewarding employees for exceptional contribution to the development and international positioning*[5] *of the University of Montenegro.* This Rulebook covers: publication in WoS journals, editorial, publishing of monographs of international importance, review activities in WoS journals, as well as guest lectures at universities positioned on the Shanghai list.

In addition to the above, certain types of support are provided, primarily through scholarships for doctoral studies for mentors and candidates, then also through Competitions for co-financing of scientific research activities of the Ministry of Education and Science through programs and provided funds; participation in scientific meetings, publication in open access journals, editing/publishing of scientific journals.

2. SCIENTIFIC PRODUCTIVITY REGISTERED IN WoS

The search of WoS databases for authors of scientific papers from Montenegro was carried out for the period from 2010 to 2024. The aim of this search was to identify the number of scientific papers in journals that are referenced in WoS, where at least one author stated that the publishing country was Montenegro. In the paper, the authors calculate the "stock of knowledge" indicator for Montenegro. This indicator represents the sum of scientific articles within individual WoS disciplines in the period from 2010 to 2024. Using the data conversion scheme from WoS scientific disciplines in the field of science and technology according to the classification given in the OECD Frascati manual (OECD Fields of Science and Technology - FoS) (OECD, 2007), the values of the **"stock of knowledge"** indicator from WoS to FoS were recalculated. By sorting the

[5] Rulebook on the procedure, conditions of evaluation and method of rewarding employees for exceptional contribution to the development and international positioning (Prečišćeni pravilnik o postupku, uslovima vrednovanja i načinu nagradivanja Bilten 550 22 i 554 22.pdf (ucg.ac.me)

"stock of knowledge" indicator, the areas of science and technology in which scientists from Montenegro published the most scientific works in the observed period are obtained.

The number of scientific papers in the WoS disciplines is greater than the actual number of published scientific papers, because when submitting a paper for publication, authors can classify their work in several disciplines. WoS has 255 scientific disciplines, which is too large a number for possible analysis. Unlike the WoS, the OECD Frascati Manual defines 6 fields with a total of 39 subfields of science and technology (OECD Frascati Manual, 2015). The mentioned WoS to FoS conversion scheme is used precisely for the translation of the calculated indicators of "stock of knowledge" into the number of areas of science and technology acceptable for further analysis.

Table 1 gives an overview of "stock of knowledge" indicator calculated for published scientific papers and the "stock of knowledge" indicator calculated for 4 categories of scientific work results: Scientific article; Abstract of the article presented at the scientific conference; Scientific article in Proceedings of the scientific conference; Review; registered in WoS databases of authors of Montenegro in the period 2010 - 2024. Moreover, the first two rows contain the number of scientific papers with repetition in several WoS areas, and the third and fourth rows contain the original number of scientific papers, without repetition, before sorting by WoS areas. In the fifth row of Table 1, the number of WoS categories, that is, WoS areas of science and technology in which identified scientific works were published, is given.

Tables 2 and 3 provide the "stock of knowledge" indicator calculated for published scientific articles published in journals referred in the WoS databases of Montenegrin authors in the period 2010 - 2024, converted and aggregated into 6 fields of science and technology OECD FoS (table 2), i.e. into 39 subfields of science and technology OECD FoS (table 3).

In tables 4 and 5, in the same way as in tables 2 and 3, an overview is given for the extended search of WoS databases, so that for the type of documents to be searched, in addition to scientific papers, three more categories were selected: Abstract of a paper presented at a scientific conference; Scientific article in Proceedings of the scientific conference; Review paper (*Meeting Abstract, Proceeding Paper, Review Article*).

The presented data indicate the first characteristic of scientific productivity in Montenegro in the period 2010-2024: until 2017, the number of scientific papers increases, then saturation follows and further growth until 2021, and then in the last two years of the observed period, there is a decline in the number of published papers. The increase in the number of papers from 2010 to 2017 can be explained by the application of laws and by-laws that define the career development of scientists in Montenegro, as advancement is conditioned by the number of scientific papers published in journals referred to in WoS. Although it was formally stipulated by the 2016 law, it was already known that it would be a key criterion, which motivated researchers to publish more and more scientific papers in WoS-referred journals.

Another phenomenon can be observed here, namely the increase in the number of WoS categories in which scientific papers are published by authors from Montenegro (the fifth row in table 1). Namely, in 2010, out of a total of 255 WoS categories, authors from Montenegro appeared in 80 categories (WoS fields of science and technology). The maximum was reached in 2022 in which authors from Montenegro published scientific papers classified into a total of 162 WoS categories, that is, WoS areas of science and technology, twice the number in 2010.

At the end of the analyzed period, in 2023 there were 2.5 times more scientific papers by authors from Montenegro than in the first year of the analyzed period, 2010. The biggest increase was recorded in 2021 when 619 were published, that is, almost three times (2.9) more papers than in 2010. when 213 scientific papers were published.

Table 1. *Number of scientific papers in WoS databases, authors from Montenegro, in the period 2010 - 2024*

FoS-Description1	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TOTAL-Articles; in all WoS categories	**270**	**322**	**305**	**359**	**387**	**426**	**462**	**586**	**602**	**717**	**853**	**987**	**963**	**854**	**122**
TOTAL- Article+Meeting Abstract+ Proceeding Paper+Review Article; in all WoS categories	**367**	**417**	**429**	**556**	**526**	**706**	**710**	**780**	**807**	**884**	**977**	**1088**	**1110**	**950**	**150**
TOTAL - WoS Article; single appearance	**213**	**223**	**239**	**267**	**287**	**312**	**331**	**416**	**420**	**473**	**554**	**619**	**584**	**540**	**71**
TOTAL - WoS Article+Meeting Abstract+Proceeding Paper+Review Article; single appearance	**278**	**276**	**319**	**374**	**370**	**467**	**473**	**524**	**538**	**573**	**637**	**670**	**664**	**600**	**88**
WoS categories	**80**	**94**	**87**	**117**	**110**	**119**	**119**	**138**	**146**	**143**	**153**	**156**	**162**	**153**	**74**

Source: *WoS, accessed 04. April 2024.g. https://www.webofscience.com/wos/woscc/basic-search Key words: DOCUMENTS; Year Published: 2010-2024; Countries/Region: Montenegro; Document Types: Article; Article+Meeting Abstract+Proceeding Paper+Review Article*

Table 2. *Number of scientific papers in WoS databases, authors from Montenegro, in the period 2010-2024, converted and aggregated into 6 fields of Science and technology OECD FoS*

FoS-Description1	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1 NATURAL SCIENCES	92	132	120	147	135	146	149	178	215	294	359	404	427	400	52
2 ENGINEERING AND TECHNOLOGY	72	77	72	74	91	94	108	138	109	105	162	165	151	134	25
3 MEDICAL AND HEALTH SCIENCES	27	36	43	57	60	61	57	80	102	120	121	149	123	131	23
4 AGRICULTURAL SCIENCES	4	12	11	16	20	15	18	31	27	33	32	37	36	27	6
5 SOCIAL SCIENCES	37	28	34	26	47	41	57	78	69	89	111	139	139	111	14
6 HUMANITIES	38	37	25	39	34	69	73	81	80	76	68	93	87	51	2
TOTAL	**270**	**322**	**305**	**359**	**387**	**426**	**462**	**586**	**602**	**717**	**853**	**987**	**963**	**854**	**122**

Source: *WoS, accessed on 04th of April 2024.g. https://www.webofscience.com/wos/woscc/basic-search Key words: DOCUMENTS; Year Published: 2010-2024; Countries/Region: Montenegro; Document Types: Article*

Table 3. *Number of scientific papers in WoS databases, authors from Montenegro, in the period 2010-2024, converted and aggregated in the subfields of science and technology OECD FoS*

FoS-Description2	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1.01 Mathematics	20	41	28	43	24	43	33	39	49	39	40	41	41	27	6
1.02 Computer and information sciences	8	7	5	14	5	9	7	14	20	11	19	24	19	18	5
1.03 Physical sciences and astronomy	22	24	11	23	17	8	11	12	12	44	105	95	102	139	3
1.04 Chemical sciences	10	15	12	19	16	11	8	16	19	28	40	48	45	50	10
1.05 Earth and related environmental sciences	4	10	21	15	26	27	24	34	38	64	66	97	115	64	10
1.06 Biological sciences	28	35	43	33	43	47	62	59	69	101	83	92	92	89	14
1.07 Other natural sciences	0	0	0	0	4	1	4	4	8	7	6	7	13	13	4
2.01 Civil engineering	2	4	3	6	7	6	6	6	7	6	13	7	11	7	0
2.02 Electrical eng, electronic eng	35	22	20	25	28	32	26	49	47	30	41	30	30	28	9
2.03 Mechanical engineering	12	21	18	13	13	18	22	10	14	7	21	14	14	10	5
2.04 Chemical engineering	0	0	1	1	3	4	5	1	5	4	3	6	3	2	0
2.05 Materials engineering	10	10	12	11	14	3	8	10	6	14	23	20	12	16	1
2.06 Medical engineering	1	0	0	0	1	3	1	0	1	3	0	1	2	3	0
2.07 Environmental engineering	1	2	3	3	5	7	8	18	8	19	28	47	37	25	4
2.08 Environmental biotechnology	2	1	0	0	2	1	5	2	1	4	0	1	1	0	0
2.09 Industrial biotechnology	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0
2.10 Nano-technology	0	1	0	0	3	0	2	2	1	0	0	2	2	1	0
2.11 Other engineering and technologies	9	16	15	15	15	20	23	40	19	18	32	37	39	42	6
3.01 Basic medical research	5	10	6	10	16	15	8	8	22	31	34	25	29	44	7
3.02 Clinical medicine	20	20	30	37	34	37	41	53	54	62	51	89	55	57	12
3.03 Health sciences	2	6	7	10	10	9	8	19	26	27	36	35	39	30	4
4.01 Agriculture, forestry, fisheries	0	3	4	11	13	9	14	19	18	20	14	19	21	11	2
4.02 Animal and dairy science	0	1	0	2	1	1	0	2	1	2	2	0	2	0	0
4.03 Veterinary science	1	1	0	1	0	0	1	0	1	1	4	5	4	3	0
4.05 Other agricultural science	3	7	7	2	6	5	3	10	7	10	12	13	9	13	4
5.01 Psychology	2	3	2	3	7	4	7	4	3	3	13	11	14	12	2
5.02 Economics and business	28	14	11	15	25	16	24	47	39	30	40	49	45	28	1
5.03 Educational sciences	2	3	2	1	4	3	5	8	5	10	9	12	13	9	0
5.04 Sociology	2	1	8	3	1	4	2	5	3	7	10	9	8	10	4
5.05 Law	2	0	1	0	1	3	5	2	2	4	0	1	1	1	0
5.06 Political science	0	3	4	3	2	3	3	4	2	11	9	11	10	7	2
5.07 Social and economic geography	0	3	1	1	5	5	8	6	10	16	21	33	39	35	2
5.08 Media and communication	1	1	2	0	0	0	0	0	2	2	1	5	4	4	1
5.09 Other social sciences	0	0	3	0	2	3	3	2	3	6	8	8	5	5	2
6.01 History and archaeology	2	0	1	3	2	4	13	6	7	14	4	15	12	8	0
6.02 Languages and literature	22	17	21	21	24	39	44	52	30	35	26	42	43	31	0
6.03 Philosophy, ethics and religion	1	1	0	1	1	2	5	2	2	2	14	8	9	5	1
6.04 Art	0	0	0	2	0	1	2	3	3	3	5	8	4	1	0
6.05 Other Humanities	13	19	3	12	7	23	9	18	38	22	19	20	19	6	1
TOTAL	**270**	**322**	**305**	**359**	**387**	**426**	**462**	**586**	**602**	**717**	**853**	**987**	**963**	**854**	**122**

Source: *WoS, accessed: 04th of April 2024.. https://www.webofscience.com/wos/woscc/basic-search Key words: DOCUMENTS; Year Published: 2010-2024; Countries/Region: Montenegro; Document Types: Article*

Table 4. *Number of scientific papers and three other categories of results in WoS databases, authors from Montenegro, in the period 2010-2024, converted and aggregated in 6 fields of science and technology OECD FoS*

FoS-Description1	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1 NATURAL SCIENCES	106	141	132	201	143	210	210	230	302	352	409	436	492	432	66
2 ENGINEERING AND TECHNOLOGY	95	109	125	180	176	215	214	209	156	163	180	200	173	146	26
3 MEDICAL AND HEALTH SCIENCES	78	81	71	78	89	126	105	116	131	159	160	177	169	173	35
4 AGRICULTURAL SCIENCES	4	15	19	16	22	20	22	33	30	37	33	34	36	30	7
5 SOCIAL SCIENCES	44	33	53	37	60	65	83	107	105	96	118	144	153	115	14
6 HUMANITIES	40	38	29	44	36	70	76	85	83	77	77	97	87	54	2
TOTAL	**367**	**417**	**429**	**556**	**526**	**706**	**710**	**780**	**807**	**884**	**977**	**1088**	**1110**	**950**	**150**

Source: *WoS, accessed on 04th of April 2024. https://www.webofscience.com/wos/woscc/basic-search Key words: DOCUMENTS; Year Published: 2010-2024; Countries/Region: Montenegro; Document Types: Article+Meeting Abstract+Proceeding Paper+Review Article*

Table 5. *Number of scientific papers and three other categories of results in WoS databases, authors from Montenegro, in the period 2010-2024, converted and aggregated in sub-fields of science and technology OECD FoS*

FoS-Description2	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1.01 Mathematics	20	41	28	44	24	44	34	39	51	39	43	41	41	27	6
1.02 Computer and information sciences	11	11	9	49	8	53	49	66	87	55	45	42	67	25	5
1.03 Physical sciences and astronomy	27	27	16	26	20	19	26	12	16	46	112	99	105	141	3
1.04 Chemical sciences	11	15	12	21	16	13	9	16	24	28	42	48	48	55	10
1.05 Earth and related environmental sciences	9	10	21	24	26	30	25	34	45	68	73	102	120	69	15
1.06 Biological sciences	28	37	46	37	45	50	62	59	71	109	88	97	98	102	23
1.07 Other natural sciences	0	0	0	0	4	1	5	4	8	7	6	7	13	13	4
2.01 Civil engineering	3	4	7	6	12	7	24	12	13	11	13	8	14	8	0
2.02 Electrical eng, electronic eng	45	42	56	107	86	107	96	99	72	57	54	54	38	31	9
2.03 Mechanical engineering	16	21	19	17	22	41	24	13	15	15	22	16	16	10	5
2.04 Chemical engineering	0	0	1	1	3	4	5	1	5	4	3	6	3	2	0
2.05 Materials engineering	15	10	20	13	19	4	14	10	7	14	24	20	12	16	1
2.06 Medical engineering	1	4	1	1	1	3	1	3	1	7	0	2	2	3	0
2.07 Environmental engineering	2	3	4	7	7	11	13	26	21	23	30	51	46	31	4
2.08 Environmental biotechnology	2	1	0	0	2	1	5	2	1	4	0	1	1	0	0
2.09 Industrial biotechnology	1	0	0	0	0	0	2	0	0	0	1	0	0	0	0
2.10 Nano-technology	0	1	0	2	4	1	5	2	1	1	0	2	2	1	0
2.11 Other engineering and technologies	10	23	17	26	20	36	25	41	20	27	33	40	39	44	7
3.01 Basic medical research	11	33	9	12	22	20	16	15	24	39	44	31	36	54	13
3.02 Clinical medicine	65	32	45	55	51	91	78	78	76	86	68	107	82	81	15
3.03 Health sciences	2	16	17	11	16	15	11	23	31	34	48	39	51	38	7
4.01 Agriculture, forestry, fisheries	0	5	12	11	15	9	17	20	21	22	15	21	21	14	3
4.02 Animal and dairy science	0	1	0	2	1	1	0	2	1	2	2	0	2	0	0
4.03 Veterinary science	1	1	0	1	0	0	1	0	1	1	4	0	4	3	0
4.05 Other agricultural science	3	8	7	2	6	10	4	11	7	12	12	13	9	13	4
5.01 Psychology	5	3	3	4	8	13	20	4	5	3	15	12	14	13	2
5.02 Economics and business	30	17	18	16	26	22	26	65	53	34	41	51	53	30	1
5.03 Educational sciences	2	4	4	3	10	5	9	8	7	11	9	13	14	9	0
5.04 Sociology	2	1	8	4	1	4	2	7	3	7	11	9	10	10	4
5.05 Law	2	0	2	0	2	4	6	3	4	4	0	2	1	1	0
5.06 Political science	2	3	4	3	4	5	4	6	4	11	9	11	10	7	2
5.07 Social and economic geography	0	4	6	4	7	7	13	10	22	17	23	33	39	36	2
5.08 Media and communication	1	1	2	0	0	0	0	0	3	3	1	5	4	4	1
5.09 Other social sciences	0	0	6	3	2	5	3	4	4	6	9	8	8	5	2
6.01 History and archaeology	3	0	1	3	2	4	13	6	7	14	5	15	12	8	0
6.02 Languages and literature	23	18	25	24	26	40	47	54	30	35	33	45	43	34	0
6.03 Philosophy, ethics and religion	1	1	0	1	1	2	5	3	2	2	13	9	9	5	1
6.04 Art	0	0	0	2	0	1	2	3	5	4	6	8	4	1	0
6.05 Other Humanities	13	19	3	14	7	23	9	19	39	22	20	20	19	6	1
TOTAL	**367**	**417**	**429**	**556**	**526**	**706**	**710**	**780**	**807**	**884**	**977**	**1088**	**1110**	**950**	**150**

Source: *WoS, accessed on 04th of April 2024. https://www.webofscience.com/wos/woscc/basic-search Key words: DOCUMENTS; Year Published: 2010-2024; Countries/Region: Montenegro; Document Types: Article+Meeting Abstract+Proceeding Paper+Review Article*

Table 6. *Knowledge stock (total number of scientific papers) of Montenegro in WoS databases, in the period 2010-2024, the first 50 WoS disciplines*

Rank	WoS_MONTENEGRO -first 50	2010-2024
1	ENGINEERING, ELECTRICAL & ELECTRONIC	330
2	LANGUAGE & LINGUISTICS	316
3	ENVIRONMENTAL SCIENCES	298
4	PHYSICS, PARTICLES & FIELDS	291
5	MATHEMATICS	265
6	MEDICINE, GENERAL & INTERNAL	244
7	HUMANITIES, MULTIDISCIPLINARY	229
8	ECONOMICS	203
9	MATHEMATICS, APPLIED	162
10	MARINE & FRESHWATER BIOLOGY	161
11	ZOOLOGY	144
12	PLANT SCIENCES	129
13	ENGINEERING, MULTIDISCIPLINARY	119
14	CHEMISTRY, MULTIDISCIPLINARY	106
15	MATERIALS SCIENCE, MULTIDISCIPLINARY	105
16	ASTRONOMY & ASTROPHYSICS	100
17	PUBLIC, ENVIRONMENTAL & OCCUPATIONAL HEALTH	92
18	FOOD SCIENCE & TECHNOLOGY	86
19	ENVIRONMENTAL STUDIES	85
20	ENTOMOLOGY	82
21	PHARMACOLOGY & PHARMACY	80
22	BUSINESS	76
23	HISTORY	76
24	GREEN & SUSTAINABLE SCIENCE & TECHNOLOGY	75
25	TELECOMMUNICATIONS	74
26	GEOSCIENCES, MULTIDISCIPLINARY	71
27	MULTIDISCIPLINARY SCIENCES	71
28	BIOLOGY	70
29	OCEANOGRAPHY	70
30	PHYSICS, APPLIED	70
31	PHYSICS, MULTIDISCIPLINARY	68
32	EDUCATION & EDUCATIONAL RESEARCH	67
33	BIOCHEMISTRY & MOLECULAR BIOLOGY	64
34	MECHANICS	64
35	LINGUISTICS	63
36	BUSINESS, FINANCE	62
37	PHYSICS, NUCLEAR	62
38	ENGINEERING, MECHANICAL	60
39	INSTRUMENTS & INSTRUMENTATION	60
40	COMPUTER SCIENCE, INFORMATION SYSTEMS	59
41	ECOLOGY	59
42	SPORT SCIENCES	56
43	MANAGEMENT	53
44	METALLURGY & METALLURGICAL ENGINEERING	52
45	ANATOMY & MORPHOLOGY	50
46	ENGINEERING, CIVIL	50
47	POLITICAL SCIENCE	50
48	ENGINEERING, MARINE	49
49	FISHERIES	47
50	AGRONOMY	46

Source: *WoS, accessed 04th of April 2024.https://www.webofscience.com/wos/woscc/basic-search Key words: DOCUMENTS; Year Published: 2010-2024; Countries/Region: Montenegro; Document Types: Article*

Table 7. *Knowledge stock (total number of scientific papers) of Montenegro in WoS databases in the periods 2010-2018 and 2019-2024, the first 50 WoS disciplines*

Rank	WoS_MONTENEGRO -first 50	2010-2018	Rank	WoS_MONTENEGRO -first 50	2019-2024
1	language & linguistics	216	1	physics, particles & fields	239
2	engineering, electrical & electronic	208	2	environmental sciences	208
3	mathematics	162	3	engineering, electrical & electronic	122
4	humanities, multidisciplinary	142	4	medicine, general & internal	106
5	medicine, general & internal	138	5	mathematics	103
6	economics	119	6	language & linguistics	100
7	zoology	104	7	astronomy & astrophysics	91
8	mathematics, applied	102	8	humanities, multidisciplinary	87
9	environmental sciences	90	9	economics	84
10	marine & freshwater biology	80	10	marine & freshwater biology	81
11	engineering, multidisciplinary	72	11	environmental studies	78
12	plant sciences	54	12	plant sciences	75
13	physics, particles & fields	52	13	green & sustainable science & technology	71
14	telecommunications	51	14	public, environmental & occupational health	65
15	biology	48	15	chemistry, multidisciplinary	63
16	materials science, multidisciplinary	45	16	materials science, multidisciplinary	60
17	chemistry, multidisciplinary	43	17	mathematics, applied	60
18	mechanics	42	18	physics, nuclear	53
19	oceanography	41	19	entomology	52
20	business, finance	40	20	food science & technology	51
21	engineering, mechanical	37	21	multidisciplinary sciences	50
22	food science & technology	35	22	pharmacology & pharmacy	50
23	business	34	23	physics, multidisciplinary	48
24	history	34	24	engineering, multidisciplinary	47
25	metallurgy & metallurgical engineering	32	25	ecology	45
26	entomology	30	26	business	42
27	pharmacology & pharmacy	30	27	energy & fuels	42
28	physics, applied	30	28	geosciences, multidisciplinary	42
29	geosciences, multidisciplinary	29	29	history	42
30	sport sciences	29	30	instruments & instrumentation	42
31	education & educational research	28	31	biochemistry & molecular biology	41
32	engineering, industrial	27	32	linguistics	40
33	mathematics, interdisciplinary applications	27	33	physics, applied	40
34	public, environmental & occupational health	27	34	zoology	40
35	computer science, information systems	26	35	education & educational research	39
36	thermodynamics	26	36	area studies	35
37	engineering, civil	25	37	anatomy & morphology	33
38	fisheries	25	38	computer science, information systems	33
39	nuclear science & technology	25	39	management	33

Rank	WoS_MONTENEGRO -first 50	2010-2018	Rank	WoS_MONTENEGRO -first 50	2019-2024
40	biochemistry & molecular biology	23	40	psychiatry	31
41	linguistics	23	41	biodiversity conservation	30
42	agronomy	22	42	political science	30
43	chemistry, applied	22	43	oceanography	29
44	engineering, marine	22	44	endocrinology & metabolism	28
45	multidisciplinary sciences	21	45	philosophy	28
46	engineering, chemical	20	46	engineering, marine	27
47	literature, slavic	20	47	sport sciences	27
48	management	20	48	water resources	27
49	physics, multidisciplinary	20	49	chemistry, analytical	25
50	political science	20	50	engineering, civil	25

Source: *WoS, accessed on 04th ofApril 2024. https://www.webofscience.com/wos/woscc/basic-search Key words: DOCUMENTS; Year Published: 2010-2024; Countries/Region: Montenegro; Document Types: Article*

Cumulatively, the largest number of scientific papers published in journals referenced in WoS databases by authors from Montenegro, in the period from 2010 to 2024, is in the following ten areas:

1. ENGINEERING, ELECTRICAL & ELECTRONIC (330 scientific papers)
2. LANGUAGE & LINGUISTICS (316)
3. ENVIRONMENTAL SCIENCES (298)
4. PHYSICS, PARTICLES & FIELDS (291)
5. MATHEMATICS (265)
6. MEDICINE, GENERAL & INTERNAL (244)
7. HUMANITIES, MULTIDISCIPLINARY (229)
8. ECONOMICS (203)
9. MATHEMATICS, APPLIED (162)
10. MARINE & FRESHWATER BIOLOGY (161)

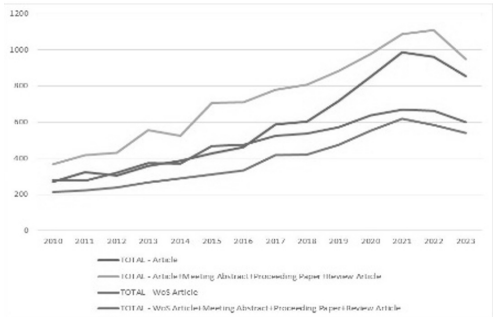

Figure 1. *Number of scientific papers published by authors from Montenegro in WoS databases, in the period 2010-2024*

Source: *WoS, Accessed on 04th of April 2024. https://www.webofscience.com/wos/woscc/basic- search Key words: DOCUMENTS; Year Published: 2010-2024; Countries/Region: Montenegro; Document Types: Article; Article+Meeting Abstract+Proceeding Paper+Review Article.*

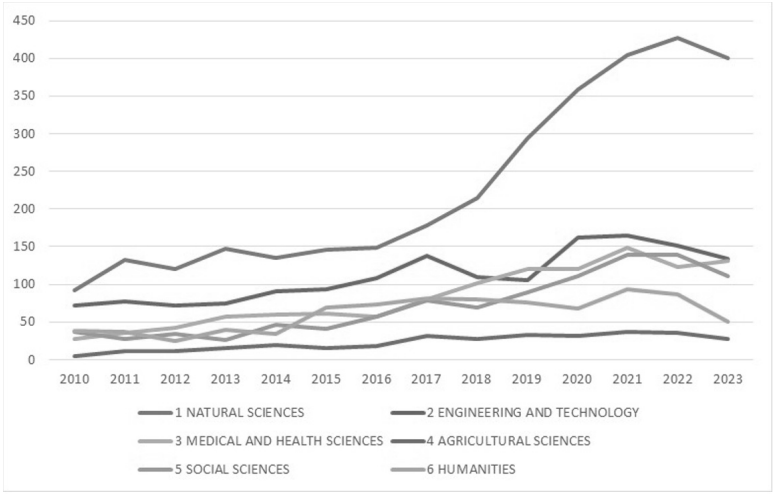

Figure 2. *Number of scientific papers in WoS databases, authors from Montenegro, in the period 2010-2024, converted and aggregated into 6 fields of science and technology OECD FoS*

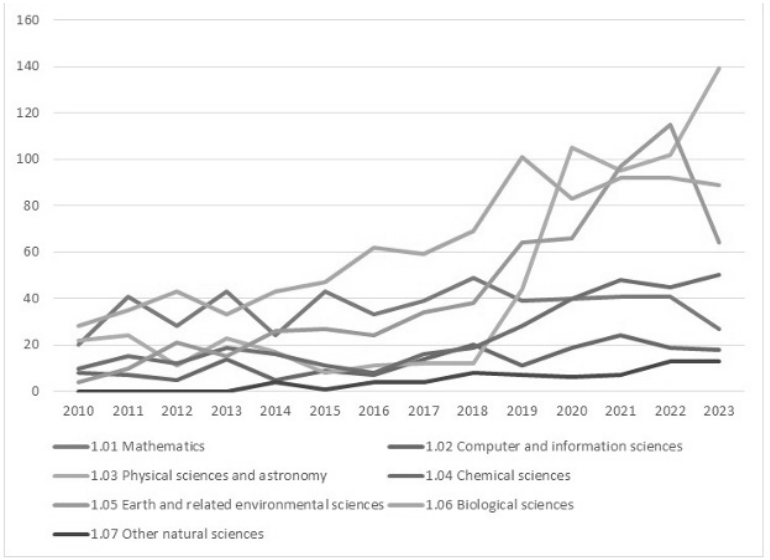

Figure 3. *Number of scientific papers in "NATURAL SCIENCES 1.01 - 1.07" published by authors from Montenegro in WoS databases, in the period 2010 - 2024, converted and aggregated in the field of science and technology OECD FoS*

The fields of science in which the most publications are published in journals referenced in WoS databases are:

1. NATURAL SCIENCES
2. ENGINEERING AND TECHNOLOGY
3. MEDICAL AND HEALTH SCIENCES

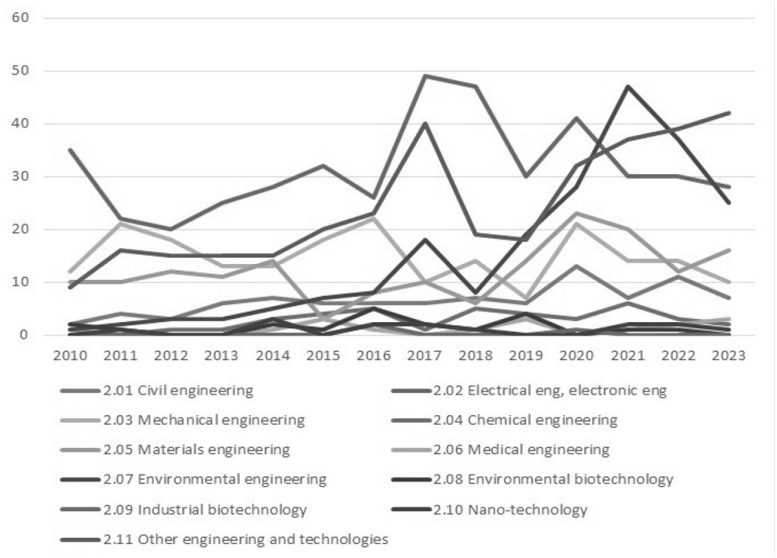

Figure 4. *Number of scientific papers in "ENGINEERING AND TECHNOLOGY 2.01 - 2.11", in WoS databases, in the period 2010 - 2024, converted and aggregated in the field of science and technology OECD FoS*

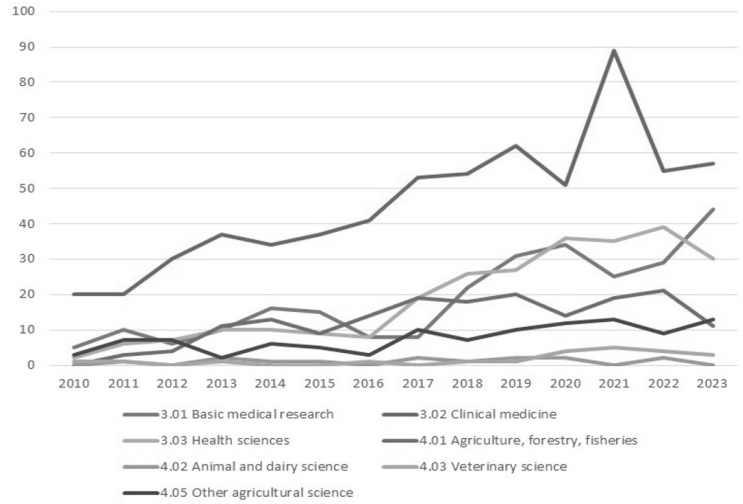

Figure 5. *Number of scientific papers in "MEDICAL AND HEALTH SCIENCES 3.01 - 3.03 and AGRICTULTURAL SCIENCES 4.01 - 4.05", in WoS databases, authors from Montenegro, in the period 2010 - 2024, converted and aggregated in the field of science and technology OECD FoS technologie*

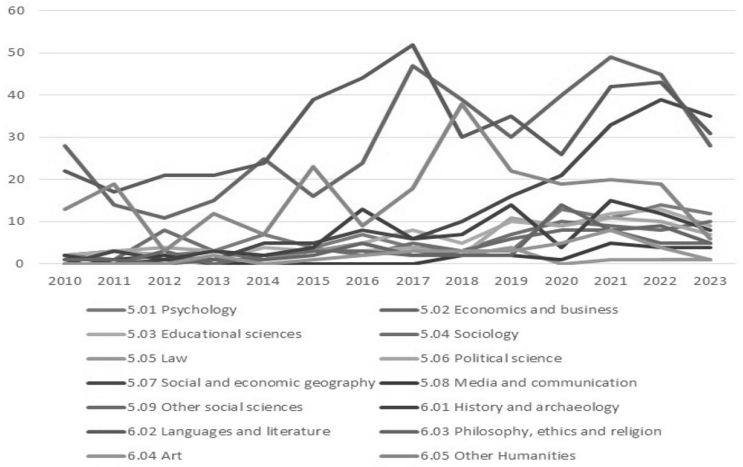

Figure 6. *Number of scientific papers in "SOCIAL SCIENCES 5.01 - 5.09 and HUMANITIES 6.01 - 6.05", in WoS databases, authors from Montenegro, in the period 2010 - 2024, converted and aggregated in the field of science and technology OECD FoS*

3. SMART SPECIALIZATION STRATEGY OF MONTENEGRO

3.1. The concept of smart specialization

Smart specialization is a new approach to strategic planning for knowledge-based development in the European Union. It was set up as a kind of platform within the cohesion policy of the European Union, strongly nationally strategic and priority-oriented, based on an analysis of strengths and potential. The concept contributes to a stronger symbiosis between science, innovation and entrepreneurial orientation. The concept enables a wide social coverage and this makes it very important for the economic and social development of society. This concept represents a coupling between an innovative policy and precisely defined national development priorities.

A Smart Specialization Platform has been established at the Institute for Prospective Technological Studies of the Joint Research Center in Seville, Spain. Within that Platform, a procedure is given for the development of research and innovation strategies for smart specialization. This platform is based on the idea of experimental management, strategically oriented, within which a detailed analysis of the existing situation and potential is carried out, a vision is created, future priorities are defined, a plan of realization is prepared, but also of the monitoring and evaluation process. Within this platform, we identify two phases. In the first phase, the procedure for selecting priority development sectors involves a dialogue between policy makers and the private sector, through the "entrepreneurial discovery process". In the second phase, thematic partnerships of public authorities, companies and researchers from the region are defined.

3.2. The priorities of the Smart Specialization Strategy of Montenegro

Montenegro was the first Western Balkan country outside the EU to adopt the S3. The adoption of this Strategy was fully in the context of the European orientation of Montenegro, its development path and NATO membership.

The Government of Montenegro adopted the Smart Specialization Strategy of Montenegro 2019-2024 at the session held on June 20th, 2019. An external evaluation of the Smart Specialization Strategy 2019-2022 was also carried out and the document is public[6]. Currently, working groups have been formed, which work on the monitoring of the implemented activities as well as the preparation of the document for the second development phase. The developed and competitive state of Montenegro, based on S3, is based on four key priorities:

- Sustainable Agriculture and the food value chain;
- Energy and sustainable environment;
- Sustainable health tourism;
- Information and communication technologies

The fourth listed is a horizontal priority in relation to the previous three listed, which are in the position of vertical priorities.

In the period 2019-2024, it is planned to invest 174 million euros in research and innovation projects, and the priorities defined by the Smart Specialization Strategy of Montenegro were used as the main criteria for the allocation of funds. For that amount, it is planned that the government will provide 116.4 million euros, the private sector 21.7 million euros, the EU 33.5 million euros and other foreign sources about 2.5 million euros. The process of creating S3 was coordinated by the Montenegrin Ministry of Science, with the help of the Ministry of Economy. More than 300 representatives of the academic, economic, public and civil sectors participated in that process. Moreover, more than half of the participants were from the business sector. However, based on the evaluation of the implementation of S3, the conclusion is that the realized investments and activities were of a smaller scale than planned, but overall, the implementation of S3 is considered successful. Some of the conclusions are[7]:

1. There is still insufficient understanding of smart specialization and the importance of innovation for development in almost all sectors covered by the strategy, including the government;

[6] External evaluation of Smart Specialization Strategy (Eksterna evaluacija Strategije pametne specijalizacije 2019-2024, za period 2019-2022. (www.gov.me)
[7] External evaluation of Smart Specialization Strategy (Eksterna evaluacija Strategije pametne specijalizacije 2019-2024, za period 2019-2022. (www.gov.me)

2. Priority areas, strategic and operational goals defined by the Strategy are still relevant and should not be changed in this strategic document;

3. Not all actors were committed to the implementation of the Strategy in an efficient manner, which affected its final result;

4. Resources for implementing the Strategy were significantly lower than planned;

5. Strategy coordination, monitoring and reporting were quite effective.

What is considered the most significant contribution of the adoption and implementation of the Smart Specialization Strategy is the creation of a good coordination system, as well as the fact that it has been shown that business, science and innovation in combination with sectoral policies within clearly defined priorities significantly contribute to economic development, but also development of the whole society. What is available on the website[8] of the Government of Montenegro is that from the adoption of the Smart Specialization Strategy, until the end of 2022, Montenegro worked on establishing a strong system of coordination and management of this process, determining support measures and invested over 70 million euros in these activities, predominantly from own funds.

4. CONCLUSION – FINAL CONSIDERATIONS

4.1. Scientific productivity vs. The priorities of the Smart Specialization Strategy of Montenegro

The results of the analysis of the publication of scientific articles by scientists from Montenegro in journals referred to in WoS, which was presented in the previous chapters of the paper, are compared with the priorities of the smart specialization strategy of Montenegro (S3 - Smart Specialization Strategy). As already stated at the beginning of this paper, that comparison should indicate the areas of science and technology in which researchers in Montenegro are most engaged, observing whether it is in the priority areas defined by document S3. At this point, it is necessary to first investigate to what extent the priorities are narrowly or broadly defined, when it comes to the possibility of focusing research work, the results of which are then published in the form of scientific papers published in journals registered in WoS databases. Table 8 illustrates WoS categories, that is, areas of science and technology, in which it is possible to publish scientific papers, and which belong to the priority areas defined first in the phase of quantitative analysis, and then as the final priority areas of the smart specialization strategy of Montenegro.

[8] Website: Crna Gora predstavljena kao uspješan primjer primjene S3 (www.gov.me)

Table 8. *Identification of potential WoS categories for the publication of scientific papers by authors from Montenegro by priority areas of the smart specialization strategy*

S3- quantitative analysis - priorities:	**WoS ST areas**	**S3 - priorities:**	**WoS ST areas**
Energetics	26	Energy and sustainable environment	26
Agriculture and Food	33	Sustainable agriculture and the food value chain	33
Tourism	24	Sustainable and health tourism	24
ICT	7	ICT	7
Medicine and quality of life	59		
Construction	3		
Manufacturing industry	19		
Total number of WoS NT areas:	171	Total number of WoS NT areas:	90
S3-quantitative analysis – share:	**67.06%**	**S3 – priorities– share:**	**35.29%**

Source: *Author's analysis.*

The first thing that can be concluded from Table 8 is the wide range of priorities identified in the phase of quantitative analysis when developing the smart specialization strategy of Montenegro. A total of two thirds of the WoS area of science and technology (67.06%) is covered by these priorities. When looking at the final results of defining priorities S3 the scope is reduced to 35.29% of WoS categories. However, it still represents a little more than one third of the WoS area of science and technology,

which cannot be considered as the focus of engagement of capacities for research and innovation in order to realize S3. *This finding should be seen as an observation and suggestion to decision makers that in defining the priorities of a country with limited resources and a relatively low level of gross domestic product per inhabitant, as is the case in Montenegro, it is necessary to focus more on a smaller number of specific, narrowly defined priority activities. This would mean that in the case of WoS category analysis, no more than 10% of the WoS field of science and technology should be covered.*

The next aspect of the analysis of the scientific productivity of authors from Montenegro, viewed in relation to the priorities of the smart specialization strategy of Montenegro, refers to the analysis of the identified *"stock of knowledge"*, that is, the summary number of scientific papers by WoS categories in the period 2010-2024. vs. priority areas S3.

According to the data from Table 6, in the first 50 WoS categories there are 15 areas of science and technology that correspond to the priority areas of S3, and in which scientific papers were published by authors from Montenegro in the period 2010-2024. That number is slightly lower when looking at the period 2010-2018, that is, the period before the adoption of the smart specialization strategy of Montenegro, and amounts to 11 WoS areas of science and technology that correspond to the priority areas of S3 (table 7). In the table 7, in the years since S3 was adopted, from 2019-2024. the number of WoS areas of science and technology that correspond to the priority areas of S3 is 15, which is a third more than in the previous period. **It is a direct indicator of a change in the engagement of the scientific community of Montenegro** in the direction of science and technology, which belong more to the priority areas of S3. *This is a positive indicator, which, as in the case of the previous finding, should be seen as an observation and a proposal to decision makers to promote even more measures and instruments that stimulate the engagement of the scientific community of Montenegro in the direction of realizing the strategy of smart specialization of the state.*

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Conflict of interest
The authors declare that they have no conflict of interest.

Availability of data and materials
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Ethics statement
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CORRESPONDANCE:

Đuro Kutlača, Full prof.
Department,
University of Donja Gorica,
11000
Belgrade, Serbia
E-mail: kutlacadjuro@gmail.com

Sandra Tinaj, Assis. prof.
University of Donja Gorica
Faculty of International Economics, Finance and Business
Oktoih 1
81000 Podgorica, Montenegro
E-mail: sandra.tinaj@udg.edu.me

Bojana Mališić, MSc.
University of Donja Gorica
Faculty of International Economics, Finance and Business
Oktoih 1
81000 Podgorica, Montenegro
E-mail: bojana.malisic@udg.edu.me

4.

Evolution of economic thought about the environment

Ivana Vojinović, PhD

Evolution of economic thought about the environment

Ivana Vojinović, PhD

Center for Climate Change, Natural Resources and Energy,
University of Donja Gorica,
ivana.vojinovic@udg.edu.org

ABSTRACT:

This Paper gives an overview of the evolution of economic thought about the environment and explains the scientific discipline - Environmental Economics (neoclassical and ecological aspect) that deals with this topic. It elaborates the issue of the environment in the framework given in the XIXth century by the German biologist Ernst Heinrich Phillipp Haeckel, who established scientific discipline which examines the environment – ecology, because it was even at that time defined as "the body of knowledge about the economy of nature". The Paper starts by pointing out that the term environment has its roots in ancient times, but immediately highlights the fact that it is in the XXth century when its use grew significantly, especially during the past five decades when the number of questions and dilemmas related to environment and natural resources multiplied. Since in the global economy of the XXIst century the issue of preserving the environment and natural resources is one of the decisive factors in shaping economic development, which must adapt to environmental constraints, the Paper explores as a necessity the way of inclusion of the environment into the economic models.

Keywords: environment, economics, resources, sustainable development

1. INTRODUCTION

Although planet Earth is about 4.6 billion years old, questions about nature and the environment are constantly changing. Man is a part of the biodiversity which allows him to survive and on which he completely depends. From the genus Homo, in modern taxonomy the only surviving species is *Homo sapiens*, which appeared 200.000-300.000 years ago. Research conducted in the 1980s showed that, in contrast to that period, ''today humans directly control 25-40% of the total primary production of the planet's biosphere'' (*Vitousek et al*., 1986). This figure is much higher today, with the number of 8 billion inhabitants on planet Earth (UN, 2022).

For decades, it has been considered in international circles of geoscience that, due to the changes in the systems of the planet Earth caused by human activities, which are unprecedented, a new epoch (*Anthropocene*) has begun, describing the latest period in the history of Earth, which means relatively "*complete human dominance*''. Hence, environmental constraints require a new vision of observing the problems of economic development.

2. INTERACTION OF ENVIRONMENT AND ECONOMIC ACTIVITY

The term *environment* has its roots in ancient times (the works of *Hippocrates, Aristotle, Herodotus*, etc.). However, it is in the XXth century when its use grew significantly, especially during the past five decades when the number of dilemmas related to environment multiplied. After studying numerous definitions elaborated by *Crnogorac* and *Spahić* (2012, p. 6-7), this Paper considers that environment includes *,,the entire system of natural and anthropogenic phenomena, processes and objects that enable the life and interaction of living beings*''. The environment is everything that surrounds us (atmosphere, hydrosphere, lithosphere, soil and organisms), i.e. everything with which human life and its production activity are directly or indirectly connected. It is dealt with by the science of *ecology* (lat. *oecologie*). This scientific discipline was established by the German biologist *Ernst Heinrich Phillipp Haeckel* when in 1866 he published the book *General Morphology of Organisms*. Haeckel defined ecology as

"the body of knowledge about the economy of nature - the study of the overall relations of organisms to the organic and inorganic environment including, first of all, their friendly and hostile relations with those animals and plants with which they come into direct or indirect contact - in a word, ecology is the study of all those complex interrelationships that Darwin calls the conditions of the struggle for survival" (translation taken from *Allee et al.*, 1949).

Since *economics* explains the trends observed in reality, it does not only deal with economic system, but also with other systems, including ecological implications of decisions made. The essence of economics is to investigate how individuals make choices and allocate scarce resources between alternative uses to maximize the satisfaction of their unlimited needs, under conditions of imperfect knowledge, risk and uncertainty. Economy is a *"creative struggle against scarcity"* (*Vukotić*, 2006, p. 36). *Adam Smith in "An Inquiry into the Nature and Causes of the Wealth of Nations"* from 1776 perceived nature as a kind of capital. According to *Smith*, the only product of the land that always and necessarily gives the owner some rent is food (*Smith*, 1776, p.150). According to the David Ricardo: *"Nature is paid for its work, not because it works a lot, but precisely because it works a little. And the more stingy it becomes in giving its gifts, the higher the price it extorts for its work" (Ricardo, 1926).*

Ecology and economy have the same etymological root, the word *oikos* (ancient Greek - home, house), so the ecology is the knowledge of house (nature), and economics is the management of that house (nature). It is the same "house", i.e. nature/planet Earth, which is a resource base for the economy, because mostly all sources of economic inputs come from the nature (*Beaton, Maser, 2012, p. xxi*). Also interesting is the observation of *Costanza et al. (1997, p. 46)* that: *"Economics can be considered as the ecology of people, because historically ecology evolved from biology (the science of life) and ethology (the science of animal behaviour) and therefore had very different intellectual roots from economics. In a practical sense, ecology has become the study of the economy of that part of nature that does not involve humans."*

2.1. The traditional perspective of neoclassical Environmental Economics

Environmental Economics is a young scientific discipline that has been developing since the 1960's within the neoclassical paradigm and is the result of scientific research of the environment as an economic phenomenon. This science is a relatively new branch of economics and studies the interrelationship between the environment and economic development, as well as the ways and means by which prevention of environmental destruction and economic development are simultaneously achieved. "It uses models and techniques of standard neoclassical economic thought to apply economic concepts to the environment" (*Harris, Roach, 2013, p. 5)*, and is focused on the efficient allocation of natural resources, determining the price of resources, externalities, the way of managing "public goods", as well as ownership rights.

Environmental Economics starts from *the neoclassical theory of prices.* It is a concept that was first used by *Thorsten Welben* in 1900 in the work *Prejudices of Economic Science*, in which he linked "marginality theory" from the tradition of *Alfred Marshall* with the *"Austrian school of economics"*. Environmental Economics is a supplement to neoclassical economic theory, which historically dominated microeconomics and together with Keynesian macroeconomics formed a neoclassical synthesis that ruled mainstream economics as *"neo-Keynesian economics"* in the period 1950-1970. It deals with the analysis of environment and aims at efficient management of natural resources, in order to adequately value natural resources, waste and pollution. The application of standard macroeconomic theory to areas where the price of natural resources is determined, tends to achieve balance on the market of natural resources. *Costanza et al. (1997, p. 29)* describe that *"Environmental Economics (a sub-discipline of economics that deals with environmental problems) today represents a unique, magnificently conceived and coherent theory".*

2.2. Perspective of Ecological Economics

The historical roots of *Ecological Economics* are long and deep and originate at least from the XVIIth century (Christensen, 1989). *Alfred Marshall* presented the thinking that "*soft economics lies in economic biology, not in economic dynamics*" *(Marshall, 1920, p. 14*). However, the immediate roots of Ecological Economics are found in works from the 1960s and 1970s. The British economist, *Kenneth Boulding* for the first time expressed the view that: "*current levels of consumption are so high that there is a decrease in natural resources*" *(Boulding, 1950)*. Boulding's 1966 classic *"The Economy of the Coming Space Earth* laid foundations of Ecological Economics. Herman Daly, as one of the pioneers of Ecological Economics, transformed economics into a science of life, related to biology and especially ecology *(Daly, 1968, p. 393)*. According to Norgaard (1989), Ecological Economics is methodologically and conceptually pluralistic and besides neoclassical market analysis, includes alternative paradigms. Ecological Economics is a multidisciplinary synthesis of sciences ("*economics cannot be explained by economics alone*", *Vukotić, V.*), because it deals with complex problems, the solution of which should lead to a mutual improvement of the well-being of people and the rest of nature, and which cannot be solved within disciplinary structures. In fact, Ecological Economics represents the "commitment of economists, ecologists and others to learn from each other, jointly explore new patterns of thinking and facilitate the execution and implementation of new economic and environmental policies" *(Costanza et al., 1997, p. 58)*.

Ecological Economics tries to put the economic system in a wider "context of biological and physical systems that support life, including human activities" *(Harris, Roach, 2013. p. 5)*. The central question is "how to balance the size of the economic system (macroeconomic scale) with ecosystem constraints" *(Harris, Roach, 2013, p. 11)*. Since industrial revolution, the human subsystem has expanded enormously, and as of the second half of XXth century it represents the main component of the entire system. Hence, there is a need to research the causes and consequences of the instability of ecological and economic systems that "*show non-linear dynamics and are limited and structured by energy flows*" *(Lotka, 1965)*.

Ecological Economics indicates that human activity must be limited by the so called "*carrying capacity*" of environment, which is the "level of population and consumption activities of humans and animals that the available natural resource base can support without depletion" *(Harris, Roach, 1997, p. 6)*. The variable *technological progress* has an important repercussion, because it indicates that more output can be created from the available inputs. Carrying capacity appears for the first time in biology and ecology as the constant K in the population growth equation *("logistic equation")*, which was established by *Pierre François Verhulst* in 1838 and later popularized by *Raymond Pearl and Lowell Jacob Reed*, as follows:

$$Nt = \frac{K}{1+ e^{a-rt}} \qquad (1)$$

where: N (population size/density), r (maximum growth rate per capita), t (time), a (constant of integration).

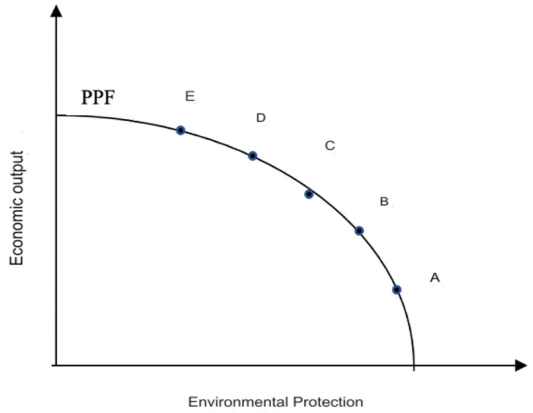
Contrary to the neoclassical approach that starts from microeconomic market analysis, *environmental macroeconomics* focuses on relationship between economic production and the natural cycles of the planet. Conflicts in these relationships create global problems such as: climate change, water shortages, massive land degradation, damage to forests, etc. Thus, this theoretical discipline is applicable to problems that occur at the boundaries of human-dominated ecosystems and other natural systems. Ecological Economics is the economy of the entire biosphere and as such the science of "*managing a portfolio of various natural assets*". Ecological economists point out that environmental factors impose restrictions on economic activities, so economic theory must include the concept of so-called "*optimal macroeconomic scope*". Its implications are particularly important "for the global economy, because national economies can overcome resource limitations through international trade" (*Harris, Roach, 1997, p. 154)*. Ecological economists apply "concepts from economics to better understand the nature of biodiversity" (*Weitzman, 1995*).

By drawing attention to the "transdisciplinary character of Ecological Economics", *Costanza et al. (2020, p. 2)* recognized that people are part of nature. Similarly, *Dasgupta (2021)* argues that accepting the fact that

man and the economy are part of nature allows to recognize the limits that nature sets for the economy, and requires an urgent change by which nature will be included in the economic calculation and decision-making process. It is also important the observation of *Hueting (1980)* that ''there was growing dissatisfaction with the deficiencies in the system of national accounts'', especially the Gross Domestic Product (GDP), due to the neglection of the depletion of natural capital. *Dasgupta (2021, p. 487)* indicated the ''institutional failure'' in determining the price of natural capital, since standard economic models have not made the "metaphysical distinction" that the global economy and population are not "external" to the biosphere, but are "embedded" in it.

2.3. Subject of Environmental/Ecological Economics

The subject of Environmental/Ecological Economics is the problem of allocation created by the use of environmental resources. As the ecological system is open and dynamic, and the anthropogenic influence in it disrupts the balance, environmental economics (its neoclassical and ecological thought) shows that activities in the environment have economic effects, both direct and indirect. According to the *"Throughput Model"*, the economic process begins with the *extraction* of natural resources, their *conversion* and *production* of intermediate and final products, and their *distribution* for sale to consumers. That final product is then *consumed* and this results in value (satisfaction, well-being, etc.), so that at the end of its lifespan it is disposed off *(Beaton, Maser, 2012, p. 57)*. By transforming ecological goods into economic goods, natural resources are used to satisfy human needs. This transformation leads to an increase in the demand for ecological quality, while the supply of other resources decreases. Environmental economics (its neoclassical and ecological thought) indicates that it is wrong to stop at the final conclusions of the *"Throughput Model"*, because that gives the wrong impression that with consumption, resources disappear from planet Earth. Instead, it focuses on the concept of reducing anthropogenic contamination to a *"socially desirable level"*.



Graph 1. *Trade-off between economic output and environmental protection*
Source: *Own presentation derived from microeconomics and macroeconomics textbooks*

The trade-off between economic production and the environment can be analysed by using the Production Possibility Frontier (PPF) (shown in Graphic no. 1). Any choice on the PPF (A, B, C, D, E) is economically efficient. At one extreme, when choosing E, the state chooses a high level of economic production, but low environmental protection. At the other extreme (choice A), the state chooses a high level of environmental protection, but a low economic result. Thus, increasing environmental protection includes the opportunity cost of less economic production. Environmental economics tries to show that this does not have to be the case, but it is possible to find an appropriate ecological-economic balance. On the other hand, excessive use of resources relative to their reproductive capacity reduces supply to the point where their price rises, creating a contraction in demand. As a result, it might be concluded that a society can have more environmental resources only by renouncing from other necessary consumer goods and services.

3. INCLUSION OF ENVIRONMENT IN ECONOMIC MODELS

Economic thought has long been influenced by the conventional historical doctrine that natural resources are free. Therefore, nature, although very present and necessary in economic life, is excluded from economic models. Keynes' classical theory deals with the conditions for achieving *ad infinitum* equilibrium between macroeconomic aggregates: consumption *(C)*, savings *(S)*, investments *(In)*, government spending *(G)*, as well as imports *(U)* and exports *(I)*. In national accounts, the irreplaceable indicator that measures economic progress is GDP, which is expressed as the market value of the flow of manufactured goods and services in a given year.

$$GDP = C+G+In+(I-U) \qquad (1)$$

This macroeconomic indicator does not take into account the depreciation of natural capital, so a country can have a high GDP and at the same time deplete natural resources, without having that visible in national statistics. If, for example, biodiversity is destroyed for building a shopping mall, the national accounts will record an increase in manufactured capital but not a decrease in the volume of natural capital. GDP gives no indication of the resources that make it possible *(Bolton, 2020a, p. 62)*. It was in the past that the global economy achieved such economic growth. However, permanent and linear economic growth is a biophysical impossibility *(Beaton, Maser, 2012, p. 175)*. Economic growth together with population growth converted environmental resources into economic goods. It has also become unclear whether technological progress will lead to a growth in global output that could overcome nature's scarcity over time.

An alternative formula for calculating economic growth that takes into account the needs of the economic system for ecological cycles (carbon cycle, nitrogen cycle, water cycle and organic cycle) could look like:

$$GDP_1 = C+G+In+(I-U) +G+ (X+Y) \qquad (2)$$

where: X (natural resources), Y (waste and pollution).

The new approach introduces the term *"sustainable development"* instead of the term "economic growth". The term "sustainable development" was introduced for the first time into public discourse in 1987 in the famous *"UN Brundtland Report: Our Common Future"*. Sustainable development is defined as *"development that meets the needs of the present generation without jeopardizing the ability of future generations to meet their own needs and consists of the triangle: ecological integrity, social equality and economic stability, whereby these three criteria are not in competition with each other, but are complementary" (WCED, 1987).*

4. CONCLUSION

By paraphrasing *Thomas Kuhn (1974)* from *The Structure of Scientific Revolutions,* in which he elaborated in great detail and supported the concept of the structure of scientific revolutions with numerous examples from the history of science (e.g. Copernicus' Theory of the heliocentric system, Newton's mechanics, Darwin's Theory of evolution, Einstein's Theory of relativity, etc.), that *"a new paradigm must appear"*, it is indicated that both analytical perspectives of Environmental Economics explained in this Paper *(neoclassical and ecological)* should be applied in a complementary manner in order to develop this theoretical discipline, aimed at solving environmental problems. Some authors even consider (thesis to which the author of this Paper inclines) that the two approaches have merged into *"Environmental and Ecological Economics" (Hoepner et al., 2012).* The new paradigm arose in historical circumstances of the XXth century and became a benchmark for understanding the world that surrounds us in the current socio-historical and geo-political circumstances.

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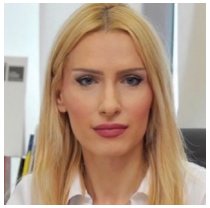

Ivana Vojinović, PhD
University of Donja Gorica
Center for Climate Change, Natural Resources and Energy
Oktoih 1
81000 Podgorica, Montenegro
E-mail: ivana.vojinovic@udg.edu.org

5.

Corporate diplomacy in a non-market environment

Danilo Đikanović, PhD

Corporate diplomacy in a non-market environment

Dr Danilo Đikanović[1]

[1]Trade Analyst, World Trade Organization
danilodjikanovic01@gmail.com

ABSTRACT:

The research examines the challenges of multinational corporations amidst evolving business conditions. The impact of globalization on the increasing importance of the non-market environment in international business is analyzed, as well as the need to adapt to the various cultural contexts through corporate strategies. The instruments for conducting successful business in a global village are identified, focusing on the challenges arising from the interests and goals of diverse non-market stakeholders. Through the review of literature, qualitative research method and analysis of secondary sources, the necessity of corporate diplomacy for corporate survival in different social contexts is proven.

Keywords: corporate diplomacy, non-market environment, global village, multinational enterprises, non-commercial risks.

1. INTRODUCTION

Globalization is increasingly understood as an evolutionary process, as opposed to an unchanging state. Its scope and meaning vary over time, depending on the interests of stakeholders. The new phase of globalization is expressed in the increased importance of non-market actors in the global village, where adapting to change requires new strategic mindsets. Success in global markets thus increasingly depends on non-market performance, since the risks lie in the social role corporations play in various cultural contexts. Operating in a non-market environment raises the following questions:

- Who, and how important are the non-market stakeholders?
- What are the key challenges in a non-market environment?
- Which corporate diplomacy strategic instruments enable successful international business?

In searching for answers to the posed research questions, the role of corporate diplomacy is examined. The focus is on multinational enterprises (MNEs), operating in communities whose stakeholders pursue goals that often conflict with corporate interests. Corporate diplomacy instruments are identified, with an emphasis on issues rather than stakeholders. Transmission belts and corporate strategies for the prevention of typical mistakes in a non-market environment are explored. Determining the above concludes on corporate diplomacy as a methodical approach to thinking and a set of tools for dealing with socio-cultural issues that affect corporate success.

2. LITERATURE OVERVIEW

As a scientific discipline, corporate diplomacy has gained momentum only in recent decades, with its roots in the latter part of the 20th century. Madi (2021) provided fresh perspestives on the roles that corporate diplomacy has when dealing with cross-boundary business challenges, with a core focus on the context of the coronavirus pandemic. While the research underscored the significance of comprehending the intricate elements influencing corporate diplomacy strategies, its focus is closely related to a specific context, limiting the generalizability of research findings and their applicability. Egea, Parra-Meroño, and Wandosell (2020) focused more on the use of corporate diplomacy for exerting influence in foreign markets. They emphasized the importance of networking with external stakeholders to improve corporate intelligence. However, the study

focused on exclusively Spanish MNEs, thus limiting its applicability in a broader international context.

On the other hand, Mirvis, Hurley, and MacArthur (2014) based their research on the analysis of corporate behavior by leveraging global pro bono service to develop business executives' diplomatic skills. They highlighted the potential of diplomacy to offer solutions for complex global issues but focused the analysis on a certain approach to developing diplomatic know-how, overlooking other dimensions of corporate diplomacy. Furthermore, Willigen (2020) offered new insights in international relations literature focusing on the role of businesses as political actors. The research contributes to a broader recognition of business diplomacy and its significance in shaping global governance, but its lack of comprehensive theoretical frameworks involving non-market environment constrains the depth of analysis.

Moreover, Monteiro and Meneses (2015) assessed the relevance of diplomatic strategies for business internationalization, highlighting the potential of a strategic management mindset for multinational enterprises. However, the study was exclusively related to the analysis of Portuguese companies, limiting the possibility of generalizing the findings and their application in different contexts. Bolewski (2018) complemented the scientific literature on the concepts of corporate diplomacy through the investigation of the link between diplomacy and corporate governance as an indispensable element of transnational business processes. However, the paper did not investigate the importance of non-market environment for conducting business through the means of corporate diplomacy.

Evidently, scholarly work lacks an overview of the mechanisms and instruments of corporate diplomacy, on the basis of which strategies of multinational companies can be developed for conducting sustainable business in non-market contexts shaped by cultural, political, and social factors. Therefore, this paper strives to fill in the research gaps and offer argumentative answers to posed research questions, thus complementing scientific findings in the field of corporate diplomacy.

3. METHODOLOGY OF THE RESEARCH

The research methodology is qualitative and exploratory. A review of the literature on the roles of corporations in non-market environments is conducted, along with an analysis of stakeholder theory and concepts of corporate diplomacy. Based on scholarly works, a theoretical framework is built, enabling to understand the relationship between corporations and the non-market environment. The research synthesizes findings to interpret the corporate engagement with non-market stakeholders, identifying patterns, challenges, and strategies. It integrates elements from stakeholder theory, social network theory, and neo-institutional legitimacy theory, to comprehend corporate conduct.

In specific terms, the methodological approach includes the following:

1. Analytical review of the existing literature.
2. Conceptual examination of corporate diplomacy.
3. Investigation of the instruments of corporate diplomacy.
4. Qualitative analysis of corporate diplomacy and sustainability.

The analytical framework is based on the "context, content, process (CCP) model", developed by Pettigrew (1985) for the research on organizational change. It allows evaluations to be conducted flexibly, providing a foundation for addressing not only the social but also the cultural and political dimensions of the research questions.

4.RESULTS AND DISCUSSIONS

4.1. Corporate diplomacy: a framework for analysis

There is little agreement on what exactly corporate diplomacy represents, what its roles are, and how wide is the scope of its activities. Scherer and Palazzo (2011), as well as Valente and Crane (2010), argue that governance gaps pressure multinational enterprises to consider their own political

responsibilities both individually and within partnerships, particularly in conditions of a political conflict. Similarly, Palmisano (2006:12) points out that corporations as well as national governments cannot act independently because issues are "too big and too interconnected." The changes that have taken place over time, particularly from the end of 20th century through the privatization of public services, ongoing processes of globalization, and an increase in the number of MNEs, have led national authorities to no longer have the means to implement policies without public-private partnerships (Garten, 1997).

In a globalized world, corporations need to expand their core roles in a way to be conscientious of their impact on the society. Henisz (2014) believes that MNEs need to be focused on non-financial values, and that their goals should be achieved through the application of corporate diplomacy. With such an approach one can develop moral legitimacy and social license to operate, while understanding that stakeholder initiatives serve to inform corporate mindsets in a global environment. Ghemawat (2010) explained that such diplomatic practice aims to create fertile ground for business operations. It involves addressing both economic and social actors to capitalize on market opportunities, deepening collaboration with business regulators. On the other hand, it also focuses on averting conflicts with external stakeholders to mitigate associated risks and assists in garnering media support to build corporate image.

Ruel and Visser (2012:44) characterize the corporate diplomat as "an entrepreneurial broker for performing a function of mediation between parties that can potentially gain from collaboration, and because the diplomat performs an entrepreneurial function by searching, discovering, conceiving, and implementing favorable conditions for the conduct of corporate activities." Asquer (2012) here argues that acknowledging the conceptualization of the corporate diplomacy can enhance the rationale behind corporate conduct. Following his understanding, some concepts like public relations appear to have narrow connotations, with a focus on specific negotiation contexts or under conditions where enterprises address public opinion (MacNamara, 2012).

Corporate diplomacy can include overlapping activities with other bordering concepts as well. As per Asquer (2012), it can aim to influence rule formation and even preempt potential conflict. Similarly, he points out that "negotiation activities may be intended to create and seize business opportunities, while public relations activities may aim to safeguard the image and reputation of the firm" (Ibid:57). However, according to the framework used in this research, corporate diplomacy integrates these activities in a strategic manner, serving a purpose to cultivate more favorable conditions for corporate operations.

Wilfried Bolewski (2018:119) endorses this by defining corporate diplomacy as "diplomatic activities of transnational corporations to practice and influence policies." He underscores that corporations grapple with evolving expectations in relation to their societal roles. Furthermore, he posits that practicing economic diplomacy has become inevitable, as MNEs must shape their management according to the ongoing globalization. The interplay between diplomatic and corporate mindsets is reflected in a symbiotic relationship, wherein diplomacy and international business management functionally converge, generating shared values that address both private and societal needs (Ibid).

The above definitions and the observed differences between them will serve as the the theoretical underpinning of this study. Considering the possibility of overlapping certain activities of bordering concepts of diplomacy, the focus is given on the comprehensive definition of corporate diplomacy, which will be studied from the perspective of multinational businesses. In doing so, its usefulness will be analyzed as a set of identified methods and tools for achieving market goals, but also as a mindset for achieving non-financial values in a non-market environment.

4.2. The non-market environment

Steger (2003) claims that, whether corporations like it or not, they cannot avoid dealing with interests, institutions, ideas and rules that are outside the market domain. In this research, the expression of "non-market" is used for such a business environment. This does not in any way diminish the relevance of market stakeholders. The question is not whether they matter - they do; the controversy is the importance of the non-market stakeholders in the contextual business environment. Many stakeholders

could be mentioned, and it depends on the issues that corporations are facing how long would that list be. But some stakeholders are commonly recognized, including governments, local communities, the media, intergovernmental entities such as the UN and the WTO, INGOs, and so on. Other civil society groups, activists, political parties, regulatory agencies, and many other stakeholders could be added to the list, depending on the issue at hand.

The focus should be the issue of stakeholder engagement. Stakeholders are not a target to be hit; they point to a problem to which the corporation contributes by its actions. The relationship with stakeholders should be built based on collaboration and joint action to address issues in the common environment. Cooperation may or may not be coordinated, as there are several ways to build relationships with stakeholders, from passive action to proactive corporate diplomacy. Steger (Ibid:42) points out that corporations that fail to realize this, make "typical" mistakes: "not really understanding the issues, the core of the controversy; underestimating the adversary; and moving too slowly, too little, and too late." Identifying issues will also indicate who the relevant stakeholders are, which is a prerequisite for corporate diplomacy to be effective, and the risk of emerging issues in the non-market environment to be reduced.

Bayne and Woolcock (2016:14) have created a list of principal actors, who according to them, play the most important roles in economic diplomacy relations. The actors are listed in the table below.

Table 1. *Principal actors in corporate diplomacy*

National State Actors	Non-State Actors	Transnational Actors
The Executive Branch	Business Interest Groups	Global Civil Society
The Legislative Branch	Confederations of Industry	International Business
Political Parties	Sector Trade Associations	International Organizations
Provincial, State and Local Government	Trade Unions	Epistemic Communities
Regulatory Agencies	Consumer Organizations	Other emerging actors

Each of the mentioned stakeholders has its own goals and means to achieve them. In relation to corporations, NGOs, as one of the most important civil society actors, are often interested in transparency, accountability, democracy, and legitimacy, as attributes that are often a shortcoming in the operation of global companies. The media, on the other hand, determine which topics will receive attention, how problems are structured and perceived. Through the "agenda setting", the media influence where civil society and state actors will focus attention and put pressure, but they also influence the provision of additional attention to already identified problems. Their interests and activities also have an impact on regulatory bodies, that can be national and international, which ultimately significantly affects the market goals of corporations. For these reasons, the non-market environment is of great importance for the financial evaluation of the corporations.

In exploring strategies for volatile and fragmented business environment, Steger (2003) states that one must understand what constitutes the "transmission belt" that can transform stakeholders' expectations, or even anger, into corporate relevance. In the contextual business environment, covering all non-market factors and stakeholders, many avenues for the transmission of influences could be identified. These transmission belts are perceived as channels, through which "drivers" of issues can try to shape corporate conduct. Depending on the importance of the issue, the effectiveness of the alternatives and the resources of a stakeholder, different "belts" could be chosen. In this regard, one of the oldest forms is through direct action, although it is rarely effective, if not accompanied by other means. This is why issues are increasingly dealt with through legislation processes and lobbying, as the public expects to see solution to a problem once its awareness has been raised, although this is usually a cumbersome process in a democracy. For this reason, stakeholders will choose the channel suitable to their interests and capabilities.

In the following figure, Steger (2003:42) displays the different types of transmission belts.

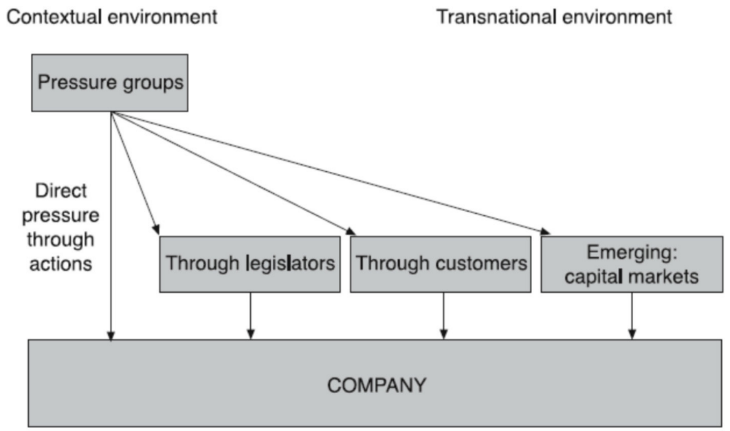

Figure 1. *Transmission belts*

The same process is applicable in international negotiation, hence the involvement of non-state actors is an essential part of the process of reconciling domestic and international pressures, because it widens the scope of accountability (Bayne and Woolcock, 2016). Thus, corporate diplomacy becomes crucial at building strong relationships with foreign non-business counterparts and external constituencies (Saner, 2000).

Further on, KPMG published a study on the interaction of MNEs with non-market stakeholders to measure change in conducting structured dialogues. According to their results, among more than the top 4,100 largest companies globally, 71% of them mention structured stakeholder dialogues in their Corporate Social Responsibility reports against 39% of the 1,600 largest companies in 2005 (KMPG, 2013). In the stakeholder theory, these actors are perceived as non-commercial parties, defined as "any group or individual who can affect or is affected by the achievement of the organization's objectives" (Freeman, 1990). As per the social network theory, understanding the stakeholder environments and how organizations respond to stakeholder forces is key (Rowley, 1997). This is additionally explained by the neo-institutional legitimacy theory, which stresses that corporations need to conform to the "rules of the game" (North, 1996) and obtain "a license to operate" in foreign markets to reduce liabilities of being foreign (Kostova and Zaheer, 1999).

However, obtaining a license to operate should not be understood solely in terms of financial valuation. Corporations play a social role, hence they are under public pressure to harmonize the stakeholder interests with societal needs, while providing sufficient attention to the public good (Bolewski, 2018). Consequently, MNEs assume a political role, thereby expanding their societal impact (Asslander and Curbach, 2017), and becoming catalysts for diplomatic resolutions (Kamphof and Melissen, 2018).

4.3. Instruments of corporate diplomacy in the non-market environment

There are many instruments of economic diplomacy which could be employed, especially ones of the non-technical nature. Egea and Wandosell (2020:55) have compiled ones deemed as the most important, displayed in Figure 2.

Concept	Objectives	Outcomes
Competitive intelligence	■ Strategic information ■ Knowledge (environment/trends) ■ Anticipate/read possible risks	■ Strategic planning
Networking with external stakeholders	■ Create and maintain good relations with groups of interest/pressure, regulators, and governments ■ Know their expectations/attitudes ■ Create internationalization networks	■ Business Diplomatic Agenda (BDA) ■ Relational capital ■ Enabling environment for business
Corporate reputation	■ Positive perception of the entity and stakeholders ■ Avoid/solve possible conflicts	■ Reputational capital
Lobbying	■ Represent, support and defend the interests of the company ■ Internal/external communication	■ Policies favorable to the entity and/or industry ■ Coherence with the company´ strategy

Figure 2. *Key corporate diplomacy instruments*

Ruel (2017:243) identified more precisely the instruments used by MNEs in building and sustaining relationships with non-market partners. Figure 3 below illustrates a matrix of the critical corporate diplomacy instruments derived from stakeholder dialogue literature, including only those employed by a minimum of two distinct companies.

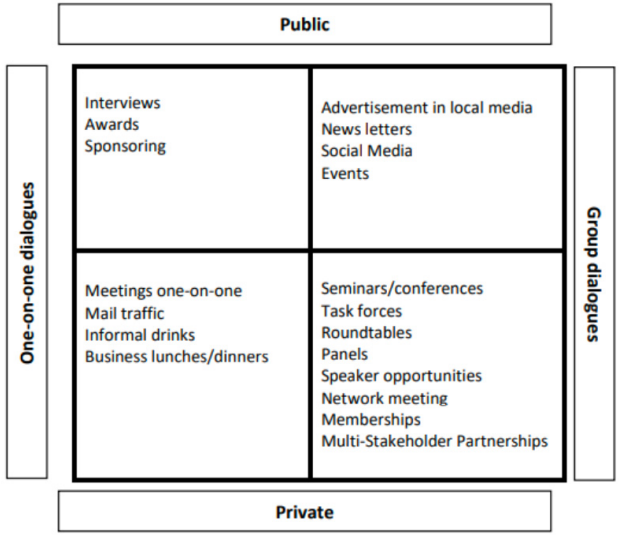

***Figure 3**. Corporate diplomacy instruments matrix*

The vertical axe indicates if the corporate diplomacy instrument is deployed in a one-on-one dialogue or in a group setting. The horizontal axe shows if the instrument applied in a stakeholder dialogue is used in a public or private manner. Varied by the nature of the issue, the type of corporation and its goals, appropriate combination of instruments should be used within the identified corporate strategies.

Hillman (2003) identifies another crucial aspect of corporate diplomacy, highlighting the significance of political connections as a means to access political insights, garner consideration in political processes, and gain preferential economic advantages. He explained that relying solely on political connections as a diplomatic strategy may fall short when addressing the underlying causes of conflicts in the non-market environment. On the other side, leveraging political affiliations alongside diverse stakeholder interactions could enable corporations to not only safeguard their market interests but also enhance societal well-being. Research findings in the area of applied corporate diplomacy suggested several instrumental approaches for this purpose, including a thorough examination of stakeholders, coupled with the identification of their interests in decision-making (Henisz, 2014).

International organizations have consolidated several prevalent stakeholder concerns to develop practical guidelines for MNEs. These guidelines function as regulatory codes of conduct endorsed by stakeholders for a variety of purposes. A prominent example, the OECD "Guidelines for Multinational Enterprises" stands as a set of recommendations directed by government actors to MNEs conducting business in compliant countries. However, the principles contained in the guidelines are non-binding, including the standards for managing a sustainable business in the non-market environment (Ruel, 2017).

Ruel (2017) further identified mechanisms useful to promote multi-stakeholder collaboration. One instance is "life cycle thinking," which aims to enhance understanding of complex decision-making and delineate aspects of stakeholder engagement. By leveraging quantitative data and stakeholder insights, this mechanism provides insight into stakeholder interactions, alternative scenarios, and potential outcomes. Another instance is "issue-focused management," which underscores the importance of stakeholder communication and collaboration in addressing common challenges. Conversely, "organization-focused management" refers to establishing legitimacy by alignment with the interests of major stakeholders. Successful collaboration with non-market stakeholders can be also facilitated through information systems, such as the multi-agent system, which serve as platforms that enable consultation and inclusive governance (Purnomo, 2005).

Choosing among the identified instruments depends on a corporate strategy appropriate for a given cause. In this regard, corporations may opt to employ more or less intensive corporate diplomacy, as presented by Westermann-Behaylo et. al. (2015:389) in Figure 4 below.

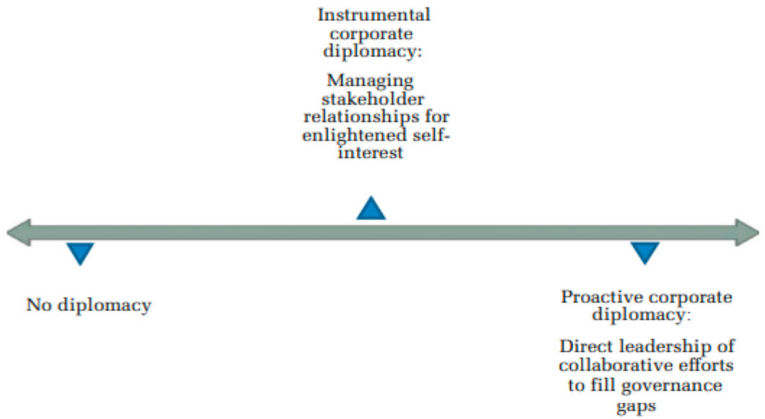

Figure 4. *Continuum of corporate diplomacy*

The authors observed corporate diplomacy as a spectrum, wherein the level of involvement and goals range from abstaining from diplomatic measures to embracing more utilitarian strategies, and ultimately to proactive diplomatic corporate diplomacy.

Given the multidimensional character of international business, corporate leaders should leverage tactics employed in diplomacy as "best practices" for interacting with stakeholders in non-market environments. The above-mentioned concepts and mechanisms serve as instruments for stakeholder engagement, which ultimately not only increases financial valuation but also enables corporations to thrive in the interconnected global community by tackling wide-ranging societal challenges.

5. RESEARCH LIMITATIONS

The research primarily focuses on theoretical aspects and conceptual frameworks of corporate behavior in the non-market contexts, as well as the instruments of corporate diplomacy. While the review of case studies is integral to the analysis, the findings lack an empirical approach and case studies for a more complete validation. Therefore, including primary data collected through empirical research would increase the applicability of the research results.

Furthermore, while the research examines different stakeholders and their roles in the non-market environment, it potentially generalizes the behavior and motivations of these stakeholders across different industries, regions, and contexts. Conducting a more nuanced analysis based on these findings could strengthen the conclusions.

Moreover, the paper primarily examines the perspective of scholars and experts in the field of corporate diplomacy. There is a potential for new research in analyzing the viewpoints of policymakers and representatives from civil society organizations, which would enable a more comprehensive understanding of corporate behavior in the non-market environment.

6. CONCLUSION

The research has shown that corporate diplomacy is taking an increasingly important place in international business strategies. Involving stakeholders in decision-making processes will not only provide social licenses to operate but enable corporations to play a role in responsible governance. Increasing social welfare is therefore a precondition for reducing the risk of survival of multinational companies, that create a great impact on the social communities.

Research has proven that corporate diplomacy, understood as a type of mindset, but also a set of various business and diplomatic instruments, is an adequate method for dealing with a wide range of diverse societal issues that exist in various cultural environments. Qualitative research methods have served to identify appropriate corporate strategies in order to prevent typical mistakes, as well as to review the possible intensities of corporate diplomacy depending on the needs and capabilities of multinational companies in given environments.

The lesson learned is that the application of corporate diplomacy is a necessity, and that non-market stakeholders are increasingly important factors in corporate success. Multinational companies that adopt or ignore the reality of multicultural influences will therefore prompt new research

findings on the importance and application of corporate diplomacy.

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CORRESPONDANCE:

Dr Đikanović Danilo, Trade Analyst
World Trade Organization
Accessions Division
Rue de Lausanne 154
1202 Geneva, Switzerland
E-mail:danilodjikanovic01@gmail.com

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The nexus of geoplitich and business

Ivan Jovetić, PhD

The nexus of geoplitich and business

Ivan Jovetic[1],

[1]University of Donja Gorica
ivan.jovetic@udg.edu.me

ABSTRACT:

Different perceptions and quests for ''truth'' or generally accepted reasoning have framed every scientific and even more philosophical revolution. Geopolitics and the role of the business within is not an exemption at all. It is strongly believed that businesses have been the structural element of state's creation. And for sure not the vice versa. The paper examines the notion of role and meaning of business into the research realm of geopolitics. The outcomes of the paper are fully in line with the necessity of business geopolitics introduction. Moreover, the paper proposes the notion of networked university geopolitics.

Keywords: geopolitics, business, network, nexus, individuals, technology

1. INTRODUCTION

Kant believed that *geography underlies the foundation of history.* [1][2] One of the important questions is whether geography shapes cultures? Is it possible that the Mediterranean is the way it is because of its geographical (semi)openness? Geopolitics *implies* global politics and its relationship with geography in the general discourse. This relationship is most often perceived on the basis of natural or artificial borders, i.e. geography. Seldom, if at all, the context of geopolitics includes business, and primarily global companies.
It is certain that the involvement of business in geopolitics is not an "innovation" of the contemporary period. Although business was then defined in the form of merchants, represented the source of power of the feudal rulers. In the past, merchants were the sources of funding for conquest campaigns in order to gain additional economic, military and political power, in that order. The logic was undeniable. Capital was necessary for further expansion. In this way, or through the return of money by the ruler, merchants were an instrument and often an actor in the geopolitics of that era. Charles Tilly is one of the authors who came to the conclusion by analyzing wars in a long historical space that wars are a "structural element of state formation". [3] Merchants/ corporations/business, viewed in this way, could certainly be defined as a *structural element of war financing*. [4] Moreover, also Ripsman claimed that money is war's driving force. [5] If business is a structural (and the one which enabled) element of war and war is a structural element of the formation of the state, are we able to perceive and understand *that business created the state and not the other way around*? And can we think that business created geopolitical relations? Moreover, it is even more important to understand the role of business in the geopolitics in history, contemporary issues but also future challenges.

In addition, examples like ''The British'' or ''Dutch East India Co.'' can be partial narrative about the involvement of business in geopolitics. The mentioned companies were not only instruments of their states, but also "operators" of the way of life and work in their geopolitical space. The existence and functioning of private security, military companies and even armies additionally support the claim both for the past and for the contemporary geopolitical time.

It seems that the influence of business on geopolitics can be direct and indirect. Additionally, this division has to do with the form of governance in a particular country. Namely, direct influence can be perceived through the activities of private companies even when they are not instruments of their own states, regardless of whether it is about ''Meta'' or ''McDonalds''. On the other hand, indirect influence is possible through the activities of state-owned companies and funds for the goals of the home state itself. Qatar could be a good example of these activities. Businesses *are an expression of the culture* of a certain geographical area. Therefore, it is not surprising that in the number of innovations in the 20th century

was significantly higher from the entrepreneurial culture in the USA than from the culture of failure from European or later EU countries. Today, we see and are yet to expect an innovation breakthrough from Asian countries, and not only China. However, perhaps a better terminology is used by Dominique Moisi explaining the existence of different cultures of fear, humiliation and hope. [6] It is precisely the culture of hope that he ties to the Asian geographical space. Analyzing trade, conflict and culture in the 21st century Khanna is on a similar path with the claim that the future is Asian. [7] If cultural patterns define both the existence and creation of states (as geopolitical actors) but also businesses (as unrecognized geopolitical actors), the question arises as to what the difference is. It seems that the difference can only be in the *perception or social construction* of the role and power of the state as such, as well as the role and (recognition) of the power of business. It is exactly the contribution which is pointed in that direction to change the perception and social construction of the role, power and importance of business for society and geopolitics.

Klement considers that the big three themes of geopolitics are: (i) climate change, (ii) the rise of China and its role in the transformation of global trade and (iii) the transformation of the world into a world of data and access with the context of cyber challenges that accompany it. [8] If he is right, can it be expected that any of the aforementioned challenges can be tried to be solved without business? Business is right at the center of the aforementioned events and a huge percentage of them create or seek solutions for the problems that have arisen. All on its own! Without state aid. However, the state often *pressures* business to solve problems without recognizing its right to be an in-fact the actor.

2. LITERATURE OVERVIEW

Literature recognizes classical, critical and feminist geopolitics as dominant discourses and forms of geopolitics. On the other hand, the introduction of business geopolitics is extremely rare and therefore valuable.

Precisely because of all that is aforementioned, the book "Geopolitics and Business" by Cedomir Nestorovic has a special importance and role in observing the constantly changing world. [9] Nestorovic very precisely explains *that it is*, but also *why* business is necessary for schools of international relations and vice versa. Global changes and their impact on business, the parallelism of processes and even the goals of international relations and global companies, the presence of risks both in international relations, i.e. geopolitics (country risk as a dominant determinant) and in business (investment, operational, ...). Bearing in mind that business is inseparable from society and that Beck also defines "risk society", it seems that business, state and society are united by *the context of security.* [10] Professor Vukotić perceives *security as an economic resource*.[11] The history of the world best attests to it.

Nestorovic considers that business should be a part of geopolitics, with regards to its relevance and the fact that it does not function in isolation from society, as well as the meaning of business interpreted in the form of its interest in productivity, efficiency and creative destruction.[9] In addition, business is also interested in geopolitics, at least in the domain of swiftness and influence on changes. At the same time, it is not solely referred to the changes in regulation, which some geopoliticians want to display as the only connection of the state as an actor and a subject of the process and business as an object of the process.

Geopolitics is usually defined as the influence of geography on politics. The question that arises is what happens when physical geography begins to submit to virtual geography? Can old solutions be valid? Can business create new solutions and new models there?

Nestorovic introduces the term business geopolitics, obviously with the intention of making a distinction with the dominant theories of geopolitics. Business geopolitics is contrasted with the term and concept of geo-economics by Joachim Klement.[8] Geo-economics is dominantly related to geopolitics from the perspective of investors. However, if the concept of business geopolitics is that business is one of the actors of geopolitics, then it seems that there are no major differences between the two concepts, having in mind that the intention of both to include *business decisions and behavior in the equation of global relations.* Especially because business, i.e. transnational companies, are investors in global relations as well. However, there is a potential difference. Klement seems

to view geoeconomics from the perspective of an individual investor, and Nestorovic views it from the perspective of corporate global aspect and influence. Consequently, the concept of risk as well as scope of gains and losses are not and cannot be the same.

Nestorovic emphasizes that geopolitics is focused on three concepts: state, space and power.[9] Classical geopolitics focuses on how geography affects states and power in international relations. On the other hand, he emphasizes that critical geopolitics is the one that takes the form of geographic imagination and emphasizes operative foreign power, regardless of whether it is: a part of political space, permeates political space, or is outside the political space. The first is focused on the material and objective while the second is focused on knowledge and discourse as sources of power. Classical geopolitics emphasizes and deals with practical matters and is based on the Westphalian concept of sovereignty, i.e. on the world as a closed system and geographical determinism. Precisely the last one, which considers that it is geography that determines human actions, has its roots in theological and natural determinism. Furthermore, he believes that classical geopolitics has its roots in positivism, rational choice theory and causalism. According to a certain number of authors, classical geopolitics aims to identify geographical opportunities and vulnerabilities and to identify ways of using them. Nestorovic analyzes both Ratzel and Kjellen.[9][12][13] By creating his concept of "lebensraum", Ratzel laid the foundations for the logic of a theoretical basis for ***conquest***.[12] However, even at the beginning of this concept there is a correlation with business. Conquering new markets or market niches is one of the forms of business functioning and essence of business. The methodology is different truthfully. Another Ratzel's element that can be "used" is ***culture***. Although he speaks about the superiority of racial culture, the focus here is on the "superiority" or otherness of corporate cultures. In certain contexts, including business and education, this otherness contributes to success. The authenticity of the culture of UDG confirms the aforementioned. [1]

Power arises from sovereignty over territory from the aspect of classical geopolitics. In addition to that, the next important element is the population, because it is the subject of the expression of the "objective" power of the state. This means that without borders and population there is no country. One could find a certain parallel with business here as well. Without a product/service and customers, there is no business. Classicists divide power into hard and soft, which in their most basic sense could be seen as the power of coercion or influence. The focus of geopoliticians is on hard power, dominantly military and economic. Truthfully, Bolding, Carr and Morgenthau "allow" economic power but attribute it as a feature of the state in global relations.[14][15] It seems, however, that the previous ones, but especially the contemporary era, are a confirmation that business is the direct bearer of economic power. The common content for all of them in the observation of power is defined as "the capacity to impose something".

In other words, according to Robert Dahl, it is *the ability to make others do what they would not otherwise do.* Precisely in this context, classicists do not give non-state actors the attribute of actors because they do not possess the so-called hard power. If we agree upon that hard power includes economic and military power, the question is whether businesses have the hard power and whether they can have it. If the answer of the majority is no, then a new question arises: what is the economic power of certain transnational companies (measured by profit, income, market capitalization) in relation to the economic power of states (measured by GDP or budget), as well as whether there is military, armed power of private military and security companies (from WatchGuard International, Constellis Holdings to Wagner). Classicists also make a "mistake" by viewing military spending as a positive influence on economic well-being. In addition to the fact that the ideas of classical liberalism deconstruct these claims both theoretically and practically, some other researches support the deconstruction of theses. Namely, Nestorovic cites the research of Mintz and Stevenson, based upon the analysis of 103 countries, who proved that the contribution to economic growth which is based on military spending is below 10%.[16] On the other hand, soft power can be based upon the export of culture, society's values, lifestyle brand. There are numerous examples that would support the Americanization of global societies. Considering that "the future is Asian" potentially, as Khanna says, the question arises whether we may witness another export of culture and the achievement of the goals of (soft) power. In both cases, the power of business is the source and the "instrument" of realization.

[1] UDG is University of Donja Gorica, private university as well as the biggest entrepreneurial project in Montenegro.

On the other hand, critical geopolitics tries to "frame the problem" by providing answers to the following questions: where the problem comes from, who created it, with what goal and whether it is possible to solve it. It appears with the rise of the attractiveness of Foucault, Derrida and Gramsci, but its roots can be found in Bacon works and his idea that "knowledge is power". Foucault continues by formulating that "power shapes knowledge in accordance with its intentions".[17] Nestorovic deconstructs the origin of the ideas of both classical and critical geopolitics very precisely. He clearly defines it as an opposition to classical geopolitics, which presupposes questions about who and for what purpose created the prevailing (global) order. The basic distinction between these two approaches to geopolitics can be seen in the relation *to the problem.* The classical one will deal with a proposal for solving the problem, while the critical one will try to answer the questions of whether the problem as such actually exists, how it can be framed and contextualized, as well as why or based on what need does it exists. Critical geopolitics will, for example, do everything to put the war conflict in the context of time and space. The motive of this approach is the identification of alternative solutions to the mentioned problem. Critical geopolitics rejects classical ideas about the objectivity of science and the existence of an objective truth precisely thanks to the introduction of "situational knowledge".

3. METHODOLOGY OF THE RESEARCH

Dominant research methodology has been desk research using comparative analysis as well as cause-consequences analysis. The topic itself requires multidisciplinary approach. Novelty of the topics descriptions also led to certain forms of historical analysis. The general idea has been to identify whether business is and can be involved in geopolitical landscape. Analysis of the historical patterns and impact of business into the formation of state and war's funding as well as other processes have been used as the its track record for involvement into the creation and development of the institutions usually not foreseen as impacted by businesses. Briefly some of the case studies have been mentioned as well. The role of the business has been also analyzed in the context of the triangle elements of geopolitics: space, power and state. Desk research has comprehended papers of Nestorovic, Klement, Moisi, Beck, Tilly, Marshall, Vukotic, Ohmae, Kuhn and others framed in the general topic of business aspect assessment within the geopolitical arena. The literature overview has been provided into the previous chapter. In addition, some of the global key risk factors such are climate change have also been analyzed in order to demonstrate necessary involvement of business for their solving.

4. RESULTS AND DISCUSSIONS

According to Nestorovic, business and politics have a complicated relation. [9] Business is dependent on politics in terms of the rules of the game and regulation. Simultaneously, politics is dependent on business because it creates value and money. Several questions arise as well. First question, do we have or can we have a special business geopolitics? Second, are companies also "contents" of social and geopolitical life? Third, is the idea of including business in geopolitics a characteristic of our time or a return to the past? Last but not least, fourth, is the wealth of states, both then and now, significantly a part of the product of business activities?

4.1. Business: space, state and power?

Business can certainly be viewed in relation to the holy trinity of geopolitics: space, state and power. It has a relation with everyone and has an attitude towards everyone. Nestorovic clearly emphasizes that companies do not live in a vacuum. They are in the environment and reflect on it and vice versa. Unlike business, states do not have the luxury of being in multiple levels of space. When looking at both the space and the scope of the businesses, they can be on the micro, mezzo and macro level according to Nestorovic. Additionally, it is not necessarily about the concepts of proximity and distance that globalization has completely redefined, but about operating spaces according to the choices of the business itself.

Business has not only adopted the concept of a different space from critical geopolitics. On the contrary, *business created* but also *used* the concept of non-physical space. The Internet, the development of virtual space, social networks, the ideas of the development of the metaverse, the development and application of artificial intelligence, if not exclusively, are significantly the product of the development of various businesses and

ideas. In addition to them, space exploration represents another potentially evolutionary leap forward in relation to the physical space of planet Earth. Businesses accept the rejection of the duality of "us" and "them", "foreign" and "domestic" from critical geopolitics.[9] However, they accept it precisely through the process of practical creation of a global market, global products as well as virtual space. Additionally, the critics accept the connection between power and knowledge, again through practicality. The latter creates added value, power and profit precisely in business. Another fundamental element of business, is narrative, or in modern terms - storytelling. In business, the narrative surrounding a product or service is sometimes more important than the product itself. The narrative in business is not focused on *wherefore we buy,* but exclusively on *why we buy.* Specifically, it is focused on *the emotion* that the purchase or the use produces. The process of "convincing" customers is an emotional, irrational process. At the same time, the process of "convincing" voters or the public is also such a process. In this context, Mackinder's position that whoever controls *knowledge* also controls *the narrative* and therefore also controls *reality* is very valid.

According to classic geopolitics, the state is above business, which is not even recognized. Critical geopolitics distinguish between transnational companies and transnational social movements. They attribute more importance to the latter ones. They accept the existence of the first but do not recognize the status of a non-state actor. Citing Susan Strange, Nestorovic makes a point by emphasizing companies as producers of wealth. Also, it seems that this is non-disputable even when dealing with divergent economic systems. If we agree with the idea that the economic power of the state is a prerequisite for all other powers and even that the state presents a key actor in geopolitics, the following question seems important: *how is it possible to ignore the meaning and importance of business?* It is business that solves two important social challenges in addition to and parallel to the creation of wealth and power: (i) creates necessary new products and services and (ii) provides employment. Entrepreneurs and business change the world even when that is not their primary intention and purpose.

For some geopoliticians, businesses are the so-called non-state actors. Classicists mention them apropos mostly criticizing their lack of coercive power. Exactly those classic characteristics of the Westphalian state. They believe that it is impossible for business to impose something on the state. However, it seems that in here lies a trap. First, businesses can impose on the state the departure from one or more of them, that is, the cessation of business activities. Second, businesses can impose entirely new markets and produce even spaces like the virtual space or metaverse. The state will be *forced* to react to it, at least with attempts at new regulation. Third, businesses directly affect the economic position of the country through their success on the global stage. Fourth, Nestorović cites the example of credit rating agencies. Although the abovementioned can be seen as a form of immoral business, there were direct positive effects for the state and negative effects for creditors on the part of (some) businesses.

Business has a specific relationship with the third element of geopolitics - power. Business geopolitics will borrow the constructions of hard and soft power, precisely from the classics, and apply them to business. Hard power is viewed in economic terms here as well (although it also has a military connotation), while soft power is viewed through the form of influence, which is also characteristic of business, bearing in mind that it shapes societies at least through the way of production and technology. Additionally, business morality or demonstrated business morality can be part of the soft, cultural power of directing a population to attempt boldness in business. Although business does not have the form of state coercive power, it can exercise it on its territory, within its "borders" towards third parties without problems. Bibar believes that "...economic power is measured by its means - money", while on the other hand, Nestorovic believes that "the base of hard power is the army and money". [18][9] However, it seems that the order is different - money and then the army. Professor Vukotić had a great and, often to us, incomprehensible maxim: *money is not the most important thing, but it comes first.* The economic power of the state comes from the economic power of business, which it uses to further create military and political power. The army is an expression of the power of states. Money being the only necessity for it to "express" itself. It also seems that almost all examples of conquest confirm the constancy of this triangle of power. In addition, its constancy is confirmed by the events during and at the end of the Cold War. It also seems to be confirmed by the rise of China and the challenge of the hegemon.

Private companies can have another element of influence on power. Arms production is a power held by private companies dominantly in the capitalist West. It seems that the power of private companies can only grow with the development of cyber challenges, artificial intelligence, robotics and the like. It seems that the development of new military and defense technologies, at least in the West, is still unthinkable without private companies. And how is it possible to imagine geopolitics without business?

4.2. Power?

At the same time, critical geopolitics wants to reveal invisible power structures and then to *challenge* power structures, i.e., it wants to contextualize power differently. In the contest of power, Nestorović emphasizes that in addition to the three known branches of power, the fourth is also emerging. Media and social networks represent one of the most effective forms of power today, regardless of whether they hide or reveal processes. However, another context related to media and social networks is also important. Social networks are exclusively and the media dominantly owned by private companies. Isn't that one of the "proofs", along with accepting the role of their power, that business has a well-founded place in geopolitical relations? If the media is a branch of power, shouldn't it be the universities? The assumption is, of course, that it can only be those who create different and generalist paradigms regardless of the dominance of specialization and uniformity. Capable universities are those that modify both education itself and the labor market, but also respond to the specific challenges of the wave of changes. Is MIT really cooperating with the Asian Business School "as usual" or is it realizing its own certain vision, its own policy? A large number of them are not businesses in the context of these considerations, but are private initiatives that cross the borders of nation-states and network on a global level. Honestly, UDG is one of the examples of such ability and otherness. The university is networked with both the USA and China, it is a part of the ASU/Cintana network, part of the ANSO network, part of the Vatel network, part of the university network of the Council of Europe, part of the UN World Tourism Organization, but it is also a part of individual professional and personal networks. It seems that the difference between the actors of global relations can be seen precisely in the example of UDG. We assume that *international relations are the way in which states relate to one or more of them (relation to the outside) in the context of political, economic and cultural ties.* Moreover, it can be assumed that politics is simultaneously an activity aimed at improving one's status or increasing one's power (within or outside the organization). It can also be seen as *"the skill of what is possible in given circumstances".* From the second assumption about politics, the word "state" was deliberately eliminated, and a definition aimed at "the skill of the possible" was deliberately added. It logically follows from this that not only the state has to be a political actor. If this ability is recognized for non-governmental organizations, why wouldn't it be recognized for business? And additionally, why wouldn't it be recognized for the university? On the practical example of UDG and Montenegro, the difference in the model of observation and reasoning can be observed. The state of Montenegro has an embassy in Beijing in charge of relations between Montenegro and China. China also has an ambassador in Podgorica. On the other hand, UDG has 27 "embassies" in China! There are 27 universities, companies and organizations (of different profiles and character) from China in the direct network of UDG with which activities, aimed at improving the power, abilities and success of, first of all, students, professors, associates, and then the institution itself are carried out. "Politically speaking", possible cooperation activities are carried out.

"Economically speaking", work is done on projects as well as students' studies and internships. "Culturally speaking", the generational experience of civilizations is exchanged. The cooperation with the French Vatel (context of cooperation between two private institutions), the American Arizona State University and Cintana Education (context of cooperation between private and state (albeit based on market economy principles) institutions), continental ANSO (context of cooperation between private and hybrid institutional networks) or, for example, the global UN World Tourism Organization (context of cooperation of private and supranational organizations), can be put in the same context. And all this on a direct level without involving the state as an actor in any segment. This is not a thesis about that, although it is clear whose range is greater. On the contrary, the thesis is that a private, university actor can have a geopolitical role such as the state and a transnational company. In addition, universities

can have their own "offices". Rather networked with similar institutions than owning a subsidiary, although it is also a potential. First of all, in the network created and later formalized by alumni clubs. A network that flourishes with each new member, but also with each new project of each individual member. Does the power of INSEAD or Harvard lie in that? By logical assumption, the rector can be the "same" as the executive director or the president of the state. Why then, predominantly university professors, challenge such power with profiles of institutions close to them? Maybe because, according to Kant, they are only of pure and without a practical reason. At the end of the short comparative case, we should look at the previous definition of international relations and replace only two words with the new ones: *inter-institutional relations are the way in which different institutions, including universities, relate to each other or more of them (relation to the outside) in the context of political, economic and cultural links.* Perhaps the power of words can be understood here! The abovementioned directs to thinking that maybe *university geopolitics* could also exist. In the end, regardless of the dominant form of ownership and access to the market, China implements colonialization precisely through education, as noted by Professor Vukotić.

4.3. Reverse power?

There is also an inverse combination of power and business, but also power and the state. Businesses are supported/maintained by customers, i.e., the market, while the state, i.e., political elites are supported/maintained by voters in elections. Business understands the essence of the concept of competition, often unlike parties and states. The power that politics withdraws from voters is often used as a narrative of democracy and elected representatives. However, this seems immensely simplified and as Nestorovic states, it is debatable which political representatives are directly elected and which are appointed. Businesses appoint people to key positions and are not selected personally by the market. However, if the individually set solution does not give a result according to the market, then it is replaced by a new set solution. This too seems more *democratic* than a test every four or five years. Additionally, this indicates the reversibility of Buchanan's theory of public choice. Simply put, Buchanan considers that the same individual will behave in accordance with the maximization of his own interest in both the economic and the political market. Without objecting to the excellent formulation, it is also necessary to emphasize the incorrect idea of the public or geopoliticians that the set solution (a minister for example) of the state is more important than the set solution (executive director) of business. This becomes especially important when placed in the context of the socialist views of Manuel Castells.[19] Namely, he considers that people are important according to what they *contribute to society*. Despite the certainly unintended consequence, this attitude raises the role and importance of entrepreneurs and businesses, bearing in mind what all of their artistic creations are.

4.4. Objection to criticism?

One serious objection to critical geopolitics concerns its perception of capitalism. It is true that there are different forms of capitalism, and the media contribute to confusion in definitions and understandings as well. It is necessary to recognize that "zombie capitalism" and free market capitalism are not the same or comparable categories. However, critical geopolitics does not seem to make a difference between the two. Critical geopolitics derives the relationship between the power and the fight against inequality from its basic postulates. Namely, it considers that the inclusion of various forms of inclusivity does not represent a sufficient segment of the "struggle", but that the problem of the possible existence of dominance that causes inequalities must be solved. According to them, the aforementioned dominance is fed by the concentration of economic power, and this represents both the cause and the solution to the problem. It seems that the concentration of economic power per se or *the economic power established in the market* is disputed, while simultaneously, the concentration of economic power that arises as a result of *neoliberal ties between the state and business* is not disputed. Nestorovic states that it is not entirely clear whether the critics of the economic inequality of capitalism really understand capitalism because it is precisely the inequality that creates the reward for entrepreneurship, innovation, talent and hard work. He adds that the introduction of quotas in business and political structures is insufficient for them.[2] According to them, the only way is to eliminate or at least reduce inequalities, including hidden ones. They believe that the way towards that is the elimination of capitalism

[2] Despite the fact that quotas are meaningless and there is no interdependence between quotas and free market capitalism.

in its entirety altogether with inequalities, or through the introduction of taxes and (re)distribution of income. They offer neither a precise nor a sustainable solution in addition to the fact that they do not understand the meaning of free market capitalism. It is interesting that they do not even offer a solution as to who will do the (re)distribution of income, taking into consideration that they have their own relation with the state. Although they are looking for different levels of analysis, they perhaps did not remember that the appetites of the state as an actor are not limited, as evidenced by numerous failed experiments. It is also certain that they did not observe the economy and therefore observed the Laffer effect, for example. In addition, it is interesting that they did not try to frame the problem they are analyzing from a different perspective, namely, the impact on entrepreneurship and innovation and, consequently, on the power of the state. It would seem to skeptics that every theory is indeed for someone and for some purpose.

Critical geopolitics has another interesting point of view. Nestorović states that everything we know about geopolitics is created (invented?), selected and distributed in the form of discourse by "knowledge depositories". The latter are usually some forms of authority. Does it mean that future combinations of elements are impossible if this is accepted? If so, can we even think about geopolitics as business geopolitics or university geopolitics? Looking at business, it is stated that the key authority is achieved through the influence of capital, specifically, through shareholders in corporations. Additionally, their decisions are considered to be an expression of said authority. The basis of this authority is the idea that business is not a democratic institution. There seems to be inaccuracy in these ideas as well, or that we do not interpret them with sufficient precision. First, the owners of capital are the ones who take the risk and whose zealous authority is not disputed. However, it is arguable that they are not the final authorities. The market, specifically, individual consumers, are the exclusive authority of capitalism. Second, the decision itself, regardless of whether it is of the capital owner or the individual consumer, is not the outcome of authority. The outcome is the result of the decision. It is exactly something that both capital owners and individual consumers are thinking about, at least post festum. Third, perhaps business is not a democratic institution, compared to the military, although adherence to rules and even hierarchy unites them (even though it is increasingly replaced by the network itself). The question is what democracy is, and beyond the usual definition of the rule of the people or the majority. If business or the market is not democratic but an institution based on rules, then the stated thesis is acceptable. If one looks beyond that and observes the choice and possibilities of choice, then business is the most democratic institution possible. Perhaps this is "extreme" thinking, but it seems to be the essence of free market capitalism observed from the perspective of freedom as the greatest responsibility.

Critics have another significant contribution in the form of the non-existence of a single, objective, universal truth. It seems that they are correct there. The objective truth is created only in the intersection of a large number of similar subjective truths and perceptions. Why do we agree that something is (not) formal art? Additionally, they introduce the importance of narrative in society. The objectivity of the Nobel Prize awarded to Shiller for the importance of introducing narrative into the economy seems to give them confirmation. Business would turn narratives into "storytelling", which additionally confirms the "objectivity" of the idea of the impermanence of singular objective science. In addition, Professor Vukotić's ideas about the relation between truth and lies in every art form create the attitude that imagination is also a lie! In other words, imagination is an individual thought, perception and ultimately one of the possible truths.

In military terminology, science is one of the battlefields of classical and critical geopolitics. The first, as already mentioned, are directed towards the existence of objective science and truths, while the others want to deconstruct science.
Critical geopolitics believe that everything from the explanation of the world to the existence of specific discipline languages or science in general is a social construct. The idea that the theological explanation of the creation of the world is a social construction is in support of this as well. Precisely because people accepted such an explanation that became "objective". Moreover, the social contract is a social construct just like the laws of physics. They became the same when what was created by Hobbes and Newton became "objectively" clear and accepted.

The creation of mathematics may be another example of social construction.

Originating from the practical activities of the "lies" of people, it became "objective" by accepting its "truth". Its example, specifically, the fact that modern mathematics becomes "universal" in place (then Western Europe) and time (XVI-XVII centuries), proves the situational nature of knowledge. The problem critics have is that people who don't belong to that time and place are excluded. If the abovementioned logic is accepted, then the involvement of business in any time and place exists as a form of social construction and even domination.

The intention of critics is to deconstruct science, system and language all in order to eliminate dominance. The question is however, if an individual acquires situational knowledge independently (at a specific physical and virtual place and time), isn't it expected that he/she "dominates" over it? Weren't Foucault and Derrida dominant with their new situational knowledge? If not, how did critical geopolitics come about then? Critics and social constructivists consider that the economy can be deconstructed by what is represented by the term disruption (Bower, Christensen). The idea is that the existing situation is first deconstructed with a new solution (product, theory, knowledge...) and a new construction is created. However, disruption is a new age term because it is rooted in the idea and knowledge of Schumpeter's creative destruction. Furthermore, it describes another precursor to that knowledge. Kuhn's theory of scientific revolutions.[20] Who knows, maybe Kuhn read Schumpeter and both read Bower and Christensen. It is precisely the difference in the views of even similar ideas that can confirm Foucault's thesis about the reader/researcher as a new author. If, for example, Nestorovic's book is based on Christensen and this view is based on Schumpeter, does that indicate both origins and changes?

It is also interesting that the ideas of social constructivists examine only certain concepts. For example, they question the purpose of the private, free market (classical liberalism) but do not question the purpose of state interventionism and rent-seeking (neoliberalism). Everything, even the state, except for the behavior of some form of state, either nation-state, or supranational "state" projects, or regions (not Ohmae's) is obviously being re-examined.[21] It's truly unfortunate as much because of the inconsistencies as because of Smith's ideas in ''The Theory of Moral Sentiments''.[22] Furthermore, business as an actor of the free market is fundamentally based on risk. According to them, there is no entrepreneurship without risk. Although from one perspective this may be true, other questions arise. Does entrepreneurship exist without an idea and realization even when there are risks? What if the entrepreneur does not recognize any risk in his venture at all regardless of whether he/she overcomes it or there really is no risk? If everything is a social construction, so is risk, and an entrepreneur can intuitively know that there is no risk for his idea. Risk, or risk calculation, is an element of entrepreneurship, but it is not the essence of it. It seems that the essence could be the energy and method of thinking that creates an idea, perceives the (non-)existence of risk, realizes and receives the reward of the market. Their addition to the basic premise of risk seems to contradictory be developing.
Specifically, there is neither risk nor safety for them, but there are how individuals, states, companies identify and perceive risk and safety, doubt and certainty, and that idea can be acceptable that by creating doubt you can fight against scientific evidence.

5. RESEARCH LIMITATIONS

The key research limitation is oriented to the novelty element of respective subsector such is business geopolitics. In spite of numerous accepted arguments of the key authors it has been quite demanding to identify negative aspects of business geopolitics and its value in terms of geopolitical analysis. Numerous disagreements with Nestorovic as the principal author in the field have been related to the ideas of previously described forms of geopolitical analysis but also philosophical foundations of the role of individual, entrepreneur and business itself in the global networked society. It will be important for future research to both, identify other authors and exchange opinion with their ideas and papers as well as to further challenge the views provided by Nestorovic in terms and relation to the ideas of classical liberalism but as well as to new information era which is undoubtedly rising.

It has been rather challenging to analyze classical, critical and feminist geopolitics addressing different realms of power, space and state while in each of these theories exist tremendous aspect of business geopolitics and business-related relations. In the same time, that creates tremendous

maneuvering space for different authors and researchers (just to name Nestorovic, Klement et alt. among the few) to create sustainable and meaningful context of geopolitics.

Finally, adding the university geopolitics as the new intervened actor in the geopolitics arena has also been challenging but rather important. Universities itself also have relation as well as ratio and resonance towards state, space and power (see table 1). In addition, they are linked to businesses in different ways while being a form of business itself. However, from many aspects they are and can be differentiated actor and achieve results and impacts which either states or business cannot.

6. CONCLUSION

Geopolitics is the relationship between geography and politics, and their mutual relationship has been changing. According to Nestorovic, geography was eliminated from the equation by critics. It could be considered a subjective and even a social construction in a certain way. Hence, it is indicative that critics do not recognize the place and role of business in geopolitics despite focusing on the context of the problem and a broader analysis. Business also has deep relations with both, geography and politics. Perhaps the problem is that, unlike them, business analyzes the bigger picture when solving a problem, but reacts practically, which is one of the characteristics of those they criticize. At the same time, business geopolitics is indeed practical, and on the level of Deng Xiaoping's cat - it doesn't matter if it's black or white as long as it catches mice or gives results. Business is focused on the result and therefore it will take what leads it to the result from all the previous models of geopolitics and reject everything else. Isn't experimenting with what works in the nature of every innovation and progress after all? It seems that the role of business in a society, regardless of who defines it and how it is defined, is a "lie". It is a construction of objectified subjective perception, i.e., a "lie" that became the truth when a certain number of actors accepted it.

The practicality of business is the first reason for its "rise" in geopolitics. Nestorovic considers that the second reason for the "rise" of business in geopolitics is that the state considers it "responsible" for solving numerous social problems. It is debatable whether business in geopolitics caused aforementioned problems and whether it wants to solve them. And contradictorily, when the business wants recognition of its involvement, the same is denied. However, this kind of "pressure" on business is perhaps not a product of desire but of the state's inability to solve numerous problems. The third reason for its "rise" can be found in the fact that it is precisely business that is an indicative and meaningful content of social life, both in the context of spending time in companies and in the context of the lack of choice with whom to cooperate. Professor Vukotic insisted, during the studies we had, on the logic that loss and profit are shared in the same way, Additionally, he insisted that freedom is the greatest responsibility. It is observed, when applied to the relationship between the state and business in problem solving, that the responsibility of business leads to the "freedom" of solving problems, but also requires the responsibility as well as power of business. Perhaps the business itself rightly demands all of that. Nestorovic, who himself considers that when responsibilities are divided, the power must be divided as well, is also on the trail of this. He goes one step further in his book with the perhaps utopian idea that big companies, such as Facebook/Meta and Walmart, should have their place in the United Nations.[9] Despite the utopia, or because of it, this does not seem like a bad idea. However, the preference of this paper would lean more towards OpenAI, Google, Microsoft, SpaceX, Boring Company, Blue Origin and the like and further because of the scope of power and challenges that their sectors and products create. Certainly, if this utopia were to be objected to with the notion that they are not states and therefore have the so-called "democratic deficits", it could be responded with a rhetorical question: aren't there dictatorships and other authoritarian regimes in the UN?

Critical geopolitics aims to frame the problem. However, it misses a great opportunity to do so by excluding business from the equation. Specifically, transnational companies operating in two or more conflicting countries have both the opportunity and the interest to practically solve these problems. Maybe it is utopia as well, but it is worth trying to frame and solve the problems of geopolitics. Nestorovic also supports this with the simple conclusion that companies are the ones who know what is needed for the well-being of the population. And it is indeed easily justified and acceptable path and framework. Their daily operations in those markets,

the exchange of employees, the interweaving of cultures and the very practicality truly seem as acceptable elements of the methodology. Localized solutions to globalized problems are the solutions that business can directly and partially simply offer.

All forms of geopolitics dealt with the contents of geopolitical life. For classicists it is the state, for critics it is the supranational or regional level, while for feminist geopolitics it is the individual, i.e., the body of the individual itself. It is indicative that critics ignore the level of business and accept the level of supranational creations because they are quite far from everyday life. In addition, it is interesting that no one yet aside this paper mentioned universities as potentially such. As Nestorovic considers, businesses represent the ideal content of geopolitical life for at least three reasons: (i) employees - according to the amount of time spent at work, it becomes a kind of living space for them, which partly shapes their way of thinking, (ii) employees do not choose with whom they will work, yet they are already directed to almost involuntary interaction but also potential exposure to different pressures and (iii) global companies have a simultaneous presence in several different countries, which points to both respect and understanding of local laws and cultures. At the same time, this also refers to the interdependence of events and outcomes in different territories. For similar and even more networking reasons, universities can be added to this.

Nestorovic's ideas that knowledge, experiences and business practices are proven are absolutely well founded, true and easily verifiable. Additionally, they are not in a position to impose because they are dependent on clients, as noted by Nestorovic. This is the difference between the countries even though they have political elections. However, it seems that a more appropriate term than the term client is exactly the market viewed as a process of spontaneous selection of an infinite number of individual decisions. The claim that the goal of the business is a satisfied customer is also fully established. It seems that this is not only in the context of income and profit, but also in the perception of the quality of products and services, the brand, the narrative that is built and is being built around the business, the attitude towards the environment, the accountability of it, the context of morality and the like.

Intuitively and practically interesting, Nestorovic perceives executive directors of companies (but why not universities as well?) as conductors of an orchestra. In addition to all the responsibilities that both executive directors and the business have, one responsibility is crucial: the business must adapt while the music plays. More precisely, business must find a solution for every (un)known problem.[3] Why couldn't it do the same for geopolitics then? It is precisely the dynamism of the business world (regardless of what level we are talking about) and practical orientation that enable this hybrid form of geopolitics, as he calls it. The form that combines the most practical solutions of all known (and sometimes unknown) models. The experience of the practicality of business, the position of the place where individuals live and interact with others makes it additionally convenient. All previous forms of politics are reminiscent of Kant's pure reason and theoretical models. Business geopolitics can be Kant's practical mind..

It is true that the rise of yet another practical reason of geopolitics is possible: the globally networked university of the future. The abovementioned can be seen in the examples of global networks of various geopolitical actors: (i) ASU/Cintana network as well as (ii) ANSO network of academies and universities. In addition to that, universities and networks can more easily create Internet and external alliance as seen in the example of ASU's cooperation with OpenAI. Universities are institutions that create future leaders whether they are real or administrative. A future-oriented university creates business leaders. Universities also have the task of creating culture, and it depends more on them than on the business, whether, in Moisi's words, they will create cultures of hope, fear or humiliation. A university aimed at creating a culture of hope, a culture of ambition, a culture of entrepreneurship truly is and should be a geopolitical actor because it solves numerous (un)framed problems. UDG, our local example, confirms the abovementioned as well as everything previously stated. In the end, it is also on the trail of Nietzsche's *"let's muster strength to be one of those who will work to restore the world"*.

[3] So does the universities.

Table 1: *Modified geopolitics division tables*

	Classical Geopolitics	Critical Geopolitics	Feminist Geopolitics	Business Geopolitics	University Geopolitics
SPACE	Level: Physical geography Virtual geography Human geography	Level: GLOBALIZATION Supranational organizations Region-city	Level: Individual body	Level: Corporate space	Level: University space: physical, virtual and network
STATE	Main actor and content of political and social life They also accept the so-called NSA	The State: A Social Construction	The state: Individual sovereignty	Corporation and sovereignty (partial state regulation)	University sovereignty
POWER	Hard and soft power	Power: Knowledge The power of discourse	Gender, race, religious dominance, epistemological quest	Economic power Social power	Social power Network power (Indirect) economic power Power of discourse

Nestorović, 2023; Jovetic, 2024.

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CORRESPONDANCE:

Ivan Jovetić, PhD
Faculty for International Economy, Finance and Business
University of Donja Gorica
Oktoih 1, 81000 Podgorica, Montenegro
E-mail: ivan.jovetic@udg.edu.me

7.

Phylosophy of leadership

Anđela Čelebić, PhD student

Phylosophy of leadership

Anđela Čelebić, MSc[1]

[1]PhD studies, International Economy, University of Donja Gorica
andjela.celebic@udg.edu.me

ABSTRACT:

We live in a time of global crisis and unpredictable circumstances, expressed and present probably more than ever before. Although full certainty never exists and the world is constantly changing, taking responsibility becomes imperative for modern man and modern leaders.

Is man destined to follow others or himself? Who were those who were a great leader? Did great leaders want to become one? What did the man of history know and could know, and what can we know today? Do we need leaders today, and what kind? What is the response of the individual in relation to the possibilities and his abilities to solve problems and create better future? These are some of the questions that inspire and stimulate thought about many of today's growing problems.

Keywords: individual, responsibility, creation, service, leadership

1. INTRODUCTION

Digitization, automation, climate change, demography and the green revolution are megatrends that will mark the years ahead. Geopolitical and geoeconomic conditions are not in favor of the reforms that need to be implemented. Nevertheless, history has shown that crises are an integral part of transition and development. Certain imbalances will be present in the time to come, but the ability to respond to them - determine the scale of negative consequences and unlimited possibilities. The new reality requires innovative leadership and new perspective. So, how do we understand leadership today?

Every time brings new circumstances and reality, and leaders have always existed. Inspiration and interest for this subject comes from the earliest examples of leadership back in the history. Some of them are grounded in the founding idea of the UDG University and responsibility of the educational institutions towards young generations. The aim of this article is to awake some of the questions important for the future of many generations that often lies in the eyes and actions of a few. What exactly does leadership mean? Why is leadership needed? Who are the great leaders? Do we have a compelling future to focus on, and, if not, how can we create one? In the end, how does this idea resonate with the leader in you?

By excluding what today leadership is not, we can focus on many aspects of leadership as a very much needed source of transformational change. The very core aspect of leadership is the individual and his responsibility to act upon his highest abilities towards their own life and the environment they live in. Therefore, the focus of the work is predominantly on the individual, corporate and leadership in the social sector, and less on state leadership, which due to the new Techno-polar world where technology companies already have primacy over state regulation and whose leadership dominates in dictating changes, will have a completely different role and power.

2. LITERATURE OVERVIEW

There has been a broad literature on variety of leadership aspects, as this topic has always been at the focus of research community. The theory has been changing significantly. Praxis even more. The starting point for this research were books, articles, documents and reports, as well as the historical, religious, political, sociological and psychological perspective on the leadership. There is a certain accent on the moral and ethical side of leading, as well. Still, even though we have rich treasury trove

of knowledge, many questions stayed unanswered and there is a lot of work ahead. The Article demonstrates the necessity of the approach to the matter of new age leadership, the ,,sector ''that is in a great need of change agents. Criticism is not lacking as well and it was mainly addressed to the responsibility of the individual for shaping their own life, therefore the society and the world we live in.

3. RESULTS AND DISCUSSIONS

Leadership is necessary until it fully serves its purpose and becomes redundant. Leadership will become irrelevant when each individual is the absolute leader of his life. To understand ourself is the beginning of wisdom. Then, the discovery is our own, not somebody else's, not something that we have been told. The very idea of leading somebody is actually antisocial and anti-spiritual. Every process of thinking and pondering is old, conditioned. Therefore, it cannot solve the problem of present time. Thought is the result of experience, and experience is always conditioning. For understanding the depth of love, freedom, courage, honesty, truth, education, leadership, one must be free from the known. Every individual can be his own leader and the main question is how an individual can reach this freedom?

The highest form of leadership I recognize is when we first put ,,Our House'' (us) in order. When I change, society changes, when I grow, society grows. Every individual must be a ''light'' unto himself. Otherwise, the leaders destroy the followers and the followers destroy the leaders. The truth cannot be ,,organized ''. If there are leaders, it stands to reason that there are followers. And is man destined to follow another man or himself? And why don't they follow themselves, centuries back?

If a follower chooses a leader from the point of confusion, it is not possible to find less confused leader. People usually want quick relief, quick solutions, satisfaction, searching not for the truth but for the comfort, and that what gives us comfort, especially if that is a leader, enslaves us. Who were those who followed themselves and pointed to such a path? Is true leader a chosen one? Did great people from the history want to be the leaders of their time? What impulse and need led them to "stand out"? Does the desire to take the action comes naturally, organically, or is it organized with a certain pre-planned goal and purpose? The attempts of many great minds and creators in history to point out the potential and truth about the world that surrounds us, put them in the center of attention and in a leadership position.

What did the man of history know and could know? The man then knew what he needed to survive, that sources he needed were limited, and that there was someone else who wanted the same. Yet, what does man know, or can know, today? Today, we have more information than we can absorb, and it takes wisdom to isolate those that can be useful. We live in a time of excessive consumerism of everything, food, drink, information, etc. It distances man from man. It leads to his self-destruction that doesn't seem so far at the moment. It would not be too much of a surprise if nature, as such, "rejects" humans, because the damage today's man is producing is becoming greater than the benefits he provides.
So, what and who will we do something about it? (This is exactly leadership impulse that came from the point of understanding the need, the urgency, the possibility for acting responsibly, humanely, and finding a solution).

At a time when man is increasingly moving away from his true self, it is becoming easier to manage him. He is a follower without even knowing it. In such a world, leadership still asserts itself today as another powerful mechanism for managing human weaknesses. In the other hand, a free individual who sees himself as he is, assumes full responsibility for himself, his life and the world around him. This includes his environment as well as the relationships he enters into. The quality of those relationships mainly determines the quality of life. As such, his inclusiveness in the world around him is necessary. And not just any kind - it is moral obligation of every individual to act in accordance with what is necessary. Leadership is born at that point. What is the alternative to the leadership behavior of the conscious individual? - Acting against the impulse that comes from clarity and awareness, that is, acting against oneself. A true leader of his life could never allow himself to do that.

A true leader doesn't ,,wish ''to be one. He does not want leadership to be his professional calling ("The Will to Power", Friedrich Nietzsche). He recognizes what is possible and takes the action. Without action man does

not fulfill his basic moral obligation - to do remarkable things. Otherwise, he sends a message to himself that his potentials are not necessary, and thus the disposal of the human potential is less available. Man dies in spirit. The body is being deformed more and more rapidly today. Still, "Without sweat and pain, the saber is not sheathed", the Montenegrin ruler Petar II Petrović Njegoš said. True leaders know both of these facts.

Just as the heart gives a natural pulse to life, leadership is an equally natural impulse that comes from the human being as a reaction to the environment and today's compulsive world we live in. Leader's way of thinking is: What is all possible?

Can humans be ''programmed'' to think differently? When he was four years old, the mother held the hand of the Mehmed II al Fatih, one of the Ottoman sultans who ruled in the 15th century, pointed with her finger at Constantinople and said that she believes he will conquer it one day. He did it when he was 21 years old, in 1453. Thomas Edison received a letter from the school saying that he will be expelled because of his many disabilities. His mother red that letter to him with the twisted meaning, as the school was praising his talents. His mother changed the course of his life. If we look back at the period of Transcendentalism under the Leadership of Emerson, it is a mixture of Goethe, Plato, Confucius, Islamic culture, Sanskrit religion, Buddhism. At the end of R.W.Emerson's Essay "Nature" it is written: ''All that Adam had, all that Caesar could, you have and can do. Build therefore your own world".

Today's understanding of science represents a human-centric approach to existence. Is the existence of everything conditioned by the existence of man? Because of its limitations, but also of man's potential, the truth about man and the world that surrounds us is present and known to the extent that man is capable of seeing it. In what way can a man enable himself and see what is, in order to do what is necessary? Does our society seeks and accepts a free individual? What is being done about it through educational system?

History has shown that many discoveries were the "burden" of their time and their bearers were often enemies in the place and time they lived in. At what point there is turn in the way of thinking, accepting or acknowledging even something that is easily proven and obvious? Those who were free, creative and consistent in their theories, it turns out, were unwillingly, but leaders of many changes. Is leadership the answer to this and many other challenges of today, which more than ever in history demonstrate the deformities and consequences of compulsive, spontaneous, violent and dormant man?

Before us is the greatest task in the history of mankind - the discovery of who human really is?! Even today, ''we know too little about us'' (Carl Jung). Internal revolution is actually the only possible one that leads to any social and collective revolution and change.

Why then do we need leadership if the responsibility and potential for change lies mostly with the individual? How does this perspective fit into real life today? How is the issue of competition treated? How we treat the existence and importance of unity of humanity and existence in whole? Can we have common global goals like the UN Agenda 2030 and act locally in such a way that we do not contribute globaly with each of our actions? What we do if we know that the Aluminum Plant in Podgorica brings acid rain to Uganda? Or vice versa? Omar Ibn El Khhatab, who liberated Jerusalem for the first time, speaking from Medina, said: ,, I am afraid that a sheep in Iraq will break its leg, because Caliph Omar (himself) did not make a road ''.

Photo/Figure 1. *Pinguins at Antarctic*
Source: *National Geographic*

Leader is only one action ahead of the group that shares the same values. Who is the first brave pinguin ready to jump and try to survive a polar plunge?

From comparing the characteristics or traits of effective leaders, especialy empathy through Emotional Intelligence, behaviors, to the contingency, modern servant, transformational and Level- 5 leadership, theories on successful leadership changed over time.

Many who possess the requisite personality traits never seek out positions of leadership (the Big Five: Extraversion, Agreeableness, Conscientiousness, Emotional Stability, Openness to Experience). Instead of identifying individuals with the skills needed, organizations could actually train them, as the **modern servant leadership** is focusing on the needs of the followers. **A transformational leader** provides a clear vision for the future emphasizing and ensuring important values. Today, we can see the evidence of what Jim Collins termed **Level-5 Leadership**. These leaders follow the cause, have a high level of humility, personal passion, confidence and focus on the team.

In Leadership Academies young leaders are often challenged through setting different questions, such as: What cause do you serve? Is failure precondition for the Growth? How will you change the lives of others and help others to succeed? If we do have a charismatic cause, we don't have to be a charismatic leader. So, what is the cause today and do we have a tolerance for what is happening in the world today?

The data are changing the world through the discoveries they provide. Today, AI operates on the concentration of enormous data base. And, if we set the question to the AI, what kind of answer do we get? Is it only informational, or, provides the best possible option, noble and human and nature oriented? Does the AI actually contain more humility and can save us from ourselves? Peter Drucker also made a fundamental change toward a cellular structure of free society and how organizations will be well managed. Leadership is not personality, title, rank, position, power and order. It is if people follow when they have freedom to not to follow. American General Eisenhauer said: ''Leadership is leading people to want to do what must be done!'' Being sure what must be done, getting people to want to do it, and developing own art form.

Modern leadership concepts more and more involve ''natural'' component as a necessity when leading change. "You do not have to try to succeed. You just have to find what is natural for you." (Dr. Ichak Adizes, Institute).

Still, today we are at the big 21. Century shift, from the society of organizations well managed, into the world being organized of society composed of networks well led – and you don't manage a network. And, if this is correct, we are going to need great leadership in every sector.

As someone with impressive record of failure, today I know that failing is the growing and the point of the climb. So how can we reframe entire experience as we are not failing but growing? Or, how we can coach, inspire others to climb together, as a team? Here lie two main messages: Let me help you and you are not alone. If we talk about Great leadership, it cannot be great if it is not great at the Unit level.

System Leadership

When people share the process of sense making together it is called collective sense-making. How new generation leaders hence the mindset of those around them? Leaders instill clear answers to the 'why' questions at every level, considering the optimal system for today and tomorrow. Nelson Mandela embodied a system leader, bringing together the remnants of a divided country to build a new nation. He helped emotional healing and shaping better future for the country. Collective intelligence emerges over time through a discipline and cannot be predicted. Change requires awareness, clarity of vision and action.

Even 2,500 years ago Chinese philosopher Lao Tzu expressed the idea of leadership: ''The wicked leader is he whom the people despise. The good leader is he whom the people revere. The great leader is he of whom the people say - We did it ourselves.''
System leaders see the larger system, foster reflection and shift the focus from problem solving to creating the future. Still, much of this work is relatively unknown.

Culture of Philanthropy

What makes a great enterprise? Leaders must be challenged and making money cannot be the main purpose. A component that emerged from successive studies of great leadership, was the need to achieve a philanthropic culture. What matters is visionary leadership and the willingness of that leadership to drive change and to invest substantively for the future. Organizational culture that is genuinely supportive of philanthropy must be build. This means that companies and organizations need to enable themselves to act, sell and collect as well as for the higher good through the principle of: learning, earning and returning.

Social leadership and intrapreneurships basically excludes the competition as an obstacle to any achievement. People working and creating together with the goal of helping society cannot be a race to be won, but the race we run together. For example, in a nonprofit sector, one of the answers is outstanding fundraising, delivering the transformational growth so that the organization can multiply its societal impact.

Universities and Leadership

Universities must decide what kind of generation they support and produce. Do educational systems prepare an individual to have better memory or intelligence? Does a society need and accepts a totally free individual? What kind of leaders we produce? What universities are doing to this matter? What kind of leader we want to see for us today, and in the future?

Greatest people in the history found the way to make a distinctive impact on people. Great leaders are changing focus by taking care of their people. You don't run for yourself, you run this race for others, too. It is our obligation to invest in Youngs, build different supportive programs, show them what is possible, help the change and improve their lives.

The truth is that for many University is often the last chance before they enter the world of creating. Every single child, no matter where born, deserves education. Universities should pick the best graduate students for the 2+ years of deployment to our most underserved schools. The once who are the bridge between the students and the education must have the passion for it and be good at it (and make a living out of it). This is something we should teach and encourage at the University through the variety of courses.

No wonder that many universities across the Globe mark the transformational success of their, both students, professors and management, trough supportive Centers and Academies established within.

4. CONCLUSION

Today's world is transforming technologically, economically, socially and politically. It has been absorbed by the speed of changes, the complexity of the issues, the unpredictable circumstances and the crisis. The involvement of true leaders has never been more necessary in the complex, polarized and rapidly changing context we face.

What kind of time we live in speaks the fact that in the same day we can talk about more than 800 million people who are on the verge of death due to hunger, threats of mutual destruction through high-tech and nuclear weapons, but also the exploration of Mars, extraordinary technological developments such as automated driving, personalized medicine, business in the age of robots? The curiosity is that there have never been more "tools" than today that can contribute to the sustainability and preservation of man and the planet. However, the man turned his intelligence against himself.

For a large number of current issues, solutions are proposed through joint initiatives, global cooperation between the business community, governments and society, integration of state and non-state actors. Is there enough centralized data in the world to be able to construct global policies that apply to billions of people? They have floundered because they failed to foster collective leadership within and across the collaborating organizations. Any central planning led to collapse. Freedom must remain at the basis of man's action and striving for creation.

More than 50% of the global population is under the age of 27, the generation that has the most interest in how we shape the future. Education and knowledge - or what is (as opposed to forcing and indoctrination), is the most important investment and task of man and leader of the modern age. Especially, because the educational systems are far below the emphasized needs of the younger generations.

Can leaders be the first line of change and help to implement many necessary transformations in a positive way? Such endeavors require special human qualities, knowledge, professionalism, vision, moral values, enthusiasm, empathy and translation of action into impact. Man's inventions must be at his service. It is up to the leaders to initiate the creation of different platforms for development, not forgetting the basic needs of humans as well as those that enable the use of new technologies (blockchain, AI, genetic engineering, etc.). Solutions must be sought through concepts that basically have freedom, education, entrepreneurial activity and creation.

There are reasons for optimism that a sufficient number of skilled leaders will emerge because of interconnected nature of core societal challenges, an expansion in the tools to support both individuals and leaders, hunger for processes of real change, growing awareness that the inner and outer dimensions of change are connected. And, leader needs support. We are at the beginning in learning how to guide systemic change. The most important thing to understand is that, if we want to unpack other human being potential, it is important that we are constantly striving to unpack our own.

How Leaders can be built and how good leaders can become great leaders is the most common question in today's leadership studies. Obviously, science and so far models are lacking many answers.

The pursuit of freedom, knowledge and creation, and total awareness, must and will once again awake a "new man" who will have the opportunity to deal with numerous challenges, most of which created by man himself, in a more intelligent and humane way.

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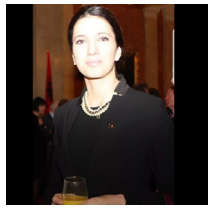

Anđela Čelebić
University of Donja Gorica,
PhD studies
Oktoih 1
81000 Podgorica, Montenegro
E-mail: andjela.celebic@udg.edu.me

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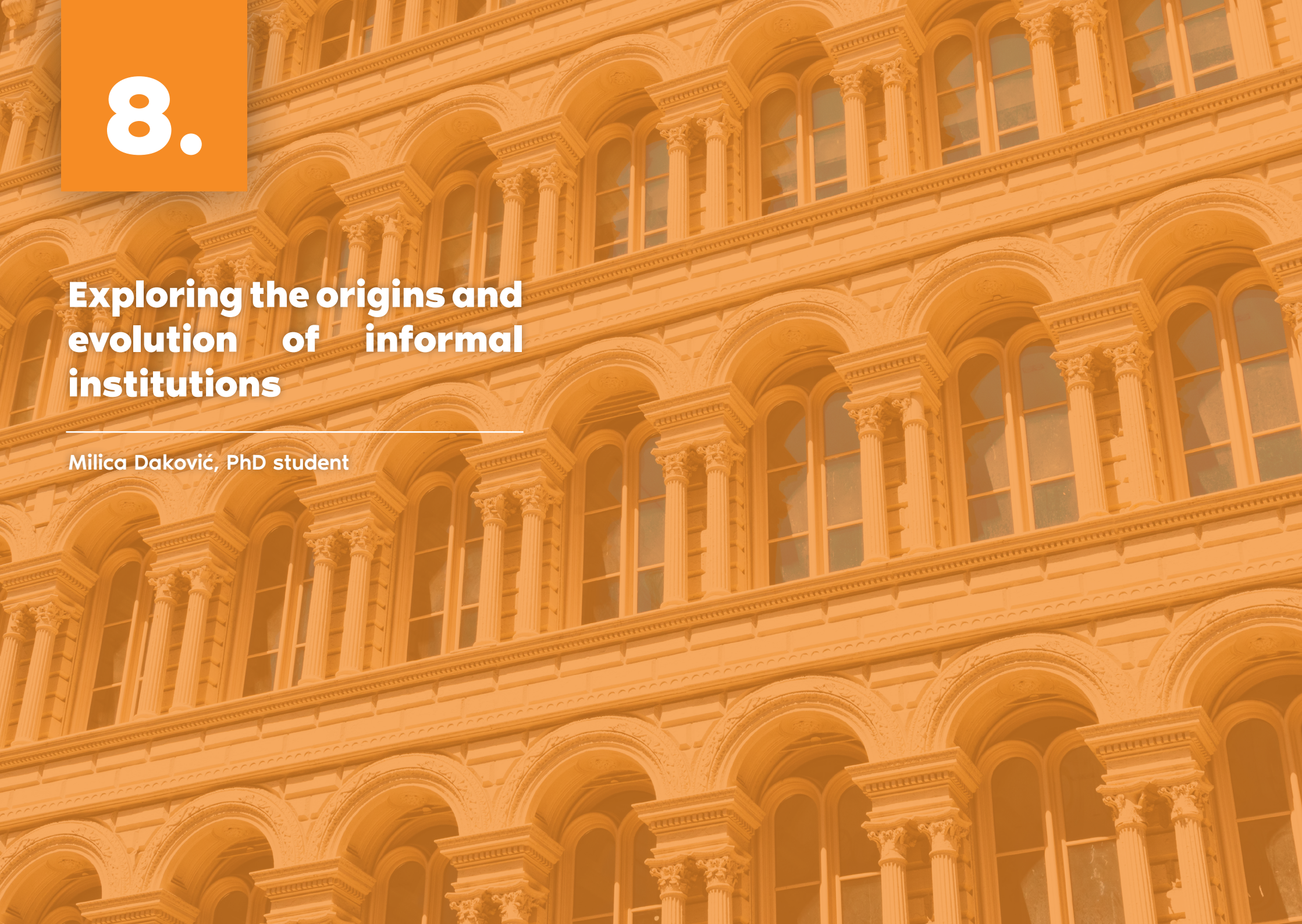
Exploring the origins and evolution of informal institutions

Milica Daković, PhD student



Exploring the origins and evolution of informal institutions

Milica Daković, PhD student

UDG PHD Studies
milica.dakovic2@udg.edu.me

ABSTRACT:

In order to comprehend the role of institutions in today's modern society and developed economies, it is essential to dive into the past and examine the causes that led to the development of the very first institutions. In this regard, the article investigates the origins of these initial institutions, operating on the premise that institutions are inseparable from humankind and that their development parallels that of humanity itself. Consequently, the article explores not only the visible formal institutions we recognize today but also delves into their roots and origins, seeking to uncover the invisible forces that prompted the creation of the earliest informal forms of institutions in ancient societies. This exploration is conducted through a historical, theoretical, and anthropological framework, applying the time train methodology.

Keywords: ancient societies, institutions, informal institutions, evolution, time train, kinship, chiefdom, redistribution, exchange

1. INTRODUCTION:

Research into the genesis of institutional development starts with the premise that institutions are not static and neutral; rather, they are dynamic. Viewed through the lens of time, institutions are natural and dynamic, evolving alongside the progress of humanity and society.

''Institutions are best understood as enduring social rules and procedures, formal or informal, that structure the social, economic, and political relationships and interactions of those they affect'' (Hodgson, 2006, pg. 378). The institutional framework we recognize today comprises both formal and informal rules. Formal rules encompass constitutional provisions, laws, contracts, and other regulations established by governments. However, these formal rules were preceded by informal ones. Which informal rules? These include *''tradition, customs, moral values, religious beliefs, and all other norms that have withstood the test of time'' (Pejovic and Vukotic, 2002, pg. 11*), whose role in the development of society and the economy should not be overlooked. This article delves into the genesis and development of informal institutions.

The interpretation of the role of institutions in society and resource management begins with the premise that institutions are not merely imposed rules created sporadically in a single time context. However, they are inherently linked to humanity, evolving organically over time. Another key premise is that institutions arose as a product of human ingenuity, aiming to reduce uncertainty and ensure the community's survival. Consequently, they are not perceived as predetermined techniques or laws but rather as a system of rules that evolved alongside humanity, naturally and gradually, emerging as a result of social interactions and progressing from ancient civilizations to modern times.

This article aims to demonstrate that the evolution of institutions parallels the evolution of humanity and is inseparable from the human nature and societal characteristics.

Therefore, to explore the genesis of institutional development, it is necessary to examine the origins of mankind and early societies through the lens of the first civilizations. In this regard, civilizations are primarily seen as environments in which institutions were conceived, simultaneously serving as a means of civilizing humanity by restraining its primal impulses through the establishment of a rule-based system. The article's objective is to illustrate that institutional regulation directly reflects the prevailing social consciousness within a society at a given time, manifested through informal rules, or informal institutions.
Hence, in understanding the concept of institutions, this article seeks to address following question: **why did informal institutions emerge, and how did they evolve over time?** In this context, the article explores the roles of survival, family structures, leadership, redistribution, and exchange in understanding the origins of informal institutions.

2. RESEARCH HYPOTHESIS

The assumptions on which this research is based can be formulated through the general hypothesis: **"Economy cannot be explained only by economics."** An additional hypothesis supporting the main one and related to institutions is following: „Institutions are a framework that enables the functioning of the market". The thought that economics cannot be explained by economics can be transformed into the question: "Is economics a completely autonomous science, a science that is outside of society, sufficient for itself?" There was, and still is existing the belief that economics as a discipline, are only responsible for creating an efficient, rational, self-sustaining global system. However, there was a crisis of 2008. How none of the economists predicted the crisis? What kind of science is it that is blind to the fact of real life? In the Sahlins book, I came across the opinion of Morse Moss, who was the first to challenge the thesis, or rather the myth, that economic life "arised from the trade itself". People invented money because they were already behaving in a market way (exchanged goods and services), but they had not yet developed the appropriate technology. He introduces the terms "gift" or „gift economy", i.e. economy outside the market, outside the interest-driven exchange.

The auxiliary hypothesis indicates that **institutions are the framework that enables the functioning of the market** and, on that basis, the efficient use of resources. The market is an economic institution par excellence. The market is the most favourable concept of rational economic activity. However, the market cannot work in a vacuum. It always works in specific institutional environment. Therefore, economy can be understood as an institutionalized process of interaction between humans and their environment in order to acquire material means to satisfy needs. From this approach to the economy, it can be concluded that the economy is viewed as a process. That process is unique and exists only because it is "institutionalized", which functions through its institutions, i.e. general social relations between people within a society. Every economic process takes place in a specialized, i.e. "institutionalized" social form.

Formed in this way, it fits into the "context of social institutions" that provides meaning to its functions and ensure that it achieves unity and stability. Therefore, economic processes can fit into the most diverse institutions, such as kinship, politics, government and some other forms of institutions that are not of an economic nature.

3. LITERATURE REVIEW

Various schools of economic thought have dealt with the role of formal and informal institutions in economic development in the period of the last three centuries. The need to research the causes and consequences of certain phenomena in the economy (e.g. the Great Economic Crisis at the beginning of the 20th century) influenced the development of various theoretical frameworks that paid special attention to the interpretation of the role of institutions in political and economic development. That theoretical framework that studies the role of institutions in economic development is defined as the *Institutional economics*. This theoretical framework is not characterized by uniformity, but by multidisciplinarity.

The theoretical framework for looking at the origin and role of informal institutions starts from the concept of institutional economics, which represented a direction within economic theories that arose as a counterweight to neoclassical economic thought. Institutional economics

contrasts with neoclassical economics, which *"sought to explain and rationalize the market economy on its own terms" (Samuels, 1984, pg. 212),* whereby neoclassical economics is interpreted as a direction based on the assumption that economic subjects will behave rationally with the aim of achieving economic balance (Hodgson, 2009, pg. 378).

Institutional economics had two stages of development, "old" and "new" institutionalism, which marked the period of the 20ies and 30ies, or the 60ies and 70ies of the last century. Although the concept of institutional economics was introduced for the first time in 1918 by the American Association of Economists different schools of economic thought studied the role of economic institutions even before that time. Thus, the English classical school of the 19th century considered economic institutions through the concept of ownership, which determines the class structure or legislative framework in the country. From the beginning of the 20th century, it was opposed by the German historical school and American institutionalism, whose international influence was significant during the last decades of the 19th century, until the 30ies of the 20th century.
On the other hand, the Austrian school of economics, as the dominant economic thought in the second half of the 20th century, almost did not deal with the study of institutions, although it had a developed institutional dimension since its inception.

The German historical school represented by Gustav von Schmoller (1838-1917) indicates the need for the economies of different countries to pay special attention to institutions and organizations. Schmoller has a broader approach to the interpretation of institutions, where he does not consider institutions in the form of political, legal and economic institutions, but also as a relationship between people that represent the internal arrangement at the level of a community that has been developed for thousands of years. Under this broader interpretation of institutions, Schmoller considers: family, marriage, slavery, serfdom, market, property. *"The study of organization and institution is to the knowledge of the social body what anatomy is to the body itself" (Schmoller, 1904)*. At the same time, Schmoller indicates that it is important to make a distinction between an institution and an organization, where he interprets the organization as a personal aspect of the institution, giving the example that marriage can be interpreted as an institution, while the family is a form of organization. By organization, he defines the association of individuals into groups in order to achieve some common goal. Those groups can have different forms such as: family, brotherhood, association, company, state, emphasizing that the tribe and family were the first spontaneously created organization with unique goals at the group level.

However, he also points out that the later complexity of social processes also leads to organizations that arise *"by the intervention of human will" (Schmoller, 1904).* Thorstein Veblen (1857-1929), as one of the founders of the old school of institutional economics, emphasizes habits, motives, and norms as important factors in individual behaviour. Therefore, he indicates that institutions arise from the habits of a society, while habits arise from the instincts. Carl Menger (1840-1921), as one of the founders of the Austrian school, points out two dimensions that are important to consider when interpreting the causes of the creation of institutions: spontaneous and pragmatic. The first "spontaneous" refers to personal interests that organically join together in institutions that serve some general well-being. Menger indicates that the process of free exchange leads to interaction between individuals, whereby rules (norms of behaviour) are born over time, which later grow into institutions.

When considering theoretical framework, the idea and inspiration for further research of the role of informal institutions in the development of today's formal institutions and economies came from the encounter with three books: *"The stone age economics" (Sahlins, 1972), "The great transformation: The political and economic origins of our time" (Polanyi, 2001) and "Sapiens: A brief history of human kind"* (Harari, 2015). They provide a broader theoretical concept for interpreting the role of institutions and the economy. Sahlins points out that economics cannot be explained only by economics, giving the idea that in order to look at a phenomenon, there must not be a one-sided approach, but on the contrary, it is necessary to look for the roots and causes of the emergence of a phenomenon.

On the other hand, Polanyi emphasizes that, in order to look at social processes, it is necessary to look at the broader environment - the economic conditions in which they were created. At the same time, he emphasizes that the approach to the formal definition of the economy

should be changed, whereas it should be abandoned the thesis where the economy exclusively relies on rational approach and the market. The economy should be interpreted as a social process made up of formal and informal institutions, where Polanyi emphasizes the fact that "people depend on nature and other people for their means of survival" (Polanyi, 2001). He further points out that all the systems that existed until the end of feudalism in Western Europe were based on the principles of simple household management, based on reciprocity or redistribution. He is criticizing the approach that refer to exclusivity and dualism (such as market-state or market-organization) and the principle that creation of an institutional structure is preceded by a simple sum of the actions and attitudes of individuals who make up a society. In his work, Polanyi examines the causes of the emergence of institutions and sees them primarily through interpersonal patterns of behaviour, indicating that the first institutions represent *"a mere combination of patterns of personal patterns of behaviour"* (Polanyi, 2001).

Therefore, the existence of informal institutions is reflected in the economic activity of the very first communities, which was characterized by the integration of land and work supported by the family ties, where a set of informal rules expressed through redistribution and exchange enabled economic stability of the first civilizations.

4. RESEARCH METHODOLOGY

Time serves as the central methodological point of this research. Therefore, in the process of studying the roots of the first informal institutions and their development over time, the concept of 'time train' is used. [1]

According to the time train methodology, time is perceived as a spiritual framework within which the process of development of institutions is interpreted and the spirit of the time guides the evolution of the institutional idea. In this sense, time is understood as both (1) space in which processes unfold and (2) continuous flow characterized by eternal movement and process.

On the other hand, the understanding of time is closely related to changes.

[1] The methodology is based on the key principles of looking at phenomena through the prism of the time train created based on various lectures by prof. Vukotic and applied to the context of institutional analysis.

Time is regarded as a "mechanism" that integrates changes into one connected, continuous flow. It is the space in which all other changes occur. From a methodological standpoint, it is important to recognize that time cannot be seen, but it can be "felt". In the context of investigating the idea of the origins of the first institutions, time is not neutral in the same way that it is not neutral for our lives. The origin of the idea and the very idea of the institution flows through the river of time, from the moment when our ancestors descended from the tree, until today...

The voyage continues its flowing towards the future. That river of time unifies the social, natural and cosmic environments in which changes occur during the development of, in this case, institutional ideas. Therefore, the metaphor of time as a river enables the observation of all the changes that occur due to the development of institutions as part of the whole of changes that occur in one society. "They all happen in the spirit of their time" (Vukotić, RPS lecture). From this perspective, important hypothesis emerge: the creation and development of institutions are products of the spirit of the time in which that idea originated and evolved. And what is the spirit of time? Why does it exist? It is a product of the friction of all events, changes that take place over a period of time. Furthermore, what propels change? Nature, culture (human activity) and the cosmos drive change. In this regard, two important approaches related to researching the emergence of informal institutions are being developed. The first indicates that everything is connected (unity), and the second that everything is moving (change). The application of the time train methodology enables understanding that delving into the essence of institutions requires investigating their foundational origins, irrespective of the fact that institutions, as they traverse the time train, adopt different forms, names, and structures during their development. This analytical method facilitates a "journey back in time" in the study of institutions, allowing for the identification of conditions that contributed to the emergence and development of institutions in their specific forms at various points in time. Each temporal point is situated at the centre of a network of temporal processes that flow into the main stream of institutional development. Therefore, this approach to understanding the emergence of the first informal institutions and their role in the development of formal ones resembles the root system of a plant, where all veins are interconnected, leading to the main root from which the tree emerges.

Therefore, the application of the time train methodology enables an exploration of the roots of the first institutions. In addition to the time-train methodology for the purposes of the research it was also used qualitative research methods which included literature review focusing on textual and descriptive analysis of the relevant literature related to the evolution of institutions.

5. RESULTS AND DISCUSSIONS

5.1. Evolution of the informal institutions

Informal institutions represent informal rules that are in force within the societies. They spontaneously emerged, where the birth of the first rules of behaviour was not the result of a rational decision of the individual, but of his natural need for survival. Ancient societies stored all the rules of behaviour of a group, where an ethos was created by repeating informal rules and passing them on from generation to generation through learning and repetition. Ethos means "a pattern of behaviour that resulted from the interaction between the prevailing ethics and the conditions for survival as perceived by the community" (Pejovic, 1999). The ethos was passed from generation to generation by imitation and with the help of oral traditions, from the elders to the younger members of the community.

What is important to emphasize is that communication among the members of the original communities was one of the key conditions for the origins of informal institutions. In the beginning, it was based on non-verbal communication between members within one community. Over the time, communication emerged between different communities spreading informal rules and customs not only within one group but also among different groups. Therefore, Pejovic indicates that informal institutions represent institutions that are woven into the essence of a society, which are passed down from generation to generation in three ways: through imitation, oral tradition or learning traditions (Pejović, 1999).

On the other hand, Douglass North in his interpretation of informal institutions defines informal institutions as a set of habits, traditions, routines, and culture of a society. In that context informal institutions are viewed as solutions that help the community to solve problems through coordination of different social activities; norms of behaviour that become generally accepted in society and self-imposed norms of behaviour (expressed through trust, interpersonal relations and fairness). Furthermore, what characterizes informal institutions is that they are slowly changing where changes might occur on average every 100 years and most often because of social conflicts (Rumianowska, 2011, pg. 3).

5.1.1. Survival

The emergence of the first informal institutions dates back to the beginnings of the first human communities. Their creation was driven by the imperative of survival in the natural conditions prevalent during the Palaeolithic era, where the group's survival depended on communication and cooperation among its members. The necessity for communication and interaction among group members stemmed directly from humanity's quest for survival. This environment gave rise to the initial rules of behaviour within the group, all aimed at a singular goal–survival. The understanding of the genesis of the first institutions begins with the recognition that humanity exists amidst uncertainty. To mitigate existential fears, there arose a spontaneous need to establish rules that would apply universally to the entire community. In the struggle for existence and the endeavour to enhance survival prospects, initial interactions among early humans emerged. These interactions, which contributed to increased chances of survival, became recurrent over time. Behaviours within the group that were established and persisted over extended periods, concurrently bolstering survival prospects, were institutionalized into habits, taboos, cultural practices, myths, and beliefs. Such informal behavioural norms, originating from the traditions, habits, and collective experiences of a group, simultaneously shaped the subjective perceptions of individuals. Gradually, individuals began to perceive these behavioural norms as reality. This marked the emergence of the first institutional forms, initially manifesting as informal institutions and later evolving into formal institutions.

5.1.2. Kinship

The beginnings of informal institutions are based on relationships that existed within the first human societies and were primarily based on kinship. Kinship represents one of the key principles of the organization of society, which defines the relationships between individuals and groups that make up that society. It means ''socially recognized relationships between people within one culture'', that is, social ties based on blood-family ties. Kinship was dominant within the first human communities. The division of labour in which members of the male population were engaged in hunting, while the female population was engaged in gathering food, required interaction, communication, and rituals that were repeated over time, which led to the creation of an ancient forms of management and organization. Thus, the roots of the development of institutions can already be seen in the first forms of social organization, that is, the household, which represented the first form of the institution within hunter-gatherer societies.
In that period, the leadership position of individuals within a family or tribe was the result of merit and earned reputation. ''A successful hunter did not sit next to his prey and overeat; he divided the meat and thereby gained reputation'' (Wright, 2014). The household was the basic unit-cell from which relations and ways of organization were developed with the aim of production, distribution and use of labour, all with the aim of fulfilling not only the economic goal, but primarily survival.

Internal relationships within the household, rules of conduct (through the relationship between husband and wife, parent and child, older and younger family members) represent the key productive relationships in society based on kinship. The production is adapted to the usual requirements of the household. The transition from a hunter-gatherer society to early forms of agriculture societies required changes in forms of organization comparing with the original communities.

5.1.3. Chiefdom

The tribe and its chief followed with the ritual order, appear during the evolution of the first communities in such a way that the basic control over the resources and economy of the household gradually overcomes the principle of solidarity within the kinship structure, and in the process acquires a political aspect. In order to understand the origin of institutions, it is necessary to highlight the period of the late Palaeolithic, in which the role of the shamans is highlighted in the organization of the ancient societies, with a large number of families grouped into tribes. During the process of the evolution of ancient societies, it is noticed that the main control over the household economy gradually shifts from the concept of solidarity based on kinship, i.e. by kinship relations it is gradually transferred to the elder of the tribe (shaman or chief).[2]

Through this change, the political aspect of management arise, where management is centralized on the leader of the tribe and where the economy that was previously based on the household, now through the role of the tribal leader, is directed from a narrower (satisfying the needs of the household) to a broader social goal (satisfying the needs of the community). In this sense, the leader of the tribe becomes a central figure who occupies a leading position in and over the kinship network. This process begins with the chief placing his own production for the benefit of others, and ends to some extent with others placing their production for the benefit of the chief. *''Chiefdom is the political differentiation of kinship relationships.'' (Sahlins, 2017) .*

5.2. Redistribution and Exchange

Redistribution meant movements towards and from the centre. It implied the existence of a central point in one or a group of societies (e.g. shaman, chief, priest). Therefore, the redistribution of goods that is realized within one group took place on the basis of custom or a centralized decision. By applying the time train methodology, it can be noticed that redistribution takes place at different levels of the development of the ancient societies and civilizations, starting from hunter-gatherer societies to the era of Sumerians, Babylon, and Egypt. Additionally, redistribution developed to

[2] Shaman" is a term originating from the Evenki people, indigenous to Siberia, meaning "the one who sees." According to its definition, a shaman is "an individual who serves as an intermediary in tribal or traditional communities." Shamans hold positions as spiritual and religious leaders within ancient communities, and similar figures appear in numerous cultures across Africa, Asia, South America, and the Western world.

a greater extent in those communities where climatic conditions caused a time discrepancy between harvest and consumption of goods.

Given that redistribution was the result of a pre-defined division of labour created from the centre, it appeared in ancient communities first in the basic unit of society - the household. Some of the examples of such arrangement can be found in Central African tribes, the Hebrew patriarchal household, the Greek estate from the time of Aristotle or the ''familia'' in the Ancient Rome[3]. The redistribution of that time meant a wide range of redistribution (from the ceremony of the distribution of fruit by the chief to gift giving).

Exchange was the basic driving force behind the evolution of the ancient societies and early informal institutions. It represents the opposite movement comparing to redistribution, whereby it takes place between individuals within one system (first informal institutions). At the same time, it represents the basic means by which goods circulate among the ancient societies, where money or any other means of exchange were still not in use. Exchange, defined within this article, is defined in a broader sense where it implies the exchange of all goods at different locations in a broader time context. By applying the time train methodology, the exchange in can be viewed in the following ways and examples:

- ***Palaeolithic phase*** - Palaeolithic phase (Old Stone Age) is characterized by a nomadic way of life, where the hunting-gathering economy was dominant. The nomadic way of life meant constant movement and the search for food and shelter.
  The constant change of location further meant a lack of time for the development of the first forms of exchange, so the first communities of that era independently made and used the objects (clothes, tools) they needed. Based on this, research indicates that during the Palaeolithic era, forms of exchange (or later trade) were not developed, which was characteristic of hunter-gatherer societies.

- ***Neolithic phase*** - The first forms of exchange in its full meaning emerged during the Neolithic phase (New Stone Age) between 9,000 and 6,000 BC. Exchange is directly related to the first forms of agricultural production. The Neolithic phase represents a period characterized by the first forms of early agricultural production, which manifested itself through the cultivation of crops and the domestication of animals. This also caused changes in the way of life of the original communities, as they gradually transformed from hunter-gatherer to sedentary communities. In this sense, the original communities did not only exchange material goods, but on a broader way where the exchange included an emotional exchange and exchange of symbols. ''Such networks of exchange grow over time in scope and intensity'' (Reingruber, 2011, pg. 293). The first exchanges of goods were of a limited scope and took place within smaller communities and involved shorter distances between the places for exchange. The gradual transition to agricultural production created the possibility not only of the production of new tools, tools, and weapons, but also of the production of surplus food, which also became an object of exchange. Therefore, the Neolithic era is interpreted as a time frame in which exchange takes its first steps through the exchange of goods between different communities and at increasingly greater geographical distances compared to the Palaeolithic phase. Although the beginnings of the exchange were modest, they encouraged communication and the development of culture, while at the same time they represented the basis for the emergence of institutions.

- ***Early Bronze Age*** - Research into the exchange of goods during the Early Bronze Age (3,600-2,300 BC) indicates that there was no single or centralized network of exchange at that time, but rather different routes or lines of exchange that occasionally converged over time and formed a network that further led from local to regional centralization. An example of this is the pottery exchange network in the area of the ancient Near East, where there were defined networks of areas within which the exchange took place (Milevski, 2009, pg. 125-159).

- ***Middle Bronze Age*** - The later period, namely the Middle Bronze Age period, indicates that exchanges took place in temples that were built in river valleys (e.g. Jordan river) or near roads. The palaces and temples of that period served as a space for the exchange of goods (being the first institutions of that time) because it was

[3] In the time of the ancient Romans, the father was the head of the family. Therefore, the term "familia" refers to a group of people who come from the same father.

believed that on that way gods protected the economic activity of that period. The exchange was under the control of the chiefs or priests. On the other hand, the craft production of that time was also centralized and controlled also by the chiefs. What needs to be emphasized is that the first forms of exchange are connected in parallel with development of writing, as evidenced by the research of the Old Babylonian period, Mesopotamia (numerical records in the form of tokens, which preceded the later development of the cuneiform script), clay tablets with numerical symbols created up to the Uruk period (IV millennium BC) which all together proves the existence of the first forms of bureaucratic administration in the area of the upper Euphrates.

6. RESEARCH LIMITATIONS

Potential research limitations can be summarized in the following points:

Research of the early informal institutions is primarily based on a desk research and literature review of the existing literature in the fields of anthropology and institutional economics.

Theoretical background is primarily focused on the 'old' institutionalism and understanding of informal institutions from the perspective of the 'old' institutionalism.

Research is not envisaging the regional and local context in the analysis of the early informal institutions and rather provides broader approach to its understanding due to lack of data and research studies on the local level.

7. CONCLUSION

Research on the development of informal institutions is based on three starting points: time, evolution and culture. Namely, evolution introduces spontaneity in the creation of institutions, it introduces the potential of spontaneous development that is created by the actions of people. The spontaneous force of evolution introduces changes that the selective mechanism of evolution tests over time. Some institutions remain and continue to develop, while some disappear as ''victims'' of evolution. Culture brings in that invisible element of conscious action, especially in the form of innovation. However, it also has an evolutionary character because it is not a comprehensive plan by itself. All changes, all innovations, have a Darwinian character: gradualness, lack of direction, changeability. If institutions are a reaction to cultural changes that condition evolutionary changes in the wider environment, then the assumption on which I base further research is that the germs of institutions arise and develop in the constant interaction of evolution and culture. The unity of this inter-relation provides time, which appears as a comprehensive framework in which evolutionary and cultural changes take place. These relations between evolution and culture have the character of today, that is, they are of a processual character. The role of time is to encompass all these processes, network changes into one whole that is constantly in motion. That totality of networked changes of evolution and culture, which is in constant motion, constitutes a time train.

The main focus of the article was to highlight the importance of informal institutions and their evolution throughout history. Institutions, both informal and formal, are understood as systems of rules that have evolved alongside humanity, naturally and gradually emerging due to social interactions. However, compared to formal institutions, informal institutions are characterized by spontaneity, whereas formal institutions are characterized by deliberate planning. It is crucial to note that these two types of institutions do not adhere to the same temporal dynamics regarding changes. Informal institutions tend to change slowly over time, while formal institutions can undergo rapid changes. Unlike formal institutions, which can be altered relatively quickly through political or judicial decisions, informal institutions operate without written forms. Another characteristic of informal institutions is their inherent lack of control.

Informal institutions have endured from ancient civilizations to the present day, embodying rules and habits that originated spontaneously in early societies and have persisted throughout human history. Moreover, there is a risk associated with attempting to replicate the model of formal

institutions in diverse cultural environments characterized by different informal institutions and habits. Such replication may not yield the same outcomes as in the originating country. As invisible set of rules informal institutions play a significant role in the economic and social development sometimes exerting a greater influence than formal institutions in certain societies.

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CORRESPONDANCE:

Milica Daković, PhD Candidate
University of Donja Gorica
Faculty for International Economics, Finance and Business
Oktoih 1
81000 Podgorica, Montenegro
E-mail: milica.dakovic2@udg.edu.me

9.

Culture and economic development: case study of China

Ivan Piper, PhD student
Aleksandra Gogić, PhD student

Culture and economic development: case study of China

MSc Ivan Piper[1], MSc Aleksandra Gogić[2]

[1]Faculty of Culture and Tourism, University of Donja Gorica,
ivan.piper@udg.edu.me

[2]Faculty of Culture and Tourism, University of Donja Gorica,
aleksandra.gogic@udg.edu.me

ABSTRACT:

Theory according to which culture affects economic growth and development has divided the opinions of economists for centuries. On one side, some economists reject the culture hypothesis on the basis that factors of production and formal institutions solely influence economic growth, while on the other side a group of economists think that formal institutions are in fact a product of values, beliefs and preferences within society, which in their opinion further strengthens the culture hypothesis. In order to research and analyze the relationship between culture and economics, this paper is based on the professor Veselin Vukotić's premise that economics cannot be explained by economics alone, which is why the main assumption of the paper is that economic development cannot be analyzed independently of culture and its influence. Research results indicate the important role of culture as a variable that influences the economic development of China. However, some questions that were raised during the research process remain open and require further research of culture as a complex phenomenon and its influence on economics.

Keywords: culture, economic development, work ethics, cultural entrepreneur, philosophy, mentality

1. INTRODUCTION

The theory that culture influences economic development can be traced back to Max Weber, who has found a connection between Protestant ethics and the process of industrialization and economic development of countries in Western Europe (Weber, 2003). During the 20th century, economists predominantly dismissed culture as a factor of development, focusing primarily on the factors of production (labor, capital, technology) and their influence on economic growth and development. However, in recent years, economists have increasingly turned to culture to explain the causes of wealth and poverty among nations, although there are still conflicting opinions about the influence of culture on economic development (The Economist, 2020).

The starting point for this research is the premise of Prof. Dr Veselin Vukotić - *"Economics cannot be explained solely by economics."* (Vukotić, 2007). Understanding economics requires a holistic approach, which includes investigating the interdependence of economics with other disciplines. In this sense, economic factors are important but not sufficient to understand the essence of the problem. Therefore, in order to observe the problem in its entirety, it is important to ask questions such as: What do individuals residing in a particular country believe in? What is their value system? What customs and social norms characterize a particular society? Does the culture within that society influence people's work habits and entrepreneurship? (Vukotić, 2004).

As China is primarily a civilization that has existed for more than 5.000 years, the aim of this research is to analyze the connection between Chinese culture and tradition and economic development. In other words, the goal is to explore whether China's economic development in recent decades relies on its culture and tradition, and if so, how? How has everything that has happened throughout its long history influenced the way Chinese people behave, think, how politicians and rulers should make decisions, how the economic and political system should function? What role does philosophy play in this process?

Therefore, this paper starts from the assumption that economic development cannot be viewed independently of the influence of culture.

Since the term "culture" is often used in various contexts and therefore has a wide application, for the purposes of this research, the following complementary definitions of culture are used:

- Culture is the framework and result of human creation, innovation, and freedom (Vukotić, 2004).

- Culture represents a "set of beliefs and values that could influence behavior, transmitted socially and shared by a specific subset of society" (Mokyr, 2018).

2. LITERATURE OVERVIEW

Cultural arguments were once widely used to explain economic and political differences between countries. Early economists often used culture, a comprehensive term that includes beliefs, preferences, and values within society, to explain the difference between rich and poor countries. For example, Adam Smith explored how culture helps or hinders the rise of capitalism. He emphasized that certain norms were necessary for a market economy to thrive, particularly emphasizing self-interest, where individuals satisfy their personal interests by adapting to the needs of others (The Economist, 2020). Karl Marx later argued that the "oriental despotism" culture prevented the establishment of capitalism in Asia (The Economist, 2020).

According to research by *The Economist* magazine, speculations by Smith, Marx, and others were somewhat unclear and insufficiently concrete (The Economist, 2020). Therefore, Max Weber's work "*The Protestant Ethic and the Spirit of Capitalism*" published in 1905, solidified the theory that culture influences economic growth. According to Weber, Protestants, especially Calvinists, led to the rise of capitalism due to their strong work ethic (Weber, 2003).

However, during the 20th century, the cultural hypothesis lost popularity. The rapid economic growth of Japan in the 1950s, followed by the "Asian tigers," contradicted Weber's theory that only Western culture is suitable for industrialization. At the same time, the increasing availability of statistical data directed economists' attention to other factors, leading them to focus more on factors such as capital accumulation, wages, or employment, rather than variables that are difficult to measure, such as morality (The Economist, 2020). Therefore, in 1970, Robert Solow argued that most attempts to explain variables such as culture ended in the "flames of amateur sociology." (The Economist, 2019). Consequently, Robert Solow rejected culture as a variable affecting economic growth and introduced the so-called Solow growth model, according to which economic growth depends on factors of production, namely capital, labor, and technology (Yueh, 2019).

However, interest in culture persisted, and since the 1980s, the cultural hypothesis has been revived, as databases such as the *World Values Survey* and the *General Social Survey* have facilitated the quantitative measurement of cultural preferences and their connection to economic growth (The Economist, 2020). Institutional economics, led by Douglas North, provides an "upgrade" to the Solow model by adding another factor that should better reflect reality–institutions. As Douglas North states, institutions are formal and informal rules, which could influence and organize political and economic systems. In other words, institutions are the "rules of the game in society" (Yueh, 2018). Some cultural economists emphasize that highlighting institutions as the main factor proves their point: "What are institutions if not the product of norms, values, and preferences?" (The Economist, 2020).

Thus, Douglas North suggests that culture, as a form of informal institution, influences formal institutions and, together with them, creates appropriate incentives in society. Culture, as he notes, in a sense forms the foundation of institutions by providing them with legitimacy (Mokyr, 2018). This is confirmed by Tyler Cowen, who further emphasizes that institutions organize the factors of production, which then produce goods and services, thereby influencing the economic growth of a country (Cowen, Tabarook, 2015). In other words, as shown in Figure 1, although factors of production directly influence economic growth, the root of economic growth, and therefore development, lies much deeper, primarily in culture.

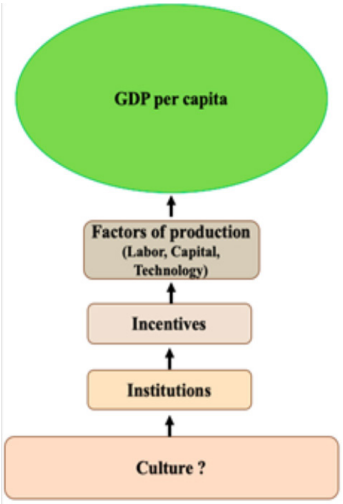

Figure 1. *Factors affecting economic growth (Cowen, Tabarook, 2015)*

In addition to Douglas North, other economists have attempted to explain economic growth using the cultural hypothesis. For example, Robert Putnam sought to understand why Northern Italy is more economically developed than the South, citing "social capital" as the main factor (The Economist, 2019). Joel Mokyr seeks to explain, based on culture, why some countries industrialized while others did not. According to Mokyr, factors often credited with initiating industrialization–such as capital accumulation and labor–are necessary but insufficient to explain economic growth. He further states that the true catalyst for industrialization in Europe was the evolution of beliefs and values. Specifically, Mokyr points out a specific cultural change that led to behavioral changes enabling industrialization, namely, the rise of a humanistic approach to evidence-based scientific inquiry (Mokyr, 2018).

Additionally, as Prof. dr Veselin Vukotić emphasizes, "it is undisputed that culture influences economic development, entrepreneurship, and is an integral part of the market. Likewise, it influences the success of transition. Culture, understood in this way, is an endogenous variable of development." (Vukotić, 2004). Samuel Huntington also proves that cultural values are enduring and autonomous values in society. Huntington also affirms the significance of culture as a primary variable influencing socio-economic development (Vukotić, 2004). The notion that culture is important for economic development was also developed by Lawrence Harrison, who argued that underdevelopment is a state of mind (Vukotić, 2004). Furthermore, Nobel laureate Amartya Sen wrote: "...cultural issues can be crucial for development.... Cultural issues are an integral part of our lives. If development can be seen as an improvement in our standard of living, then efforts aimed at development can hardly ignore the world of culture... Cultural conditions strongly influence human behavior and can thus affect economic and business decisions, just as political decisions do." (Sen, 2001). Thus, there are numerous opinions that form the basis for understanding culture as an important development factor, despite the widespread problem of scientific specialization.

However, a certain number of economists still reject the cultural hypothesis today. For example, Daron Acemoglu and James Robinson, recognized economists of the new institutional economics, argue that economic growth is influenced solely by formal inclusive and extractive institutions, rejecting the cultural hypothesis, geographical hypothesis, insufficient knowledge hypothesis, and wealth distribution theory as explanations that do not reflect reality. Therefore, they argue that today's Chinese economic growth has no connection to Chinese values or changes in Chinese culture, and that it is instead the result of the economic transformation process initiated by Deng Xiaoping and his associates. (Acemoglu, Robinson, 2013).

On the other hand, Joel Mokyr, in response to Daron Acemoglu and James Robinson's claims, emphasizes that institutions are based on what people believe and know. If culture and institutions are not aligned, the foundation will be unstable. In other words, if there is a conflict between culture and institutions, (for example if belief in institutions is undermined or if institutions have lost the legitimacy provided by culture), then there will be political disequilibrium (Mokyr, 2018). This is reminiscent of Professor Steve Pejović's and Professor Veselin Vukotić's "interactive thesis"– whether the transition will be effective and at what speed it will occur largely depends on whether informal institutions in that country (culture, customs, social norms, etc.) support the process, i.e., whether the formal institutions envisaged by the reforms are compatible with the informal

institutions (Pejović, Vukotić, 2002). As Professor Veselin Vukotić points out, institutions cannot be transplanted. The efficiency of new institutions depends on the specific circumstances existing in a particular environment, primarily on the cultural heritage of that environment, which is why it is not possible to mechanically transfer institutions from one environment to another (Vukotić, 2004). Therefore, if economic development cannot be understood without institutions, then it also cannot be understood without taking culture into account (Mokyr, 2018).

Using the example of China, authors like Ray Dalio and Martin Jacques emphasize that China did not achieve extraordinary economic results by simply copying Western institutions and rules, but rather by aligning them with its own culture and tradition. Similarly, Martin Jacques emphasizes that culture is the main cohesive force that has preserved the unity of China, and that China's economic development over the past 40 years would not have been possible without the support and influence of its culture (Jacques, 2012). Such a conclusion confirms Professor Vukotić's thesis that culture is the glue that holds society together (Vukotić, 2023). Additionally, numerous studies have been conducted on the relationship between culture and economy, with the *"Chinese Value Survey"* being particularly noteworthy. This research led to the discovery of a set of Confucian values directly linked to the economic success of East Asian cultures, especially China. Regarding the connection between Confucianism and the economic development of the "Asian tigers" and China, Hofstede and Bond have written that "culture in the form of certain dominant values is a necessary condition for economic growth." (Hofstede, Bond, 1988).

3. METHODOLOGY OF THE RESEARCH

During the research, several scientific methods were applied. Considering the research area, qualitative analysis was conducted to explain and analyze the interdependencies of certain phenomena, such as the relationship between Chinese culture and tradition on one hand, and the economy on the other. Additionally, descriptive methodology was used, involving the description of facts and processes, along with the comparative method, which was used to explain and analyze the Chinese way of thinking through comparison with other cultures. Furthermore, the research adopted an approach to examining and exploring connections between different phenomena, as well as cause-and-effect relationships.

In order to analyze the emergence and evolution of certain phenomena throughout China's history, the historical method was utilized, based on Professor Veselin Vukotić's "time train" methodology. The aim of the "time train" methodology is not to describe history and historical events, but to find and analyze key turning points and processes that have shaped today's phenomena (Vukotić, 2023). As Professor Veselin Vukotić notes, one of the important images for understanding the logic of emergence or origin of phenomena is the tree - what is visible (leaves and branches) cannot be understood without understanding the root, or the seeds of certain phenomena (Vukotić, 2023). This concept serves as a metaphorical and symbolic explanation of the logic of emergence of all phenomena present today, thus serving as the methodology for conducting this research.
Similar to the example illustrating factors influencing economic growth (Figure 1), potential cultural roots of China's economic development can be similarly depicted:

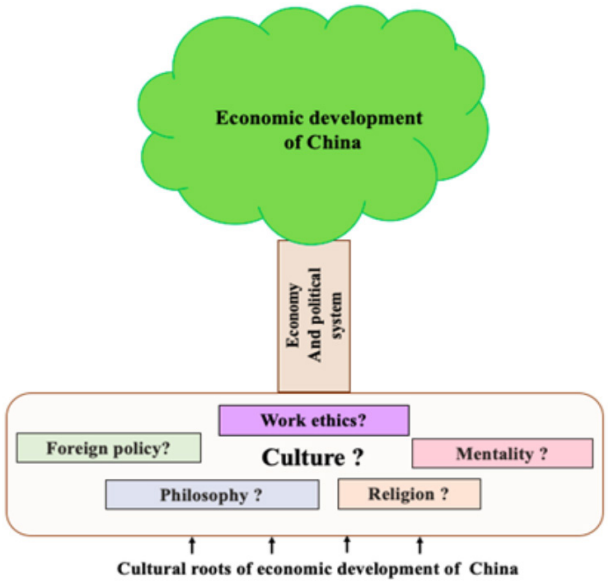

Figure 2. *Cultural roots of economic development of China (Vukotić, 2023)*

As depicted in the diagram, at the root are potential factors that constitute and more closely determine Chinese culture: philosophy, religion, work ethic, mentality (the characteristic way of thinking and behaving of Chinese people), and foreign policy (which analyzes traditional attitudes and the Chinese approach towards others). The assumption is that these cultural roots shape China's economic and political system, resulting in its economic development.

Therefore, the assumption of the study is that China's economic development is not solely the product of formal institutions that make up its economic and political system, but that it also has its cultural roots (Figure 2). Accordingly, the question arises of whether and how culture, along with factors that more closely determine it (philosophy, religion, work ethic, mentality, foreign policy...), has shaped the formal institutions constituting the economic and political system, and through them influenced China's economic development?

4. RESULTS AND DISCUSSIONS

Economists are still divided in their opinions when it comes to connection between culture and economic development. On one hand, a certain number of economists still reject the cultural hypothesis. As mentioned before, Daron Acemoglu and James Robinson argue that economic growth is influenced solely by formal inclusive and extractive institutions, rejecting the cultural hypothesis as explanation that do not reflect reality. As they emphasize using the example of China, "the poverty of the Chinese before Mao Zedong's death had nothing to do with Chinese culture–it was a consequence of the catastrophic way Mao organized the economy and led the policies", referring primarily to the "Great Leap Forward" and "Cultural Revolution" policies (Acemoglu, Robinson, 2013). Furthermore, they argue that today's Chinese economic growth has no connection to Chinese values or changes in Chinese culture. Instead, "Chinese economic growth and development is the result of the economic transformation process initiated by Deng Xiaoping and his associates" (Acemoglu, Robinson, 2013).

On the other hand, some economists strongly advocate for the cultural hypothesis. For example, unlike Daron Acemoglu and James Robinson, authors like Ray Dalio and Martin Jacques emphasize that China did not achieve extraordinary economic results by simply copying Western institutions and rules, but rather by aligning them with its own culture and tradition, or more precisely – "by dialectically merging the Chinese culture and philosophy with capitalist practices creating the so-called "socialist market economy with Chinese characteristics."" (Dalio, 2021). Additionally, Joel Mokyr, in response to Daron Acemoglu and James Robinson's claims, emphasizes that institutions are based on what people believe and know, and are as such a product of norms, values, and preferences, or in short - culture (Mokyr, 2018). Moreover, several surveys have confirmed their view, which will be analyzed in the next part of this paper.

Therefore, in order to understand the Chinese economy, it is important to analyze the influence exerted on it by Chinese culture, values, history, and traditions. To that end, this part of the research will analyze the connection between cultural roots and the economic development of China.

4.1. The Confucian connection: From cultural roots to economic growth

Several conducted surveys have found the connection between culture and economic development. For example, the *World Values Survey* research has quantified the ways in which countries express a range of cultural beliefs and values, such as attitudes towards saving, work ethic, individualism, political and legal institutions, openness to other countries and cultures, etc. According to the results of this research, China ranks quite highly in terms of savings, work ethic, and education for children (Jin, 2023). As Keyu Jin notes, "many believe that these are characteristics that have been crucial to China's economic success in recent decades, but there is a fundamental confusion between what drives income levels as opposed to growth" (Jin, 2023).

As further noted by Keyu Jin, culture and values change slowly and cannot be considered primary factors directly influencing economic growth (Jin, 2023). However, in the long term, culture can shape the income levels, thus

providing fertile ground for economic development, which encompasses a broader concept than growth (Jin, 2023). For example, countries characterized by a tendency towards saving are more likely to become wealthier, although this outcome is not guaranteed. The same applies to countries with a strong work ethic, such as China or Japan. Culture can also serve as an ''interaction variable'' when it comes to determining economic development. In other words, cultural values alone may not influence economic development, but they can affect it in combination with other factors (Jin, 2023).

There are several other studies that investigate the relationship between culture and China's economic development, all of which point to the significance of Confucianism both in China and in other East Asian countries. Accordingly, as Geert Hofstede states, ''It is possible that the driving force behind the economic success of Asian countries developed precisely from the principles of one of the oldest Asian philosophers, Confucius'' (Hofstede, Bond, 1988).

This especially applies to the ''Asian tigers''. Many economists have tried to explain the success of these countries, often citing better governance compared to other nations as the reason. However, according to Hofstede and Bond, this is too simplistic and incomplete, as the quality of governance depends on the quality of the people being governed (Hofstede, Bond, 1988). Therefore, for a complete explanation, the domain of culture needs to be included in the equation.

Herman Kahn believed the roots of East Asian cultures lay in the teachings of Confucius, which is why he termed such cultures as neo-Confucian. His neo-Confucian hypothesis is suggesting that East Asian countries share common cultural roots that stem from distant history, and that in new, global conditions, such cultural heritage has given these countries a competitive advantage in successful business activities (Hofstede, Bond, 1988). In that regard, the following is a brief analysis of Confucius's teachings and key principles which emerged as lessons based on Chinese history, as presented by Hofstede and Bond (Hofstede, Bond, 1988):

1. State stability is based on unequal relationships between people, which imply following obligations: younger individuals must respect and obey their elders, while elders must protect the younger ones.

2. The family is the prototype of all social organizations. Someone is identified first and foremost as a member of the family, and only then as an individual.

3. One should treat others as one would like to be treated, which represents the Confucian principle of benevolence, but it does not extend to the extent that one should love their enemies, as is the case in Christianity.

4. Everyone should cultivate virtues such as acquiring new skills and education, hard work, moderate consumption, patience, and perseverance throughout their lives. Moderation is encouraged in all aspects, including consumption.

Given the assumption that culture is a factor determining a country's future in economic terms, several researches have been conducted to examine such influence. To this end, among other surveys, the IBM survey was conducted, according to which the 53 cultures surveyed primarily differ along four dominant dimensions (clusters of interconnected values), namely:

1. The so-called ''Power Distance'' dimension, as an extent to which inhabitants support the unequal distribution of power.
2. Individualism compared to collectivism
3. Masculinity compared to femininity
4. Uncertainty avoidance (Hofstede, Bond, 1988)

When comparing the first three dimensions with the teachings of Confucius analyzed in the previous part of this chapter, it is not surprising that neo-Confucian states rank high in the ''power distance'' dimension, low in individualism, and in the middle when it comes to masculinity/femininity. However, as Hofstede and Bond point out - although these four dimensions can greatly influence people's motivations, which type of

governance will be most effective in a state, or the image people form of what an organization should be - none of the four dimensions mentioned is linked to economic growth (Hofstede, Bond, 1988). In other words, this research did not uncover a connection between culture and economic growth that applies to all countries.

However, the study titled *"Chinese Value Survey"* (CVS) yielded different results. Namely, the study covered 22 countries and consisted of examining which values are given greater importance in everyday life compared to other values. Just like in the IBM study, the set of values determined for the research produced four dimensions by which the cultures of countries differed (Hofstede, Bond, 1988). The first CVS dimension was very similar to the "power distance" dimension in the IBM study, the second related to individualism/collectivism, and the third to masculinity/femininity, despite the fact that the questions, respondents, time period, and countries were different in the CVS study compared to the IBM study. However, the fourth dimension from the IBM study which is associated with uncertainty avoidance was not found within the CVS research. Instead, a dimension encompassing a set of values stemming from the teachings of Confucius was discovered, and accordingly, this dimension was named "Confucian dynamism" (Hofstede, Bond, 1988).

As mentioned earlier, none of the four dimensions from the IBM study is linked to economic growth in all countries included in the research. However, as the results of the CVS research show, the new dimension "Confucian dynamism" is clearly associated with economic growth in each of the 22 countries covered by the study. Thus, the existence of a connection between culture and the economy has been confirmed (Hofstede, Bond, 1988).

Namely, the dimension of "Confucian dynamism" encompasses several Confucian values that have been directly linked to economic growth. For example, as noted by Hofstede and Bond, a "sense of hierarchy" and complementary relationships undoubtedly facilitate entrepreneurship (Hofstede, Bond, 1988). The "sense of shame" encourages the interconnectedness of the inhabitants of a particular country. Values such as "frugality" lead to greater savings, and consequently to greater availability of capital for reinvestment, which is a factor that directly affects economic growth (Hofstede, Bond, 1988). This value is particularly prevalent among the "Asian tigers," including China. Moreover, values such as "perseverance" and "persistence" suggest that people in these countries will strive to achieve all the goals they have set, including economic goals.

Similarly, it has been shown that assigning less importance by respondents to certain Confucian values in those countries also promotes economic growth (Hofstede, Bond, 1988). Primarily, this refers to values such as "respect for tradition," as excessive respect for tradition could hinder economic growth. Ultimately, the secret of the economic success of the "Asian tigers" partly lies in the ease with which they embraced technological innovations from the West. Additionally, if "personal calmness and stability" are overemphasized, they can discourage initiating initiatives, risk propensity, and adaptability, which are characteristics that successful entrepreneurs should possess.

Therefore, as Hofstede and Bond conclude: "Culture in the form of certain dominant values represents a necessary condition for economic growth. However, culture itself is not sufficient for such growth to occur. Two other necessary conditions are the existence of a market and a political context that enables development" (Hofstede, Bond, 1988). As they further indicate: "The first condition explains why the economic growth of the "Asian tigers" began only after 1955 when all the conditions for the existence of a truly global market were first met in history." (Hofstede, Bond, 1988). Also, the political context as support for economic growth and development has been fulfilled in all "Asian tigers," although the role of the state varied from active support to the economy to the laissez-faire system. As Hofstede and Bond noted: "The influence of the political context is particularly evident in the country that is the cradle of Confucianism - China, where political factors during Maoism hindered economic growth, especially when considering the consequences of the Cultural Revolution" (Hofstede, Bond, 1988). However, despite Maoism, many Confucian values persisted in China, and thanks to economic reforms and an adapted political context, it surpassed the success of the "Asian tigers" and "Five Dragons," becoming the sixth and strongest dragon among them (Hofstede, Bond, 1988).

As Hofstede and Bond conclude, it is interesting to note that the connection between culture and economic growth was not discovered in the IBM study designed and conducted by Western researchers. It was only through the implementation of the "Chinese Value Survey" research - an Eastern instrument in itself - that a set of Confucian values directly linked to the economic success of East Asian cultures was revealed (Hofstede, Bond, 1988). Therefore, this fact reflects how culture is indeed a fundamental phenomenon. As noted by Hofstede and Bond: "Not only does culture influence daily tasks - how someone lives, thinks, behaves - but the theories that people are able to develop to explain these everyday tasks as well." (Hofstede, Bond, 1988).

Other authors have also emphasized a significant contribution made by Confucius to Chinese culture and tradition, and consequently to economic development. As a consequence of the hardships of life in an agrarian society, Confucius emphasized the importance of hard work, as well as the value of a large family. Since a large family represented a burden on limited resources, the Confucian virtue of thriftiness became deeply rooted as one of the values that the Chinese respected and practiced. As Confucius's disciples also wrote, "extravagance is the worst of all evils." (Jin, 2023).

In addition to knowledge and learning, Confucius greatly valued character and moral integrity. While the Emperor held absolute power, the daily affairs of the state had to be handled by officials who were competent, educated, just, restrained, and dedicated to fulfilling their duties. In this context, Francis Fukuyama has emphasized the importance of merit-based bureaucracy, and China has established a meritocratic system for selecting state officials as early as the 3rd century BCE (Jin, 2023). Selection based on abilities and character traits has persisted and also characterizes the current Chinese system. What was once the imperial examination system for selecting officials is now the grueling entrance exam at Chinese universities. Such a system, in design, is meant to ensure that the most prepared and capable individuals gain a place at university and opportunities for employment.

It is not by accident that Chinese advocates for order and governance as very important principles. Those principles also have roots in Confucianism. Confucius lived during the chaotic Warring states period, and as a consequence he was aware of the importance of social stability and harmony. It was believed by modern economists that these principles, with aversion to individualism, have hindered entrepreneurial spirit and innovation, as Max Weber indicated. However, as Keyu Jin indicates, "Confucian principles such as social order, thriftiness, hard work and meritocratic bureaucracy have played an important role in the economic success of countries such as Japan, South Korea, Taiwan and China (Jin, 2023).

Beside high savings and investment rates, rapid industrialization, and rich human capital, these countries are also recognized for efficient public institutions and technocratic bureaucracies. In other words, as Yan indicates, "Unlike the European and American model, which draws its roots from the tradition of Adam Smith, which treats the state as a necessary evil that should be reduced only to law and order, Confucian values and tradition have spawned a model of maximum state, with a multitude of responsibilities, duties, and obligations. The state is not just a supervisor and regulator by function but also plays a leadership role in development and education. The state, or government, is not just composed of administrative officials: its members are often seen as leaders, intellectuals, and teachers" (Jin, 2023).

Although there isn't a singular Confucian economic model officially presented as an alternative to capitalist and socialist models, based on the results of the previously analyzed research, it's possible to conclude that the principles originating from Confucianism play a significant role in China's economic development. Dr Sheh Seow Wah has also written about the connection between Confucianism and the economy: "According to Confucius, the economic development and prosperity of a nation require the integration and balancing of work ethics with entrepreneurship within a politically stable and harmonious society" (Wah, 2015). Therefore, as argued by Dr Wah, according to Confucius, only when these principles and conditions are met, through their mutual interplay and synthesis, will fertile ground be created for the country's economic development (Wah, 2015). Thus, this reflects the statement of Prof. Dr Veselin Vukotić that *"Economics cannot be explained by economics alone"* – the formula includes other factors (especially cultural ones) that must be satisfied

and that serve as support to the economy (Vukotić, 2007). In this way, Confucius reflects another characteristic of the Chinese stemming from the tradition and culture of China – a holistic approach that involves viewing problems in their entirety.

4.2. The roots of Chinese work ethics

For the Chinese, hard work is traditionally regarded as one of the most important characteristics they take great pride in as a nation. Work ethic is deeply ingrained in the character of the Chinese people, which is directly linked to the lack of resources and means of living throughout much of their history. For thousands of years, the majority of Chinese people have been involved in agriculture, thus firmly believing in the saying "no pain, no gain." (Lulu, et al., 2019). Given that China often faces natural disasters and turbulent crises, farmers diligently work during peaceful times to prepare for potential natural or man-made disasters. This work ethic is also instilled in their children from a young age.

As Ronald Wright argued, many ancient civilizations became extinct because they did not think long-term. They pushed progress too far and ended up being destroyed by natural disasters, such as the irrigation system in Mesopotamia, changes in river courses, salt accumulation in the soil, deforestation on Easter Island, etc. (Rajt, 2007). On the other hand, China is an exception. As Wright notes, China had vast arable fields and land available, but the survival of Chinese civilization was also due to the wisdom of the Chinese. Specifically, the Chinese thought long-term and devised terraced rice cultivation, which represents a form of sustainable agriculture, thereby preventing soil erosion as seen in other civilizations (Rajt, 2007). Consequently, rice has been cultivated in China for several millennia, and from there it spread to other countries.

The fundamental question addressed in this chapter is as follows: besides enabling sustainable agriculture and thus the longevity of Chinese civilization, did rice also influence Chinese work ethic, and if so, in what way?

Historically, agriculture in Western countries has been "mechanically" oriented. If a farmer wanted to be more efficient and increase yields, they would devise sophisticated equipment to replace human labor with mechanical work (e.g., hay balers, tractors, etc.). This would allow them to accomplish more tasks with the same effort, resulting in higher yields. However, as Malcolm Gladwell points out: "Farmers in China and Japan did not have the money to buy equipment, nor was there additional land that could be converted into new fields for planting. Therefore, rice farmers increased their yields by working smarter, managing their time better, and making better decisions." (Gladwell, 2009). According to anthropologist Francesca Bray: "Unlike agriculture in Western countries, which is mechanically oriented, rice cultivation is skill-based: if a farmer is willing to weed more carefully, become more skilled at fertilizing, spend more time monitoring water levels, better maintain the land where rice is planted, and utilize every inch of the rice field, then they will achieve higher yields" (Gladwell, 2009). Therefore, throughout history, people who cultivated rice worked significantly harder than almost all other farmers.

The cultivation of rice provided the Chinese with satisfaction and meaning, as there was a clear connection between the effort invested and the reward obtained. The harder a farmer worked in the rice fields, the higher the yield. On the other hand, rice cultivation is a complex task, as it involves not only planting in the spring and harvesting in the fall. As Gladwell notes, a Chinese rice farmer essentially manages a small business, as they oversee the family workforce, mitigate uncertainty by carefully selecting seeds, build and manage sophisticated irrigation systems, and coordinate the complex harvesting process while simultaneously preparing for the next crop (Gladwell, 2009).

Historian David Arkush has compared popular folk sayings among farmers from China and Russia, and the differences are very pronounced. "If God doesn't give, the land won't give," is a typical Russian saying, which is characteristic for repressive feudal systems (Arkush, 1984). Conversely, Chinese folk sayings stand out for their belief that "hard work, clever planning, self-confidence, and cooperation with a small group will pay off over time" (Arkush, 1984). Such a set of values and beliefs is certainly influenced by the absence of monotheism in China, as well as the fact that the most prevalent religions in China are actually philosophical schools– Confucianism, Taoism, and Buddhism. Below are some of the sayings

uttered by farmers in China as they spent thousands of hours each year under the sun and in the dampness of the rice fields:

"Without blood and sweat, there is no food."
"Farmers are hardworking; farmers are hardworking; if farmers were not hardworking, where would the food for winter come from?"
"When winter comes, the lazy man will freeze to death."
"Do not rely on the heavens for food, but on your hands that carry the burden."
"If a man works diligently, the land will not be lazy."
"Anyone who rises before dawn for three hundred and sixty-five days a year will succeed in enriching their family."
As Gladwell notes, for a farmer in Russia who sleeps through the winter, such a saying would be unimaginable (Gladwell, 2009).

Gladwell's observation about Asian students staying in the library long after others have left on Western university campuses is not uncommon. In Chinese schools, students don't have long summer breaks. Hard work and work ethic characterize successful individuals, and a particular cultural value born in rice fields is that hard work provided farmers a way to find meaning amid great uncertainty and poverty (Gladwell, 2009). This lesson has served the Chinese well in many endeavors, including economic ones.

An additional incentive was the fact that China's system had been based on meritocracy for centuries, encouraging hard work as important positions were earned based on merit (Sterckx, 2019). In ancient China, people studied and took state exams to become civil servants and improve their lives. Government positions were awarded solely based on talent, skills, and knowledge, making it a relatively fair process of selection and employment. To pass exams, students had to diligently study and prepare, fueled by intense competition. As a result, the virtue of diligent learning was passed down through generations and remains today, even visible in U.S. universities where Asian students, including those from China, stand out for their hard work and good results (Lulu, et al., 2019).

Today, the work ethic of the Chinese can be seen in various aspects. For example, migrant workers diligently work in cities to earn money for their children's education or to support their parents. Many urban workers also work overtime to increase their income and improve their lives. Many studies confirm this. For instance, according to a 2015 study, Chinese workers on average work between 2.000 and 2.200 hours per year, while, for comparison, UK residents work an average of only 1.677 hours per year (Lulu, et al., 2019). Viewed on a macro level, the work ethic of the Chinese people has been the driving force behind China's rapid economic development in recent decades. Therefore, there is a reasonable assumption that Chinese work ethic, stemming from traditional Chinese culture, directly contributes to China's economic performance.

4.3. Cultural entrepreneurs

Joel Mokyr identifies a certain number of individuals who have expanded the cultural "menu" available to others, enriching it with new ideas, values, and beliefs. Mokyr calls these individuals "cultural entrepreneurs" (Mokyr, 2018). Cultural entrepreneurs are, in essence, individuals who do not adapt to the world but rather adapt the world to themselves (Vukotić, 2023).

Therefore, cultural entrepreneurs can be considered individuals who successfully challenged and overthrew existing authorities in certain areas of culture, offering a competitive alternative. In Europe, these would include Martin Luther, Adam Smith, John Locke, Karl Marx, Ayn Rand, Joseph Schumpeter, Charles Darwin, and many others. In other words, cultural entrepreneurs are individuals who become influential enough to change the set of values and beliefs held by a sufficient number of people and "convince" many of them to adopt the new set of values they offer. The number of "converted" people should be large enough to significantly influence institutions and behavior (the required number depends on the context) (Mokyr, 2018). Thus, cultural entrepreneurs influence the change in what people believe in, and if they succeed in "converting" a sufficient number of people, they will change institutions to align with the new beliefs, thereby changing the environment in which future cultural entrepreneurs will find themselves (Mokyr, 2018). They often reach their audience through their students, followers, descendants, and if they leave behind written works, in some cases, the exact content of their writing may be less important than the messages future generations draw from

their teachings.

In China, cultural entrepreneurs are most often philosophers: Confucius, Laozi, Buddha, Mencius, Sun Tzu, Zhu Xi, but also politicians like Mao Zedong and Deng Xiaoping. As Ray Dalio points out, Chinese culture is actually the result of numerous experiences of known and unknown inhabitants of China and the lessons they learned based on those experiences over thousands of years. These experiences and lessons are embodied in philosophical teachings that speak to how things work and how to confront reality and problems, providing principles on how people should relate to each other, how politicians and rulers should make decisions, how the economic system should function, and so on (Dalio, 2021).

Therefore, Chinese philosophy is an integral part of the daily life of the Chinese people, primarily due to its practicality. The significant questions that occupied the minds of great Chinese thinkers were not "who are we" and "what are we," but rather how to live life, how to relate to others, how to organize society, and how to ensure the well-being of loved ones. Questions posed by Chinese philosophers included what makes a good person, what kind of person should lead and be a leader to others, how to maintain order in society, how to learn from tradition, what can be learned from ancestors, what strategies can help outsmart enemies, how to negotiate with others, whether social engagement leads to a fulfilling life, or instead, complete withdrawal from society (Sterckx, 2019)? Ancient Chinese philosophers rarely engaged in intellectual debates for the sake of debate itself. Their ideas served as a guide for living, to be experienced and practiced (Sterckx, 2019).

Chinese philosophy is a product of a period of constant warfare, death, and destruction. A particularly "fruitful" period for the flourishing of philosophy was the era of the "Warring States," and such circumstances produced some of the most famous cultural entrepreneurs in China, whose legacies became central pillars of Chinese culture. The most creative and original philosophers among them had significant influence and were crucial in changing values and ways of thinking within society, and therefore in changing institutions and economic performance (Mokyr, 2018). Due to the frequent warfare that lasted for several centuries, Chinese thinkers began to think intensively about the meaning of life, the nature of existence, as well as ways to stop the horrors of war. Thus, philosophy experienced a flourishing, giving rise to the phenomenon known as the "Hundred Schools of Thought." In other words, during that period, a large number of different philosophical schools were founded, including Confucianism, Taoism, and Legalism (Mokyr, 2018). It was also during this time that the famous book by the philosopher and military strategist Sun Tzu, "The Art of War," was created, which promotes peace and whose main message is that victory should be achieved before war even occurs (Jaivin, 2021).

The era of relentless political upheavals and constant warfare focused thinkers in a way that comfort in peace probably never would. Ancient Chinese philosophers had little time to waste on abstract theories and to be interested in questions that did not have visible answers. These historical circumstances explain why a large part of Chinese thought is focused on social and political issues, ethics, and etiquette (Sterckx, 2019). Thus, this flourishing of philosophy has defined the cultural parameters that are still present in Chinese society today.

In many cases throughout Chinese history, the prime ministers were actually leading philosophers of their time, originating from different philosophical schools, thus shaping China's official state policy (Ju-Lan, 1971). This clearly demonstrates the direct connection between Chinese culture, in this case, philosophy, and the state and its outcomes, as philosophers governed the state. Of course, one should not forget the education system based on the teachings of Confucius, as well as the testing system that all those interested in public service had to pass (Wood, 2020). In these tests, the most significant works of Confucius and other significant philosophers were examined, thereby establishing a meritocratic system by which government officials could only be highly educated individuals (Dalio, 2021). Thus, defining the art of governance was at the top of the agenda for ancient Chinese philosophers. Many principles and teachings of Confucianism, Taoism, and especially Legalism have greatly shaped China's political culture and are present today. These are three very different political philosophies. For example, Confucianism regards the state as an extended family. In the family, which, along with the state, is considered the most important institution in China according to Confucianism, all members are aware of their roles and strictly adhere

to the hierarchy. Therefore, the Chinese family plays a significant role in society, as children are getting familiar with authority within it. Children are obliged to take care of their parents – everything parents (especially the father) say must be strictly respected, and children must not oppose them. Within the family, children are introduced to the hierarchy and find their place in it. The state, or the Chinese government, functions in the same way, making the family and the state complementary and supportive of each other. Just like parents, with whom it is often compared, the state does not know the limits of its authority. Therefore, as Martin Jacques notes, paternalism is considered a desirable and necessary characteristic of the Chinese government (Jacques, 2012).

On the other hand, according to Legalism, the state should exercise authoritarian rule based on strict laws and severe punishments. Legalism also served as the main political philosophy of the Qin dynasty, which unified China and is remembered for its "brutal" methods of rule. Unlike Legalism and Confucianism, Taoism is based on liberal principles reminiscent of the *laissez-faire* policy of physiocracy, whereby the state should not interfere in the economy and the private lives of citizens, emphasizing that things should unfold spontaneously, naturally, in their own course (Sterckx, 2019). However, as one saying goes, "those who ruled China were Confucians on the outside, and Legalists on the inside," while "in every Legalist a Taoist is hiding" (if the penalties are severe enough, people will respect the rules and there will be no need for frequent state intervention) (Sterckx, 2019). Although these are three very different political philosophies, institutions in China often, in the spirit of Chinese dialectics, the golden middle, and the yin-yang philosophy, reconcile opposites, thereby adopting different characteristics from different philosophical schools that complement each other.

In September 2011, the Chinese government released a document on foreign policy entitled "China's Peaceful Development," in which it clearly emphasized that the Chinese government based its foreign policy on the tradition of Chinese culture, stating that "Peaceful development continues China's historical and cultural tradition" (Yan, 2013). This was previously predicted by Henry Kissinger in 2008 when he said he believed that "when China becomes a strong global power, the Chinese government will adopt the principles of ancient Chinese philosophy to govern its foreign policy, rather than the principles of Marxism or liberalism." (Yan, 2013).

As Ray Dalio points out, Chinese culture, which encompasses the expectations of its inhabitants about how families and communities should behave towards each other and how leaders should govern while citizens should follow, has evolved over thousands of years through the rise and fall of numerous dynasties and the development of Confucianism, neo-Confucianism, and numerous other philosophical currents and beliefs. These typical Chinese values have manifested themselves in various ways throughout China's history; for example, they formed the basis of Deng Xiaoping's economic and leadership approach, the driver of Chinese reforms, and Lee Kuan Yew's, the former Prime Minister of Singapore. Both combined Confucian values with capitalist practices, which in Deng Xiaoping's case represented "socialist market economy with Chinese characteristics." (Dalio, 2021). Thus, although certain formal institutions were "borrowed" from Western countries during the reforms, they were adapted to Chinese culture, so the roots of the "Chinese characteristics" that characterize its economic system can be found in China's history, tradition, and culture (Dalio, 2021). Thus, China's culture and history have laid the foundation for its economic development, but achieving this required a complete overhaul of the economic system. China has largely succeeded in this, as its reform program has created a unique economic system that is authentic and in line with its culture and tradition.

5. RESEARCH LIMITATIONS

Considering the field of research, qualitative analysis was applied in explaining and analyzing the interdependence of certain phenomena, such as the connection between Chinese culture and tradition on the one hand, and the economy on the other. However, in order to address limitations of this research, further research should also conduct quantitative analysis in order to further test the results of this paper, and therefore to further test the connection between culture and economic development. Additionally, given that this research has selected certain factors (i.e. philosophy, work ethics, mentality, foreign policy etc.) that explain Chinese culture, further research should include more factors in order to expand the holistic approach and analyze Chinese culture in even more depth.

6. CONCLUSION

The cultural hypothesis has sparked divided opinions among economists throughout history. On one hand, there are views that culture does not influence economic growth, but rather formal institutions, which can be inclusive or extractive (Acemoglu, Robinson, 2013). However, on the other hand, there is a large number of economists who believe that culture plays a crucial role in economic growth, as it shapes formal institutions, which then organize production factors efficiently through a set of incentives, influencing economic growth and development. Some cultural economists argue that the emphasis on institutions as the main factor proves their point: ''what are institutions if not the product of norms, values, and preferences?'' (The Economist, 2020).

Research results show that a set of values, beliefs, preferences, customs, and norms within society influence the formation of institutions. For example, the most creative and original cultural entrepreneurs in China (predominantly philosophers) had a significant influence and were instrumental in shaping values and ways of thinking within society, thus influencing institutional change and economic performance. Such a flourishing of philosophy has defined cultural parameters that are still present in Chinese society today.

In many cases throughout China's history, leading philosophers from various philosophical schools have served as prime ministers, directly shaping China's official state policy based on their teachings. Additionally, modern China's foreign policy, according to official documents, is based on the tradition of Chinese culture. Typical Chinese values have manifested themselves in various ways throughout China's history, thus forming the basis of the economic and leadership approaches of Deng Xiaoping, the architect of Chinese reforms, and Lee Kuan Yew, the former prime minister of Singapore. Both combined Confucian values with capitalist practices, representing, in Deng Xiaoping's case, a ''socialist market economy with Chinese characteristics,'' thus basing China's economic system on the tradition of Chinese culture. This is further supported by Chinese work ethics, or the way in which Chinese people perceive the relationship between effort and reward, which potentially influences economic performance. Research analyzing the relationship between Chinese culture and economic development further supports these arguments. In this regard, the ''Chinese Value Survey'' stands out, which revealed a direct link between a set of Confucian values and economic growth and development, and thus between culture and the economy.

Therefore, the basic assumption of the work – that economic development cannot be viewed independently of the influence of culture – can be confirmed. However, some questions remain open. For example, why do people from similar cultures achieve different economic outcomes? It seems likely that the economic development of countries depends on a combination of economic incentives, culture, institutions, but also luck – however, what is most important among these factors remains unclear (The Economist, 2021). Researching the causes of the wealth and poverty of nations has been the main mission of numerous economists for centuries. The ''revival'' of the cultural hypothesis in recent decades has contributed to this mission, but it is far from over.

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CORRESPONDANCE:

Ivan Piper, MSc, teaching assistant
University of Donja Gorica
Faculty of Culture and Tourism
Oktoih 1
81000 Podgorica, Montenegro
E-mail: ivan.piper@udg.edu.me

Aleksandra Gogić, MSc
University of Donja Gorica
Faculty of Culture and Tourism
Oktoih 1
81000 Podgorica, Montenegro
E-mail: aleksandra.gogic@udg.edu.me

10.

Digital technologies and additive manufacturing play central role in sustainable tourism

MSci Ema Mandić
MSci Sara Đikanović

Digital technologies and additive manufacturing play central role in sustainable tourism

Ema Mandic[1], Sara Djikanovic[2]

[1]ema.mandic@udg.edu.me
University of Donja Gorica

[2]sara.djikanovic@udg.edu.me
University of Donja Gorica

ABSTRACT:

In the modern world, a significant challenge for tourism offerings is the increasing need for new tourist attractions and products at destinations. By introducing innovations to existing destinations, the tourism industry adapts to the demands of the contemporary tourism market. In order to present and promote cultural heritage assets in better way, it is necessary to stimulate the development of cultural routes that can be applied in tourism practice. The synergy between human and the environment has been shaken by human's negative impact on the environment through the decades which resulted by global warming and drastic climate changes. A huge part of this problem that actively contributes with over 50% is construction sector, but with nowadays technology not everything that humans do in this sector should have a negative impact on the environment and ways of living for new generations. Dealing with architecture means seeing the invisible, seeing the impact it has on people and all areas of their lives. Architecture is part of history and culture and represents the identity of an area. 3D printing technology emerges as a transformative solution, enabling sustainable architectural practices and the preservation of cultural heritage. By leveraging this innovative approach, Montenegrin cultural routes can be developed with eco-friendly techniques, enhancing the overall experience for tourists while safeguarding the environment and cultural identity.

Keywords: tourism, cultural heritage, cultural routes, synergy, architecture, 3D printing, sustainability.

1. INTRODUCTION

Cultural tourism represents an increasingly important form of tourism in the global tourism market and all relevant research and data suggest that it will play an even more significant role in the future. For this reason, all destinations are making great efforts to conceive and design unique cultural products that will enable them to create a recognizable image and gain a competitive advantage in the global tourism market. One of the current trends that is attracting increasing interest from both tourists and tourism policymakers is cultural routes, which represent unique tourism products based on cultural and historical resources. They allow tourists to visit places off the beaten tourist path, discover local traditions, cultures, crafts, gastronomy and experience authentic tourist experiences. Cultural routes are a meeting point of the past, present and future, fostering the uniqueness of local cultures while simultaneously bringing them together into a network of European cultural heritage.

What is particularly important to mention is that cultural routes can significantly contribute to solving some of the most current problems faced by many tourist destinations, including uneven regional development, seasonality of tourist offerings and so on, while also contributing to the development of the concept of sustainable tourism.

Tourism in Montenegro represents one of the key foundations of the country's economic development and has been recognized as one of the most significant strategic directions for future development. Considering the richness of cultural and historical heritage, as well as the fact that Montenegrin tourism, perhaps even more than competitive destinations, faces numerous problems related to uneven dispersion of tourism offerings both spatially and temporally, it is clear why the creation and introduction of cultural routes are significant for Montenegro's tourism offerings.

Therefore, on one hand, they can significantly improve the quality of the tourism offerings and encourage the adequate preservation, promotion and valorization of cultural heritage, while on the other hand, they contribute to an even distribution of tourism traffic - both in terms of including the central and northern regions in the tourism offerings, and in creating offerings that will be attractive and appealing to tourists

outside the tourist season. Moreover, cultural routes can contribute to enhancing cooperation among cultural institutions and organizations, as well as encourage the more active involvement of local residents and other significant stakeholders in the creation and implementation of tourism content.

With the ever-increasing emergences of new technologies, people's awareness and daily needs have changed drastically compared to the time of 100 years ago. Today it is unthinkable, even impossible, to spend a day with a switched off mobile phone or computer. Advanced technologies are implemented in all spheres of our lives. Thus, advanced technologies have also found application in engineering industries like construction, architecture, machine, and also in in culinary arts, aeronautics, fashion industry etc. The need for the implementation of these technologies in the field of AC sector increases proportionally, in order to speed up the process of project execution, but 17 also for long-term monitoring of the "behavior" of the built object.

Since engineering sector strongly influence the economy, the environment and society as a whole, represents a challenge for this industry, it is safe to say that a change in the construction process is really necessary because in compared to many other industries, the construction industry is extremely slow in technological development.

Additive manufacturing stands for a variety of manufacturing processes, techniques and technologies used to create a finished product from a digital model throughout the process of adding given thickness of layers of material (one upon another) in time.

3D printing can significantly contribute to the improved realization of cultural routes and the sustainability of tourism. By enabling the production of detailed and accurate replicas of cultural and historical artifacts, 3D printing allows for immersive and educational experiences along cultural routes. Tourists can engage with tangible representations of local heritage, deepening their understanding and appreciation of the region's history and traditions.

Furthermore, 3D printing can be utilized to create customized and cost-effective souvenirs that reflect the cultural identity of a destination, providing visitors with meaningful keepsakes while supporting local artisans and businesses.

Additionally, 3D printing can facilitate the restoration and preservation of historical sites and objects, extending the lifespan of valuable cultural heritage and enhancing the overall experience of cultural routes. This technology can also be used to design and produce sustainable infrastructure for tourism, such as eco-friendly signage and installations that blend seamlessly with the environment. In these ways, 3D printing supports the goals of cultural routes by enriching tourist experiences and promoting the responsible management of cultural and natural resources.

2. LITERATURE OVERVIEW

Cultural tourism has been a significant area of interest for several authors. Csapo (2012) emphasizes the critical role that cultural tourism plays in promoting economic growth and cultural preservation. Similarly, Jelinčić (2008) provides a comprehensive guide on cultural tourism, focusing on its principles and best practices, which are essential for fostering cultural exchange and understanding.

Tinaj and Jakšić Stojanović (2022) contribute to the discourse by examining the intersection of cultural heritage and tourism. Their work highlights the necessity of preserving cultural assets while promoting tourism, thereby supporting sustainable tourism practices through the protection of cultural heritage.

The integration of digital technologies in tourism and hospitality is extensively covered by Altinay and Paraskevas (2008). They explore how digital tools can enhance research methodologies and strategies within these fields, ensuring more efficient and effective planning.

Buhalis and Costa (2006) discuss the impact of digitalization on tourism management. They provide insights into how emerging digital trends, such as data analytics and online marketing, are transforming tourism management, leading to more sustainable and customer-centric practices.

Additive manufacturing (AM) is a revolutionary technology with significant implications for sustainable tourism. Ertas and Stroud (2022) discuss recent advancements and applications of AM, emphasizing its potential to create customized, eco-friendly products that can enhance the tourism experience.

Gibson and Rosen (2015) provide a comprehensive review of AM technologies. Their work discusses the potential of AM to produce sustainable products and reduce waste, which is crucial for the tourism sector.

Mandolini, Pradel and Cicconi (2022) highlight the importance of tailoring design processes for AM. Their research discusses how these methods can support the creation of sustainable and innovative products for the tourism industry.

Mercado and Arciniegas (2020) examine various AM techniques and their applications. Their work highlights the potential of AM to revolutionize product development in tourism, making it more sustainable and efficient.

Salmi (2021) discusses the integration of modeling, simulation and data processing in AM. His research underscores the importance of digital tools in optimizing AM processes, which can contribute to more sustainable practices in tourism-related manufacturing.

The environmental implications of AM are explored by Kellens and Baumers (2017). Their work maps the environmental impacts of AM across different domains, providing critical insights into how AM can support sustainable manufacturing practices in tourism.

Kochov (2016) provides foundational knowledge on rapid prototyping technologies, which are integral to AM. His research highlights the potential of these technologies to create sustainable and innovative products for the tourism sector.

Hermann and Pentek (2015) review design principles for Industry 4.0 scenarios. Their research emphasizes the integration of digital technologies and smart manufacturing practices, highlighting how these advancements can drive sustainability in tourism.

Raval and Patel (2020) discuss the potential of 3D printing in construction. Their work addresses the challenges and opportunities of using 3D printing to create sustainable infrastructure for tourism.

The European Construction Sector Observatory (2021) report provides an overview of how digital technologies, including AM, are transforming construction practices. Their insights emphasize the importance of digital transformation in achieving sustainability in tourism infrastructure development.

The reviewed literature demonstrates a comprehensive understanding of how digital technologies and additive manufacturing are central to advancing sustainable tourism. Cultural tourism, enhanced by digital tools, promotes cultural preservation and economic growth. Additive manufacturing offers innovative solutions for sustainable product development and infrastructure, critical for the tourism industry's future. Integrating these technologies ensures that tourism can grow responsibly, minimizing environmental impacts while enhancing cultural and economic benefits.

3. METHODOLOGY OF THE RESEARCH

The methodological approach to research was conducted using two methods. These are:

- Desk analysis which involves researching relevant literature, studies, strategies and other relevant sources about cultural routes and 3D printing.

- Survey which involves collecting and analyzing the opinions and attitudes of local residents, tourism workers and other relevant stakeholders in Montenegro's tourism industry. The survey was conducted on a relevant stratified sample and includes all questions that are significant for a comprehensive understanding of the topic.

4. RESULTS AND DISCUSSIONS

The research was conducted through an electronic survey. The survey was conducted on a stratified sample of 96 respondents. The first part of the survey involves collecting basic informations from the respondents, including their gender, age and level of education. The second part of the survey deals with questions about the perception of Montenegro as a destination for cultural tourism and the identification of key resources that could stimulate the development of this form of tourism. Additionally, the survey included questions about respondents' opinions on whether 3D printing could contribute to cultural routes in Montenegro and support sustainable tourism development. This aspect of the research explored the potential impact of emerging technologies on the cultural and tourism sectors.

When we analyze the sample structure, we observe that most respondents belong to the female population, specifically 69.8% of the total number. Regarding the age structure, the largest number of respondents or 45.8% falls within the age group between 26 and 35 years. Regarding the level of education, as many as 72.9% of the respondents have completed a university degree.

Table 1. *Demographic Characteristics of the Respondents*

Demographic Data	Percentage Participation of Respondents
Gender	
Male	30.2%
Female	69.8%
Age	
>18 years	5.2%
19-25 years	29.2%
26-35 years	45.8%
36-50 years	13.5%
50+ years	6.3%
Education Level	
Primary Education / High School	24%
College Education	3.1%
University Degree	72.9%
Other	/

Source: *Results of the conducted research, independent work*

Respondents' answers to the question "Do you believe that culture influences the image of Montenegro as a tourist destination?" indicate that the majority of respondents, precisely 95.8% of the total, believe that culture has a significant impact on the perception of Montenegro as a tourist destination. Only 1% of respondents stated that they believe culture does not influence the image of Montenegro as a tourist destination, while 3.2% were unsure. The survey results clearly show that culture is considered a key factor shaping the image of the country in a tourist context.

The survey results show that the majority of respondents (57.3%) rate Montenegro's current tourist offerings in terms of cultural experiences as poor. This information suggests that there is significant potential for improvement in the tourism offerings in the area of cultural tourism in Montenegro.

The research showed that 61.5% of the total respondents are familiar with the concept of cultural routes. A significant number of respondents also responded negatively (38.5%). These results indicate the current level of awareness about cultural routes and provide guidance for further efforts in promoting and developing this concept among the wider population.

In response to the question "Have you heard about the existing cultural routes in Montenegro? (If so, please name them.)", 93.4% of respondents answered negatively. Only 6.6% of respondents have heard about cultural routes in Montenegro such as the Olive Tree Route, World War II Monuments, Godinje (Lake Skadar) and Medieval Towns. This result indicates that the existing cultural routes in Montenegro are not sufficiently promoted. It is necessary to dedicate much more attention to educating and informing the public about cultural routes, as well as raising awareness about the importance of cultural heritage.

Respondents were asked how interested they were in exploring cultural routes in Montenegro. Of the total number of respondents, 40.6% answered that they were very interested in exploring cultural routes in Montenegro, while 52.1% said they were moderately interested. Respondents who expressed uncertainty made up 7.3% of the total. Interestingly, none of the respondents indicated that exploring cultural routes in Montenegro

was unimportant to them. This suggests a general awareness and interest among respondents in this topic. This can be a positive sign for potential research and the promotion of cultural routes in the country.

In response to the question "Do you believe that the introduction of the concept of cultural routes could contribute to the sustainable development of Montenegro as a tourist destination?" 96.9% of respondents answered affirmatively. Those who responded negatively make up a minor portion at 1%, and those who are unsure that the introduction of the concept of cultural routes could contribute to the sustainable development of Montenegro as a tourist destination account for 2.1%.

The results indicate that the majority of respondents, 45.8%, are somewhat familiar with 3D printing technology, while a quarter (25.0%) are very familiar with it. However, a substantial portion - 29.2% of respondents is not familiar with 3D printing technology, suggesting the need for increased education and awareness in this area.

Most respondents - 63.5% believe that 3D printing can enhance the cultural routes experience in Montenegro. A smaller percentage (12.5%) disagree, while a significant portion (24.0%) are unsure, indicating the potential for further research and education on the topic.

Respondents identified creating replicas of historical artifacts (51.0%) and producing personalized souvenirs (41.7%) as the main aspects of cultural routes that could benefit from 3D printing technology. Designing interactive exhibits (35.4%) was also seen as a significant benefit, showing interest in enhancing visitor engagement and interaction with cultural heritage.

A majority of respondents - 67.7% expressed interest in purchasing 3D-printed souvenirs representing Montenegro's cultural heritage. This suggests a potential market for 3D-printed cultural products, which could enhance tourists' experiences and support local artists and craftsmen.

Respondents who believe that 3D printing can contribute to sustainable tourism development in Montenegro cited several reasons such as reducing waste and promoting local crafts. By creating sustainable souvenirs and interactive exhibits, 3D printing can foster greater appreciation and preservation of cultural heritage while minimizing environmental impact.

The survey results demonstrate a positive perception of 3D printing technology's potential to enhance cultural routes and contribute to sustainable tourism development in Montenegro. While familiarity with 3D printing technology varies, there is notable interest in leveraging it to create replicas of historical artifacts, design interactive exhibits and produce personalized souvenirs.

This emerging technology offers opportunities for innovative approaches to showcasing Montenegro's cultural heritage and engaging visitors in immersive experiences. The interest in purchasing 3D-printed souvenirs suggests a promising market for local artists and businesses. As Montenegro seeks to develop its cultural tourism sector, integrating 3D printing could offer sustainable and creative solutions to attract and retain visitors while preserving cultural heritage.

5. RESEARCH LIMITATIONS

In conducting the research, we encountered several limitations that may influence the results and the overall applicability of the findings. Firstly, the relatively small sample size of 96 respondents may limit the ability to generalize the results to the broader population. Additionally, respondents' unfamiliarity with the concepts of cultural routes and 3D printing could have impacted their answers, potentially reducing the quality of the data collected.

6. CONCLUSION

Although tourism in Montenegro is one of the key economic sectors and a strategic priority for future development, there is undoubtedly much room for improvement in the quality of the tourism offering. This is especially true for cultural tourism. Given the current trends and developments in the global tourism market, as well as the exceptionally valuable cultural resources that Montenegro possesses, the introduction of the concept of cultural routes could significantly contribute to diversifying and enhancing

the quality of the tourism offering, as well as creating a recognizable image on the global tourism market. Additionally, it could greatly contribute to addressing the challenges faced by Montenegrin tourism, such as the seasonality of the tourism offering and uneven regional tourism development.

However, the design of this concept must be approached thoroughly and carefully, taking into account the cultural potentials of Montenegro and their adequate protection and valorization, drawing inspiration from best practices and involving all relevant stakeholders. The integration of 3D printing into the development of cultural routes can further enhance the visitor experience and offer innovative ways to engage with Montenegro's cultural heritage. By using 3D printing, it is possible to create detailed replicas of historical sites and artifacts, produce interactive educational materials, and offer unique, personalized souvenirs. This fusion of technology and culture can provide a more immersive and engaging experience for tourists while supporting sustainable tourism development in Montenegro.

Through the symbiosis of technology, art, innovation and vision this innovative technology opens the door to new horizons of creativity and self-expression. As Aristotle said: "Architecture is the play of light, form and soul". 3D printing allows architects to materialize their ideas and create objects that convey deeper philosophical messages. In line with Kant's imperative of beauty, this technology encourages architects to think about the harmony between nature and technology, creating a space for reflection and contemplation. The usage of biomimicry in architecture using 3DCP has never been easier. Indeed, 3D printing is a bridge between philosophy and architecture, bringing together abstract ideas with concrete materializations. It corresponds in strategy with the environment.

Since 3D printing technology is still in its infancy, there are a variety of difficulties that users of this technology throughout the world must overcome. The essence of the informatics paradigm is reflected in investing efforts in the understanding of the philosophy of informatics, that is, the information society. In order to reach that understanding, it is necessary to invest as much effort as possible tounderstand that we live primarily in today's time and that the spirit of our time is important for us.

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CORRESPONDANCE:

Ema Mandić, Teaching assistant
University of Donja Gorica
Faculty of Culture and Tourism
Oktoih 1
81000 Podgorica, Montenegro
E-mail: ema.mandic@udg.edu.me

Sara Đikanović, Teaching assistant, Head of ProDe laboratory
University of Donja Gorica
Faculty of Polytechnics
Oktoih 1
81000 Podgorica, Montenegro
E-mail: sara.djikanovic@udg.edu.me

11.

Stećci (Stecci) in Montenegro: the possibility of touristic valorisation through the examples of comparative practices

MSci Vedran Pean
Aleksandra Gogić, PhD student
Todor Mitrovic

Stećci (Stecci) in Montenegro: the possibility of touristic valorisation through the examples of comparative practices

Vedran Pean[1], Aleksandra Gogic[2], Todor Mitrovic[3]

[1]Faculty of Arts, University of Donja Gorica,
vedran.pean@udg.edu.me

[2]Faculty of Culture and Tourism, University of Donja Gorica,
aleksandra.gogic@udg.edu.me

[3]Faculty of Arts, University of Donja Gorica,
todor.mitrovic@udg.edu.me

ABSTRACT:

This paper intends to present the importance of evaluating the cultural heritage of stećci as an integral part of the touristic offer of Montenegro. Beside the fact that its territory has the smallest number of stećci compared to Bosnia and Hercegovina, Serbia or Croatia, the identified stećci are representatives of various influences, styles and represent chronicles of the complex history of Montenegro, specific social structure, traditions and customs. However, besides their diversity in Montenegro, as well as in the countries of our Region, there is an evident problem of non-existent long-term plans for their preservation, conservation and valorization as a cultural property. Through theoretical frameworks, but primarily in relation to comparative practices and models related to the preservation and valorization of cultural heritage, this paper intends to provide framework for the future activation of stećci as an important segment of Montenegrin cultural tourism, as well as their internal and external popularization.

Keywords: Stećci, Montenegro, culture, tourism, valorization, heritage, preservation

1. INTRODUCTION

Stećci, monolithic stone tombstones, widespread in the Balkan area, represent the common cultural heritage of Montenegro, Serbia, Croatia and Bosnia and Herzegovina, dating back to the period from the 12th to the 16th centuries. They were listed on the UNESCO World Heritage List in 2016, but, even though they are protected as a valuable cultural heritage, there were no means, nor there was attention paid to their touristic valorization. Also, the study of these monuments, as well as the interest of the local population remains at an unsatisfactory level, as indicated by the fact they are left to the influence of atmospheric phenomena and without sustainability strategy.

In Montenegro, stećci necropolises are mostly located on mountain valleys and hills, close to former fortifications; and together with nature that surrounds them they form an ambiental environment. These monuments contain complex cultural characteristics, which testify about medieval culture and even today they give impression of mystery among visitors. Three localities in Montenegro stand out for their value, which is why they are deservedly listed on the UNESCO World Heritage List: Greek Cemetery (Žabljak), Bare Žugića (Žabljak), Greek Cemetery (Plužine). Localities, as well as individual monuments, differ in size, as well as in the level of preservation and decoration. Stećci can be found in the western part of Montenegro, mostly in towns such as Pljevlja, Žabljak, Nikšić and Plužine. Stećci also have a special artistic value, which is seen in their shapes, but in their decoration as well, which makes them different and more attractive than many other cemeteries. (Bešlagić, 1982).

Stećci differ in their types of shape from recumbent such as slabs, chests and ridged tombstones to upright such as steles, pillars, crosses, etc. These basic forms can variate depending on the certain characteristics.
Stećci sometimes have decorations executed in shallow relief, the motifs of which include social and religious symbols, representations of horses, figural representations and so-called pure ornaments. Inscriptions containing religious or eschatological formulas, moral teachings, as well as those containing information about the deceased, and sometimes also about his relatives and the circumstances of his death. Decorations are made of reliefs of different motifs, which still attract visitors today and

give the impression of mystery of people who lived in this area. In the following text, we will briefly describe these stećci sites from the World Heritage List:

1. ***Greek Cemetery, Riblje jezero (Fish Lake), Novakovići*** – The Site is located at 1,431m above sea level, 11.4km southeast of Žabljak, in the village Novakovići, at only 200m northwest of the road and the shore of Riblje jezero. It is located on a low rise, overgrown with grass and contains: 49 tombstones: 10 slabs, 27 chests and 12 ridged tombstones. Of these 49, as many as 22 are decorated, while the rest are amorphous and natural in shape. The most common motifs are in the form of decorative strips that function as friezes or frames, but arcades can also be found next to them. Motifs of symbolic character can also be recognized on stećci, such as crosses (and variations), circles, rosettes, stars, and heraldic motifs symbolizing a sword or shield. In addition to these, the stećci in the Greek Cemetery also contain figural representations of a man holding a sword and shield, and a hunting scene. All stećci are made of local limestone. The necropolis is inseparable from the nature that surrounds it, the Lakes and Durmitor landscapes, so it forms a special combination of cultural and natural heritage.

Photo 1. *Greek Cemetery, Riblje jezero , Novakovići, Žabljak*

2. ***Bare Žugića, Novakovići, Žabljak*** – The site is located at 1,416m above sea level, 13.6km southeast of Žabljak in the hamlet of Novakovići, on the same road that leads to the Greek Cemetery site. It is also located on a hill on the left side of the road. 300 stećci were registered at this site, namely: 240 slabs, 50 chests and 10 ridges. Although more numerous than those at the Greek cemetery site, only 10 of them have a regular shape, while the rest are irregular, or natural and amorphous, and some are unfinished. Decoration can be found on 23 stećci in the form of decorative strips that function as friezes or frames, arcades, and figural symbols such as the cross (and variations), circles, rosettes, stars, bow and arrow, sword, shield. The stećci are made of local limestone. Based on the number of stećci in this locality, we can conclude that this place was once densely populated.

Photo 2. *Bare Zugića, Novakovići, Žabljak*

3. ***Greek Cemetery, Šćepan polje (Šćepan Field), Plužine*** – The site is near the mouth of the Tara and Piva river, in the hamlet of Zagrađe, high on a hill. The necropolis is smaller than the previous two and it is located at 908m above sea level. Also, unlike the previous two, it is not easily accessible, but it can be reached via main road from Šavnik to the Drina bridge and Bosnia and Herzegovina's border, then via the village road that leads to the church in Zagrađe, from which the site is 1.3km away. The necropolis is covered by a beech forest and consists of 16 stećci, namely 3 are slab type, 6 chest type and 7 ridge type, while one has a natural amorphous form. The stećci are made of stones from the surrounding area and are mostly undecorated, but one stands out, which is bigger than the others, a chest with an engraved epitaph for Petko Hrišćanin (Petko Christian). This inscription gives as an insight into historical information, by which we could conclude when the stećak was made and it is also important for linguistic studies, language structure and Cyrillic letter of 15th century.

Photo 3. *Greek Cemetery, Sćepan polje, Plužine*

Stećci point to an important intercultural exchange of human values over a long period, they also point us to the unique cultural tradition of a people, which is reflected in the rich material heritage of these monuments, which vary in their forms and artistic decorations, and in addition suggest the connection between living traditions, beliefs and ideas, which are reflected in various forms of intangible heritage, primarily burial customs (UNESCO, 2015). All this led to the transnational (Montenegro, Serbia, Bosnia and Herzegovina, Croatia) listing of stećci on the UNESCO World Heritage List.

The recognition of the importance of these monuments by UNESCO was not reflected in their better maintenance and tourism valorization in Montenegro, which is the case in other countries also. In order to preserve these monuments, we think that appropriate tourism valorization, along with the education of the local population, would lead to the achievement of this goal. The stećci sites represent one of the most important cultural monuments in Montenegro, and in addition to them, the Natural and cultural-historical region of Kotor, the Fortified City of Kotor (part of the Venetian fortifications between the 16th and 17th centuries) and the Durmitor National Park are also listed on the List of Cultural Heritage.

Regarding the level of preservation of the stećci sites, as we have previously stated, it is not at an enviable level, as evidenced by UNESCO's reports. The necropolis of the Greek cemetery at Riblje jezero and the site of Bare Žugića are in relatively good conditions, but like most other stećci, to a lesser or greater extent, they also show damage, which is reflected in broken parts. Bearing in mind that the Greek Cemetery necropolis is situated on a hill, it is therefore subject to extreme atmospheric conditions that cause partial dislocation of its parts. Moreover, the current state of stećci is largely caused by climatic influences, especially strong winds and heavy rainfall. Also, the surfaces of stećci at the necropolis of the Greek Cemetery are covered with lichens and moss, which makes any attempt at their detailed observation or research almost impossible.

Regarding the Bare Žugića site, most of the decorated stećci were either buried in the ground or moved to the south side. The impression is that the reasons of these changes are primarily the age of stećci, the atmospheric influence and the unfavorable surrounding terrain.

Although Montenegro has the smallest number of stećci on its territory compared to Bosnia and Hercegovina, Serbia or Croatia, they represent valuable component of the cultural heritage of Montenegro (Bešlagić, 1982). The cultural heritage of previous generations can be of particular value to contemporary societies, but the question arises to what extent and in which way this potential can be used.

2. LITERATURE OVERVIEW

UNESCO defines cultural heritage as: ,,artefacts, monuments, a group of buildings and sites, museums that have a diversity of values including symbolic, historic, artistic, aesthetic, ethnological or anthropological, scientific and social significance. It includes tangible heritage (movable, immobile and underwater), intangible cultural heritage (ICH) embedded into cultural, and natural heritage artefacts, sites or monuments ''(UNESCO Institute for Statistics, 2009).

In National Strategy of Sustainable Development of Montenegro until 2030 (2016), culture is perceived as one of fundamental values of Montenegrin society and main segment of sustainable development. Considering this fact, it is necessary to find means for the touristic valorization of stećci sites in Montenegro, in order to implement the concept of sustainable development supported by the cultural heritage listed on the UNESCO World Heritage list. Protection of cultural heritage, with its regeneration, is one of the main humanitarian components of development of democratic societies (Santoro, 2017).

Just as it is difficult to define culture itself, we also encounter several definitions of cultural tourism. The United Nations World Touristic Organization (UNWTO, 1985) defined cultural tourism as travel motivated by culture, such as study, theater and cultural tours, travel to festivals and similar events, visits to historical sites and monuments, travel to study the nature, folklore or art, and pilgrimage. In the contemporary literature the most acceptable definition of the cultural tourism is that it signifies ''the movement of people caused by the cultural attractions outside of their usual residence, with the intention of collecting new information and experiences, or to meet their cultural needs.'' (Richards, 1996). However, this definition, excludes, unplanned visits to cultural contents, which exist in any case. Cultural tourism includes visits to cultural institutions (museums, galleries, theatres, concerts, etc.), but visits to historical monuments and sites, societies with different customs, etc. Even though, it is difficult to define frameworks of cultural tourism Janos Csapou (2012) offered certain categories:

1. Cultural tourism related to cultural and historical heritage;
2. Thematic routes;
3. Urban tourism;
4. Ethno tourism;
5. Event/festival tourism;
6. Religious tourism;
7. Creative tourism.

Sustainable development, therefore, depends on cultural tourism, which enables the income for others, whose profession is not touristic in nature. From which it follows that cultural heritage can generate direct and indirect benefits (Cappellin, 2014). Every country has its own cultural heritage and cultural production, however, the problems faced by cultural tourism are reflected in the revitalization of cultural heritage and the promotion of local culture, both to its citizens and tourists.

The complexity of these problems is related to the management of cultural heritage and the management of tourist destinations. Their correct valorization allows resources to be allocated and used by the creators of tourism development, from which it follows that valorization is the process of transforming tourist resources into tourist attractions (Risteski, 2020). From this, it can be concluded that tourism and culture are tightly connected and dependent on each other, where tourism enables the preservation of culture, its promotion, increasing its visibility among tourists and the local population, and culture affects the authenticity and attractiveness of tourism (Golja, 2016).

Today, vacation is no longer the only reason for travel, but tourists are increasingly interested in something that could be called active tourism, where, in addition to visiting locations, they also seek active participation in cultural activities (Dujmović, 2014). Therefore, a passive holiday has been

replaced by an active one, which contributes to the authentic experience of certain locations, through interaction with the local population, and from these interactions comes mutual rapprochement and learning about different cultures, and from the point of view of tourism valorization, the local economy is also helped. We can perceive that the revitalization of cultural monuments would lead to an increase in their attractiveness, as important localities, even for some form of active tourism, such as research, storytelling, cultural routes, etc. In this manner, cultural tourism differs from mass tourism in the way that it ''cares for the culture it consumes while culturing the consumer'' (Richards, 2007). In this case, tourism and culture work together, guided by management policies, which can act as a catalyst for the promotion of local destinations as places to live, visit, work, and invest, which necessarily leads to an improvement in the standard of living of the local population (Arfić Rakitovac, Urosević, 2017). However, if the development does not meet the sustainability of the chosen model, the promotion of cultural heritage can have a negative impact on the local population (La Bara, et al., 2018). This influence can be reflected in the violation of the integrity of traditional social systems, cultural conflict between locals and the increased number of tourists, increased product prices, increased environmental pollution, all of which lead to a decline in the quality of life (Cicerchia, 2009). From this it can be concluded that the issue of tourism valorization of certain cultural assets or localities is very complex and implies, as stated by Katerina Angelevska-Najdeska (2017) ''qualitative and quantitative assessment of the value of tourism resources and represents the most significant phase in the planning of the spatial development of tourism, all that in order to objectively assess the tourism values of resources'' (Angelevska-Najdeska, 2017). To begin with, it is necessary to determine the basic elements (Jovičić, et. al., 2005), which are reflected in: 1) attractiveness of motives (resources); 2) geographical position; 3) distances of home regions. From all of the mentioned, it follows that tourism valorization must also be in a function of sustainable development, which begins with the determination of the current state of existing resources, from the assessment of objective and realistic opportunities for tourism development, but also the protection of those resources or localities, as well as finding solutions for their protection, as well as investment opportunities and chances for tourist traffic (Božic, Berić, 2013).

3. METHODOLOGY OF THE RESEARCH

In this paper, we used literature sources in the field of cultural heritage, cultural tourism and tourist valorization, as well as a review of comparative practices related to stećci sites in the surrounding countries and other related places in this area, in order to find appropriate models for the possible tourism valorization of stećci in Montenegro, which are listed on the UNESCO World Heritage List. To assess the condition of these sites, we used a joint document (UNESCO, 2015) of Bosnia and Herzegovina, Croatia, Montenegro and Serbia, which was used during the nomination for the World Heritage List. In addition to the desk research method, we also did initial field research, i.e. visited the localities and their environment, in order to evaluate their current state and utilization for the purposes of cultural tourism, and based on comparative practices, we could define which potential models could be applied for the purposes of promoting stećci as a form of cultural tourism offer.

During proposal of possible strategies for tourism valorization of stećci, we used the FAS model (Factors, Attractors and Support Services), which is based on connecting existing resources within a certain tourist destination and developing modern alternative forms of tourism. It is primarily a qualitative model that is also applicable in quantitative research (Ristevski & Kočevski, 2018).

4. RESULTS AND DISCUSSIONS

Through a comparative analysis and by investigating possible models of more effective management and valorization of the cultural heritage of stećci, we came across several examples that can be conceptually applied in our context as well. First of all, it should be pointed out that all the mentioned examples are based on an interdisciplinary approach and intensive cooperation of experts from different fields: geologists, art historians, anthropologists, etc. It is also important to note that the dislocation of stećak is prohibited and that they can only be valorized in situ.

Primarily in the form of conservation of stećci sites, as a prerequisite for their adequate touristic valorization in contemporary context, an interesting example of overall community inclusion in the issue of cultural tourism management could be that of *Vondelpark*, one of the largest city parks in the Netherelands, which was adapted several times starting in 1867.

In the first decade of its first adaptation, it was expanded by 45 hectares of land and was located on the outskirts of Amsterdam. In the years that followed, with the rapid development of the capital of the Netherlands, the park became the central part of the city, but the surrounding urbanization did not destroy its original appearance, and in 1996 it was officially named a National Cultural Property protected by law. However, in spite of the somewhat successful preservation of this valuable cultural monument, it was already condemned to decay when it was formed, having in mind that it was built on a muddy area that is sinking more and more each year due to geological changes. As a result, it is prescribed that this park is continuously evaluated and renovated as necessary within a time frame of 30 years. It is interesting that the efforts to save important segments of this park included the relocation of the main monument dedicated to the prominent Dutch writer Joost van den Vondel, after whom the park was named. Thus, today this monument is located on a small hill, supported by wooden pillars that raise it in relation to the surface of the earth, whose height in relation to the surface of the sea changes every year (De Beer, Boogaard, 2017).

Continuous evaluation is crucial in adequate monitoring of all eventual changes which may occur in locations which are located in areas of unfavorable geomorphological characteristics and climatic conditions. The example of *Vondelpark* can serve as an adequate model so that the process of preservation could be put into practice on the example of stećci, through the cooperation of experts in various fields – primarily geologists and art historians; and other important participants such as representatives of local community and administrative bodies in relation to long-term planning of preservation strategies. The example of *Vondelpark* is significant due to it being touristic attraction that is visited by more than 10 million tourists annually, which in itself presupposes a direct comparison with the sites of stećci, that are now, and may be in a greater extent in the future, a significant potential in the context of promotion of cultural tourism on the territory of Montenegro. It is important to note that *Vondelpark* is in located in the huge urban settlement, while stećci in Montenegro are located in the mostly isolated inhabited areas. Although, they are in the close proximity of the two lakes (Vražje and Riblje lake), which are visited by the tourist, they are not part of the urban center such us *Vondelpark.*

Another example of good valorization practice and with much more similarities to stećci is Stonehenge, a prehistoric stone circle monument, and cemetery, which is located on the Salisbury Plain, which is at a distance of 13 kilometers north of Salisbury, Wiltshire in England. During the time Stonehenge endured despite human activities throughout the centuries and today it is one of the most famous stone circles, visited by more than million people per year. Still, it gives the air of mystery to its visitors, reimagining the life past. Next to the Stonehenge a visitor center was built where visitors could see and exhibition featuring artifacts from the time of the Stonehenge, as well as contemporary exhibition with multi-media setup. Tourist could also find Neolithic houses, where they can learn about the technology of the past. Stonehenge is a great example of how something mysterious and sacred such as a place for religious gatherings and cemetery could be made into something still alive. Around stećci on Žabljak there is plenty of open space and natural beauty to make it into touristic attraction. This requires significant investment into creating a place for storytelling and education.

Although the question of touristic valorization of old cemeteries is complicated to answer, because it depends on many factors, a good practice can be found even in the more recent cemeteries. Cemetery of Montmartre, which is a resting place of many famous artists who lived and worked there, is one example, where a cemetery is made into popular tourist destination. Cemeteries could offer insight into old religions, burial tradition, craftsmanship, artistic and spiritual life of the past, and as such could have a great potential for storytelling, even through new medias, for the visitors.

The main problem of the current state of stećci is the coverage of these cultural monuments with lichens and moss, which makes all attempts to

explore their rich decorative motifs difficult. In the process of cleaning monuments from lichen colonies, different removal methods are currently used in the world and they are divided into three separate groups. In the first place, there are ***mechanical approaches*** that involve either the use of special brushes or, less often, a scalpel. Then, ***chemical methods*** that include the use of biocidal products, and ultimately ***physical methods*** with the use of laser beams that have a special application. Often, when applying chemical methods, natural biocides are also used, such as essential oils, which have a less harmful effect on the environment and achieve the same effect of removing the consequences of the spread of lichens (Pozo-Antonio et al., 2016; Gomes et al., 2017). It is precisely this form of treatment of damaged stećci that can have the most adequate application in sites located in Montenegro.

In the following research phase, after defining the potential models of stećci conservation, as the main prerequisites for their attractiveness and accessibility in the context of touristic valorization, we defined certain comparative examples of valorization within the tourism framework, especially on the example of stećci in our Region.

What is noticeable in a large number of research papers that deal with the topic of potential tourism valorization of stećci in our Region is, first of all, pointing out the shortcomings, first in terms of road infrastructure, signaling, promotional activities, but also adequate planning of a wider scope of content that does not necessarily have to be related to stećci sites (which in themselves do not belong to sites of high tourist attractiveness). These additional contents are often near the vicinity of stećci localities and can contribute to the motivation of tourists to visit stećci sites. In terms of the problem of adequate road infrastructure in the case of Montenegro, it is expressed only in terms of the obsolescence of the roads and the inaccessibility of certain locations such as the Greek cemetery in Plužine by the main transit roads. In this sense, there is certainly room for improving the road infrastructure and adequate signalization that would direct tourists to these areas. The existing signalization in Montenegro only indicates the existence of identified stećci locations, but does not offer detailed descriptions or interactive content in the form of promotional billboards that would interest tourists to visit these locations. In the terms of road networks and connections with other areas (cities, nearby cultural monuments, National Parks, ethnic villages, recreational areas, etc.), Montenegro certainly has an advantage over the Region in terms of the proximity of all these localities, which can be defined as its main competitive advantage in terms of tourism valorization of stećci. When it comes to the above-mentioned promotional activities in Montenegro, there is enough space for devising new strategies, especially in terms of a wider scope of cultural content that may not necessarily be contextually connected to stećci, but with their greater attractiveness in the terms of touristic valorization, can contribute to a greater motivation of tourists to visits to the stećci sites. At least in terms of transit tourism, these contents can offer a more comprehensive understanding of the autochthonous history of the areas where stećci are located, as well as the complexity and diversity of our cultural heritage. The accessibility segment, which is also insufficiently elaborated on the example of stećci sites in Montenegro, also contains the aspect of parking zones, and planned places where tourists can refresh themselves (especially in the summer) and get the services of tourist guides who would conduct them in all important zones. Having in mind the proximity of stećci to the larger cities, and especially in terms of the Greek cemetery in Žabljak and the site of Bare Žugića, the mutual proximity of the stećci localities themselves, there is enough space for touristic valorization in the form of ***cultural routes***, and one of the most important segments of this type of valorization is precisely adequate connectivity and planning of the carefully designed content. Without adequate planning in this sense, the tourist potential of stećci, regardless of their cultural and historical importance, cannot be sufficiently utilized.

Regarding creation of contents that could improve attractiveness of stećci sites, by using primarily the criteria of their geographical proximity, as well as the specificity of their locations, we segmented these sites into two units. As a result, in the following, we will consider proposals of potential touristic valorization separately for the sites of Greek Cemetery in Žabljak and Bare Žugića as one unit; and the Greek Cemetery in Plužine as another unit. We particularly focused on the mentioned sites, having in mind that they are the only ones currently listed on the UNESCO World Heritage List.

The sites of the Greek Cemetery in Žabljak and Bare Žugića have their advantage in terms of accessibility, given that they are located near the roads that lead directly from the main transit zones, which are surrounded

by untouched nature and picturesque landscapes. Also, in terms of rural tourism, their proximity to the lakes Vražje and Riblje, as well as ethnic villages, Durmitor National Park, but also to Žabljak itself, which already has a developed tourist offer in terms of rural tourism, already assumes the possibility of valorizing the existing forms of diverse tourist offer - horse riding, hiking, camping and agritourism.

In the context of the location of the Greek Cemetery in Plužine, the proximity of the Piva Nature Park, Piva Eye and Piva Lake, as well as the existing infrastructures in the form of viewpoints, already provides adequate prerequisites for rural tourism, which would ultimately enable a longer stay of tourists near the locations where stećci are located.

Photo 4. *National park Durmitor, Žabljak*

In terms of the direct valorization of stećci sites in the context of cultural tourism, and in relation to the importance of an interdisciplinary approach, it is primarily important to point out some existing examples of promotion by those who are not directly involved in the process of planning strategies related to preservation and valorization, but contribute to the overall popularization of stećci cultural heritage. In this sense, we cite the example of the exhibition "Otisak vremena – Stećci u Crnoj Gori" (The Imprint of Time - Stećci in Montenegro) by the Montenegrin artist Anka Burić, conceived in the form of graphic processing of decorative motifs of preserved examples of stećci, recorded on the sites themselves, which were then exhibited in a modern gallery space and had an educational function. Furthermore, on the basis of such examples, artists could be included in the conception of content that would relate to the cultural valorization of stećci, either through similar interventions and exhibition activities or through artist and student art colonies that would actively participate in the design of various contents that would be realized in the stećci sites, of course, with their adequate treatment. Also, it is necessary to include students of art faculties in the process of designing content within their academic communities, but also more widely, in planning new ways of popularizing the cultural heritage of stećci.

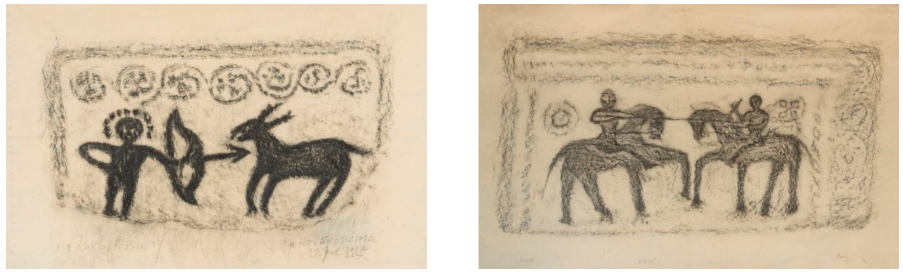

Photo 5. *Anka Burić, Otisak vremena*

In relation to the Greek Cemetery site in Plužine, and having in mind the cultural and historical context of its development, primarily in the form of the ruins of the old town Soko and within it the church of St. Stefan (St. Stephen), we should certainly think about combining digitalization and *storytelling* in the revival of important historical locations, as an act of contemporary visualization of long-lost places.

By defining the problem of preservation and tourism valorization, and finding comparative models that could valorize the existing sites of Stećci as an offer of cultural tourism in Montenegro, we used different comparative models, primarily the FAS model (Factors, Attractors and Support Services) components that have the greatest impact on the tourist valorization of cultural sites. Of course, the possibilities of planning in terms of potential contents are much wider than those we have mentioned, and all future qualitative and quantitative research into factors related to the promotion

of cultural tourism will certainly contribute to their further definition.

5. RESEARCH LIMITATIONS

This research is based on comparative practices, covered through theoretical research on cultural heritage, cultural tourism and touristic valorization which covers possibilities of touristic valorization of stećci sites in Montenegro. However, in the future, it is necessary to conduct comprehensive qualitative and quantitative research which will be reflected in the assessment of possible models of touristic valorization on the mentioned sites. Such research would support the selection of implementation of certain proposed models. In addition, a quantitative assessment of the current attractiveness of stećci and its surroundings is required. Stećci in Montenegro remain widely unresearched and undocumented, which also limits their potential for the comprehensive valorization. In depth archeological, historical and anthropological research could provide a knowledge which could be a key factor in creating successful touristic valorization.

Furthermore, in order to transform stećci into a touristic destination, first and foremost, a certain conservation strategy should be implemented, especially in the light of the ongoing climate changes, which greatly impact stećci and its surrounding. More visitors will also bring another threat to these medieval monuments in the form of the potential anthropogenic threats. From there on strategies for tourist valorization could be implemented, because stećci are first and foremost cultural heritage recognized as such on the UNESCO list. Also, comparative practices, which are not directly related to stećci, can give ambivalent answers in their application to a certain case, but at the same time open up possibilities for thinking about certain models, which could produce ''living monuments'' from cultural heritage. It is also important to note that in Montenegro, some of the proposed strategies could require investments that are beyond the limit of funds allocated to culture, and especially local communities.

6. CONCLUSION

As previously stated, stećci represent one of the most significant and unique monuments of this Region, but are widely under researched, and neglected by the local governments, even after the inscription on the UNESCO list of cultural heritage. Recognition of stećci by UNESCO should have led to the development of the strategies for further research, conservation, and touristic valorization. Examples of comparative practices mentioned in this article could be used as a starting point for future projects in relation to safeguarding and valorization of cultural heritage. Having in mind the proximity of the location of stećci to other important tourist areas, such as National Parks, recreational areas, cities recognized for developed rural tourism and agritourism practices; the possibility of implementing cultural routes with the modernization of the existing infrastructure, and the application of digital technologies with the careful design of new artistic and cultural contents, is huge. For such project, it is primarily necessary to involve all the actors who are included in the reevaluation of stećci to a certain extent, namely tourist organizations, local self-governments, academic communities, non-governmental organizations, artists, and experts in the field of natural and social sciences, as well as arts and humanities. Stećci are an example of the lack of care, or cooperation from the state institutions, but also, lack of education among local population on the cultural value of such monuments and vision on how to valorize them today. As they are unique to this region they are of great potential for nurturing certain cultural identity of the area, or even further, of the region (Montenegro, Croatia, Serbia, Bosnia and Herzegovina), which could bring peace and understanding to once war-torn countries. Having in mind the increasing need for interdisciplinarity in the matter of preserving cultural heritage, the conclusion of this paper is that the only way to achieve it at an appropriate level is to establish the cooperation of experts from different fields in the development of long-term strategies related to conservation and, therefore, tourism valorization of stećci sites.

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CORRESPONDANCE:

Vedran Pean, MA, Teaching assistant
University of Donja Gorica
Faculty of Arts
Oktoih 1
81000 Podgorica, Montenegro
E-mail: vedran.pean@udg.edu.me

Aleksandra Gogić, MSc
University of Donja Gorica
Faculty of Culture and Tourism
Oktoih 1
81000 Podgorica, Montenegro
E-mail: aleksandra.gogic@udg.edu.me

Todor Mitrović, Sp.A., Teaching assistant
University of Donja Gorica
Faculty of Arts
Oktoih 1
81000 Podgorica, Montenegro
E-mail: todor.mitrovic@udg.edu.me

12.

The role of the deposit protection system in Montenegro with examples from domestic and international practice

Vojin Vlahović, PhD student

The role of the deposit protection system in Montenegro with examples from domestic and international practice

Vojin Vlahović, MSc[1],

[1] Deposit Protection Fund, Montenegro,
vojinv2@gmail.com

ABSTRACT:

Deposit protection is one of the key pillars of the stability of the entire financial system of the country. By strengthening trust in the banking system, deposit protection institutions, together with financial authorities (central bank, ministry of finance) contribute to the stability of country's financial system, and thus to the overall stability of its economy. The "Core Principles for Effective Deposit Insurance System" established by the International Association of Deposit Insurers (International Association of Deposit Insurers - IADI, Core Principles for Effective Deposit Insurance System) represents international deposit protection standards. The deposit protection system in Montenegro is aligned with these Principles, as well as with the European Union Directive 2014/69. After the introduction of bankruptcy at the beginning of 2019, as of December 31, 2022, €105,367,545.71 in guaranteed deposits were paid to depositors of the bankrupt Atlas Bank and the bankrupt IBM Bank, or 92.91% of the total calculated guaranteed deposits in both banks. Individually, a sum of €21,921,830.98 or 97.94% of the total calculated guaranteed deposits have been paid to IBM bank depositors by this date, and €83,445,714.73 or 92.39% of the total have been paid to Atlas bank depositors by this date. The year 2023 brought significant instability in the banking system of the USA and Switzerland and opened several issues concerning deposit insurance. Apart from the payment of guaranteed deposits in the event of bank bankruptcy, there is also the dilemma of what treatment to give to the remaining deposits, i.e. those that exceed the guaranteed level.

Keywords: deposit protection, depositors, banking system, guaranteed deposits, payment

1. INTRODUCTION

Deposit protection is one of the key pillars of the stability of the entire financial system of the country. By strengthening trust in the banking system, deposit protection institutions, together with financial authorities (central bank, ministry of finance) contribute to the stability of country's financial system, and thus to the overall stability of its economy.
The levels of protection, i.e. deposit insurance, are different. For example, the FDIC (Federal Deposit Insurance Corporation), the government deposit protection agency in the United States of America, insures deposits of individuals and legal entities up to $250,000, IPAB (Mexico's state agency) insures deposits up to €154,999 with adjustment to the annual inflation rate, while the level of guaranteed deposits in European Union countries is €100,000.
In Montenegro, deposits are guaranteed up to €50,000, per depositor, per bank. After Montenegro's accession to the European Union, this level will be €100,000, established by the Law (*Law on Deposit Protection, "Official Gazette of Montenegro", No. 072 /19 from 26.12.2019*). . Cooperation between deposit insurers and key participants in the financial system of the state, the central bank and the Ministry of Finance is very important. for the system of guaranteeing and paying out deposits in case of bank bankruptcy.

2. LITERATURE OVERVIEW

The role of the deposit protection system is precisely defined in the "Core Principles for Effective Deposit Insurance System" established by the International Association of Deposit Insurers (IADI). In this document, the basic principles governing deposit insurance bodies that are members of the association are given. The document accurately defines the requirements that deposit insurers should meet in terms of staffing and resources, as well as deadlines, to act effectively in the event of bank bankruptcy.

In the USA, the Federal Deposit Insurance Corporation (FDIC) is the authority responsible for the protection of deposits, and their statements on banks failure cases were used. The specificity of all three banks that are processed is the payment of all deposits, regardless of the level of protection through the so-called Systemic Risk Exception, approved by US Treasury, Federal Reserve and FDIC. This exception allows for the payment of all deposits, even those above the insured limit, to prevent broader systemic risks to the financial system. The decision to invoke this exception indicates a significant concern for maintaining stability and public confidence in the banking system.

The model in Switzerland was different: after the crisis in the second largest bank (Credit Suisse), the state decided that the largest bank (UBS) have to take over Credit Suisse. This approach of direct intervention and enforced acquisition highlights a different method of addressing banking crises, where systemic stability is achieved through consolidation rather than merely protecting depositors. The Swiss strategy underscores the importance of having robust mechanisms for managing large financial institutions and preventing systemic risks through strategic mergers and acquisitions.

The literature used in Montenegro, in addition to the relevant laws, includes the Annual Reports of the Deposit Protection Fund, which provide relevant data and analyses. These reports conclusion is that the deposit protection system in Montenegro adequately responded to the challenges of the crisis in the banking system and provided guarantees to depositors in accordance with its competences defined by law. The reports emphasize the effectiveness of the Montenegrin deposit protection system in maintaining depositor confidence and ensuring financial stability during times of banking sector distress. The comprehensive response included timely interventions and adherence to legal frameworks, showcasing the robustness of the system in place.

Additionally, the Montenegrin system's ability to adapt and respond to the crisis indicates a strong alignment with international best practices as outlined by IADI. The successful handling of the banking crisis in Montenegro serves as a case study for other countries looking to strengthen their deposit insurance frameworks and crisis management strategies. This alignment with global standards helps bolster confidence among international investors and depositors, further contributing to the overall stability and resilience of the country's financial system.

3. METHODOLOGY OF THE RESEARCH

Quantitative research was utilized in the paper, primarily through the application of statistical and comparative methods. The main goal of this research was to gather precise and accurate data from the deposit protection system in Montenegro and at the international level. The focus was particularly on the payout of depositors during bank bankruptcy and the role of state institutions in this specific area.

The process began with the meticulous collection of data, ensuring that it was comprehensive and accurate. This data collection was not only focused on the national level but also included international comparisons. The primary data points collected included the annual value of payments made to depositors and the recovery of assets from the bankruptcy estate in cases specific to Montenegro.

After the data collection phase, a comparative method was employed to analyze the gathered data. This involved a thorough examination of the annual value of payments to depositors in Montenegro and the efficiency of asset recovery from bankrupt banks. By using this comparative method, the research aimed to provide a detailed analysis of the effectiveness of Montenegro's deposit protection system.

The comparative analysis was further extended to include international cases, with a particular focus on the state intervention in the United States. In the U.S., there have been notable instances where the state has intervened to cover all deposits in banks that have gone bankrupt. This scenario was contrasted with the situation in Montenegro, where the law does not provide for total coverage of deposits.

This comparison highlighted the differences in the approaches taken by different countries, showcasing the strengths and weaknesses of Montenegro's deposit protection system relative to those in other nations.

By examining these international cases, the research provided a broader context for understanding the role of state institutions in protecting depositors during financial crises.

Through this rigorous comparative analysis, the paper aimed to illuminate the effectiveness of various deposit protection systems and the critical role state institutions play in safeguarding depositor interests during bank failures. The findings of the research offered valuable insights into the current state of Montenegro's deposit protection framework, highlighting areas of strength and potential areas for improvement. These insights provided a solid foundation for proposing policy recommendations and reforms to enhance the effectiveness of the deposit protection system in Montenegro.

In conclusion, the quantitative research methodology, combined with statistical and comparative analyses, allowed for a comprehensive examination of the deposit protection system in Montenegro and its comparison with international standards. This approach ensured that the research findings were robust, providing a clear understanding of the effectiveness of current policies and potential directions for future improvements.

4. RESULTS AND DISCUSSIONS

Deposit protection represents a significant guarantee that in the event of bank bankruptcy there will be no "bank run" of depositors because they will be confident that their guaranteed deposits will be paid out in a very short period. It is therefore necessary to familiarize depositors with their rights in time, so that they do not form unrealistic expectations - depositors should have precise information about the amount guaranteed to them in case of bank bankruptcy, as well as about the terms and places of payment of their deposits.

The "Core Principles for an Effective Deposit Insurance System" established by the International Association of Deposit Insurers *(International Association of Deposit Insurers - IADI, 2014)* represents international deposit protection standards. Article 15 of this document states that "the deposit insurance system should enable the prompt payment of depositors' protected assets, in order to preserve financial stability." (*International Association of Deposit Insurers - IADI, Core Principles for Effective Deposit Insurance System, 2014, p.39)*. In the same document, it is further stated that deposit insurers should have adequate resources, including IT equipment, qualified personnel, as well as an elaborate scenario of events in the case of bank bankruptcy. Also, it specifies the deadline for the start of payment of guaranteed deposits after the declaration of bankruptcy of the bank, and it is seven working days in the European Union member states *(International Association of Deposit Insurers - IADI, Core Principles for Effective Deposit Insurance System, 2014, p.39*), while in Montenegro the Law on Protection of Deposits *(Law on Deposit Protection "Official Gazette of Montenegro", No. 072/19 of 26.12.2019)* defined a deadline of ten working days valid until the end of 2023, so from 01.01.2024 this deadline is harmonized with the EU to seven working days.

To guarantee the timely payout of guaranteed deposits, the deposit insurer must always have liquid funds available for that purpose. If this is not the case and the payment is not started within the deadline, there will be an undermining of trust in the financial system and strong negative influences on its stability. Deposit insurance institutions can be financed ex ante, which means that they provide funds for payment in advance through the collection of premiums from member banks, or ex post, which means that they provide funds after the introduction of bankruptcy in a certain bank. In the case of missing funds for the payment of guaranteed deposits, the regulations in the deposit insurance systems in various countries allow the indebtedness of deposit insurers through loans from banks, issuance of securities or loans from the state budget, which is also allowed by the Montenegrin Law. After the accession of Montenegro to the EU, a loan from the deposit protection system of the member states will be possible too.

The records that banks keep about their depositors must be complete and correct, so that in the event of bankruptcy, these records can be reconciled with the deposit insurer in a short period of time, and then with the bank (or banks) through which the payout of guaranteed deposits will be realized. In most countries, the deposit insurer handles claims for the payment of guaranteed deposits, while the bankruptcy administration takes care

of other assets, their possible sale and settlement of creditors, owners of deposits above the guaranteed and bank shareholders. Depending on the legal framework for this area, the bankruptcy administration is determined by the regulator (central bank) or the competent court. There are also examples of countries where the deposit insurer is responsible for all the mentioned actions during the bankruptcy procedure, and in such a case the deposit insurer must consider the potential occurrence of a conflict of interest, because he has the largest claims against the bank in bankruptcy.

When bankruptcy proceedings are opened, the owners of secured claims are in the first line of payment, while the order of others is regulated by national legislation. In Montenegro, claims of the Central Bank of Montenegro based on loans given to the bank or other obligations of the bank incurred during the temporary administration, resolution or bankruptcy proceedings are in the second payment line, while the claims of the Deposit Protection Fund based on paid guaranteed deposits are in the third payment line (*Law on bankruptcy and liquidation of banks, "Official Gazette of the Republic of Montenegro", No. 47/01 of 01.10.2001, "Official Gazette of Montenegro", No. 62/08 of 15.10.2008, 44/10 of 30.07. 2010, 72/19 of 26.12.2019).*

When it comes to bank resolution, in some countries the deposit insurer is also the authority responsible for resolution, and in that case it decides on resolution methods and the use of funds from the deposit insurance fund. In most other legal systems, the deposit insurer, and the authority responsible for the resolution of banks are separate entities. In such systems, the deposit insurer plays a role in the resolution of banks mainly in two ways: during the transfer of the bank's assets and liabilities to another legal entity or after the introduction of bankruptcy and payment of guaranteed deposits in a bank that was in the process of resolution. In the Montenegrin legal framework, the competent authority for the resolution of banks is the Central Bank of Montenegro, while the Deposit Protection Fund also participates in the procedure in accordance with the Law on Resolution of Credit Institutions *("Official Gazette of Montenegro" No. 072/19 of 26.12.2019, 082/20 of 06.08.2020, 008/21 of 26.01.2021).* In accordance with Article 154 of this Law, which states that "In the implementation of the resolution procedure, the responsibility of the Deposit Protection Fund cannot exceed 50% of the target level, established by the law governing the protection of deposits, as well as of losses that would arise in bankruptcy proceedings against a credit institution under resolution."

At the EU level, discussions are ongoing on the reform of the system of supervision and rehabilitation of banks, as well as deposit protection. When it comes to the latter, the establishment of a common fund for the protection of deposits at the EU level (DIF) is foreseen, which would be financed by contributions from the similar funds of the member countries. The role of such a fund would be to finance the deficits of EU member countries' funds in the event of bank bankruptcy, and if the funds of the DIF would not be sufficient for the national fund in deficit, the DIF could borrow from another national fund. In April this year, the Committee for Economic and Financial Affairs of the European Parliament (ECON) adopted a draft report on EDIS (European Deposit Insurance Scheme), which in the first phase envisages the establishment of the mentioned DIF to provide support to national deposit insurers not only in the case of payout, but also in their participation in bank resolution.
Another important element of the upcoming reform of the deposit insurance system according to the proposal of the European Commission from April 2023 - Reform of bank crisis management and deposit insurance framework (CMDI), will represent the abolition of preferential treatment of insured deposits in case of bank bankruptcy. In other words, insured deposits (up to €100,000 in the EU) will not be paid before uninsured deposits during bank bankruptcy, but they will all be in the same level of payout. Of course, these proposed solutions will have to wait for the new composition of the European Commission and a new vote in the European Parliament, the so-called "new reading", after the Parliament had already approved them once. Since the proposal of the EC, on expert levels, meetings and conventions of European deposit insurers, there has been a significant discussion over the proposed solutions, with significant resistance from key EU members. It is to be expected that certain modifications of the proposed solutions will happen, primarily regarding the preferential treatment of insured deposits. When it comes to smaller deposit insurance systems such as the Montenegrin one, these solutions are certainly premature and cannot be applied in practice in the foreseeable future. Of course, Montenegro's obligation as a candidate

country and future member of the EU will be to harmonize its policies with those of the Union, but considering the interests of depositors of Montenegrin banks who in previous years built their trust in the system on clear rules and timely response to the crisis.

A protected case defined by the Law on deposit protection happened after the declaration of bankruptcy in two credit institutions in Montenegro

On December 7, 2018, the Council of the Central Bank of Montenegro introduced a temporary administration in Atlas bank and Invest bank Montenegro (IBM), ''in accordance with the imperative norm of the Law on Banks, and based on the findings of direct controls that showed that the banks are critically undercapitalized and insolvent, because the established solvency ratio for both banks was below one half of the one determined by law'' *(Central Bank of Montenegro, Financial Stability Report for 2018, p.11*). On January 4, 2019, bankruptcy was introduced in IBM Bank, because on December 31, 2018, based on the report of the interim administration nominated by Central Bank of Montenegro (CBCG), CBCG stated that ''the bank's solvency ratio, own assets and bank capital are negative, which are the conditions for revoking the bank's license, while based on the Law on Bankruptcy and Liquidation of Banks, the conditions were fulfilled for the bankruptcy of the bank'' (*CBCG, Financial Stability Report, 2018, p.11*). For Atlas Bank, the interim administration proposed a capital increase of 22 million euros, ''which would ensure the bank's adequate capital position in accordance with its risk profile and improve its liquid position'' (*CBCG, Financial Stability Report, 2018, p.11).* Considering that additional capitalization by the shareholders, and later by other interested entities, was not realized within the stipulated time, the interim administration in this bank was also ended by the opening of bankruptcy proceedings on April 5, 2019. With the opening of bankruptcy proceedings in IBM and Atlas Bank, in accordance with the Law on Deposit Protection, a protected case was effectively in place, and the deadlines defined by this Law began to run.
On the day the bankruptcy proceedings were opened, the total calculated guaranteed deposits of up to €50,000 in both banks amounted to €112,617,267. Of this amount, €22,333,240 for 2,677 depositors belonged to IBM Bank, and €90,284,027 to Atlas Bank for 90,095 depositors (*2020, Deposit Protection Fund, Annual Report for 2019, p.34,35*). The payment was made through payout banks that registered at the public invitation of the Deposit Protection Fund. Four banks made payments to depositors of Atlas Bank at 75 payment points in their branches in Montenegro, and three banks repaid depositors of Invest Bank Montenegro at 10 payment points in branches in Montenegro (*2020, Deposit Protection Fund, Annual report on work for 2019, p.34,35).*

During 2019, the Deposit Protection Fund paid out €21,475,374 of the guaranteed deposits of Invest Bank Montenegro in bankruptcy, i.e. 96.16% of the total guaranteed deposits in this bank. During the same year, the Deposit Protection Fund paid out €80,408,226 of guaranteed deposits to the depositors of the bankrupt Atlas Bank, i.e. 86.06% of the total guaranteed deposits *(Deposit Protection Fund, 2020, Annual Report for 2019, p. 34- 36).*

After the payout of the largest part of the guaranteed deposits was made in 2019, in 2020 Fund paid a smaller part of its obligation, due to the spread of the Covid19 pandemic and the impossibility of a number of remaining non-resident depositors to arrive in Montenegro, as well as due to the fact that there was a significant number of depositors who have deposits with a low balance (below €5). Those deposits probably will not be withdrawn by the end of the legal term (10 years for Atlas and IBM bank depositors). In 2020, a total of €1,691,853.11 was paid, of which €257,017.20 to IBM bank depositors, and €1,434,835.91 to Atlas bank depositors *(Deposit Protection Fund, 2021, Annual Report for 2020, p. 35).*

In 2021, there is a further decline in depositors' interest in withdrawing guaranteed deposits and a total of €1,085,699.44 was paid, of which €89,792.20 to IBM bank depositors, and €995,907.24 to Atlas bank depositors *(Deposit Protection Fund, 2022, Annual work report for 2021, p.33-34).*

In 2022, a total of €730,144.43 of guaranteed deposits were paid, of which €99,647.58 to IBM bank depositors, and €630,496.85 to Atlas bank depositors *(Deposit Protection Fund, 2023, Annual Report for 2022, p. 36-37).*

As of December 31, 2022, €105,367,545.71 of guaranteed deposits or 92.91% were paid out for both bankrupt banks. Individually, a total of €21,921,830.98 or 97.94% of the total calculated guaranteed deposits have been paid to IBM bank depositors by this date, and €83,445,714.73 or 92.39% of the total calculated guaranteed deposits have been paid to Atlas bank depositors by this date *(Deposit Protection Fund, 2023, Annual report on work for 2022, p. 36-37) -Table 1.*

Table1*: Payout of guaranteed deposits by year*

	Guaranteed deposits	2019 payout	2020 payout	2021 payout	2022 payout	Remained for payment
Atlas bank	90,284,027	80,408,226	1,434,836	995,907	630,497	6,838,312
IBM bank	22,333,240	21,475,374	257,017	89,792	99,647	411,409
Total	112,617,267	101,883,600	1,691,853	1,085,699	730,144	7,249,721

Sources: *Deposit Protection fund, Annual Reports for 2019, 2020, 2021, 2022*

As stated above, according to the Law on Bankruptcy and Liquidation of Banks, the Deposit Protection Fund is in the third payment line. From 2019 to the end of 2022, a total of €69,983,240 was repaid to the Fund from the bankruptcy administration of both banks. €18,983,240 came from the bankruptcy proceedings of IBM Bank, and €51,000,000 from the bankruptcy proceedings of Atlas Bank. By year, in 2019 €41,300,000 was repaid to the Fund from the bankruptcy proceedings of both banks, i.e. €16,300,000 from the bankruptcy proceedings of IBM Bank and €25,000,000 from the bankruptcy proceedings of Atlas Bank *(Deposit Protection Fund 2020, Annual Report on work for 2019, p.34,36)*. In 2020, €12,400,000 was repaid to the Fund from the bankruptcy proceedings of both banks, i.e. €1,400,000 from the bankruptcy proceedings of IBM Bank and €11,000,000 from the bankruptcy proceedings of Atlas Bank *(Deposit Protection Fund, 2021, Annual Report for 2020, p.35)*. In 2021, the Fund received a total of €9,683,240 from bankruptcy, of which €683,240 from the bankruptcy proceedings of IBM Bank, and €9,000,000 from the bankruptcy proceedings of Atlas Bank (Deposit Protection Fund, 2022, Annual Report on Work for 2021, p .34). In 2022, the Fund's total income from the bankruptcy proceedings was €6,600,000, of which IBM bank €600,000, and Atlas bank €6,000,000 *(Deposit Protection Fund, 2023, Annual Report for 2022, p.37) -Table 2.*

Table 2: *Inflows from bankruptcy proceedings by year*

	IBM bank	Atlas bank	Total per year
2019	16,300,000	25,000,000	41,300,000
2020	1,400,000	11,000,000	12,400,000
2021	683,240	9,000,000	9,683,240
2022	600,000	6,000,000	6,600,000
Total per bank	18,983,240	51,000,000	69,983,240

Sources: *Deposit Protection fund, Annual Reports for 2019, 2020, 2021, 2022*

Inflows from the bankruptcy proceedings and regular inflows through premium collection from banks in the system influenced the gradual increase of the Fund's assets, and at the end of 2021 they reached and exceeded the level from the end of 2018, i.e. before the opening of bankruptcy proceedings. That year assets were €117,440,242 *(Deposit Protection Fund, 2022, Annual Report for 2021, p.27),* while at the end of 2022 the Fund's assets amounted to €142,156,433 *(Fund for deposit protection, 2023, Annual work report for 2022, p.30).*

In the case of Atlas and IBM Bank, timeliness and security of depositor payments were of key importance. In today's practices, depositors of the largest number of banks in developed countries can access their deposits through the electronic banking system. In the case of a bank's liquidity problems or even rumors announcing its imminent bankruptcy, the depositor can transfer his deposit to another bank within a few minutes, without going to the counter. In Montenegro, depositors had to come to the counters of payout banks and collect their guaranteed deposit or open an account in the payout bank, so this action could not be done remotely. Also very important was the fact that the whole process went smoothly, without major complaints, which was especially important during the initial months of payment. After that, trust was consolidated, and the Deposit Protection Fund and the payout banks could continue their work without any kind of obstacles. Furthermore, the success of these transactions

helped to further strengthen confidence in the entire banking system of Montenegro and assure depositors' knowledge that their money in banks is safe. Of course, further questions could be raised here regarding the amount of the guaranteed deposit, as well as the treatment of other, i.e. uninsured, deposits. If we bear in mind that the amount of the guaranteed deposit in Montenegro at the time of the establishment of the deposit protection system was €5,000, we can conclude that the current amount of €50,000 is an adequate insurance framework.

The level of money recovery from the bankruptcy estate of Atlas and IBM Bank to the Deposit Protection Fund is satisfactory, bearing in mind the years of crisis caused by the Covid 19 pandemic and the reduced interest of potential buyers in the assets of these banks. For the Deposit Protection Fund, priority treatment in payment is very important, because with funds from recovery and with regular premiums paid by banks, the Fund can raise its funds to the level of 10% of total guaranteed deposits in the banking system defined by Law *(Law on Deposit Protection "Official Gazette of Montenegro", No. 072/19 of 26.12.2019).*

Cases of banking crisis in the USA and Europe during 2023 and the reactions of competent institutions

The year 2023 brought significant instability in the banking system of the USA and Switzerland and opened several issues concerning deposit insurance on a global level. Apart from the payment of guaranteed deposits in the event of bank bankruptcy, another dilemma is also open: what treatment should be given to the remaining deposits, i.e. those that exceed the level of guaranteed deposits? It also brought to the discussion of the introduction of faster ways of paying depositors through technological innovations. All these issues in the coming period will lead to a review of the entire deposit insurance system among the member countries of IADI (International Association of Deposit Insurers).

Silicon Valley Bank (SVB)

On March 10, 2023, The California Department of Protection and Financial Innovation closed SVB. Immediately after that, the FDIC (Federal Deposit Insurance Corporation) opened DINB (Deposit Insurance National Bank of Santa Clara), which took over all the guaranteed deposits of SVB *(Federal Deposit Insurance Corporation – FDIC, 2023, Press releases).* Consequently, on March 12 the US Treasury, the Federal Reserve and the FDIC jointly announced the approval of the Systemic Risk Exception (SRE) - an exception for SVB due to systemic risk in such a way that all depositors of this bank will be fully paid (*Federal Deposit Insurance Corporation - FDIC, 2023, Press releases)*. Using this exception, the FDIC transferred all deposits, including guaranteed deposits, as well as almost all assets to Silicon Valley Bridge Bank (SVBB), which now has approximately $167 billion in assets and approximately $119 billion in total deposits.

On March 26, the FDIC signed the Purchase and Assumption (P&A) Agreement with First Citizens Bank & Trust Company for all Silicon Valley Bridge Bank deposits and loans. First Citizens purchased approximately $72 billion in SVBB assets at a discount of $16.5 billion. The balance of about $90 billion in securities and other assets is available to the FDIC. Also, the FDIC and First Citizens concluded the so-called Loss-Share Agreement for commercial loans, by which they agreed to share eventual losses or potential gains from SVBB loans covered by this agreement. The FDIC has estimated that the resolution of SVB will result in a cost to the DIF (Deposit Insurance Fund) of about $20 billion *(Federal Deposit Insurance Corporation – FDIC, 2023, Press releases).*

Signature Bank (Signature)

Similar to SVB, the FDIC transferred all deposits and almost all of the bank's assets to Signature Bridge Bank (SBB). As for SVB, in the case of Signature, the SRE was approved, and it fully covered all the bank's depositors. On March 19, the FDIC signed the P&A Agreement with Flagstar Bank N.A. (Flagstar) which included all deposits except approximately $4 billion of digital banking and part of the SBB loan portfolio. In total, Flagstar purchased approximately $38.4 billion of SBB's assets. The FDIC has estimated that the rehabilitation of Signature Bank will result in a DIF cost of approximately $2.5 billion *(Federal Deposit Insurance Corporation – FDIC, 2023, Press releases).*

First Republic Bank (FRB)

On May 1, The California Department of Financial Protection and Innovation closed First Republic Bank (FRB) and designated the FDIC as the resolution authority. To protect depositors, the FDIC signed the P&A Agreement with JPMorgan Chase Bank, N.A. on the takeover of all deposits and essentially all the FRB's assets, i.e. $229 billion in total assets and $103.9 billion in total deposits. A Loss-Share Agreement was also signed, whereby the FDIC and JPMorgan will share eventual losses or gains on commercial loans that JPMorgan purchased from the FRB. The FDIC has estimated that this total transaction will result in a DIF cost of approximately $13 billion *(Federal Deposit Insurance Corporation – FDIC, 2023, Press releases)*.

Credit Suisse

Court proceedings, such as the "tuna bonds" case of 2022, i.e. the loan to the government of Mozambique between 2012 and 2016, i.e. a case of corruption in the amount of $50 million, have severely damaged the creditworthiness of the bank. Also, the bank suffered large financial losses in two cases: Hedge fund Archeos - the bank lost $5.5 billion due to risky exposure to this fund which went bankrupt in 2021; another case is the company Greensill, which was engaged in financial services. After its bankruptcy in 2021, Credit Suisse was forced to suspend $10 billion invested in Greensill, which the company then gradually repaid, but not in full.

These affairs led to the subsequent loss of trust of the bank's clients over the years, and then in the second half of 2022 to the rumors about the bank's bankruptcy that spread through social networks. It led to the withdrawal of deposits in the amount of about 100 billion CHF and a drastic drop in the value of the bank's shares. After the largest shareholder of the bank, Saudi Bank, announced that it would not pay additional capital, on March 15, 2023, the government made available to the bank emergency liquidity support in the amount of CHF 50 billion. On March 19, 2023, the Swiss Ministry of Finance, the Central bank, and the financial market regulator announced the takeover of Credit Suisse by Union bank of Switzerland - UBS (*www.the guardian.com, "A timeline of Credit Suisse scandals", 2022), (www. economic observatory, "Why did Credit Suisse fail and what does it mean for banking regulation, 2023).*

Case studies from the USA and the payout of all bank deposits in bankruptcy, regardless of the level of protection, indicate that similar solutions could be applied in the European Union, as already stated here. In the future, it will be discussed which level of protection is appropriate, but if the current level of €100,000 is going to be raised, it will open many questions and dilemmas about which banks will be subject to payout through resolution or bankruptcy. In both cases, funds from the deposit insurers will be used.

The system in Montenegro is set on a sound basis and has shown its effectiveness in practice. Future improvements will probably be made through expanding the base, i.e., the type of deposits. Following the example of the EU, deposits of public institutions and certain public companies can also be discussed in Montenegro. This will require changes in legislation, but also additional strengthening of the capacity of the Deposit Protection Fund. Possible direction is to widen the tasks of the Fund, not only as money payer through its paybox plus function in the bank resolution, but also as resolution authority.

5. CONCLUSION

In the time of growing insecurities and negative global impacts caused by conflict situations at multiple points, deposit insurance is gaining more and more importance in the light of confidence in the banking system. The prompt reaction of the competent authorities is extremely important when a crisis occurs in parts of the system. Examples from 2023 show that timely action prevented further harmful consequences on the European and US banking system, which had a positive effect on the world's largest financial markets through index stabilization. The quick response to the crisis of American banks was also important because of the global financial crisis in 2007 and 2008, which started precisely in the USA. The cases in the USA and Switzerland represent significant novelties in the current practice of deposit insurance, because, in addition to guaranteed deposits up to the limit in accordance with the national legislation of the two countries, all other deposits were also covered. In the USA, the deposits were paid out or transferred to a new bank, and in Switzerland

they were taken over from UBS Bank. In the coming period, this will be one of the main topics of discussion in the countries of the European Union. The new composition of the European Commission will again face a proposal regarding the ranking of payment lines in case of bankruptcy of credit institutions in EU member states. Until now, guaranteed deposits have had priority treatment in these countries, and accordingly to that also in Montenegro, while the new proposal envisages the abolition of preferential treatment of guaranteed deposits over all other deposits. For now, this proposal is strongly opposed by some of the key EU countries, as it would lead to a reconsideration of the role of deposit insurers in the system, and even to the possible end of the need for them. In any case, the next period will bring certain changes when it comes to deposit insurance at the international level. According to this and according to the need for Montenegro to harmonize its policies with EU policies, it is realistic to expect probable changes in our system as well, considering clear rules we have had in recent years.

The increase in the level of deposit protection is defined by the Law, and after Montenegro's accession to the European Union, deposits of up to €100,000 will be guaranteed. Other issues related to the expansion of insurance coverage, the treatment of Deposit Protection Fund assets in bank resolution, as well as the role of the Fund itself, will be addressed. It is certain that decision-makers must consider the achieved level of stability of the deposit protection system and the need to preserve it even through future changes.

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CORRESPONDANCE:

Vojin Vlahović
Deposit Protection Fund
Miljana Vukova bb
81000 Podgorica, Montenegro
E-mail: vojinv2@gmail.com

13.

Governance Models, Challenges, and Best Practices, of Entrepreneurial Education in Montenegro

Nikola Mićunović, PhD student
Danilo Popović

Governance Models, Challenges, and Best Practices, of Entrepreneurial Education in Montenegro

Nikola Mićunović [1], Danilo Popović [2]

[1] PhD. candidate,
nikola.micunovic@udg.edu.me

[2] Graduate student,
danilo.popovic01@icatt.it

ABSTRACT:

The study, "Challenges, Best Practices, and Governance Models of Entrepreneurial Education in Montenegro" aims to evaluate the current state of entrepreneurial learning in Montenegro and compare formal and informal educational environments. Utilizing both qualitative and quantitative research methods, as alongside an analysis of comparative best practices, particularly from Scandinavian countries, the study derives conclusions and recommendations. These findings are intended to inform policy and decision-making processes to enhance the entrepreneurial mindset of Montenegrin youth and improve their competitiveness in aligning with modern trends and global marketplace.

Keywords: entrepreneurship, entrepreneurial learning, formal education, competencies, youth engagement.

1. INTRODUCTION

In Montenegro, entrepreneurship is seen as an opportunity to address the crucial issue of youth unemployment. Various measures to support youth entrepreneurship have been implemented and are still ongoing in Montenegro, albeit more on an ad hoc basis and without continuity. These measures can be grouped into financial support measures (grants, loans and incentives), the development of so-called "soft" skills, a combination of financial and advisory support, initiatives to raise awareness of the importance of entrepreneurial development, and support measures related to providing necessary infrastructure for entrepreneurs, especially in the innovation sector.

Although a relatively large number of initiatives aimed at promoting entrepreneurship and supporting startups and business beginners have been identified, most of them are not exclusively focused on young people. Furthermore, most identified measures are isolated, ad hoc measures without continuity and effect, which usually are not part of a broader comprehensive policy framework to support the development of youth entrepreneurship. In other words, current policies focus on the development of existing companies rather than focusing on entrepreneurship linked to target groups such as young people and students (Radević, 2017).

Although entrepreneurship has a positive connotation among youth in Montenegro, there are several constraints affecting the entrepreneurial activity of young people. Such constraints include society's negative attitude towards entrepreneurship (there is a tendency to choose a "safe job" in the public sector, regardless of lower income, compared to engagement in the private sector, which is considered an insecure and risky job), lack of skills that young people recognize as important for entrepreneurship, inadequate education that does not prepare young people for market competition, lack of experience, lack of funds to start a business, lack of social networks and contacts, inadequate entrepreneurial ecosystem, as well as market barriers and regulatory burdens.

2. LITERATURE OVERVIEW

Youth unemployment has been recognized as one of the burning issues in Montenegro, hence policies aimed at addressing this issue are included in the strategic framework. In both broader and narrower contexts, youth employment is addressed as an issue in the Employment Strategy 2021-2025, the Strategy for the Development of Micro, Small and Medium Enterprises in Montenegro 2023-2026, the Strategy for Lifelong Entrepreneurial Learning 2020-2024, and the National Youth Strategy 2023-2027.

According to the Montenegro Youth Strategy (2023-2027), which defines among the lines of situational analysis for its firs strategic goal the following: ''Youth work develops personal, professional and entrepreneurial competencies among young people, and in some cases serves as a bridge to education, training and retraining or employment, thus ensuring that young people are not excluded '' *(Ministry of Sports and Youth, 2023).*

More than a third of youth in Podgorica think that **knowledge gained through formal education is insufficient for proper employment** (UNDP, 2022). Moreover, research conducted on Entrepreneurial universities indicate that the accent in modern higher education should ''on recognizing opportunities for development and innovation, especially in linking different disciplines in solving social problems'' *(Radević and Tinaj S, 2011).*

The SME Policy Index considers Entrepreneurial learning and women's entrepreneurship the first dimension of the index, directly tackling issues of entrepreneurial learning policies, implementation gaps and entrepreneurial experiences *(OECD, 2022).*

In the European Union, discussions on entrepreneurship education take place at almost all levels. Initiatives are not solely based on the implementation of entrepreneurial educational programs but rather set a broader framework, encompassing employability and collaboration. In May 2018, the Council of the European Union adopted recommendations in the field of Key Competences for Lifelong Learning, *(European Council, 2018)* which ranks entrepreneurship among the 8 key competences for youth development. Entrepreneurial competence is defined as the ability to act on opportunities and ideas, transforming them into added value for others. Competences are also discussed in the European Commission's Communication on the ''Youth on the Move'' *(European Commission, 2010)* initiative, specifically addressing the development of modern educational and training systems for acquiring key competences and excellence. There are other initiatives, such as The Oslo Agenda for Entrepreneurship Education in Europe, that state the importance of integrating entrepreneurial education on all levels, including withing the Bologna process *(European Commission, 2006)*, as well as European entrepreneurship competence framework – EntreComp.

In the Conclusions on promoting youth entrepreneurship to foster social inclusion of young people *(European Council, 2014)*, adopted in Brussels in 2014, entrepreneurial learning is not only recognized as a powerful factor but also defined as a priority basis for which member states are called to action. The first priority states ''**strengthening the entrepreneurial mindset** of young people through formal, non-formal, and informal education.'' In point 15 of the EU Council's Conclusions, member states are called upon to recognize the importance of entrepreneurial education from an early age and to emphasize the role of non-formal and informal education, all aimed at a holistic approach to the labor market. It is also important to note the Youth Work *(European Commission, 2014)*, which represents research in the field of youth work, with a special section dedicated to entrepreneurship and employment. The research mentions that activities of the Junior Achievement network are mentioned in as many as 11 national reports, whose work is recognized in strengthening entrepreneurial competencies through extracurricular education.

Moreover, the ''Entrepreneurship 2020 Action Plan'' *(SME Finance Forum, 2013)* defines entrepreneurial education and training to support business development and establishment as its first priority axis, stating that between 15 and 20% of students who go through mini-company programs later establish their own business. It suggests that entrepreneurship should be implemented in the educational process through practical and experiential learning models and should be based on real entrepreneurial experiences. **Partnerships with businesses**, as stated in the Action Plan, can ensure that education and training curricula are relevant to the

real world. The document also defines a set of steps to be taken, both at the EU level and at the level of Union members, by calling for the inclusion of entrepreneurial competence in education curricula, providing opportunities for students to gain practical entrepreneurial experience before completing compulsory education, and promoting entrepreneurial learning among young people through structural funds.

Therefore, in Montenegro, the interest in introducing entrepreneurial education is not only reflected in creating new jobs, developing a favorable environment for the development of entrepreneurial skills and capacities, and fostering economic activity growth, but also represents a broader societal, economic, and educational interest in integration processes aligning state policy with European Union practices.

3. METHODOLOGY OF THE RESEARCH

The methodology of the research was developed to tackle two main research questions to be addressed: (1) to what extent are formal and informal education practices linked and to what extent are either of them efficient; (2) do civil society organizations have the capacity to actively engage in the matter of entrepreneurial education and implement innovative models of entrepreneurial learning. The questions contribute to the **general goal to be tackled,** that being an **assessment** of the **entrepreneurial learning ecosystem** and compilation of **best practices and recommendations** for the global issue of development of **entrepreneurial competencies and mindset** in rapidly changing **educational needs.**

Therefore, the research is comprised of several steps that are aimed at two main aspects:

- desk research that entails an analysis of the legal framework put in place in Montenegro, a PESTLE analysis of the macro environment in formal and informal entrepreneurial education, and a stakeholder analysis. Analysis of the legal framework entailed a review of national laws, strategic and sectoral strategies, as well as international directives, policy recommendations, mechanisms, and other relevant international documents. A stakeholder analysis was conducted via basic power/interest matrices accompanied by a clear rationale for ordering.

- Simultaneously, qualitative research on the capacities of NGOs in the field of entrepreneurial education is conducted. Influential NGOs in the subject matter are mapped, and a questionnaire based on the SIDA Octagon methodology *(SIDA, 2002)* is distributed to a total of 10 organizations in order to assess the 8 basic aspects of organizational capacities. Moreover, the questionnaire was supplemented by open-ended questions to obtain experiential sincere inputs on the pros and cons of their work efficiency. Note that the restriction of the small number of organizations did not allow for random sampling. However, the nature of the research does not ask for it, as inputs gained are meant to be derived from experience and organizational learning, and formulated to facilitate the assessment of the overall ecosystem of informal entrepreneurial education. Therefore it makes little meaning for the sample to be random. This allowed for the expression of best practices and challenges faced in the work of the fourth sector.

- Analysis of comparative best practices is conducted in order to create a set of feasible solutions and recommendations that can be tailored in accordance with Montenegrin sectors' needs in order to enhance entrepreneurial learning and lifestyle, complemented by a focus group with Montenegrin teachers.

It is important to note that, even though conducted on a national scale, the research was oriented towards reflecting global issues faced in modern educational practices and trends of implementation of innovative models of learning experience.

4. RESULTS AND DISCUSSIONS

The research "Governance Models, Challenges, and Best Practices, of Entrepreneurial Education in Montenegro" encompasses a series of investigative activities aimed at collecting and analyzing data for various segments of both entrepreneurial education and the overall economic

status of young people living in Montenegro.

Perception of Entrepreneurship and Entrepreneurial Education Among Youth

What is entrepreneurship? A study among high school students shows that 71.9% of respondents consider entrepreneurship to be **starting their own business** *(BY LEAP, 2020)*. A third of the respondents (34%) see entrepreneurship as an opportunity to earn more money. A philosophical approach to entrepreneurship, i.e., entrepreneurship as a lifestyle and mindset, is perceived by 37.9% of high school students, while the lowest frequency of responses is related to working in a state or private company. Young people acquire entrepreneurial skills to a very limited extent in formal education. **Only 14.5% of respondents believe that attending entrepreneurship classes helps them acquire entrepreneurial competencies.** Participation in national and international competitions, as well as visits to business incubators and companies, received very low levels of support (13.2% and 17.1%, respectively).

Majority of respondents have not attended entrepreneurship classes in high school (57.9%). Even smaller number have participated in other forms of entrepreneurial-innovation culture (21.4%). Respondents believe that entrepreneurial-research projects contribute more to their development than formal entrepreneurial education. Informal initiatives were rated highly by 30.3% of respondents, while formal ones received high ratings from 28.26% of respondents. When it comes **to creative abilities,** with 43.47% (almost every other respondent) believing that they develop in formal education, while 39.39% believe they develop in entrepreneurial initiatives. It is concerning that a third of young people believe that research skills are not acquired or are acquired to a very limited extent through participation in entrepreneurial-research projects (33.33%). The situation is different for communication skills, which are believed to be acquired in almost equal measure in both models of work (45.66% and 45.45%).

Through entrepreneurial-research projects, more practical and applicable skills are acquired. 48.48% of respondents stated that their knowledge and experience in these initiatives are useful. The same assertion for entrepreneurship classes is supported by 36.96% of respondents. Innovations are less applied in formal education but are also insufficiently represented in informal practice. 39.13% of respondents believe that innovation is low in school, while 36.36% believe it is low in entrepreneurial projects. **Research skills** are more extensively acquired **through entrepreneurial-research projects.** In the domain of informal education, **teamwork** is better applied. Over half, 63.6% of respondents, believe that teamwork is significantly improved through entrepreneurial initiatives.

Employment and Business Opportunities for Youth in Montenegro

When it comes to the possibility for young people to work during their schooling, a staggering 66.8% of respondents have gained work experience, while 33.2% have not. Slightly less than 30% of respondents had work experience in both seasonal and non-seasonal job opportunities *(BY LEAP, 2020)*. This highlights the need for more intensive involvement of young people in non-seasonal jobs due to insufficient long-term financial stability, which contributes to independence and encourages long-term decision-making and planning. As a motivation for their first employment, 69.7% of respondents cited earning money for personal livelihood, while the next two highly prevalent driving forces are gaining practical skills and financial or personal independence from parental care (37.5% and 33.2%, respectively).

Other notable motivations include networking and contributing to the household community. However, the data shows that almost **every fifth young person (19%) encountered difficulties or serious barriers in finding their first work experience**. Around a third (36.4%) of young people stated that **they did not gain work experience due to a lack of job opportunities** in their field of interest, and a similar number (33.6%) relates to insufficient information about potential engagements. Almost 40% of respondents **do not believe that young people have the foundation to become independent**, which is consistent with the fact that Montenegro ranks high in terms of the years young people spend living with their parents.

Focus group: How do educational workers address the challenges of entrepreneurial education?

As the primary advantage of entrepreneurial-research projects, teachers in the research and focus groups recognized the opportunity for students to establish, run, and close a company during one school year. This allows students to become acquainted with the procedures of starting a company, selecting the management board, raising capital, and the process of selling products or offering certain services, as well as preparing financial reports after closing the company at the end of the school year. Within the focus group, teachers identified five types of competencies that high school students develop through entrepreneurial-research projects: **digital, civic, mathematical, interpersonal, and verbal competencies.** The first problem teachers noticed when working with students is attention deficit disorder, followed by knowledge uniformity within certain frameworks, as well as issues with predetermined education.

According to teachers' opinions, several steps are necessary for the reforms of entrepreneurial education and the development of entrepreneurship among youth to succeed in Montenegro. Firstly, **financial support** is needed to enable companies to start their operations, while in terms of legal factors, it is necessary to create a **legal framework** focusing on entrepreneurship and student companies, and to define the conditions and methods under which youth companies operate. Regarding the social factor, various recognitions from the community can help such a model succeed. Also, coordinated **cooperation between schools, municipalities, ministries**, and other relevant institutions is crucial for the success of this entrepreneurial education model. The support companies receive should be more visible, while students should be more frequently informed about startup ventures.

The financial factor represents the greatest challenge. Students want to participate in various projects, but there is a problem providing funds for idea implementation. According to teachers' opinions, the ideal model would be a combination of all the suggestions mentioned. Additionally, it is pointed out that the ideal model would be based on cooperatives, providing students with the opportunity to start their student companies in their schools, with provided workspaces, along with a legal framework to help them offer their products and services in the market (*Ministry of Economy of Montenegro, 2019).* At the beginning of the school year, students should be given the opportunity to apply for work in student companies, to present their ideas to other students, after which the best idea would be supported by school leaders, municipalities, social partners, etc.

What non-formal forms of entrepreneurial education are currently available in Montenegro?

There are currently several extracurricular support programs for the development of youth entrepreneurship in Montenegro, organized within the educational system, which could potentially lead to the establishment of youth companies. However, the legal framework does not recognize youth companies as a specific category, leading to a lack of opportunities for young people to learn important skills and test their ideas in the market while still in the process of schooling.

- **STUDENT COMPANIES**

Student companies exist in Montenegro as part of the educational program implemented by Junior Achievement Montenegro. The implementation of the program has been accredited by the Center for Vocational Education and it is conducted as an extracurricular activity in high schools, where students, under the supervision of trained teachers, learn and practice how to start and develop their company throughout the school year. Within the program, students have the opportunity to present their companies at national and international competitions.

- **ENTERPRISE SIMULATION**

As part of the educational program in the third year of education for the educational direction "Economic Technician," the module "Enterprise Simulation" is implemented, which is studied through practical classes. It is a model of a simulated company with appropriate organizational

form (procurement, sales, marketing, accounting, administration, etc.) and processes, operating in a competitive business environment enabling students to acquire entrepreneurial skills and develop a positive attitude towards teamwork, responsibility in decision-making, and connecting theoretical knowledge with practical work. In this way, economic processes and flows, decision-making, and cooperation between companies are simulated. Through this program, students have the opportunity to collaborate with peers in the country and abroad.

- **ENTREPRENEURIAL CENTERS IN SCHOOLS**

In previous years, primary and secondary schools have been involved in delivering education through elective subjects (in primary schools) and through the establishment of entrepreneurial clubs and centers (in secondary schools). Entrepreneurial clubs in secondary schools represent a form of extracurricular activity. Students, together with a teacher-mentor, choose the club's activities depending on the type of secondary school, the educational profile they are pursuing, material and technical conditions, production conditions in the school, and other similar factors.

ANALYSIS OF COMPARATIVE PRACTICES

Below are just a few examples of legislative solutions created at the national level in European Union member states. The countries in question are Finland and Sweden, as Scandinavian countries tend to be viewed as ones with highest level of development of educational policies.

Finland *(Jalo, M. Seikkula-Leino, J, 2022):*

Recognizing the significance of entrepreneurship as an important aspect of education, Finland has established policy lines related to strengthening entrepreneurial culture in education. The aim of these policies is to create an environment where young people are given the opportunity to develop entrepreneurial skills, problem-solving abilities, and creativity, enabling them to start their own companies and succeed in the business world.

Specifically, these programs include activities such as educating teachers and school administration, entrepreneurial activities within schools, as well as the establishment of youth/student companies, and various projects supporting entrepreneurship in early education. Support is aimed at:

1. Integration of entrepreneurship at all levels of education: introducing entrepreneurship education from preschool to higher education to support students in developing entrepreneurial competencies and enabling early acquisition of experience.
2. Development of entrepreneurial culture: support the development of entrepreneurial culture by supporting innovative ideas, strengthening the concept of entrepreneurial networks.
3. Innovations in education: focusing on innovations provides conditions for developing innovative abilities and acquiring knowledge and skills necessary for successful entrepreneurship in the modern world.
4. Intersectoral cooperation: cooperation between the educational and real (business) sectors is necessary to ensure additional value for students and the development of entrepreneurial infrastructure.

Sweden *(Skolverket, 2024):*

According to the Education Act in Sweden, all students during their education must have the opportunity to develop into active, creative, and competent citizens of society. In the curriculum for primary school, secondary school, and adult education, it is stated that schools and education should contribute to the development of abilities, knowledge, and attitudes that support entrepreneurship. Starting from secondary school, attention must also be paid to the development of abilities and the acquisition of knowledge that foster entrepreneurial and innovative actions.

What are the capacities of NGOs currently operating in Montenegro? How can their experience contribute to ecosystem development?

Results obtained from questionnaires encompass 10 NGOs operating in the field of entrepreneurial education. Distributed questionnaires, were based on several qualitative segments that were marked by management

representatives of targeted organizations. Additionally, clarifications for given marks were requested to derive good (and less good) practices and account for biased responses. Namely, not every high mark was adequately argued.

The Octagon test for 8 areas (Identity, Structure, Implementation, Relevance, Qualifications and experience, Systems, Target groups, and The Working Environment) through 16 parameters.

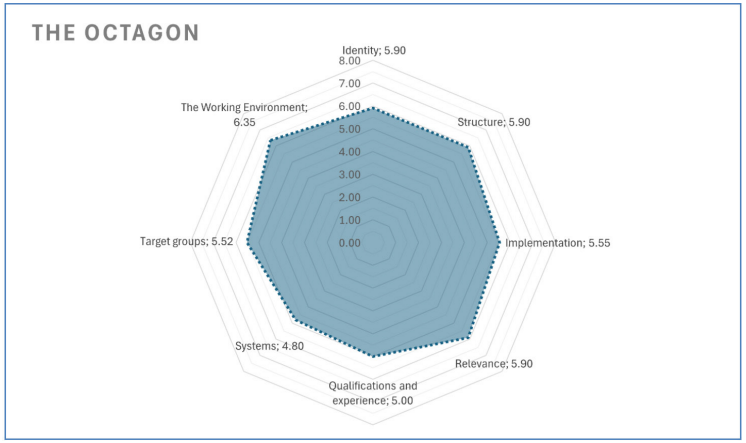

Figure 1. *Research results - NGO self-evaluation in Montenegro*

Montenegrin entrepreneurial NGOs mainly **have well-defined identities**, scoring 6.5 in the definition of mission(s) and vision(s), and 5.3 in terms of developed strategies for their fulfillment, converging to a mean of 5.9. Organizations scoring the highest grades fulfill the complete criteria, having mission and vision statements clearly defined and publicly available via websites and social media, whereas the lowest grade (still scoring on the high end of the scale) was 4, for organizations having their mission and vision defined within documents and accepted amongst members, but not displayed shared available outside of the organization, and where developed strategic directions are highlighted within documentations but are not alienated through one umbrella strategic document.

Structure scored the same mean but with inverse results between parameters. More precisely, they attributed lower scores to having a clearly defined set of tasks amongst workers (5.5) and higher to following democratic rules and principles (6.3). The greatest scorers had a **clear division of labor, responsibilities, and accountability,** as well as **using establishment lists.** Low scorers attributed the grades to **unclear division of labor, lots of multitasking, and ad-hoc distribution of tasks.**

However, due to the fact that only one organization in the sample had a clearly established set of rules and establishment lists, in a qualitative sense, a clear distribution of tasks is overestimated. Democracy and transparency are highly appreciated, with good practices ranging from **high degree of inclusion of women in managerial positions,** to **open publishing of administrative and financial data** (despite not having the legal obligation under national NGO regulation), compilation of reports distributed to each member, and decision making made via member assemblies.

The Implementation score went up to 5.55, scoring somewhat higher in activity planning and preparation (5.7) than in follow-ups (5.4). The **biggest gaps in Implementation were in terms of no qualitative monitoring practices of executed activities.** Administrative practices and project-related feedback sessions are mentioned as examples of good practice.

Relevance scores 5.9 as well, although the mean is computed by averaging closer grades than in the previous examples - a 6 for activities successfully reflecting vision, and 5.8 with work methodology being aligned with it. **Training methodologies are aligned with target groups**, although sometimes ad hoc initiatives are conducted which do not necessarily reflect vision and mission targets.

Scores regarding Qualifications and Experience average out to 5 on both employees' qualification and management capabilities. Some NGOs, although a small number of them, have clearly defined work positions and prescribed qualifications. **Most of them contract labor on a case-to-case basis** and **do not have specified procedures**, although their managements express that they are acknowledged with organizations' needs regarding qualifications and know-how. Management is **kept on**

low-size boards, mostly consisting of CEOs only. Some organizations mention **setups of compensation measures, although none of them have clear human capital development plans.**

Systems are the lowest scoring component of the research. This is most probably caused by the specific nature of NGOs that are dependent on external funding, as they are non-profit by nature and do not conduct revenue achieving activities (all except one, which offers services, but remains non-profit). The whole component got a score of 4.8, where 4.6 is attributed to management of financial resources, and 5.0 is attributed to administrative routines. Most **organizations indicate that they are project-dependent, meaning their funds rely on funding from external donors** (European Commission in most cases), and that their projects are in most cases conducted in the short-term.

This implies that most **organizations do not have the luxury of long-term planning**, as there is no feasible way to forecast future income streams and income quantities. Despite organized bookkeeping and numerous donators, the short-term nature of projects remains an obstacle. **There are no guidelines on handling administrative documentation**, although some organizations utilize modern cloud technologies and digital databases to organize and structure information, which is an important component of organizational learning and memory.

Target groups are among the high-scoring components, relations bearing the mark of 6.4 and dialogue being graded with 5.9, averaging the component at a mean of 6.15. NGOs find it easy to establish relationships with their target groups, as youth is clearly defined and can be easily accessed via modern communication channels. Moreover, managements of NGOs operating in the field of youth are mostly youth led, which helps with both the outreach and tailoring of activities, enabling for an easier dialogue and engagement.

The highest scoring component is the Working Environment, scoring a mean of 6.35 – 6.3 in Legitimacy and 6.4 in Active Participation in Networks. Most NGOs indicate that they are recognized by relevant stakeholders and have clear strategies on public relations and media communication. Information on organizations' activities are public and easily accessible, and NGOs are recognized as relevant factors by all social actors. Organizations take active participation in networks, take part in institutional working groups and strategic partnerships.

NGOs prove to be solid mechanism for both outreach and effective implementation of their goals: improvement of entrepreneurial learning and development of entrepreneurial competences in society. Obstacles remain stable and continued financing. development of administrative and procedural capacities in order to preserve organizational learning and stable growth. In this case, it is especially true and confirmed that "decisions arise from the interaction of constraints (access structures and deadlines) and the *time-dependent flows of problems* (or issues), *solutions*, and *participants* (decision-makers)" (McFarland D. A, Gomez, C. J, 2016, p. 64).

However, **due to their flexibility and adaptational capabilities**, the **non-governmental sector participants can play a key role in** meeting the ever-developing and fast-paced learning trends, and trough meaningful partnerships, play a pivotal role in **educational sector, especially regarding entrepreneurial learning.**

5. RESEARCH LIMITATIONS

The main limitation in the research was unclear classification of NGOs in Montenegro that made it difficult to target organizations dedicated to entrepreneurship and entrepreneurial learning. The lack of clear taxonomy also made it impossible to target organizations of different sizes and structures. Moreover, inexistence of databases regarding NGO activities, quality indicators of learning processes in formal and informal education, and overall lack of systematic data from educational institutions made research focus on different independent research done by external stakeholders and organizations. This is, least to say, a clear indication that both formal and informal learning processes lack proper monitoring and cannot be expected to output high quality results, especially in contemporary trends in learning such as entrepreneurial competencies. Still, the research managed to work around the limitations and gather significant amount of data that, although at the first glance not being so related, can indeed give a holistic overview of learning trends and

entrepreneurship development with a special focus on youth.

6. CONCLUSIONS

Entrepreneurship is not a form. That's why within the research, the response that entrepreneurship is an adventure received the most applause. Indeed, most people perceive entrepreneurship as a challenge to think and work differently. **The way of thinking is the main characteristic of someone who is an entrepreneur.**

Can entrepreneurship be learned as a subject in school or university? According to teachers, entrepreneurship is learned through group work, which not only addresses potential shortcomings that everyone has but also allows each individual to develop in a direction that suits their potential. Through group work, differences in individuals' competencies can be positively highlighted. Just as it's irrational to think we can learn to swim by reading 1000 books on swimming, it's necessary to jump into the water and try to stay afloat. We always need someone to "support" us in the beginning until we get used to it. The key parallel between swimming and entrepreneurship is that the only learning model is **facing risk**. Moreover, "the quality of a student's knowledge largely determines the quality of his being as a person, his view of the future, while experience and work contribute to the intensity of life" (Vukotić, 2020, p. 394).

Most theoretical and empirical findings argue that **entrepreneurial education is and must be a lifelong process.** We learn entrepreneurship daily, and it's not limited to one area. Entrepreneurship simply doesn't fit into a form that any narrative can withstand because externalizing problems is the key to entrepreneurial education. So, without skills to recognize problems within existing narratives, we cannot create new ones. What sells a product or service is added value, which is precisely created by entrepreneurs.

To support students in forming an entrepreneurial personality profile, it's necessary to change approaches to the educational process. **The student must be placed at the center of the educational process**, while the teacher should have the role of a mentor and someone who creates a stimulating learning atmosphere. These changes should lead to greater student activity in the learning process because only in this way is it possible to encourage the development of more complex cognitive functions such as creativity, connecting knowledge in a broader context, and its application in solving specific problems. It's also important to develop competitive skills and spirit as an opportunity for young people to express their potential and develop critical thinking, to express their diversity.

If teaching exclusively uses lecture as a method, students will not have the opportunity to develop the skills. Therefore, it's necessary to encourage learning **through discovery and problem-solving, learning by modeling, teamwork, and research.** Furthermore, through active participation in the learning process, the development of critical thinking in students is encouraged, which is reflected in the ability to question, evaluate, and assess one's or others' thought processes and products, according to clear evaluation criteria. Today, this is extremely important for success because we are faced with a sea of information and ideas that must be critically approached **(re-learning)**, and the process of selection and evaluation is often very fast, so it's essential to constantly encourage the development of critical thinking.

Young people are insufficiently informed and aware of the opportunities available in the market, so it's necessary to work on raising awareness and strengthening information channels about opportunities for young people. Educating young people about financial literacy is a prerequisite for acquiring the financial skills of new generations; competitions must be an integral part of the formal education of every young person.

Organizations that operate in the field of entrepreneurial education **must be supported** through capacity building, mainly in areas of organizational learning. Whilst maintaining dedicated and detailed approaches in their activities towards target groups, NGOs in the field of entrepreneurial education face barriers in term of financing and unclear administrative capabilities, which are essential for continued and more effective outcomes of activities.

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CORRESPONDANCE:

Nikola Mićunović, PhD candidate
University of Donja Gorica
Faculty of Informational Systems and Technologies
Oktoih 1
81000 Podgorica, Montenegro
E-mail: nikola.micunovic@udg.edu.me

Danilo Popović, Graduate student.
Università Cattolica del Sacro Cuore Facoltà di Economia
Largo A. Gemelli 1
20123 Milano, Italy
E-mail: danilo.popovic01@icatt.it

14.

Regression analysis of GDP growth rate and the impact of education on GDP

Semina Kalač, BSc

Regression analysis of GDP growth rate and the impact of education on GDP

Semina Kalač

Faculty for International Economics, Finance and Business
University of Donja Gorica
semina.kalac@udg.edu.me

ABSTRACT:

This paper explores the origins of education and its relationship with economic growth, with a specific focus on the impact of education on the gross domestic product (GDP) growth rate. Through data analysis from 30 countries, regression analysis is applied to quantify the influence of education on economic growth. First, the development of education will be explored, from primitive forms of learning to institutionalized systems. Then, the correlation between the development of the population's education and the GDP growth rate will be analyzed using education and GDP data for 30 European countries. The impact of education on economic growth will be examined using variables such as the number of college graduates and doctoral-level science graduates.

This paper provides insight into the importance of education for economic growth and highlights the need for further investment in education to ensure sustainable progress and readiness to face the challenges of the modern era.

Key words: education, economic growth, GDP, human capital, regression analysis.

1. INTRODUCTION

It has always been known that education is significant for personal and societal development. The importance of education has been recognized since the early stages of human civilization, as evidenced by numerous historical records. Although the connection between education and economic growth is apparent, the challenge has been to quantitatively and empirically prove it. This is particularly important for decision-makers involved in funding the education system.

While the above-mentioned thesis is assumed to be true, there is still uncertainty regarding the impact of education, namely whether the fruits of education are immediately realized. Additionally, measuring economic growth pertains to individual countries, even though education knows no boundaries as it is dispersed. This presents a complicating factor in researching this issue.

The aim of this paper is to examine whether education today has a significant impact on economic growth, inspired by the increasingly common assertion: ''a diploma is dead.'' Education has advanced greatly on a global scale. Is there a mutual relationship between education and economic progress? Many economists have emphasized that economic progress cannot be explained solely by economic factors, stating economics cannot be explained by economics (Vukotić,2007,p.17). Economics is a multidimensional science. The way of life influences its development, and in elucidating economic concepts, Joseph Schumpeter particularly emphasizes the importance of non-economic phenomena. Therefore, education, which was long considered a non-economic variable, is now used to explain economic growth.

2. LITERATURE OVERVIEW

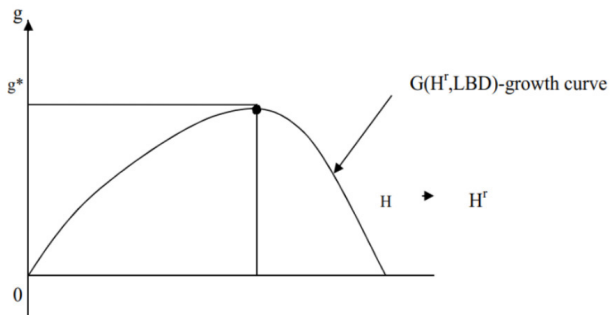
Robert Solow developed a model that quantitatively and theoretically measures the impact of certain factors on economic growth, including education (Solow,1956). He argued that better education, along with improved organization in the workplace, leads to increased productivity and, consequently, economic growth. The model explains that society saves a certain portion of income, that the population and workforce grow steadily, and that capital is evenly regulated. As the intensity of capital decreases, so does production. As a result, in the long run, capital, labor force, and production will grow at the same rates, without technological development. Solow particularly explains in the model the impact of technological development, which is a result of education, on economic growth. Therefore, the accelerator of economic growth is technological progress, and technological progress depends on the knowledge and skills of the population.

Although technological progress, crucial for understanding economic growth, was not an integral part of that analysis, economists further elaborated the neoclassical growth theory. Mankiw includes human capital in the analysis, emphasizing the role of education as a factor of production, accumulation of education increases human capital (Mankiw,1992). With advanced education, the economy moves towards a higher level of education. However, once it reaches a new level, education no longer has an impact on growth in such a model. Changes in GDP per worker are associated with changes in education (capital). This model has significant shortcomings because there are natural limitations in the duration of schooling (formal education has the highest academic degree).

The existence of a connection between education and human capital is also explained by Aghion and Howitt in their work "Endogenous Growth Theory". In the short term, it is very difficult to increase human capital, and therefore, countries with low levels of human capital often remain at the same level of productivity for a longer period. On the other hand, countries with high levels of human capital easily increase productivity and thus achieve significant economic growth.

Graph 1 illustrates a concave curve of economic growth. On the x-axis, human capital or the so-called learning by doing (LBD) is displayed, while on the y-axis, economic growth is measured by the GDP growth rate. Investing in primary and secondary education, i.e., focusing on increasing productivity, positively impacts economic growth. The economy grows up to a certain point, after which a decline in economic activity is recorded when investments in education shift towards research. Therefore, sometimes investment in education does not align with economic growth in the short term.

Graph 1. *Relationship between Education and Economic GrowthTop of Form*



Source: *Aghion P. and Howitt P. (1998),Endogenous Growth Theory,The MIT Press, Massachusetts, p. 347*

A different perspective on the impact of education on economic growth was developed by Joseph Schumpeter. He introduced the term "creative destruction," where economic growth is promoted through the destruction of old models and innovation. Schumpeter (1949) in his work "The Theory of Economic Development" points out that "especially in a competitive economy, where new combinations mean the competitive elimination of old ones, on the one hand, explains the process by which individuals and families rise." By developing new ideas and technological inventions, the innovative capacity of the economy is enhanced. Therefore, given education influences the birth of new ideas, indirectly impacting economic development even without adding new education. Education facilitates the easier transmission of knowledge necessary for the creation and use of new technologies.

Accordingly, human capital plays a significant role in economic development, notwithstanding the fact that technology leads in the development of countries today; behind technology stands a person with knowledge. It is important to emphasize that besides being crucial for acquiring skills, developing technology, and people's creative abilities, education also has humanistic goals. Even in the earliest stages of education development, moral values and philanthropy were the first pillars of education, as later indicated by the most prominent philosophers and scholars.

3. METHODOLOGY OF THE RESEARCH

The data used for the regression analysis of GDP growth rate and the impact of education will be official data from the European Union available on the Eurostat website. The model will analyze whether the dependent variables adequately explain the GDP growth rate across a sample of thirty European countries. To understand economic indicators, research from significant global institutions such as the World Bank and the International Monetary Fund will be utilized.

The research will rely on secondary sources, including literature on the subject, previous studies by economists, measures of the impact of education on economic growth, and their respective models. Additionally, documentary notes and statistical data that will be included in the regression analysis model will be used.

The most commonly used statistical method for analyzing the relationship between an independent variable and a dependent variable is regression analysis. With this method, one can determine which factors have the greatest influence on the dependent variable and how these factors contribute to changes in the values of the dependent variable. It is important to note that regression does not guarantee a causal relationship between variables; it only identifies statistical associations and provides a basis for prediction or explanation.

4. RESULTS AND DISCUSSIONS

4.1. The impact of education on economic growth

It is widely known that knowledge and education are prerequisites for the progress of human civilization, and their advancement to a higher level is a condition for the survival and further development of human society. Education is considered a key factor influencing productivity, innovation, entrepreneurship, and social mobility, all of which deeply impact economic growth. Through the acquisition of knowledge, skills, and abilities, educated individuals become more resourceful and adaptable in changing economic conditions, thereby stimulating competitiveness and societal progress. The knowledge economy is a term that implies a greater recognition of the role of knowledge and technological advancement in economic growth. Knowledge, in the form of human capital, on one hand, and technological achievements on the other hand, are recognized as central elements of stable economic growth (Bacović, 2013,p.153).

The first occupation of man after gathering fruits was agriculture. The agricultural revolution was one of the most significant revolutions in human history. Its consequences were more food, population growth, and overall societal progress. Despite all other economic sectors influencing economic growth, agriculture has played a significant role from the very beginning because it concerns existential needs. Kaucki (1953) said that "it developed from a craft, whose routine was passed down from father to son, into science, or even into a complex of sciences that quickly expanded the scope of their research and the boundaries of theoretical knowledge. A farmer who does not know these sciences well is just a "practitioner," stands helpless and confused in the face of all the novelties, but cannot remain as he used to run the farm as his fathers and grandfathers did." The first agricultural school was established in 1779. in Hungary (present-day Hungary), marking the beginning of agricultural education. The importance of education and acquiring new skills and knowledge in using technology is a prerequisite for progress in this sector, which significantly contributes to the economic growth of the country (Božić et al.,2011).

Quality education enables the workforce to cope with the challenges of the modern business environment. Highly educated individuals often possess

specific knowledge and skills needed for performing complex tasks and creatively solving problems. This results in increased labor productivity, as educated workers can effectively apply technology and bring innovative solutions that promote the growth and development of the industry.

Education also fosters innovation. Through research, the development of new ideas, and the application of advanced technologies, educated individuals are often drivers of change and generators of new technological and business practices. Innovations are crucial for creating new jobs, increasing competitiveness, and stimulating economic growth.

Entrepreneurship also gains a significant role in the relationship between education and economic growth. In 1942, Joseph Schumpeter explained economic progress through the disappearance of old industries and the development of new, more productive industries. He termed such spontaneous order ''creative destruction.'' Educated individuals often possess the skills required to start and manage successful business ventures. Through education, entrepreneurial spirit is developed, favorable conditions for the development of new ideas and innovative entrepreneurial ventures are created, and a network of people who later participate in this business is built.

Education is often said to be the only capital that cannot be stolen from you. Since real income depends on today's investments in human resources, economists have traditionally viewed differences in people's wealth solely through the possession of physical capital. However, Becker (1962) argues that income growth research shows that factors other than physical resources play a greater role, shifting attention to less tangible resources such as knowledge, education, and ideas. Starting from factory workers, many employees increase their productivity by refining old skills and learning new ones. On-the-job training increases future productivity and thus overall economic growth.

Although a country's economic growth is often associated with its wealth in natural resources, the situation in many African countries has long rejected this principle. Education, as an economic discipline, and human capital, according to Schultz (1961) are considered unexplored. Human beings remain the most important resource, as everything starts with them. Self-investment represents a favorable foundation for capital acquisition.

Theoretical literature identifies three ways education influences economic growth. Firstly, education enhances human capital.''Human capital brings significant advantages to both the individual possessing it and society as a whole. Regarding individuals, there is solid evidence of a link between education and earnings. Research on earnings in developed countries shows that each additional year of schooling increases earnings by 5 to 10 percent.''(Šuković, 2013,p.44) Through increasing the workforce and productivity, there is an increase in the equilibrium level of production. Furthermore, the economy's innovative capacity depends on education, with Lucas and Romer particularly emphasizing the importance of knowledge of new technologies and production processes in boosting economic growth. Secondly, knowledge itself serves a purpose, namely to satisfy the needs of its possessor. Education is significant in transmitting the knowledge necessary for understanding new developments to prevent falling into the trap of constant repetition.

Many policymakers argue that investing in education yields significant benefits. The returns from education far exceed the costs. Economists believe that positive externalities from investing in education are much more common due to the stimulation of technological innovations, thereby increasing productivity.

Although there are logical conclusions about the relationship between education and economic growth, quantitative indicators are still weak. Some models are difficult to measure. Developed countries develop faster and have greater opportunities to invest in education. Here lies the problem of reverse causality. Furthermore, direct investments in education are rare, so the average number of years of schooling is used as a measure of education. This measure is not the most realistic indicator because one year of basic education has the same impact as one year of doctoral studies. Thirdly, it is difficult to isolate the impact of education on economic growth from indirect variables.

Innovations have proven to be crucial in the economic growth of a country. They require highly educated individuals, while greater productivity

and imitation of others rely more on physical capital together with less educated labor. Technological advancement frees workers from many tasks, giving them enough free time for exploration, self-investment, and thus creating greater prosperity.

Looking at the relationship between education through innovation and economic growth, we can compare Europe and the United States in recent years when Europe has grown significantly slower. Andre Sapir (2003) suggests that slower growth may be due to the European Union's lower investment of 1.1% of its GDP in higher education compared to the 3% invested in the USA. On the other hand, Asian countries, which are among the most populous, feel the most investment in primary and secondary education, thereby increasing productivity, with less investment in higher education. Empirical findings by Denison (1985) show that the growth of the workforce's education level in the USA contributed to a quarter of the total economic growth achieved during the period from 1929 to 1982. So, education is the driving force of the economy in many societies. The extent to which education is significant for the economy in European countries will be demonstrated by the regression analysis model in the continuation of the study.

4.2. Regression Analysis

The research conducted in this study pertains to the state of the educational system in thirty European countries. More precisely, it examines how the number of employed individuals according to the level of education and doctoral-level students affect the GDP growth rate. The GDP growth rate used is from the year 2019, with the base year being 2016, to exclude the extreme effects caused by the COVID-19 pandemic, which significantly reduced economic growth due to the cessation of operations in many industries. Raw data were obtained from the official website of the European Union, Eurostat.

The objectives of regression analysis are to determine the quantitative agreement of variations between two or more phenomena being analyzed. When studying the relationships between two variables, simple (linear and nonlinear) regression methods are applied, and in the case of observing multiple variables, multiple (linear and nonlinear) regression methods are used. In this study, multiple linear regression will be applied.

Due to data limitations, it is not possible to examine the time series of the impact of individual education factors on the GDP growth rate. Therefore, a cross-section from the year 2019 is conducted on thirty European countries. The independent variables used in the study are:

X_1 - The number of individuals proficient in foreign languages according to the level of education in 2016.
X_2 - Population according to the level of education, gender, and age, main indicators aged 16-64.
X_3 - Graduates at the doctoral level in science, computer science, engineering, and construction, by gender per 1000 people (aged 25-34).
X_4 - Employment according to gender, age, and level of education.
X_5 - The total population.

The expectations are that the independent variables explain the dependent variable (GDP growth rate) well. Below, the regression, ANOVA tables, coefficients, as well as the regression equation setup, will be interpreted.

Table 1: *Coefficients of determination, correlations, and Durbin-Watson coefficient*

Model Summary[l]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
11	.891k	.794	.745	.33013	1.946

k. Predictors: (Constant), number of foreign language proficiencies by level of education in 2016, population by level of education aged 16-64, employment by level of education, graduates at the doctoral level in science, mathematics, engineering, construction by gender per 1000 people (aged 25-34), population size

l. Dependent Variable: GDP growth rate in 2019 (base year 2016)

Correlation analysis determines the existence and strength of a statistical relationship between phenomena. It measures the degree of dependence between variables, i.e., the correlation coefficient measures the strength of the already established relationship between two variables. For two phenomena represented by quantitative values, the strength of the

relationship is measured by the correlation coefficient. The closer the absolute value of the correlation coefficient is to one, the stronger the dependence between the observed phenomena. The correlation coefficient (R), representing the strength of the relationship between variables, is 0.891, indicating a strong positive correlation.

The first absolute measure of deviation of empirical points from the regression line is called the standard error of the regression. The second measure used as a relative indicator is the coefficient of determination. The coefficient of determination (R Square) is 0.794, indicating that 79.40% of the variation in the dependent variable, in this case, the GDP growth rate, is explained (determined) by the variability of the above-mentioned independent variables. The remaining 20.6% of the total variability is not explained by the regression line, i.e., it is influenced by unidentified factors.
The mutual independence of residual values assumes that the random errors of different observations are independent, meaning that the value of a random error in one period is not dependent on its value in any other period. This implies that there is no systematic relationship between random errors. As for the Durbin-Watson coefficient, it is 1.946, indicating that there is no autocorrelation in the observed model.

4.3. Anova table

To determine the representativeness of the regression line, it is necessary to consider the components of variability in the dependent variable. The total variability arises partly due to the regression model, while another part of the variability, Yi, is a result of the random error term εi and cannot be explained by the regression model.

Table 2: *ANOVA Table*

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
11	Regression	8.845	5	1.769	16.232	.000[1]
	Residual	2.289	21	.109		
	Total	11.134	26			
a. Dependent Variable: GDP Growth Rate 2019 (baseline 2016)						

l. . Predictors: (Constant), Number of Foreign Languages by Educational Level 2016, Population by Educational Level 16-64 years, Employment by Level of Education, Graduates at Doctoral Level in Science, Computer Science, Engineering, Construction by Gender per 1000 people (25-34 years), Population.

The total deviation of the dependent variable Y can be treated as the sum of explained and unexplained variability. This equality holds when both sides of the equation are squared and summed for all values in the sample. The calculation yields the sum of squares of deviations. The resulting equation is an analysis of variance equation. Its components are:

Df (degree of freedom) – represents the number of values in the final calculation that are free to vary.
Degrees of freedom (df) for SST (sum of squares of treatment) is 5. They represent the difference between each treatment mean and the overall mean.
Degrees of freedom (df) for SSE (sum of squares of error) is 21. They represent the difference between each observation and the mean of its treatment.

SS (sum of squares) – represents the sum of squares, equal to the sum of treatment sum of squares SST (explained sum of squares) and error sum of squares SSE (unexplained sum of squares). It represents the difference between observations of all samples and their overall mean.

SST = 8.845
SSE = 2.289
SS = 11.134

MS (mean sum of squares) - variance estimate, obtained by dividing the corresponding sum of squares by the corresponding degrees of freedom.
MST = SST / (k-1) = 1.769
MSE = SSE / (n-k) = 0.109

F – the calculated F value obtained when the variance estimate of treatment and error are compared:
MST/MSE = 16.232

Sig. – significance based on which hypothesis testing is conducted. It indicates whether there is at least one independent variable that explains the dependent variable well.

H_0 – means of all populations are equal
H_1 – at least one population mean differs

Since the significance value is 0.00 < 0.05, the null hypothesis, indicating that no independent variable explains the dependent variable well, is rejected, and the alternative hypothesis is accepted. Therefore, it can be concluded that there are differences between the means of populations. After rejecting the null hypothesis, individual testing follows.

Deeper analysis of the relationship between the dependent and independent variables can be examined based on the obtained coefficient results in the regression model. It investigates the individual contributions of each independent variable in explaining the dependent variable. Additionally, it serves in the analysis of multicollinearity, i.e., the interrelationship between independent variables. Table 3 shows the regression analysis coefficients in the observed model.

4.4. Coefficients

Table 3: *Coefficients of the Observed Model*

Coefficients[a]

Model	Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	T	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
(Constant)	33.971	7.167		4.740	.000		
number of foreign languages according to education level 2016	.547	.105	.759	5.194	.000	.459	2.179
population according to education level 16-64	-.492	.189	-.274	-2.605	.017	.882	1.134
graduates at the doctoral level in science, math, engineering, 25-34	-.474	.141	-.388	-3.355	.003	.733	1.364
employment according to education level	3.645	.976	7.450	3.733	.001	.002	406.805
Population	-3.863	.964	-8.098	-4.008	.001	.002	417.032

a. Dependent Variable: growth rate 2019-16

The standardized beta coefficient for the number of foreign languages according to the level of education (2016) is 0.759. For employment according to the level of education, it is 7.450. Therefore, the variable of employment according to the level of education contributes the most to explaining the dependent variable. The standardized beta coefficient for the variables: population according to the level of education (16-64 years), graduates at the doctoral level in science of mathematics, computer science, engineering (25-34 years), and the population count have negative values.

T-tests are used to test individual variables to determine which independent variables have regression coefficients different from zero. The significance for all independent variables used in the model is less than 0.05, meaning that all three variables effectively explain the dependent variable, thus rejecting the null hypothesis and accepting the alternative hypothesis.

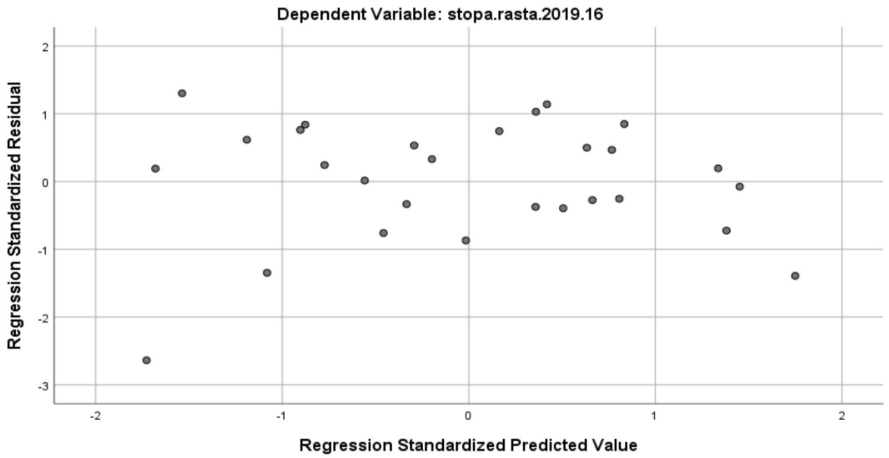
Subsequent analyses check for multicollinearity, which assesses whether there is a significant interrelationship between independent variables. The absence of multicollinearity means that explanatory variables are not perfectly correlated. Analysis is conducted using the tolerance level percentage and variance inflation factor.

Tolerance level represents the percentage of the dependent variable explained solely by that independent variable and cannot be explained by other independent variables. The tolerance value ranges from 0 to 1. The closer it is to one, the larger portion of the dependent variable cannot be explained by other independent variables. In this model, the tolerance level for the variable "number of foreign languages spoken by education level (2016)" is 0.459, meaning that 54% of the dependent variable can be explained by other variables; for the variable "population by education level, gender, and age, main indicators 16-64 years," the tolerance level is 0.882, indicating that only 12% of the dependent variable can be explained by other variables. Furthermore, the tolerance level for the variable "graduates at the doctoral level in science, mathematics, computer science, engineering, and construction by gender per 1000 people (25-34 years)" is 0.733, suggesting that 27% of the dependent variable can be explained by other variables. Regarding the variables "employment by gender, age, and level of education" and "population," the tolerance level is 0.02, meaning that 98% of the dependent variable, GDP growth rate, cannot be explained by other variables. Therefore, a large proportion of the explained dependent variable cannot be attributed solely to the variables "employment by gender, age, and level of education" and "population."

The Variance Inflation Factor (VIF) represents the reciprocal of the tolerance level, or the factor by which the variance of the coefficient estimates is increased. It should be less than 10, preferably close to 1, or less than 5. In this example, the VIF for the variables "number of foreign languages spoken by education level in 2016," "population by education level, gender, and age, main indicators 16-64 years," "graduates at the doctoral level in science, mathematics, computer science, engineering, and construction by gender per 1000 people (25-34 years)" is less than one, which satisfies the model's conditions.

Based on graph, the normality of variables, homoscedasticity, or heteroscedasticity is checked. If there is no clear clustering of points on the graph, it indicates homoscedasticity, i.e., the variation or residual must be the same for all Y values. If there is clustering of point values, it indicates heteroscedasticity. In this model, there is no clear clustering of points on the graph.

Graph 2. *Scatter plot*



The deterministic part explains the average impact of the independent variable X on the dependent variable Y. Parameter a represents the constant term of the model and is called the intercept, while parameter b is the regression coefficient or slope coefficient.

The regression coefficient b represents the average change in the dependent variable Y for a one-unit increase in the independent variable X. Parameter a, the regression constant, determines the "level" of the regression line. It is the value of Y when X = 0 and represents the point where the regression line intersects the y-axis. In other words, it is the initial value of Y when the independent variable has not yet begun to act. Since the model used five independent variables to explain the GDP growth rate, a multiple regression analysis was performed. It is represented by the multiple regression equation:

$$Y' = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5$$

$$Y' = 33.971 + 0.547X_1 - 0.492X_2 - 0.474X_3 + 3.645X_4 - 3.863X_5$$

where:

a is the coefficient indicating the value of the dependent variable (GDP growth rate) when all five independent variables are 0.

b_1 is the coefficient indicating that with an increase in the number of foreign language skills according to the level of education in 2016 by 1, while other independent variables remain unchanged, the GDP growth rate increases by 0.547.

b_2 is the coefficient indicating that with an increase in the population according to the level of education, gender, and age, the main indicators of 16-64 years by 1, while other independent variables remain unchanged, the GDP growth rate will decrease by 0.492.

b_3 is the coefficient indicating that with an increase in the number of graduates at the doctoral level in science, mathematics, computer science, engineering, and construction by gender per 1000 people (25-34 years) by 1, while other independent variables remain unchanged, the GDP growth rate will decrease by 0.474.

b_4 is the coefficient indicating that with an increase in the employment rate by gender, age, and education level by 1, while other variables remain unchanged, the GDP growth rate will increase by 3.645.

b_5 is the coefficient indicating that with an increase in the population by 1, while other variables remain unchanged, the GDP growth rate will decrease by 3.863.

5. RESEARCH LIMITATIONS

This research has several shortcomings. Firstly, it was conducted over a period of four years, which is a very short timeframe. To obtain more accurate data, it is desirable for the research to be conducted over a period of twenty years. This is precisely because the benefits of education are not immediately visible; rather, the results of education are observed after many years of work.

Another shortcoming is related to the use of the level of education. In this research, the level of education at the doctoral level was used. Although it makes sense that the most educated people contribute the most to the country's development, it is still a smaller number of people. Therefore, a small number of people who influence GDP are taken into account, and other levels of education, such as primary and secondary, have a significant impact on the country's development. The workforce is most often found among people with secondary education, so their influence must not be neglected.

The third shortcoming is that education cannot be expressed solely quantitatively. The results of education are not seen solely in the quantitative growth of the country, but also in cultural development. Culture is the basis of the economy and has a significant contribution to civilizational progress, especially today when certain civilizations are facing cultural deficiencies, such as some European countries.

It is important to note that regression analysis alone cannot reveal the existence of a cause-and-effect relationship between the phenomena under investigation, in the sense that one phenomenon is the cause and the other is the effect. This can be determined through other quantitative methods or with the assistance of qualitative analysis.

6. CONCLUSION

Based on the research conducted in this study, it can be concluded that all five independent variables (number of foreign language skills according to the level of education in 2016, population according to the level of education, gender, and age, main indicators of 16-64 years, graduates at the doctoral level in science, mathematics, computer science, engineering, construction by gender per 1000 people (25-34 years), employment by gender, age, and education level, population) effectively explain the GDP growth rate.

There is a positive relationship between the number of foreign language skills in 2016 and the employment rate by education level, age, and country of birth, and the GDP growth rate in 2019. Surprisingly, the variables

such as population according to the level of education, gender, and age, number of graduates at the doctoral level in science, mathematics, computer science, engineering, construction by gender per 1000 people (25-34 years), and population show a negative relationship with the GDP growth rate. However, the results of the model indicate that knowledge applied in practice contributes to an increase in the GDP growth rate.

As stated at the beginning of this research, education as a factor influencing economic growth is indisputable, but measuring its impact is challenging. Additionally, the benefits of knowledge acquired today may only manifest after a certain period. Accumulated knowledge and its transmission, such as education, contribute to the generation of new ideas that drive economic activity. All economic sectors and the entire social system rely heavily on education. Ardent (2009) in her work "Crisis in Education" point out "the general crisis that is everywhere in all spheres... manifests itself in its most characteristic and striking form as a crisis in education." Significant progress in education has an immeasurable contribution to technological development. The internet has enabled quick and easy access to a vast amount of information, significantly expanding educational opportunities, as evidenced by distance learning implemented worldwide due to the COVID-19 pandemic in 2020.
However, technology is developing to such an extent that it becomes a threat to education due to its unrestricted use. Artificial intelligence is increasingly being used, neglecting the importance of brain development through imagination. Therefore, technology and artificial intelligence in education are morally neutral. It depends on people whether they will use it more for benefit or harm.

Based on the examined model in this study, it is concluded that education is an investment that does not yield returns in the near future. Quality education requires a significant amount of money, which is not immediately recoverable. People implement their knowledge later through work. This is an attempt to explain why the variable of graduates at the doctoral level in science, mathematics, computer science, engineering, construction by gender per 1000 people (25-34 years) has a negative relationship with the GDP growth rate in 2019.

Overall, education plays a crucial role in the economic development of countries. This is confirmed by the fact that economic growth and education have historically "helped" each other. There has been continuous economic growth and progress in education. If we observe this relationship in the short term, the level of educated people does not significantly affect economic growth due to financial costs and insufficient time to apply knowledge in practice. Therefore, the null hypothesis set at the beginning of the study did not prove to be accurate in the observed three-year period, which does not mean that the same results would occur if a longer period were observed. Therefore, the alternative hypothesis is accepted, stating that the number of doctoral graduates does not affect GDP growth but rather slows it down.

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CORRESPONDANCE:

Semina Kalač, BSc
University of Donja Gorica
Faculty of International Economics, Finance and Business
Oktoih 1, 81000
Podgorica, Montenegro
E-mail:semina.kalac@udg.edu.me

ENTREPRENEURIAL ECONOMY
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