

A COMPARATIVE ANALYSIS OF THE INNOVATION INDEX BETWEEN WESTERN BALKAN COUNTRIES, UNDER A QUALITY MANAGEMENT APPROACH

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ABSTRACT.

My goal in conducting this study was to evidence and show the importance of the innovation concept and the relations of this concept to quality and quality management, in a comparative analysis between Balkan countries under a worldwide perspective approach.

Collecting data and information about innovation index worldwide, Balkan countries included, describing the newly introduced ISO family of standards for innovation, handling a descriptive statistic for innovation index, making a comparative analysis of this index between Balkan countries, as well as a comparison of Balkan countries with the rest of the world on this issue, was the methodology of this research.

Application of ISO standards generally and the application of the ISO family of standards for innovation helps companies to strengthen their commitment to their clients, improving innovative activities, processes and procedures, and economies of Balkan countries to achieve a competitive advantage, as a response to Crisis and Post-Crisis Period, was the main recommendations of the research.

Keywords: *Innovation, ISO standards, quality, quality management, competitive advantage.*

INTRODUCTION

Discussing innovation we immediately think about products and/or services that are new, new combinations that result in improved ones, new methods of processing, manufacturing, assembling, entering new markets, a new way of resources usage, innovated business models, new organization models, etc., and this related to effectiveness and efficiency of processes, procedures, methodologies, methods, tools, technologies involved on the process of production of goods and services.

Innovation doesn't always require inventions, but easy implementation in the practice of problem-solving techniques and decision making, implementation of individual and group activity-based ideas.

Interest in innovation is increasing, especially related to a quality culture and ISO standards

Quality culture serves as a guide for continuous

improvement, belonging to all members of an organization, since QC forms a link between internal and external clients, as well as with suppliers too.

The main core value of quality culture is embodied in ISO standards, for which there is an increasing interest worldwide, aiming to achieve competitive advantage.

Between them, ISO 9000, ISO 14000, ISO 20000, ISO 22301 (Wiboonrat. 2020), ISO 27000, ISO 45000, ISO 50000 family of standards, and especially ISO 56000 family of standards, which is directly related to Innovation Management, introduced during 2019, which clashes with the period of pandemics of Covid – 19 too, are the most required standards.

Innovation, quality, quality culture, management, and ISO standards are becoming an important part of business models achieving competitive advantage under the new reality and new normality.

Innovation index (GII. 2021) includes:

- Institutions
- Human capital and research
- Infrastructure
- Market sophistication
- Business sophistication
- Knowledge and technology output
- Creative output (Aita, Idlebi, Denner, Dimassi. 2017)

1. LITERATURE REVIEW

Currently, literature on innovation, quality, ISO standards, the culture of quality, etc, has been improved all around the world, besides the country and level of economic development. This is because concepts of innovation, quality, quality management, and ISO standards, applied correctly, help private and public organizations to be more competitive in an open market when and where the offer is much higher than the demand, one of the main characteristics of the last 50 years of the world economy (Ceko. 2021).

1.1 MEGATRENDS OF 2020 - 2030 AND WORLDWIDE ECONOMIES RESPOND TO CRISIS AND POST-CRISIS PERIOD

Five main megatrends for the next 10 years shall be (1) Population growth, as the heart of the shift in economic power (Fisk. 2019). (2) The impact of global warming is all around us, having a significant impact on yield and coastal regions. (3) We're in the midst of a fourth industrial revolution, which will become known as the digital revolution (Fisk. 2019), with the rapid advancement of technology (Fisk. 2019), AI, and machine learning. (4) Changes in global demographics (world population, density, ethnicity, education level, and other aspects of the human population) will bring about significant social change, and therefore challenges and opportunities, for both government and business (Fisk. 2019). These megatrends underpin structural shifts, technological development, shifting economic power, etc., having a profound effect on local and global markets and societies. (Fisk. 2019).

In response to these big changes/megatrends and crisis and post-crisis period, the World is going towards (1) information revolution, (2) flexible & learning organizations and innovation systems, (3) explosion of skills, knowledge, and competencies, (4) improving systems of creation, production, and distribution, (5) usage and expand of innovation systems, creativity, and quality management culture, etc.

1.2 INNOVATION

As per an OECD report (Nadim Ahmad and Richard G. Seymour 2006), since around 35 years ago, entrepreneurship has been defined as an act of innovation that involves endowing existing resources with new wealth-producing capacity (Drucker, 1985, Popescu. 2014), with its core, which lies with the creation and exploitation of entrepreneurial opportunities regardless of the context (Shane. 2003, Popescu. 2014) and as a creative activity that takes place when neither the goal nor often the initial conditions are known at the start, but constructed during the process (Sarasvathy. 2001, Popescu. 2014).

Innovation is defined by the Oslo Manual (OECD 2005, ISO 2015) of the Organization for Economic Cooperation and Development (OECD) as "the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations" (ISO. 2015).

In economics, further to Schumpeter's lesson, it is now part of mainstream thinking to consider innovation as the primary engine of economic dynamic: a process of "...industrial mutation that increasingly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one (Schumpeter. 1942, ISO. 2015)".

This notion is particularly relevant in today's globalized world and knowledge-based economies, which rely ever more on intangible resources.

Not surprisingly, innovation is widely recognized as one of the essential drivers of successful business and a key contributor to the productivity and economic and social development of nations

(ISO. 2015).

Innovation is the practical implementation of ideas that result in the introduction of new goods or services or improvement in offering goods or services (Schumpeter. 1939). ISO TC 279 on innovation management proposes in the standards, ISO 56000:2020 (ISO 2020) to define innovation as “a new or changed entity creating or redistributing value”.

According to the International Organization of Standards, “innovation is a new or improved product or process that differs significantly from previous products or processes and is made available to users. This definition is in line with those found in ISO standards so that they can be useful tools for comparing and assessing innovation within and amongst organizations” (ISO. 2019).

Some common element in the different definitions is a focus on newness, improvement, and spread. It is also often viewed as taking place through the provision of more-effective products, processes, services, technologies (Mayala & Tesha. 2022), and artworks (Lijster, Thijs, ed. 2018) business models that innovators make available to markets, governments, and society. Innovation is related to, but not the same as, invention: (Bhasin, Kim. 2 April 2012) innovation is more apt to involve the practical implementation of an invention (i.e. new/improved ability) to make a meaningful impact in a market or society (Morgan 2015), and not all innovations require a new invention (Schumpeter 1939).

The innovation system in any country consists of institutions, rules, and procedures that affect how the system acquires, creates, disseminates, and uses knowledge. Innovation in a developing country concerns not only the domestic development of frontier-based (Hendarman, Tjakraatmadja. 2012) knowledge but also the application and use of new and existing knowledge in the local context. Innovation requires a favorable climate (Hendarman, Tjakraatmadja. 2012) for entrepreneurs, among which shall be free from bureaucracy, regulations, and other obstacles (WB Institute, 2005, (Hendarman, Tjakraatmadja. 2012).

Designing and developing cutting-edge products

and processes to maintain a competitive edge requires an environment that is conducive to innovative activity, supported by both the public and the private sectors. In particular, it means sufficient investment in research and development (R&D), especially by the private sector; the presence of high-quality scientific research institutions; extensive collaboration in research between universities and industry; and the protection of intellectual property (Porter & Schwab, 2008, Robert. W. 2021).

1.2.1 SOURCES OF INNOVATION

Innovation may occur as a result of a focused effort by a range of different agents, by chance, or as a result of a major system failure. According to Peter F. Drucker, the general sources of innovations are different changes in industry structure, market structure, local and global demographics, human perception, mood and meaning, the amount of already available scientific knowledge, etc., (Drucker. 2002).

The robotics engineer Joseph F. Engelberger asserts that innovations require only three things:

- a recognized need
- competent people with relevant technology
- financial support (Engelberger 1982).

As per current tougher and tougher competition, globalization of (Burger-Helmchen. 2012) products, services, production mode, business models, and markets, as well as the implementation of new technologies (Burger-Helmchen. 2012), it looks that the success of businesses is dependent on (Burger-Helmchen. 2012) the effectiveness, efficiency, and intensity of innovation, which is considered as a decisive condition of competitive advantage in entrepreneurship, as a process created through interactions between various actors, which represents an important element of a company's future success (Burger-Helmchen. 2012).

It is clear that the growth of output is not attributable to labor or capital but is deemed to be linked to innovation and technological change (Greenhalgh & Rogers. 2010, Neil Robert Anderson, Kristina Potočnik, Jing Zhou, 2015).

Other authors stress the relations

between innovation, integrative creativity, entrepreneurship, leadership, and management too (Shung Jae Shin, Xiaomeng Zhang, and Kathryn M. Bartol (2015), Kris Byron, and Shalini Khazanchi (2015), Lucy L. Gilson, Hyoun Sook Lim, Robert C. Litchfield, and Paul W. Gilson (2015), Jill Perry-Smith, and Pier Vittorio Mannucci, (2015).

As per above, considering competitive advantage as one of the main driving forces for entrepreneurship, innovation, and creativity as key factors should be considered, requiring physical and nonphysical support for an optimal result.

Every crisis brings opportunities and room for creative disruption. One side effect of the current crisis has been to stimulate interest in innovative health solutions, naturally, but also areas such as remote work, distance education, e-commerce, and mobility solutions. With growing attention to innovation as the way to build a sustainable and inclusive future, unleashing these positive forces may well support societal goals, including reducing or reversing long-term climate change. (GII 2021).

The unprecedented global crisis that resulted from the outbreak of COVID-19 has propelled us into reinvigorating the important dimension of innovation to mitigate the pandemic's profound adverse effects on the economy and restore growth, calling for nations to embrace innovation as never before. While the crisis has naturally stimulated interest in innovative healthcare solutions, it has also catalyzed other areas, such as remote working, distance learning, e-commerce, and mobility solutions (GII. 2021).

The COVID-19 pandemic has triggered severe health and economic crises that will have lasting impacts. Vaccine research and scientific investigation to prevent the spread of coronavirus have increased awareness of the pivotal role of science, technology, and innovation (STI) in economic and social development (GII. 2021).

Innovation is an instrument of development that plays an increasingly important role in global trade. Particularly over the past two decades, the arena of global trade has been changing, with economies of scale gradually being replaced by an innovation economy focused on high value-added

products and services (GII. 2021).

The Global Innovation Index (GII) is a ranking of countries as per their success and capacity in innovation. It is published yearly by the World Intellectual Property Organization (WIPO). Global Innovation Index 2021, data which are used in this research, captures the innovation ecosystem performance of 132 economies and tracks the most recent global innovation trends.

1.3 A SHORT EXPLANATION OF THE GLOBAL INNOVATION INDEX (GII)

- Developed by Cornell University, INSEAD, and World Intellectual Property Organization, the Global Innovation Index (GII) is a ranking of countries based on certain indicators like their success and their capacity for innovation. This index is based on both subjective and objective data derived from different sources.
- The Global Innovation Index (GII) is published yearly by the World Intellectual Property Organization (WIPO). The GII ranks 131 countries based on 81 indicators. This index was started in 2007 by INSEAD and world business (Morrison. 2018), which is a British magazine.
- This index is calculated by averaging the scores of two indices —the innovation input index and the innovation output index (Morrison. 2018). These two subindices are composed of seven pillars (the innovation input index of five pillars and the innovation output index of two pillars).
- The Global Innovation Index (GII) ranks the innovative performance of the economies (Morrison. 2018) each year by highlighting the strengths and weaknesses of certain innovation metrics. This index is based on the most recent global innovation trends and aims at measuring the innovation metrics based on indicators like political environment, education, infrastructure, and knowledge creation of the economies.
- These different indicators which are used to calculate the Global Innovation Index (GII) can also be used to monitor the performance of the economies and compare the developments of these economies with other economies in the

same region.

- In the Global Innovation Index (GII) edition of 2020, India was ranked as the 48th most innovative nation in the world. This year was also marked as the first year for India to enter the top 50 countries in this Index.
- As for the Global Innovation Index (GII) edition of 2021, the index includes the impact of the COVID-19 pandemic along with the other indicators while tracking the recent trends in global innovation.

1.4 QUALITY AND CULTURE OF QUALITY

The core definition of quality, as a group of values that helps on how improvement is done on the daily practice of works and outputs related, a group of applications taken for granted that forms the philosophy of organizations or working groups, has been identified by several authors, which in paraphrasing that has defined quality culture as “social attack that supports people in the organization to stay together” (Ceko. 2021. Robbins, 1999).

Products and services features and improvement of them thrive. This is a culture expressed in several issues: (1) improvement individually, (2) tolerance and respect, (3) entrepreneurship (4) having proven capacity (Ceko. 2021).

“Culture of quality is a group of common, respected and integrally formed approaches of features of products and services, identified on the culture of organizations and systems of management” (Vlăsceanu, Grünberg & Pârlea, 2007, Ceko 2021).

“The importance of quality culture, quality management culture on doing business, achieving competitive advantage, relating them with corporate social responsibility, sustainable business, business ethics, diversity issues, international, cross-cultural management, national/international organizational culture, culture and sectors of the economy in a country, as well as currently as an important part of the history of economic thought (related to business management culture)” (Ceko. 2021, Gordon and Owen, 2008), Harvey and Stensaker, 2008), (Schein, 2010, 2013).

ISO standards, their importance, use of them

in practice, etc. have been described in several publications (Harrington & Mathers, 1997, Ceko. 2021).

Main ISO standards required then most currently are:

- ISO 9000 Family – Quality management system
- ISO 10244:2010- Document management — Business process baselining and analysis
- ISO 14000 – Environment protection
- ISO 20000 – Information technology
- ISO 22301:2019- Security and resilience — Business continuity management systems — Requirements
- ISO 27000 – information security management
- ISO 45000 – Health and safety at work
- ISO 50000 – Energy efficiency
- ISO 56002:2019 - Innovation management — Innovation management system — Guidance
- Etc.

According to ISO, there are three main types of benefits of using standards (ISO, 2014):

- Key benefit 1: Streamlining internal operations

One main finding is that standards can be used to streamline the internal processes of a company, for example by reducing the time needed to perform specific activities in the various business functions, decreasing waste, reducing procurement costs, and increasing productivity. The case studies consistently report that the contribution of standards to the gross profit of companies ranges between 0.15 % and 5 % of the annual sales revenues.

- Key benefit 2: Innovating and scaling up operations

Some case studies provide examples where standards served as the basis for innovating business processes, allowing companies to expand their suppliers' network or to introduce and manage new product lines effectively. In other instances, standards helped mitigate the risk to companies of introducing new products onto national markets.

- Key benefit 3: Creating or entering new

markets

Standards have been used as the basis for developing new products, penetrating new markets (both domestic and export), supporting the market uptake of products, and even creating markets. In exceptional cases, the impact of standards far exceeded the figure mentioned above, with companies achieving a gross profit contribution of up to 33 % of their annual revenue, which helped them position themselves as leaders in their field, at least over a certain period (ISO. 2014).

1.5 INNOVATION AS AN ISO FAMILY OF STANDARDS. ISO 56000

Innovation is the fuel that drives a successful business. And organizations that give their managers and employees the tools to respond to and make the most of opportunities, both internal and external, are well placed to grow profits, improve the health and well-being of their employees, and, thereby, the wider society. With effective innovation management systems in place, organizations – both large and small – can not only be in a better position to achieve their business growth goals but also be more agile and better prepared in their response to unexpected challenges and disruptions (Brady. 2021).

An innovation management system helps organizations capture the best ideas and continually improve to keep up with the competition. The latest standard in the ISO innovation management series has been published in 2019 (Naden. 2020).

All organizations, whatever their nature or size, need to continually evolve to survive, and the ISO 56000 series will help them to do that in a structured and effective way. Innovation is about creating something new that adds value; this can be a product, a service, a business model, or an organization. And the value that is added is not necessarily financial, it can also be social or environmental, for example. The ISO 56000 family will help organizations significantly improve their ability to survive in our changing and uncertain world. They allow organizations to permanently reinvent themselves. (Naden. 2020).

The ISO series on innovation management includes the following published documents:

- ISO 56000:2019 - Innovation management — Innovation management system — Guidance
- ISO 56002, *Innovation management – Innovation management system – Guidance*
- ISO 56003, *Innovation management – Tools and methods for innovation partnership – Guidance*
- ISO/TR 56004, *Innovation management assessment – Guidance*
- ISO 56005, *Innovation management – Tools and methods for intellectual property management – Guidance (Naden.2020)*
- ISO 56006, *Innovation management – Strategic intelligence management – Guidance*
- ISO 56007, *Innovation management – Idea management*
- ISO 56008, *Innovation management – Tools and methods for innovation operation measurements – Guidance (ISO. 2019)*

It is clear that even for International Standards Organization, relations between Innovation and Creativity are strong, since the ISO 56000 family of standards of innovation expresses the connection clearly, saying that the application of ISO standards generally the application of ISO 56000 family of standards helps companies strengthen their commitment to their clients, improving innovation and creativity activities, processes and procedures, and economies worldwide to achieve competitive advantage as a response to Crisis and Post-Crisis Period.

2. METHODOLOGY

Specifically, while acknowledging the importance of innovation and quality management in doing business and entrepreneurship ecosystem, prior empirical (Ceko. 2021) research does not explain how innovation and quality management influence doing business and entrepreneurship and among them together, besides the fact that few serious theoretical studies show the strong connection between innovation and quality management, but not numerical, statistical and algebraic studies.

The methodology followed for the realization of this study was the creation of the idea for the field of study for which the research would be

performed, the collection of data, figures, facts, and information as well as the literature that would be used for the realization of the study, based on desk research.

The desk research was done through:

1. Gathering information on innovation index worldwide.
2. Gathering information on innovation for Western Balkan economies.
3. Gathering theoretical information about ISO 56000 standards.

The literature, data, figures, facts, and information were then read, and selected, to determine the materials to be used in this study. Subsequently, the study methodology has been the processing of data through comparative analysis of innovation, and its sub-patterns (Institutions, Human capital and research, Infrastructure, Market sophistication, Business sophistication (Aita, Idlebi, Denner, Dimassi. 2017), and Knowledge and technology output (Aita, Idlebi, Denner, Dimassi. 2017), for Western Balkan countries, to provide reliable data, to create other reliable data, combining using descriptive statistics method data, figures, information, defining the current situation in region's business sophistication issue. All information, data, and facts gathered and processed helped to identify, quantify, and visually display the main research results, and propose solutions for Western Balkans economies.

After writing the final text, the abstract and the introduction of this paper were constructed, and then drew the relevant conclusions and recommendations, as well as later, all information and data were prepared in a user friendly, visual manner understandable for a wider audience in case of publication of this paper research dedicated to Canadian Institute of Technology Journal.

2.1 CASE SELECTION

The case was selected based on three main criteria: a theoretical approach, suitability of relations, and practical (Ceko. 2021) positive impacts of business sophistication in doing business and entrepreneurship ecosystem,

considering business sophistication as a property of ISO 30401 family of standards too.

DATA COLLECTION AND ANALYSIS

- Data for the Innovation index and its sub-patterns have been gathered from the Global Innovation Index Report 2021 (World Intellectual Property Organization, 14th Edition) too.
- A descriptive statistics for the Innovation index for 132 countries worldwide were performed.

Table 1. Innovation index ranking (GII, 2021)¹

| No | Country | Innovation Index |
|----|--------------------------|------------------|
| | Switzerland | 1 |
| | Sweden | 2 |
| | United States of America | 3 |
| | United Kingdom | 4 |
| | Republic of Korea | 5 |
| | Netherlands | 6 |
| | Finland | 7 |
| | Singapore | 8 |
| | Denmark | 9 |
| | Germany | 10 |
| | France | 11 |
| | China | 12 |
| | Japan | 13 |
| | Hong Kong, China | 14 |
| | Israel | 15 |
| | Canada | 16 |
| | Iceland | 17 |
| | Austria | 18 |
| | Ireland | 19 |
| | Norway | 20 |
| | Estonia | 21 |
| | Belgium | 22 |
| | Luxembourg | 23 |
| | Czech Republic | 24 |
| | Australia | 25 |
| | New Zealand | 26 |
| | Malta | 27 |
| | Cyprus | 28 |

¹ Data for Kosovo was not available.

| | | |
|--|--------------------------------|-----------|
| | Italy | 29 |
| | Spain | 30 |
| | Portugal | 31 |
| | Slovenia | 32 |
| | United Arab Emirates | 33 |
| | Hungary | 34 |
| | Bulgaria | 35 |
| | Malaysia | 36 |
| | Slovakia | 37 |
| | Latvia | 38 |
| | Lithuania | 39 |
| | Poland | 40 |
| | Turkey | 41 |
| | Croatia | 42 |
| | Thailand | 43 |
| | Viet Nam | 44 |
| | Russian Federation | 45 |
| | India | 46 |
| | Greece | 47 |
| | Romania | 48 |
| | Ukraine | 49 |
| | Montenegro | 50 |
| | Philippines | 51 |
| | Mauritius | 52 |
| | Chile | 53 |
| | Serbia | 54 |
| | Mexico | 55 |
| | Costa Rica | 56 |
| | Brazil | 57 |
| | Mongolia | 58 |
| | North Macedonia | 59 |
| | Iran (the Islamic Republic of) | 60 |
| | South Africa | 61 |
| | Belarus | 62 |
| | Georgia | 63 |
| | Republic of Moldova | 64 |
| | Uruguay | 65 |
| | Saudi Arabia | 66 |
| | Colombia | 67 |
| | Qatar | 68 |
| | Armenia | 69 |
| | Peru | 70 |
| | Tunisia | 71 |

| | | |
|--|-------------------------------|-----------|
| | Kuwait | 72 |
| | Argentina | 73 |
| | Jamaica | 74 |
| | Bosnia and Herzegovina | 75 |
| | Oman | 76 |
| | Morocco | 77 |
| | Bahrain | 78 |
| | Kazakhstan | 79 |
| | Azerbaijan | 80 |
| | Jordan | 81 |
| | Brunei Darussalam | 82 |
| | Panama | 83 |
| | Albania | 84 |
| | Kenya | 85 |
| | Uzbekistan | 86 |
| | Indonesia | 87 |
| | Paraguay | 88 |
| | Cabo Verde | 89 |
| | Un, Rep. Tanzania | 90 |
| | Ecuador | 91 |
| | Lebanon | 92 |
| | Dominican Republic | 93 |
| | Egypt | 94 |
| | Sri Lanka | 95 |
| | El Salvador | 96 |
| | Trinidad and Tobago | 97 |
| | Kyrgyzstan | 98 |
| | Pakistan | 99 |
| | Namibia | 100 |
| | Guatemala | 101 |
| | Rwanda | 102 |
| | Tajikistan | 103 |
| | Bolivia (Plur. State of) | 104 |
| | Senegal | 105 |
| | Botswana | 106 |
| | Malawi | 107 |
| | Honduras | 108 |
| | Cambodia | 109 |
| | Madagascar | 110 |
| | Nepal | 111 |
| | Ghana | 112 |
| | Zimbabwe | 113 |
| | Côte d’Ivoire | 114 |
| | Burkina Faso | 115 |

| | | |
|--|------------------------|-----|
| | Bangladesh | 116 |
| | Lao People's Dem. Rep. | 117 |
| | Nigeria | 118 |
| | Uganda | 119 |
| | Algeria | 120 |
| | Zambia | 121 |
| | Mozambique | 122 |
| | Cameroon | 123 |
| | Mali | 124 |
| | Togo | 125 |
| | Ethiopia | 126 |
| | Myanmar | 127 |
| | Benin | 128 |
| | Niger | 129 |
| | Guinea | 130 |
| | Yemen | 131 |
| | Angola | 132 |

Table 2. Descriptive statistics for innovation index

| Innovation Index | |
|--------------------------|----------|
| Mean | 66.5 |
| Standard Error | 3.329164 |
| Median | 66.5 |
| Mode | #N/A |
| Standard Deviation | 38.24918 |
| Sample Variance | 1463 |
| Kurtosis | -1.2 |
| Skewness | 8.95E-17 |
| Range | 131 |
| Minimum | 1 |
| Maximum | 132 |
| Sum | 8778 |
| Count | 132 |
| Largest (The worst) | 132 |
| Smallest (The best) | 1 |
| Confidence Level (95.0%) | 6.585881 |

Table 3. Value and ranking of Western Balkan economies for business sophistication (prepared by the author of this paper with data from GII 2021)

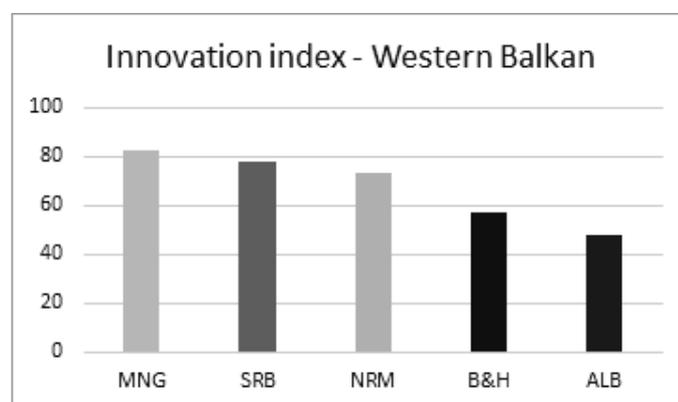
| COUNTRY | ALB | B&H | MNG | NRM | SER | | | | | |
|---------------------------------|-------|------|-------|------|-------|------|-------|------|-------|------|
| INNOVATION INDEX | 84 | 75 | 59 | 54 | 50 | | | | | |
| Sub-Patterns | Value | Rank |
| Institutions | 64.9 | 60 | 59.5 | 82 | 69.6 | 48 | 68.9 | 52 | 69.3 | 50 |
| Human capital and research | 22.7 | 90 | 31.4 | 68 | 32.7 | 59 | 30.2 | 73 | 32.3 | 62 |
| Infrastructure | 43.0 | 62 | 45.7 | 52 | 43.2 | 60 | 46.9 | 49 | 48.7 | 44 |
| Market sophistication | 44.1 | 79 | 49.3 | 51 | 50.9 | 41 | 63.7 | 12 | 48.4 | 58 |
| Business sophistication | 25.0 | 68 | 18.8 | 99 | 25.3 | 67 | 25.4 | 65 | 25.5 | 63 |
| Knowledge and technology output | 12.0 | 103 | 20.7 | 66 | 17.1 | 78 | 22.7 | 57 | 29.1 | 43 |
| Creative output | 20.3 | 81 | 15.9 | 99 | 35.9 | 33 | 19.5 | 83 | 21.4 | 76 |

Table 8. Innovation index Western Balkan countries rank and color to identify them in this research.

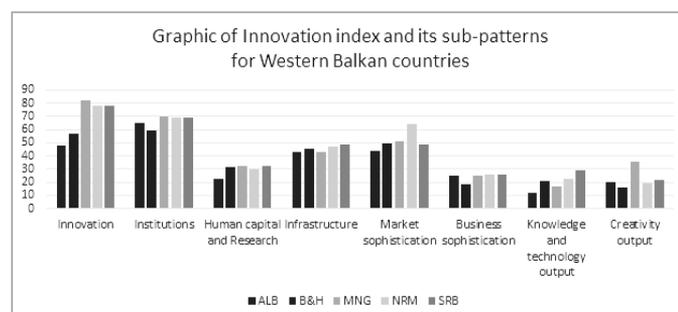
Colors were selected by the author of this research for easy identification purposes.

| No | Country | Rank |
|----|-----------------------------|------|
| 1 | Montenegro | 50 |
| 2 | Serbia | 54 |
| 3 | North Republic of Macedonia | 59 |
| | Mean & Median | 66.5 |
| 4 | Bosnia & Herzegovina | 75 |
| 5 | Albania | 84 |

Graph 1. Innovation index, in Western Balkan economies, graph prepared by the author of this research²



Graph 2. Innovation index and its sub-patterns, in Western Balkan economies, graph prepared by the author of this research



4. RESEARCH RESULTS

- Based on the data of this research, it appears that the countries of the Western Balkans are at a level unsuitable for the innovation index compared to the goals of these countries for
- 2 Building the graph, author uses the inverse ranking data. Inverse ranking data uses to show the larger figures when they are listed from the minimal level (the best) to the highest (the worst).

integration in Europe and among themselves.

- Three of the Western Balkan countries (Montenegro, Serbia, and the North Republic of Macedonia) are in a better position compared with the mean and median (66.5) in the list of 132 countries, while Bosnia & Herzegovina, and Albania are below the mean and median (as per descriptive statistics analysis of this research).
- Examining the constituent characteristics of the Innovation index and its sub-patterns, it turns out that Montenegro is in a better position, followed by Serbia, and the North Republic of Macedonia, while in the end, Bosnia & Herzegovina, and Albania remain.
- Since in terms of innovation the countries of the Western Balkans are not in a suitable position, also for the elements of institutions, human capital and research, infrastructure, market sophistication, business sophistication, and creative output, these countries have shortcomings.
- Implications for theory and practice
About the theory, based on the final results of this research, a new window has been opened for further research on the field of innovation and its relations with quality management, ISO standards, and its sub-patterns which form this index, considering them as a tool for a stronger competitive advantage approach for individual businesses and as a country's economy too.
- Limitations and further research

This research has been undertaken using plenty of data about the Innovation index and its sub-patterns for 2021.

Further research is needed to verify if these relations exist for other periods.

CONCLUSIONS AND RECOMMENDATIONS

1. Towards fixedness of natural resources and restrictions on boundless economic growth approach, the direction of innovation is important in overcoming resource constraints.
2. There is a tendency for innovations to save on scarce resources. If technological progress will be fixed-factor saving, then fixed factors may not be a large barrier to growth. The same argument and logic can be applied to quality management, since TQM is not a fixed

resource, and is strongly connected with innovation too.

3. Achieving competitive advantage requires a positive approach towards innovation, quality management, and all sub-patterns of innovation index, a group of subjects which helps and support doing business climate in SMEs, seeing this as a general microeconomic perspective too, while, in a broader context, this study extends the general understanding of the relations between innovation, quality management, institutions, human capital and research, infrastructure, market sophistication, business sophistication, and creative output, which should be used as a combination for a future managerial approach/mechanism in real-world situations, suggesting future research could focus on developing and validating the proposed framework and investigate the issue in more contexts and settings.
4. There is a strong connection between the Innovation index, ISO standards, and institutions, human capital and research, infrastructure, market sophistication, business sophistication, and creative output.
5. The main recommendation is that application of ISO standards generally and the application of ISO 56000 family of standards helps companies to strengthen their commitment to their clients, improving innovation and business sophistication activities, processes and procedures, and economies worldwide to achieve their competitive advantage, as a response to Crisis and Post-Crisis Period.

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