

Innovation at the Global Level: An Analysis of the Global Innovation Index in the Period 2021-2023

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Abstract

The last decades have seen an increase in entrepreneurial development based on innovation. Having access to innovation and setting up a business in a country that can serve as an innovation-enabler can increase the degree of attractiveness of that respective country. Governments around the world have adopted innovation-centered views and implemented relevant policies to serve as a driver for reaching high competitiveness and to ensure a more rapid economic and, implicitly, social progress. The aim of the paper is to present the top ten countries in the world in their evolution specific to the Global Innovation Index (GII) for the 2021-2023 period. The research methodology is based on a qualitative method. The paper shows that the top ten ranked countries in the world using this specific index remained the same for the investigated period, also maintaining a fairly constant relative position for the three years subject to analysis, Switzerland being the acknowledged leader.

Key words: innovation, Global Innovation Index, entrepreneurship, country

J.E.L. classification: L26

1. Introduction

Information becomes knowledge and knowledge can generate great ideas, bring solutions to existing problems, and can improve overall living conditions. Mankind has registered progress based on the conversion of ideas into practice and, therefore, innovation becomes pivotal for progress.

Innovation has been under the lens of many scholars, academics, managers (Schroeder *et al*, 1989) and policymakers alike. Innovation is pivotal as it becomes a promoter of change, pushing humanity towards reaching success starting from the individual level and going towards business, countries and reaching the entire global level. Due to innovation, progress is registered in terms of improving and diversifying products, technologies, and systems (Carr *et al*, 2016). Innovation is portrayed through the lens of certain features that can either bring completely new changes on existing conditions or it can entail adopting something new that was previously applied and, thus, actually meaning the implementation of inventions or the application of creativity and, respectively, ideas (Goswami *et al*, 2005).

Innovation drives economic progress and through it companies (Grădinaru *et al*, 2020) and countries reach a high level of competitiveness. Thus, entrepreneurs and policymakers tend to be more and more innovation-centered, pushing innovation not only at the pure research and development level (and, thus, technology itself), but driving it towards new types of business models, and also having a strong social sense. Led by two fundamental phenomena regarding the "increase of international integration of economic activities and the raising importance of knowledge in economic processes" (Archibugi *et al*, 2002, p.98), the globalization of innovation has led countries to base their competitiveness on their level of innovation integration.

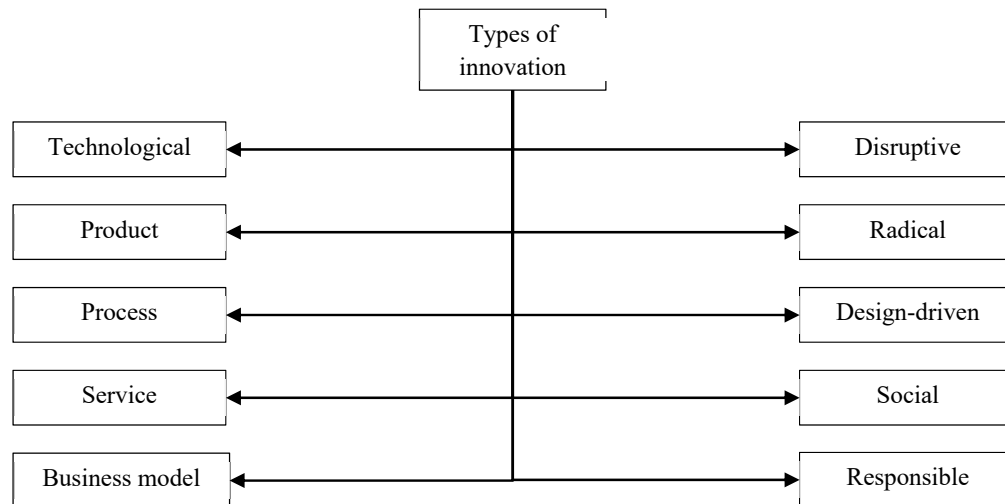
The aim of the paper is to present the evolution of the top ten countries in the world according to the Global Innovation Index (GII) in the period 2021-2023. The research methodology is based on a quantitative method. The paper is organized as follows. The next section of the paper is presenting the theoretical background. Section 3 is dealing with the findings specific to the analysis of the GII in the period subject to analysis. The paper ends with conclusions.

2. Theoretical background

Innovation has earned its assertive and positive value due to its technological applicability (Godin, 2020) that, in turn, is a driver for general progress (even though it is often linked to the economic one). After all, innovation is a promise for finding solutions to problems, increasing performance and boosting comfort or safety (Smil, 2023).

Innovation has various types (Figure no. 1) or shapes (Kotsemir *et al*, 2013) such as technological, product, process, service, (Kogabayed *et al*, 2017, p.64 apud Afuah, 1998), business model, disruptive, radical, design-driven, social, or responsible (Edwards-Schachter, 2018). Furthermore, innovation is prone to high influences coming from various key stakeholders such as government policy makers, implementers or strategists, and managers working in private firms or organizations providing business development services and NGOs (Heeks *et al*, 2013).

Figure no. 1. The types of innovation



Source: adapted from (Kotsemir *et al*, 2013; Kogabayed *et al*, 2017, p.64 apud Afuah, 1998; Edwards-Schachter, 2018)

Academics have formulated multiple definitions for innovation that have multifaceted factors that shape it (Table no. 1).

Table no. 1 The 2021 Global Innovation Index

Author	Definition
Keller <i>et al</i>	Innovation is the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new organization method in business practices, workplace organization, or external relations.
Baregheh, Rowley and Sambrook	Innovation is the multi-stage process whereby organizations transform ideas into new/improved products, service or processes, in order to advance, compete and differentiate themselves successfully in their marketplace.
Schumpeter	Innovations create value by definition, being new to all and useful to some actors, but also tend to destroy value, being harmful to some actors.
Quintane <i>et al</i>	Innovation should be considered as duplicable knowledge considered new in the context it is introduced to and demonstrated useful in practice.

Singh and Aggarwal	The operationalization of creative potential with a commercial and/or social motive by implementing new adaptive solutions that create value, harness new technology or invention, contribute to competitive advantage and economic growth.
Gault	The implementation of a new or significantly changed product or process.
Wijnberg	A stylistic innovation is a product, or a characteristic of a product, which is recognized by the relevant selectors as a new and legitimate response to a set of preferences which the selectors cannot specify in such a way that other actors could perform the actual determination of how far the product satisfies those preferences, and the value of which consists of the very differences the selectors perceive between the product under consideration and earlier and other products from the same category.

Source: adapted from (Keller et al., 2018, p.12638; Baragheh, Rowley and Sambrook, 2009, p.1334; Grandstrand and Holgersson, 2019, p.8 apud Schumpeter,1942; Quintane et al., 2011, p.939; Singh and Aggarwal, 20201, p.9; Gault, 2018, p.619, Wijnberg, 2004, p.1422)

From the abovementioned definitions, certain key elements distinguish themselves as being relevant to innovation: introduction of novelty (Manuylenko, 2015), improvement, a transformational process, value-generation or creation (potential), knowledge-based, invention and change. This is why companies around the world are making huge efforts to become innovative. In this respect, most innovative companies are successful ones. In an ever-changing environment (Toma, 2013; Toma *et al*, 2015), their business success is based on a plethora of major elements as follows:

- continuous innovation (Marinescu *et al*, 2016);
- entrepreneurial spirit (Grădinaru *et al*, 2017; Zainea *et al*, 2020);
- creativity (Toma *et al*, 2018);
- strategic-oriented (Toma *et al*, 2016a; Toma *et al*, 2016b);
- strong leadership (Cornescu *et al*, 2004);
- lean thinking (Naruo *et al*, 2007; Marinescu *et al*, 2008);
- total quality management (Toma *et al*, 2009);
- social responsibility (Toma *et al*, 2011; Imbrișcă *et al*, 2020);
- corporate citizenship (Toma, 2008) etc.

3. Research methodology

In order to arrive at the research objective, the methodology adopted by the authors of this paper was based on qualitative research. The information handled to interpret the situation of the top ten most innovative economies in the world according to the Innovation Index criteria comes from sources of secondary data, scientific publications such as books, articles and reports (ranks). The literature review was conducted using electronic databases.

4. Findings

The chapter’s highlight is the analysis of the top ten countries in the world ranked using the innovation criteria. The main trackers used within their dashboard are represented by science and innovation investment, technological progress, technology adoption and socioeconomic impact (WIPO, 2023, 22).

The data used in this specific analysis comes from the Global Innovation Index rank for the 2021-2023 period. The research was based on the country rank and their specific achieved scores and was extended towards the continent level. The investigation starts with the year 2021 (Table no. 2).

Table no. 2 The 2021 Global Innovation Index

Rank	Country	Continent	Score
1	Switzerland	Europe	65.5
2	Sweden	Europe	63.1
3	United States of America	North America	61.3
4	United Kingdom	Europe	59.8
5	Republic of Korea	Asia	59.3
6	Netherlands	Europe	58.6
7	Finland	Europe	58.4
8	Singapore	Asia	57.8
9	Denmark	Europe	57.3
10	Germany	Europe	57.3

Source: adapted from (WIPO, 2021, 4)

In 2021, Switzerland was the leader of the ranking according to the Global Innovation Index. The score difference between it and the 10th (and 9th since Denmark and Germany have the same country score) ranked country is quite sizeable, of 8.2. The gap relative to its follower is of 2.4. There are seven countries from Europe, two from Asia and one from North America. The second part of the study is specific to the rank from 2022 (Table no. 3).

Table no. 3 The 2022 Global Innovation Index

Rank	Country	Continent	Score
1	Switzerland	Europe	64.6
2	United States of America	North America	61.8
3	Sweden	Europe	61.6
4	United Kingdom	Europe	59.7
5	Netherlands	Europe	58.0
6	Republic of Korea	Asia	57.8
7	Singapore	Asia	57.3
8	Germany	Europe	57.2
9	Finland	Europe	56.9
10	Denmark	Europe	55.9

Source: adapted from (WIPO, 2022, 19)

The leading country in 2022 based on innovation is Switzerland, leading the 10th ranked one, Denmark, by 8.7 points in terms of achieved score. 2.8 points is the difference relative to the United States of America, the runner-up. Europe is dominating the rank with seven countries, Asia is second with two countries in the top ten and North America only has one. The last year subject to analysis is 2023 (Table no. 4).

Table no. 4 The 2023 Global Innovation Index

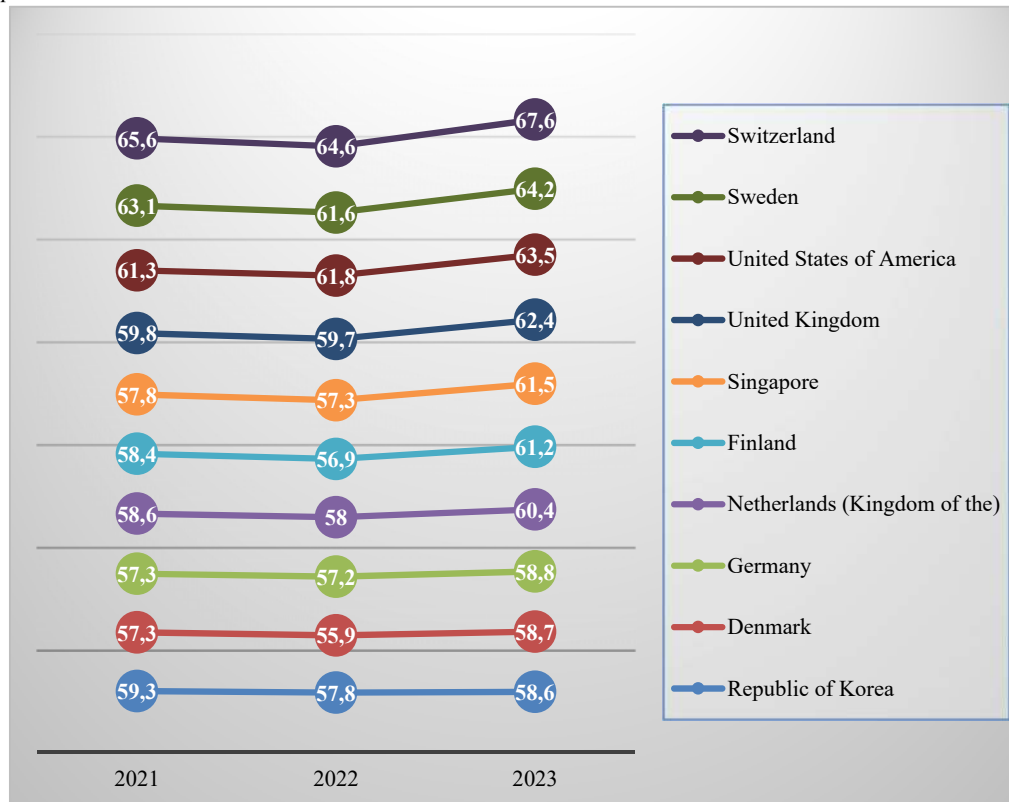
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5	Singapore	Asia	61.5
6	Finland	Europe	61.2
7	Netherlands (Kingdom of the)	Europe	60.4
8	Germany	Europe	58.8
9	Denmark	Europe	58.7
10	Republic of Korea	Asia	58.6

Source: adapted from (WIPO, 2023, 19)

The 2023 countries' rank based on innovation is led by Switzerland. The leader exceeds the score obtained by the Republic of Korea, the 10th ranked country, by 9 points that actually represent a noticeable gap. The second ranked country is 3.4 points away from the first position. The continent with the most countries in the top ten rank in the world according to the index is Europe (seven), followed by Asia (two) and North America.

An analysis of the entire period is required to see a timed evolution of most innovative economies in the world (Figure no.2).

Figure no. 2. The evolution of the top ten countries in the world according to the GII in the 2021-2023 period



Source: adapted from (WIPO, 2021, 2022, 2023)

Based on the 2021-2023 data specific to the GII, the following observations can be drawn:

- The same countries constitute the top ten in the world.
- Europe is the dominant continent, placing seven countries on the rank: Switzerland, Sweden, the United Kingdom, Finland, the Kingdom of the Netherlands, Germany and Denmark. Asia has two countries, Singapore the Republic of Korea. North America is represented by the United States of America.
- Switzerland has been the constant leader managing to steadily increase its scoring difference relative to its follower.
- Sweden and the United States of America have managed to remain amongst the top three.
- The United Kingdom held the 4th place.
- Republic of Korea registered the biggest decrease, going down five position, losing its 5th place from 2021 and reaching the 10th in 2023.
- The Netherlands fluctuated, ranking 6th, 5th, and 7th.
- Finland was even more volatile than the Netherlands, starting from the 7th place in 2021, reaching the 9th spot and ending on the 6th one.

- Singapore was the country with the highest position increase, registering a sizeable increase on the ranking, starting from the 8th spot and landing on the 5th in 2023.
- Denmark held a relatively steady position amongst the lowest ranked countries, finishing in 2023 on the 9th place, the same as in 2021.
- Germany held its 8th position in 2023, starting from the 10th in 2021.
- The difference between the leading country and the one on the last position on the rank subject to analysis continued to grow, starting with a difference of 8.2 points, increasing to 8.7 and to 9 in 2023.

5. Conclusions

Innovation has been seen as a the driver for advancements and the aid economies need to grow. Based on the findings of the research, Switzerland kept its leading position in the last years as the most innovative economy in the world. Europe has been the continent placing most economies in the top ten international rank according to the Global Innovation Index. The ranking is a powerful tool that could serve as a strong informational basis for policymakers that want to take innovation-centered decisions and for businessmen in terms of at least company placement and growth potential.

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