

THE CHANGING METHODOLOGY OF THE GLOBAL COMPETITIVENESS INDEX AND ITS IMPACT ON SLOVAKIA

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Abstract: As national competitiveness is a complex issue, the methodology of the indexes trying to capture its essence is crucial. After a decade of stability, the Global Competitiveness Index introduced a major methodological change in 2018. The aim of this article is to discuss the changes in the methodology of the index and to assess whether the new methodology is able to better capture the real competitiveness of nations in an exceedingly complex global economy. The paper also tries to assess the impact of the new methodology on the national competitiveness of Slovakia and its position in the global rankings of national competitiveness.

Keywords: national competitiveness, global competitiveness index, methodological changes, Slovakia

1 Introduction

The concept of national competitiveness has gained a lot of popularity over the past two decades. Introduced by Michael Porter in the early 1990s (Porter, 1990), the modern view on the competitiveness of nations raised a lot of discussion in the economic literature. To measure national competitiveness, several indexes have been constructed with the Global Competitiveness Index (GCI) being the most widely accepted and discussed. This index is produced every year by the World Economic Forum and it is published in their flagship publication The Global Competitiveness Report (GCR). The position of countries in the annual global rankings of national competitiveness is closely scrutinized by analysts and policymakers and its recommendations are often used to improve economic policies.

As national competitiveness is a complex issue, the methodology of the indexes trying to capture its essence is crucial. The Global Competitiveness Index introduced a major methodological change in 2018 after a decade of stability. The aim of this article is to discuss the changes in the methodology of the index and to assess whether the new methodology is able to better capture the real competitiveness of nations in an exceedingly complex global economy. The paper also tries to assess the impact of the new methodology on the national competitiveness of Slovakia and its position in the global rankings of national competitiveness.

2 The theoretical framework of national competitiveness

The concept of national competitiveness is a relatively novel concept in economics. Competitiveness was originally studied on the corporate level in the 1970s and the 1980s and it was raised to national level only in 1990 by Michael Porter in his renowned book *The Competitive Advantage of Nations*. Porter devoted a lot of effort to examine the concept of competitiveness on the corporate level, so it was a logical step for him to raise the examination of competitiveness to the national level since states and their institutions have a significant impact on the competitiveness of domestic corporations.

Michael Porter states that national competitiveness is a dynamic model and identifies the basic stages of its development. Porter distinguishes three main phases of the development of national competitiveness: a factor-driven, investment-driven and innovation-driven (Porter, 1990, p. 545). In economies that are factor-driven, competitive advantage comes solely from the factors of production (available natural resources, land suitable for agriculture and a large number of less educated but cheap labor). Companies in these economies build their competitiveness on low prices and operate mainly in technologically undemanding sectors (Porter, 1990, p. 546-547).

In investment driven economies, national competitiveness is based on the state's willingness to invest aggressively, with the use of new technologies acquired from abroad (through the purchase of licensing or joint ventures). The competitiveness of local firms is based not only on factors of production but also on more advanced business strategies. The highest level of development of national competitiveness is the innovation-driven phase. At this stage of economic development, competitiveness is based on innovation, unique business strategies of domestic companies and on globally recognized products and brands. Significant outward foreign direct investments emerge at this stage, as domestic companies seek to exploit their competitive advantages abroad (Porter, 1990, p. 552, 554).

Certainly, the examination of national competitiveness cannot be limited to the works of Michael Porter. Indeed, in recent years interesting alternatives to the model were created by various authors. However, currently the field of study is largely fragmented and there is not a universally accepted definition of national competitiveness today. The problem is that the concept of national competitiveness can be defined in different ways and can be influenced by several different factors. For example, Michael Porter defines national competitiveness strictly based on productivity. According to him, this is the only relevant perspective to national competitiveness (Porter, 1998, p. 160).

Other authors have different approaches to the concept of national competitiveness. However, in the variety of definitions, we can find some unifying ideas and themes. For example, Scott and Lodge define national competitiveness as "a country's ability to create, produce, distribute, and/or service products in international trade while earning rising returns on its resources" (Scott and Lodge, 1985). Blaine uses a similar approach to national competitiveness when he describes it "a nation's competitiveness refers to its ability to produce and distribute goods and services that can compete in international markets, and which simultaneously increase the real incomes and living standards of its citizens" (Blaine, 1993). Lastly, a very similar definition of national competitiveness can be found in the World Competitiveness Yearbook. This defines it as the country's ability to create added value and thereby increase the wealth of the nation (IMD, 2006).

3 The changing methodology of the Global Competitiveness Index

During the last two decades, The Global Competitiveness Report published by the World Economic Forum emerged as the leading publication to provide an international comparison of national competitiveness. As this concept was still evolving in the 1990s and the early 2000s, the methodology to assess national competitiveness has undergone several changes. Initially, the assessment of national competitiveness was based on the work of Michael Porter, Jeffrey Sachs, and John McArthur. The Current Competitiveness Index provided a microeconomic approach focusing on firm-level data using the framework of Porter and the Growth Competitiveness Index pioneered by Sachs and McArthur was based mostly on macroeconomic indicators (WEF, 2002).

The 2004-2005 edition of The Global Competitiveness Report introduced a new complex index of national competitiveness called the Global Competitiveness Index. This index has been developed by Xavier Sala-i-Martin and Elsa V. Artadi and presents a holistic approach of national competitiveness (WEF, 2004). After a transition period The Global Competitiveness Report abandoned the previous indexes designed by Porter, Sachs and McArthur and from the 2006-2007 edition the GCI became the main tool to measure and compare national competitiveness (WEF, 2006).

The GCI introduced a new concept of national competitiveness based on nine pillars that evolved into a twelve-pillar structure used until the 2017-2018 edition of the report. The last edition of the GCI before the major methodology change in 2018 was based on 114 indicators sorted into the 12 main pillars (see Table 1). The twelve pillars were divided into three main groups (basic requirements, efficiency enhancers, and innovation and sophistication factors) to sort the participating countries that are on various levels of economic development into three distinct phases of national competitiveness – factor-driven, efficiency-driven and innovation-driven. For each group of countries, different weights were applied for the 12 main pillars to get a better picture of national competitiveness (WEF, 2017). In case of a less developed country, the basic requirements are more important than in case of a modern innovation-based economy.

The indicators used in the GCI have been a mix of hard data obtained from various international organizations and soft data collected via the global Executive Opinion Survey conducted by the World Economic Forum and its local partner institutions in the participating countries. If we analyze the data sources, it is visible that most of the indicators (77 of the 114 total) were obtained by the Executive Opinion Survey. Out of the 12 main pillars of competitiveness according to the GCI, only four contain more hard data than data obtained from the global questionnaire (see table 2). On the other hand, some of the pillars contain no or almost no hard data (ex. institutions, financial market development or business sophistication).

The creators of the index argue that only the global questionnaire can provide insight into areas, where the availability of the hard data is scarce, but we can object the objectivity of the survey data, as for smaller countries a relatively small sample size is used to calculate the national data. In the case of Slovakia, the sample size for the 2017-2018 edition was only 110 respondents, so there is a chance that various biases can get into the questionnaires. Moreover, the Executive Opinion Survey comprises of 150 questions in many different areas ranging from health issues, corruption or safety to innovation or business sophistication. The question is whether managers filling out the questionnaire have sufficient expertise to answer all the questions.

Table 1 The pillar structure of the GCI in the 2017-2018 and in the 2018 edition

GCR 2017-2018 edition	GCR 2018 edition
<i>Basic requirements</i>	<i>Enabling Environment</i>
1. Institutions	1. Institutions
2. Infrastructure	2. Infrastructure
3. Macroeconomic environment	3. ICT Adoption
4. Health and primary education	4. Macroeconomic Stability
<i>Efficiency enhancers</i>	<i>Human Capital</i>
5. Higher education and training	5. Health
6. Goods market efficiency	6. Skills
7. Labor market efficiency	<i>Markets</i>
	7. Product Market
8. Financial market development	8. Labor Market
9. Technological readiness	9. Financial System
10. Market Size	10. Market Size
<i>Innovation and sophistication factors</i>	<i>Innovation ecosystem</i>
11. Business sophistication	11. Business dynamism
12. Innovation	12. Innovation Capability

Source: WEF, 2017 and 2018.

To remedy this situation and to adapt the Global Competitiveness Index to the new challenges of the global

economy, the team working on the Global Competitiveness Report decided that deeper changes are needed in the methodology of the GCI. The new methodology has been presented in the 2017-2018 edition of the GCR and was fully implemented in the next (2018) edition of the report. The new index is called GCI 4.0 to reflect the ongoing fourth industrial revolution. Although the new index retains the 12-pillar structure, the methodological changes are all but trivial.

Firstly, although the GCI 4.0 is still based on 12 main pillars, many of these pillars have been changed, and not only in their label but also in their content. The new index also abolished the grouping of pillars into three main groups and introduced four new groups – enabling environment, human capital, markets, and innovation ecosystem. The new groups clearly show the changing focus of the GCI 4.0 as it puts a bigger emphasis on the capacity to adapt to a changing economic environment and respond to internal and external economic shocks (WEF, 2017).

Table 2 Hard data and soft data in the 12 main pillars of GCI in the 2017-2018 edition

GCR 2017-2018 edition	Hard data	Soft data
<i>Basic requirements</i>		
1. Institutions	1	20
2. Infrastructure	3	6
3. Macroeconomic environment	5	0
4. Health and primary education	9	1
<i>Efficiency enhancers</i>		
5. Higher education and training	2	6
6. Goods market efficiency	5	11
7. Labor market efficiency	2	8
8. Financial market development	1	7
9. Technological readiness	4	3
10. Market Size	4	0
<i>Innovation and sophistication factors</i>		
11. Business sophistication	0	9
12. Innovation	1	6

Source: WEF, 2017.

Secondly, the new index discontinues the three stages of economic development on the weight of the individual pillars on the final index. Instead of using a changing weight associated with the stages of economic development the GCI 4.0 uses a system, where all the pillars are weighted equally (8.3 %). The goal of the new concept is to help less developed countries with a better-developed innovation ecosystem and to penalize countries that neglect key factors of competitiveness. Additionally, almost all pillars have been modified with individual indicators being added, deleted, modified or reshuffled. For example, the former pillar Health and primary education have been broken up and an individual Health pillar has been introduced and some indicators from the primary education part have been moved to the new pillar called Skills. In some cases, the number of individual indicators has been decreased and less complex indicators have been replaced by more complex ones. The Health pillar now consists of only one indicator (health-adjusted life expectancy) which replaced the previous eight health-related indicators.

Thirdly, the new GCI 4.0 puts more emphasis on hard data. Although the new index uses slightly fewer indicators as the previous one (98 vs. 114), but the creators of the GCI 4.0 considerably increased the number of indicators based on hard data collected from various international organizations. Unlike its predecessor, GCI 4.0 contains 54 indicators based on hard data in comparison with 44 indicators based on the Global Executive Survey. If we compare the methodology of GCI 4.0 with the previous edition, it is clearly visible that most of the

main pillar is now more hard data based than in the past. For example, the pillar Institution was almost exclusively questionnaire based in the previous edition (20 indicators based on the Global Executive Survey from the total 21 indicators). Now it contains a balanced mix of indicators (10 indicators from the Global Executive Survey and 10 data-based indicators) with data from United Nations, Legatum Institute or the World Bank group (WEF, 2018). Only two pillars rely more heavily on soft data from the global questionnaire (Skills and Labor market), which is a complete opposite of the previous edition of the GCI.

Table 3 Hard data and soft data in the 12 main pillars of GCI 4.0 in the 2018 edition

GCR 4.0 2018 edition	Hard data	Soft data
<i>Enabling environment</i>		
1. Institutions	10	10
2. Infrastructure	7	5
3. ICT Adoption	5	0
4. Macroeconomic Stability	2	0
<i>Human Capital</i>		
5. Health	1	0
6. Skills	3	6
<i>Markets</i>		
7. Product Market	4	4
8. Labor Market	4	8
9. Financial System	6	3
10. Market Size	2	0
<i>Innovation and sophistication factors</i>		
11. Business sophistication	4	4
12. Innovation	6	4

Source: WEF, 2018.

3 The impact of the introduction of the GCI 4.0 on the position of Slovakia in the global ranking

It is understandable that such a significant change in the methodology of the GCI impacts the total scores of the individual countries and their position in the global ranking of national competitiveness. The authors themselves warn in the appendix of the 2017-2018 edition of the Global Competitiveness Report that the proposed changes can significantly impact the performance of a country in individual pillars and indicators. They state that changes are possible also in the overall index, although it is difficult to isolate and quantify the effects because of the many overlapping and interconnected changes (WEF, 2017). Obviously, the methodological changes also ruined the backward compatibility of the GCI 4.0. To remedy the situation the authors of the 2018 edition of the GCR calculated the GCI 4.0 also for the previous year, but it will take several years to have a reasonable time series for the current version of the index.

The question is, how deep impact did the change of methodology have on the global ranking of national competitiveness. Before we examine the case of Slovakia, let us have a look at the top 10 countries in the 2017-2018 and the 2018 edition of the global rankings. Despite the significant changes in the methodology of the GCI the top 10 in the 2018 edition of the GCR is virtually the same as in the 2017 edition using the previous methodology. 9 of the 10 countries from 2017 retained their position in the top 10, only Finland dropped out (fell to the 11th place) and was replaced by Denmark (12th place in 2017). If we broaden the comparison to the top 20 countries, we get similar results. In the 2018 edition of the global rankings, 17 countries retained their top 20 positions from the previous year based on the old methodology. The only newcomers are Australia, France, and Republic of Korea, that are countries that almost made the top 20 in 2017 (21st, 22nd and 26th position).

As we can see, the methodological change to GCI 4.0 did not produce major changes in the leading positions of the global ranking of national competitiveness. In the next part, let us have a look at the case of Slovakia. After the global economic crisis of

2008/2009, Slovakia's competitiveness started to suffer, and the country fell from the 48th position in the global ranking (2008) to the 78th place in 2013. At that point, Slovakia became the least competitive country in the V4 region (Slovakia, Czech Republic, Hungary, and Poland). Since 2014, the competitiveness of Slovakia started to improve, but not very spectacularly. According to the 2017-2018 edition of the global ranking, the national competitiveness of Slovakia was on a similar level as the competitiveness of Rwanda, Botswana or Jordan. However, macroeconomic and socio-economic indicators suggest, that Slovakia is a more developed country than these countries with a considerably higher quality of life. The question therefore was, why did Slovakia achieve so underwhelming results in the national competitiveness according to the GCI. The most probable explanation is that the managers participating in the Global Executive Survey in Slovakia have an overly critical attitude towards the political and economic situation of the country and this attitude is translated into the GCI index via the 77 indicators based upon this survey.

Table 4 Position of the V4 countries in the global ranking of competitiveness between 2014 and 2018

	2014	2015	2016	2017	2018
Methodology	GCI	GCI	GCI	GCI	GCI 4.0
Slovakia	75	67	65	59	41
Czech rep.	37	31	31	31	29
Poland	43	41	36	39	37
Hungary	60	63	69	60	48

Source: World Bank TCdata360 database.

If this assumption is true, that means that Slovakia should achieve better results in the new GCI 4.0 based more on hard data. The 2018 edition of the global ranking based on the new methodology seems to support this assumption. In this edition, Slovakia improved 18 positions in the global ranking of competitiveness, as it jumped from the 59th position to the 41st position. It is clearly visible, that fewer indicators based on the Global Executive Survey meant a considerably better position in the global rankings. Instead of Rwanda and Botswana, Slovakia now borders with Latvia and Lithuania, what seems a much more realistic assessment of the Slovak national competitiveness. Further proof for the significance of the hard data is visible in the first pillar of the GCI 4.0 called Institutions. According to the current methodology, this pillar contains 10 indicators based on hard data and 10 indicators based on the Global Executive Survey. It is clearly visible, that the position of Slovakia is considerably better in the indicators based on hard data (average ranking of 48 from the 140 participating countries) as in the indicators based on the questionnaire data (average ranking of 94).

If we compare Slovakia with the other three V4 countries, we can see that in the case of the Czech Republic and Poland there was no significant change in their position in the global ranking after the introduction of the GCI 4.0. The reason for this could be that the general mood in the business sector was much better than in Slovakia in the last years, what transformed into better results in the Global Executive Survey. On the other hand, the position of Hungary in the global ranking improved in a similar way to Slovakia after the introduction of GCI 4.0 (see table 4). The difference could be in the Global Executive Survey also in this case, as the Hungarian entrepreneurs are very critical of the Hungarian government led by Viktor Orbán. Once again, fewer indicators based on the global survey lead to a better position in the global ranking of national competitiveness.

4 Conclusion

The aim of the article was to assess the methodological changes that have been introduced to the Global Competitiveness Index in the 2018 edition of the Global Competitiveness Report. As this index is the basis of the most widely recognized global ranking of national competitiveness used by policymakers and analysts, any methodological changes in the creation of the index

are very important. It is interesting to see, what kind of effects are the changes having on the global ranking of national competitiveness.

The analysis of the methodological changes shows that the new index (called GCI 4.0) is more hard data-driven. More than 50 % of the indicators used in the GCI 4.0 are based on hard data, what is a step in the right directions, as the data obtained from the Global Executive Survey could introduce various biases into the index. The case of Slovakia is a good example, as a hard data-driven index improved the position of the country in the global ranking of national competitiveness by 18 places between 2017 (old methodology) and 2018 (new methodology). Although it is too early to make a final evaluation of the new methodology after one year, the first impression is that it provides a more objective picture of the national competitiveness of the analyzed nations. However, we will need to revisit the topic in the next years to make a more nuanced assessment of the new methodology.

Literature:

1. Blaine, M.: Profitability and competitiveness: Lessons from Japanese and American firms in the 1980s. *California Management Review*, 1993, 36.1, p. 48-74.
2. IMD: *World Competitiveness Yearbook 2006*. 1. issue. Lausanne: IMD, 2006. 535 p., ISBN 2970051400.
3. Porter, M. E.: *On competition*. 1. issue. Boston: Harvard Business Press, 1998. 485 p. ISBN 0875847951
4. Porter, M. E.: *The Competitive Advantage of Nations*. 1. issue. New York: Free Press, 1990. 875 p. ISBN 0029253616.
5. Scott, B. R., Lodge, G. C.: US competitiveness in the world economy. *The International Executive*, 27(1), 1985, p. 26-26.
6. WEF: *The Global Competitiveness Report 2001-2002*. 1. issue. New York: Oxford University Press, 2002. 76 p. ISBN 0-19-521837-X.
7. WEF: *The Global Competitiveness Report 2004-2005*. 1. issue. Basingstoke: Palgrave Macmillan, 2004. 624 p. ISBN 1403949131.
8. WEF: *The Global Competitiveness Report 2006-2007*. 1. issue. Basingstoke: Palgrave Macmillan, 2006. 569 p. ISBN 1-4039-9636-9.
9. WEF: *The Global Competitiveness Report 2017-2018*. 1. issue. Geneva: World Economic Forum, 2017. 379 p. ISBN 978-1-944835-11-8.
10. WEF: *The Global Competitiveness Report 2018*. 1. issue. Geneva: World Economic Forum, 2018. 656 p. ISBN 978-92-95044-76-0.

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