

MEASURING COUNTRIES COMPETITIVENESS: WEAKNESSES AND POSSIBLE AREAS FOR IMPROVEMENT

Alexei Alyokhin

*Odessa National Polytechnic University, Ukraine
aba99@ukr.net*

Anna B. Brutman

*National University “Zaporizhzhia Polytechnic”, Ukraine
a_brutman@yahoo.com*

Zoia Sokolovska

*Odessa National Polytechnic University, Ukraine
nadin_zs@te.net.ua*

Iryna Kapustyan

*Odessa National Polytechnic University, Ukraine
kapustyanirene@gmail.com*

ABSTRACT

The article is devoted to the analysis of frameworks for measuring the World Economic Forum (WEF) and International Institute for Management Development (IMD) countries' competitiveness for their compliance with general provisions of the theory of measurement, the methodology of the theory of competitiveness and the content of its basic concept – the concept of a country's competitiveness. It is shown that, despite the decades-long debate around the concept of competitiveness and the lack of a satisfactory definition of this concept, in the opinion of many leading scientists, the frameworks for assessing the countries' competitiveness and other economic agents are available, actively developed and used widely in management practice. The analysis of these frameworks suggests that they are based on methodologically flawed definitions of the competitiveness concept, so the competitiveness indexes (Global Competitiveness Index (GCI) and World Competitiveness Index (WCI)) are not assessments of competitiveness as such, but generalized assessments of the competitiveness factors' system at best. A list of common elements of frameworks that significantly reduce the feasibility and accuracy of competitiveness measurement results, and which should be considered as focus of efforts to improve the frameworks for measuring the competitiveness of economic agents of any types, has been identified. Based on the methodologically rigorous definition of a country's competitiveness concept proposed by the authors, the article identifies the main properties of competitiveness as an object of measurement and the tasks arising from the nature of this attribute of the national economy, the solution of which would improve the scientific validity and reliability of countries' competitiveness assessments.

Keywords: *bottlenecks, country competitiveness, framework, measurement, methodology*

1. INTRODUCTION

Categories of competition and competitiveness are among the most widely discussed in modern economic theory and used in managerial practice. Being a category of management science, the competitiveness of any economic agent, including the economic system of a country, is an object of management, which cannot be managed effectively without accurate and reliable measurements of a manageable attribute's level. The most figurative assessment in the field of the conceptual apparatus of the theory of competitiveness is given in [17, p. 1], the author of which has identified the problem as: "Competitiveness – 'corporate graffiti' invades economic

theory" and explained its essence as follows: "Even a casual observer of the practice and science of management will not fail to notice how a continuous flow of new concepts are born, become fashionable, and then disappear from management jargon. A recent article in Financial Times (1, p.10) suggests the term 'corporate graffiti' – or 'management graffiti' – to describe the unthinking use of buzz-words. Management language is 'opaque, ugly, and cliché-ridden', FT claims" [17, p. 1; 18, p. 24]. Thomas Hatzichronoglou в [8, p. 17] believes that "One of the difficulties with which those seeking to analyse international competitiveness are confronted right from the start is that there is no agreement on how to define it. The term competitiveness may be used with contradictory meanings in various passages of the same article or report. This view, expressed by the US Office of Technology Assessment, is broadly shared by all the experts". Christian Ketels stresses in [15, p. 7]: "The term competitiveness has been intensively dissected in the academic literature ever since it became a focus of the policy debate in the late 1980s and early 1990s. ... The different views on what competitiveness is and what value it has for policy that emerged at the time were never really reconciled. ... Definitions of abstract concepts like competitiveness are never true or false. They can as conceptual tools only be evaluated with regards to their ability to shed light on the particular issues that they are being proposed to address. This somewhat abstract but fundamental insight has often been lost in the debate about competitiveness as a concept". Karl Aiginger ([1, p. 174]) writes: "The competitiveness of nations is one of the most intensively discussed issues in politics. Economic investigations on this issue differ in content, in scope and most importantly according to the definition of competitiveness". Nikolaos Alexandros Psfogiorgos and Theodore Metaxas also speak about the complexity and contradictory points of view on competitiveness in the paper [3, p. 76]: "Competitiveness is a multidimensional and dynamic concept, a term wide and multileveled. It also makes it possible to distinguish at different levels depending on the priorities and objectives set each time. However, the measurement of real competitiveness in terms of productivity and conceptual flexibility that allows the formulation of alternative approaches seems to repel any objections to the concept of competitiveness. Unlike the definition of macroeconomic competitiveness for which there is a broad agreement among scholars, the concept itself of national or macroeconomic competitiveness raises many concerns. It seems to be a vague concept with greatly disputed importance. Competitiveness at the national level has not key features but there is also no consensus on whether ultimately this concept has meaning or not, namely if nations actually compete with each other or not". "America cannot address its economic prospects without a clear understanding of what we mean by competitiveness and how it shapes U.S. prosperity. The concept is widely misunderstood, with dangerous consequences for political discourse, policy, and corporate choices that are all too evident today" – declares M. Porter and Jan W. Rivkin [16, p. 55]. Savchuk S.I. in the introduction to his book "Fundamentals of the Theory of Competitiveness" [19, p. 6] notes: "For representatives of economics and the theory of competition, in particular, unlike representatives of exact natural and technical sciences, such as, for example, mathematics, astronomy, physics, chemistry and others are characterized by a significantly less "reverential" attitude to the conceptual and categorical apparatus of the theory. This is most clearly manifested in the absence of incentives to ensure, with the development of the theory, greater accuracy and rigor of basic concepts' definitions considering the instability of such concepts system itself, the insufficient expression of the cumulative effect, according to which the basic core of the conceptual system remains stable and with the development of theory enriched ("overgrown") with new concepts, retaining the features of an integrated, coherent system. As a consequence of such trends in the development of economic theory, the definitions of its basic concepts aren't becoming more accurate and complete over time, but continue to be debated for many decades". However, despite the fact that the concept of competitiveness of economic agents is scientifically poorly defined, there are numerous frameworks for measuring competitiveness, among which the most well-known and

authoritative methods are WEF and IMD, which are used for decades to compare the competitiveness of many countries [10, 21]. This situation isn't satisfactory in terms of assessing current level of the theory of competitiveness development, methodology and tools for measuring competitiveness, which determines the relevance of the analysis, in particular, using WEF and IMD frameworks, known approaches to measuring countries' competitiveness for quality and feasibility of competitiveness assessments and defines the purpose of this study.

2. THE MAIN RESULTS OF THE RESEARCH

2.1. The concept of competitiveness as a theoretical basis of measurements

Obviously, the analysis of existing and development of new approaches to the measurement of the nations' competitiveness should be based on a methodologically rigorous definition of the country's competitiveness concept, which clearly identifies the object of measurement. From this point of view, the interpretation of the countries' competitiveness concept by the developers of the WEF and IMD frameworks is quite vulnerable to criticism. World Economic Forum defines economic competitiveness as follows: "We define competitiveness as the set of institutions, policies, and factors that determine the level of productivity of a country. The level of productivity, in turn, sets the level of prosperity that can be reached by an economy. The productivity level also determines the rates of return obtained by investments in an economy, which in turn are the fundamental drivers of its growth rates. In other words, a more competitive economy is one that is likely to grow faster over time" [21, p. 317]. There are serious complaints about formulation of the competitiveness definition. Firstly, a country's competitiveness is defined through poorly defined entities (this is a typical mistake when defining concepts [7]). Secondly, according to such definition, the competitiveness is anything and everything that affects the productivity of a country. But everything that affects a country's productivity is nothing more than a set of productivity factors. Consequently, the concept of competitiveness is replaced by another concept in this definition, that is a set of productivity factors' concept, which is methodologically unacceptable. Thirdly, such definition is its unconstructiveness from the point of view of measuring competitiveness problem, since, in strict accordance with definition, it makes the task of measuring competitiveness more difficult or even impossible to measure institutions, policies, factors and their entirety. Although the authors of this framework emphasize the decisive role of productivity in ensuring the prosperity of the economy, the totality of prosperity factors of the economy as a whole and, moreover, factors that shape the standard of living of citizens, remains outside the scope of this definition and, as a result, is not fully reflected in the indicators' system on which the measurement of the countries' competitiveness is based. According to IMD documents (see, for example, [9, 10]), WCY developers do not have a holistic concept of the economic agents' competitiveness, including the competitiveness of a single country. So, in particular, in [10] there are formulations of the definition of certain varieties of competitiveness, which are incompatible between each other:

- global competitiveness can be understood as a process in which advanced levels of competitiveness are achieved at different levels, that is, at firm, regional and national levels;
- international competitiveness can be defined as a process in which higher levels of competitiveness are achieved at different levels, that is, at firm, regional and national levels;
- country competitiveness refers to the ability of the government to generate prosperity for its people.

As can be seen, global and international competitiveness is defined as a process that does not correspond to any of the modern concepts of competitiveness. At the same time, a country's competitiveness is rightly defined as a certain ability, but this ability is for some reason

attributed to the government, but not to the national economy, in which, as in the system, the government is only one of the elements. In [9], a number of well-known definitions of competitiveness of economic agents at various levels are given, but WCY authors' own position in relation to these definitions is not announced. There is also no argument in favour of the competitiveness concept interpretation accepted by methodology authors for measuring the competitiveness of countries. Unlike the authors of GCR [10], the brochure on the methodology of analyzing the competitiveness of countries [11], followed by the authors of WCY, does not explicitly define the concept of a country competitiveness and directly indicates that the subject of analysis are factors of competitiveness. This position excludes the possibility of assessing the degree of compliance of the factors' system to be assessed to the nature of the measurement object – the country's competitiveness as one of the generalized characteristics of the national economy. Thus, based on the above, it can be concluded that the theoretical foundation itself (interpretation of the national economy competitiveness concept), on which the most popular frameworks for measuring the competitiveness of countries are formed, is highly debatable.

2.2. Competitiveness frameworks: main bottlenecks

In the further analysis of these methodological approaches to measuring the competitiveness of countries, the authors of this study adhere to the position contained in [2, 4, 5, 6, 19, 20], according to which the competitiveness of a country is defined (as specified by the authors of this paper) as the ability of such a system to create in a competitive environment the population's quality of life without outside assistance on a long-term basis. Such interpretation of this concept's content is based on the recognition as the main goal of the state functioning (the country's economic system) ensuring acceptable population quality of life, and the very attribute of competitiveness as a latent attribute (the ability), not available for direct observation and measurement [4, 5, 19, 20]. The frameworks for measuring the countries competitiveness developed by WEF and IMD [11, 21] are based on hierarchically ordered indicators system proposed by their developers, as well as methods for constructing an integral competitiveness indicator based on a system of primary indicators (GCI and WCI). As the analysis of these indicators composition shows, they characterize either (a) the state of certain factors of competitiveness, or (b) actual results of activity and the state of the country's economy, or (c) actual trends in the results and parameters of the national economy state as noted in the preceding paragraphs. There are quantitative indicators among such indicators, i.e. indicators measured in interval scales, and quality indicators – indicators measured in ordinal scales. Some of these indicators are the result of economic or statistical analysis, others – the result of expert assessment. The main tool for constructing generalized indicators and, eventually, the integral indicator (index) of competitiveness is averaging using weights determined by an expertise. The procedure of such averaging is dictated by the hierarchy of the indicators system taken into account when assessing the countries competitiveness. In this case, ordinal indicators are pre-digitized using procedures that contain elements of expert assessment. Based on above, the following can be concluded. The competitiveness index itself is not an assessment of such an attribute as a country's competitiveness. The specified index is a generalized (integral) assessment of the indicators system underlying the assessment. And this is the first and one of the most significant bottlenecks of the analyzed frameworks, their methodological weakness. In such conditions, i.e. in terms of indirect (through a system of indirect attributes and corresponding indicators) assessing the national economy competitiveness, the key task is to make a scientifically based choice and form a classification of these attributes (indicators), suggesting evidence of the countries competitiveness level dependence on each candidate for inclusion in the system such indicators in general, justification of choice of significant classification attributes. It follows from the definition of a country competitiveness concept considered in this study, that such an analysis should be based on: (i) a scientifically strict

definition of the concept of citizens' quality of life; (ii) a system of factors affecting the citizens' quality of life, with the allocation of a subsystem of state-controlled factors; (iii) a system of factors affecting the state's ability to shape the citizens' quality of life. Description of the discussed frameworks for assessing the competitiveness of countries does not contain a comprehensive presentation of the solution to this problem, which does not allow to consider the indicators (attributes) underlying them as fully justified. This circumstance is another bottleneck of these approaches. Obviously, an important independent scientific task is the proof of justification of considering the integral estimates of primary indicators as the assessments of the countries' competitiveness as a whole. The lack of such evidence can also be regarded as a bottleneck of these methods. An important bottleneck of well-known frameworks for measuring the competitiveness of countries is the mechanism for constructing group (generalized) and integral indicators of competitiveness in general. As noted above, such a mechanism is weight-based averaging. As is well known, averaging by default assumes full (for additive average) or partial (for multiplicative average) interchangeability of averaged indicators. Thus, averaging presupposes the existence in some way of the marginal substitution rate between indicators. However, the systems of primary indicators of countries' competitiveness include indicators of a qualitatively different nature (see, for example, indicators of Property rights, Quality of air transport infrastructure, Trade tariffs, Broadband Internet subscriptions, etc. [21]), which are basically incommensurable with each other. In fact, there are no objective reasons to believe that reducing the value of the Quality of roads indicator by Δ_1 units can be offset, from the point of view of maintaining the level of the integral competitiveness index, by constant increase in the value of the Domestic market size index by Δ_2 units. It follows that it is implicitly assumed in the relevant calculations that the norms of marginal substitution between all indicators are defined, and they are implemented using weighting voluntary (by experts). This circumstance calls into question the feasibility of the integral indicators of the countries' competitiveness, which is, as noted above, one of the most important bottlenecks of these methods. The interval and ordinal indicators sharing and averaging should also be considered as a bottleneck of the analyzed frameworks for assessing the competitiveness of countries. It should be noted that digitization of ordinal indicators (regardless of the method of digitization) does not change the nature of indicators, does not eliminate the problems of establishing equivalence between the levels of various indicators and the admissibility (in terms of economic sense) of averaging interval and ordinal values. The national economy of any country is an integral economic system. The competitiveness of the national economy as one of its attributes at the highest level of the hierarchy is a function of the entire set of factors influencing or capable to influence on the level of competitiveness, is the result of the joint influence of the specified set of factors. There are no mechanisms, in the considered frameworks, for direct consideration of the factors (indicators) interaction used in measuring the level of countries competitiveness, which is one reason for the occurrence of errors in measuring the competitiveness of countries using the GCI and WCI competitiveness indexes. It is well known that the results of applying the so-called resource and factor approach (this very approach is implemented in the considered frameworks) and the system approach to the measurement of complex attributes of economic agents differ significantly [4, 12, 13, 14, 19]. In this regard, the noted feature of these frameworks should be considered as one of the most significant bottlenecks in such systems for measuring the competitiveness of countries. One of the most important indicators of the quality of any measurement is the reproducibility of measurement results. The use of expert assessment methods as part of measurement procedures, including the stages of indicators system forming, digitizing ordinal indicators and determining weights for averaging, avoids the possibility of obtaining the same results when changing experts' group. This circumstance obviously represents a bottleneck of the methods of this type, indicating the impossibility of providing the necessary quality of measurements in such measurements.

2.3. Methodological backgrounds ensuring quality of measurements of countries competitiveness

As noted above, a mandatory prerequisite for methodologically correct measurements of the countries' competitiveness is a methodologically rigorous, unambiguous and constructive definition of the countries' competitiveness concept, determining the basic properties of competitiveness as an object of measurement. The definition of a country's competitiveness, formulated by the authors of this article earlier, can serve as such a basis. In accordance with such ideas, competitiveness as a measurement object has the following properties:

- it is the ability of a country (national economy) to ensure (form, maintain, improve) the quality of life of its citizens (on a long-term basis in a competitive environment);
- it is an absolute attribute of the national economy, the availability of which is determined only by the fact of the existence (and functioning) of the economic system, it is an inherent property of this system;
- it is a latent attribute of the national economy that is not available for direct observation and measurement;
- it is an interval attribute, i.e. an attribute defined at a certain long period of time.

It follows from the absolute nature of competitiveness that there is a possibility in principle to measure the competitiveness of each individual country followed by comparing the competitiveness of countries in terms of the integral index of competitiveness. Due to the latent nature of competitiveness, measuring its level is possible only on the basis of indirect attributes. Such attributes may include: (a) actual results (in the broadest sense) of the national economy functioning (the competitiveness past and present actual manifestations); (b) the present and the future state of competitiveness factors). It follows from the interval nature of competitiveness, that estimates of competitiveness should have a predictive character, i.e. should represent a forecast of the degree of achievement of the national economy main goal of the functioning – ensuring (one or another) the citizens' quality of life in a competitive environment in the future (on a long-term basis). Obviously, such forecasts should be based on the forecast (forecast trajectories) of the internal and external environment state of the national economy as a dynamic system. Taking into account this circumstance, one more bottleneck of the analyzed frameworks can be noted: their preferential focus on the current state of competitiveness factors, as well as the absence of any recording mechanisms when constructing integral estimates of competitiveness, changes in the state of the country's economic system and its external environment in the future. From the above characteristics of ability, which is competitiveness, it follows that in order to measure such ability it is necessary to be able to measure the level of quality of life of a country's population. Assuming that this task is solved, which is actually far from being the case, as evidenced by the review of the relevant literature, the problem of developing scientifically based methods for measuring the competitiveness of countries suggests solving the following set of tasks:

- determination all factors of a country's competitiveness (such factors include factors that may affect the ability of a country's economy to achieve its main goal of functioning);
- systematization of these factors and the development of competitive factors classifiers;
- identification of a subset of manageable factors of competitiveness, which are potential objects of government management;
- development of methods for measuring the state of competitive factors, including the choice of scales and units of measurement;
- development of methods and forecasts for changes in the factors of internal and external environment of national economies in the future;

- development of scientifically based methods for constructing integral estimates of a country's competitiveness level based on estimates of primary and generalized competitiveness factors (the so-called problem of convolution of particular indicators into an integral one).

3. CONCLUSION

A mandatory requirement for the measurement of any property of economic systems is a strict scientific definition of this property as an object of measurement. At present, a paradoxical situation has developed in the theory of competitiveness. Despite a long period of ongoing debates, scientists still have not developed generally accepted ideas about the content of the competitiveness concept, and the existing definitions of this concept usually do not satisfy the basic methodological requirements for the definitions of scientific concepts. At the same uncertainty of competitiveness as an object of measurement did not prevent the development of numerous frameworks for measuring the competitiveness of various economic agents and their use in managerial practice. The best known among such frameworks are the frameworks of measuring the competitiveness of countries developed by the The World Economic Forum and the International Institute for Management Development, which are widely used by governments of different countries. The methodological analysis of the WEF and IMD frameworks suggests that they are based on poorly defined, from methodological positions and non-constructive from the positions of measurement theory, definitions of a country competitiveness concept. As a result, the countries' competitiveness indicators systems, which are used as the basis for calculating countries' competitiveness indexes (GCI and WCI indexes), remain controversial, and the integral competitiveness indicators themselves are generalized estimates of these primary indicators, rather than their own competitiveness as an attribute of their national economies. The most vulnerable points of WEF and IMD frameworks include the mechanism of aggregation of estimates of primary factors used in them into an integral index based on averaging techniques, digitizing ordinal indicators and expert estimation. This casts doubt on the economic meaning of the estimates themselves, their accuracy, as well as the reproducibility of the calculations as one of the most important indicators of the measurements' quality. The list of bottlenecks of frameworks for measuring the countries' competitiveness of countries, identified as a result of the research, points to priorities in the development of the theory of competitive comparisons, possible ways to increase the scientific validity of measurement methods and the quality of the results.

LITERATURE:

1. Aiginger, K. (1988). A framework for evaluating the dynamic competitiveness of countries. *Structural Change and Economic Dynamics*, Vol. 9, 2, 159-188.
2. Aiginger, K., Bärenthaler-Sieber, S. & Vogel, J. (2013). *Competitiveness under new perspectives*. (WWWforEurope Working Paper No. 44). Vienna: WIFO.
3. Alexandros, P. N. & Metaxas, T. (2016). Porter vs Krugman: History, Analysis and Critique of Regional Competitiveness. *Journal of Economics and Political Economy*, Vol. 3, 1, 65-80.
4. Alyokhin, A. B. (2011). Measuring competitiveness at the national and microeconomic levels: methodological aspects. *Khmelnytsky National Bulletin of Khmelnytsky National University. Economical science*, Vol 4, 2, 7-12 [in Russian].
5. Brutman, A. B. (2018). Category of competitiveness as a generalization of the enterprise's economic potential concept. *Business Inform*, 2, 127-134 [in Russian].
6. Fagerberg, J. (1996). Technology and competitiveness. *Oxford Review of Economic Policy*, Vol. 12, 3, 39-51.
7. Getmanova, A. D. (2012). *Logics*. Moscow: Knorus [in Russian].

8. Hatzichronoglou, T. (1996). Globalisation and Competitiveness: Relevant Indicators. *OECD Science, Technology and Industry Working Papers*, No 1996/05, Paris: OECD Publishing.
9. IMD. *Defining International Competitiveness*. Retrieved 03.09.2019 from <https://www.imd.org/wcc/world-competitiveness-reflections/international-competitiveness>
10. IMD. *Global Competitiveness Report*. Retrieved 03.09.2019 from <https://www.imd.org/wcc/world-competitiveness-reflections/global-competitiveness-report/>.
11. IMD. *Methodology and principles of analyses. IMD Competitiveness Yearbook*. Retrieved 03.09.2019 from <https://www.imd.org/globalassets/wcc/docs/methodo/methodology-yearbook-presentation2.pdf>.
12. Karapeychik, I. N. (2013). Resource and factor concept of potentials: object and evaluation methodology. *Contemporary Scientific Bulletin*. 23 (162), 11-20 [In Russian].
13. Karapeychik, I. N. (2013). Factor approach to the assessment of potentials: constraints and opportunities. *Ural Scientific Bulletin*, 6 (54), 42-57 [in Russian].
14. Karapeychik, I. N. (2013). Factor and systematic approaches to the measurement of the enterprises' potentials: a comparative model analysis. *Ural Scientific Bulletin*, 15(63), 100-117 [in Russian].
15. Ketels, C. (2016). *Review of Competitiveness Frameworks*. Dublin: National Competitiveness Council.
16. Porter, M. E. & Rivkin, J. W. (2012). The Looming Challenge to US Competitiveness. *Harvard Business Review*, 90 (3), 55-62.
17. Reinert, E. S. (1994). *Competitiveness and its predecessors – a 500-year cross-national perspective*. (Step rapport/report, R-03/1994). Oslo: STEP.
18. Reinert, E. S. (1995). Competitiveness and its predecessors – a 500-year cross-national perspective. *Structural Change and Economic Dynamics*, Vol. 6, 1, 23-42.
19. Savchuk, S. I. (2007). *Fundamentals of the Theory of Competitiveness*. Mariupol: Renata.
20. Shpak, S. O. (2018). On the temporal nature of competitiveness, economic potential and development potential. *Bulletin of the National Technical University "KhPI". Series: Economic sciences*, 19, 11-18 [in Russian].
21. World Economic Forum. (2017). *The Global Competitiveness Report 2017-2018*. Geneva: World Economic Forum.