

# SCIENTOMETRIC CRITERIA IN SOCIAL SCIENCES EVALUATION

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## Abstract

*The concern for ensuring research excellence and international competitiveness, together with the increasingly higher demand for greater transparency and accountability of the public funds for scientific research called for a rapid development of systems, methods and instruments for evaluation of the research output that would help sifting the relevant from the piles of research papers.*

*As R&D funding is directed towards natural and physical sciences, evaluation processes and procedures by scientometric criteria is of greatest concern. When the interest for assessing social sciences research activity increased, it underwent the almost same evaluation processes, despite characteristics that would have called for different and specific criteria, procedures and methods. It is well recognized by different experts in specialized field that socio-economic R&D should answer to the both, the socio-economic needs and opportunities and scientific performance requests. The literature on scientific research evaluation highlights the potential pitfalls associated with applying only scientometric assessment tools, methods and data sources for Social Sciences and Humanities research, ignoring the specificity of this type of research, which is addressed, first of all, to the economy and people.*

*Following a review of the relevant literature on the issue, the present paper surveys the recently elaborated and officially established evaluation criteria for research performed within the SSH fields, in Romania. The author will look into the potential merits, as well as setbacks of the new regulation, underlining challenges and likely impact on the SSH research community, output and performance.*

**Keywords:** *economic and social sciences, evaluation criteria, scientometric criteria versus socio-economic effects, and responsibility in social science evaluation*

## Introduction

Substantiate, objective and reliable assessment of scientific research work has always been a constant concern and pursuit for both scientific community in search for recognition and performance, and outer stakeholders such as R&D funding agents, be they public or private contributors, prestigious journals, publishing houses or society as a whole. Performance orientation and evaluation has become more adequate to prove efficiency of public funds using, as well as competitiveness, expressed as international rankings. The experience of different countries proves that, in last time, research activity is increasingly linked to innovation and interaction with society.

Effective and timely integration of the Romanian research system within the European Research Area has become a national strategic target and, consequently, the policy makers are searching for tools and mechanisms for increasing the international competitiveness of the national research work. The public investment in R&D was more and more related to the scientific performance at international level and evaluation procedures adopted, also, international scientometric criteria, even for social and humanities sciences. Incorporating international standards in the scientific evaluation has often brought the desired balance between financial effort and researcher scientific performance.

The most traditional, common and widely accepted evaluation method remains the *peer-review* assessment, which involves anonymous appraisal by experts. Especially useful in journal / book editors' decision making, as well as in merit-based funding, it's objectivity level is improved through multiple simultaneous reviews. With rising competition for funds and other acknowledgements, the issue of bias and subjectivity became wide spread asking for new, more

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objective quantifiable tools and techniques to evaluate science output and scientists' careers and potential. These should complement or substitute peer evaluation, which, by itself, might favor the creation and domination of "select few cartels of senior scientists" (1, 6, 7)

The new sub-discipline of scientometrics – or bibliometrics – has proved very productive, many research papers elaborating on the citation, publishing and Impact Factor (IF) figures, addressing mostly the interests and decision making processes of librarians, potential employers, research institutions and universities, funding agencies, etc.

Alongside its widespread application, increasing criticism emerged (2, 5, 8, 10)<sup>1</sup>, especially when it is applied in social sciences evaluation.

### **1. The Specific of Social Sciences in terms of output evaluation**

It has been largely acknowledged that the pace, impact pattern, publishing and citation culture and behavior associated to the research output significantly differ between the natural and life sciences, on one hand, and social and humanistic sciences, on the other. Ever since 1955 (4), considerable research work has been done to draw attention to the differences between the two broad scientific research areas that should call for different approaches, criteria of evaluation, bibliometric tools, computation methods. (5,6 etc)

Following extensive reviewing of social science bibliometric methodology and papers, some authors (5) warn that, relevant and correctly performed bibliometric based evaluation of Social Sciences output is possible, but with high costs, complexity and difficulty. Compared to the natural and life sciences, properly assessment of social scientist's scholarly work cannot rely solely on the same methods and data (e.g. SSCI-Social Science Citation Index), which, even cheaper and easier, misrepresent the true state of the subject examined.

It has been noted that the scientists of natural sciences publish most often in English (16), are oriented to the research frontier, referencing recent papers, and work within disciplinary frameworks and normally reach consensus. SCI (Science Citation Index)<sup>2</sup> covers mostly English work, use short citation windows and rely on the premises that there is large consensus among scholars regarding criteria of relevance, importance, truth, etc. Therefore, using bibliometrics through SCI may remain effective, reliable and extremely useful sound evaluation of scientific work in natural and life sciences, despite the criticism presented above. This might not be, unfortunately, the case for social sciences.

Foremost, social sciences (SS) address, very often, their national public, as society is their concern. Therefore, even if scientific research transcends national borders, social science is, to a considerable extent, of national interest. SS research priorities reflect national trends, local policy concerns and may not even stay relevant if expressed in other languages. Bibliometric evidence suggests that both, producers and consumers of social science, are nationally oriented (5, 8, 10) and

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<sup>1</sup> Other most acknowledged limitation and deficiencies generally associated to bibliometrics are related to: some lack of transparence in Thomson Reuters's methodology and process in journals selection, citations collection and IF computation ; the citation window applied in counting IF is often questioned, being considered sub-optimal; other factors than relevance and quality might often alter the indicators as it has been noticed that open-access journals, available online and journals with higher frequency receive good IF despite their lower scholar recognition in their scientific fields; given the huge volume of scientific research output and full automation of evaluation, it happens that controversial and even invalid, fraudulent and retracted articles continue to be cited and counted for IF, as there is no system of linking indication of retraction in the original publication; it has also been frequently reported that editors and publishers are able and accustomed to manipulate and manage the IF of their journals (impact factor game), especially through citation cartels and through publishing more review articles which are more often cited than the original research papers, etc. Many authors have also urged attention on the fact that SCI seems to be biased towards North American journals due to a higher frequency of self and colleague citations (5, 7, 9) and to the fact that English journals are much better covered in the detriment of other languages.

<sup>2</sup> In 1960, Eugen Garfield's Institute for Scientific Information introduced the first citation index for papers published in academic journals, first the Science Citation Index ( SCI) and later the social Science Citation Index ( SSCI) and the Arts and Humanities Citation Index (AHCI).

that national science literatures are largely excluded from the SSCI, which provide the main data for bibliometric evaluation of the social sciences<sup>3</sup>.

Literature highlights that the research front on many topics in the social and behavioral sciences are more and more international. Social scientists seem to become more internationally oriented and there are clear tendencies towards the homogenization of social sciences given the economic globalization, widespread internet usage, high European pressure for international collaboration, the national level evaluation requiring publishing in high impact journals (5). The percentage of social scientists publishing in English is increasing.

Nevertheless, there is still large amount of relevant, high-quality scientific literature that elaborates on national issues that address primarily a national audience being, therefore, under-appreciated and excluded in bibliometric-based evaluations.

Secondly, it is important to note that many of the social sciences research work is stirred by the mission of educating the public they observe, of informing, of enlightening and determining behavior. If psychologists, statisticians and geographers do not publish much in non-scholarly literature, other fields, such as economics (despite it being scientific in publication patterns), linguistics, education and sociology do, as they address non-specialists.

Moreover, non-scholarly literature has been acknowledged as of a high applicative character, being, therefore, associated, in substance and role, to patents. Yet, it has not been subject for consistent bibliometric evaluation, as it requires a sound qualitative evaluation base (5).

Be it scholarly work or non-scholarly literature, this research output loses its meaning and relevance if published in other language than the national one, as its readers would be others than the addressed ones. (2,5,8). It is obvious that non-scholarly literature, as well as national literature is less well indexed and international evaluation criteria, usually based on bibliometrics, would certainly misrepresent the real performance of a scientist career in social sciences.

Bibliometric based evaluation criteria, widely used on an international base, also focus on scientific *journals bibliometrics* (mainly SSCI), leaving under shadow book publishing. Extensive research literature on this issue arguments that journal based bibliometric indicators are generally based on a smaller fraction of research output in the social sciences than in the natural sciences. (5). The percentage for natural scientists publishing in journal articles or conference proceedings is considerably higher than for social scientists.

The classic bibliometrics techniques (used in SSCI) are also frequently criticized (5, 7) for applying the same citation windows as for SCI (used for natural and life sciences). The time distribution of citations shows that a much longer time is needed in order to capture the slow pace of citation accumulation in SS and the germinative potential of research work in social sciences.

The strong transdisciplinary character of social sciences often alters the SSCI based bibliometric results, as it leads to fragmentation of literature. That would cause a weaker coverage of journal literature by SSCI, which cannot identify any core literature and cannot provide comprehensive coverage (5).

However, bibliometric evaluation in the social sciences gains more credit, as fields like economics and psychology come to resemble more and more in publication patterns to natural and life sciences. Scholars try to boost their evaluations, tending to change publishing behavior towards SSCI indexed journals, leaving aside book publishing and other disseminating means.

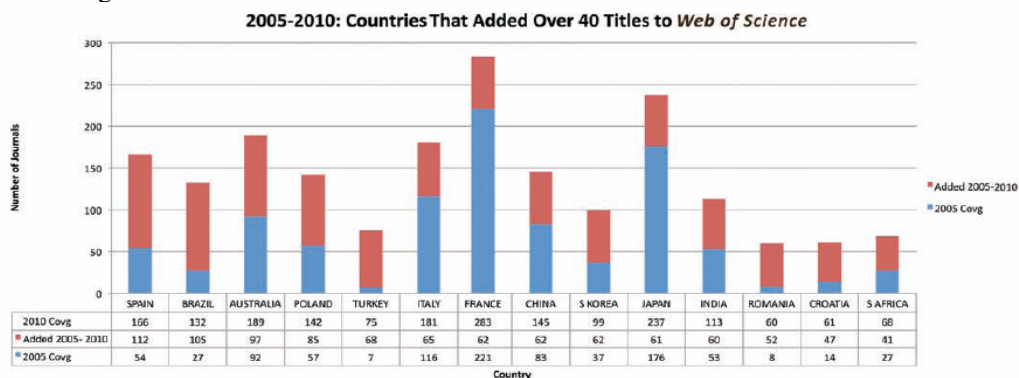
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<sup>3</sup> To name a few examples, the afore-mentioned papers conclude that German and French authors cited material in their own language more than 60% of the time, although such material accounted for less than 10% of literature in the field (Yitzhaki, 1998); the top 20 most cited documents by Polish sociologists in the Polish SCI versus SSCI contained none in common, as all but one of the SSCI cited documents were in English and all PSCI cited documents were in Polish; the most cited sociologist on the national list ranked far lower in the SSCI and vice-versa; SSCI lack in coverage of Chinese and Indian social science, etc. These results show that the SSCI and national literatures represent partially overlapping, yet different worlds.

## 2. Recent approaches towards social sciences research evaluation, in Romania

World scientific publications in “Economics” and related area have experienced the greatest growth during 2005 - 2010. Globalisation gave a good impetus to “Management”, “Business, Finance” and “Social Sciences” fields of sciences. Consequently, these fields increased by over 30 world journals each. Social & Behavioural sciences had one of the highest rates of growth that is 31%.<sup>4</sup> Romania is represented in Social and Behavioral sciences for the first time during 2005-2010, with 10 journals coverage.

Fig.nr.1



Source : James Testa : The Globalization of Web of Science:2005-2010, Thomson Reuters, June 2011 , p.4

Recently, Romania has also increased its performance in scientific publications. The number of articles published and monitored by the Web of Science by Romania’s researchers increased from 8,228 articles in 2000 to 11,739 in 2010. At the same time, it has been the increase of the number of Romanian journals, which are monitored by the Web of Science from 8 in 2005 to 60 in 2010, that is higher international visibility of Romanian researchers. Despite this, Romanian researchers still mainly publish in “national international journals”, but Romania has become more international. On average, a country is expected to have 10% of its publications among the top 10% most cited ones worldwide but for Romania it is too early to have such high international performance<sup>5</sup>.

Given the path-dependency character and the specific evolution of the social sciences in Romania, the issue of science and scientist evaluation would have required a sound substantiation based not only on recent international practice but, also, on the rich literature available on the matter and on the past experience of other more advanced countries regarding R&D performance, scientific visibility and expertise (1, 6). This would allow for avoiding potential pitfalls hidden in evaluation criteria less adequate for social sciences, or uncorrelated to the specific of the Romanian context.

The good intentions of policy makers and the optimistic expectations that drew forward the recent radical reform in the policy of scientific activity evaluation haven’t been completely confirmed in the aftermath. The scientific community support has also been lower than expected<sup>6</sup>.

<sup>4</sup> James Testa : The Globalization of Web of Science:2005-2010, Thomson Reuters, June 2011

<sup>5</sup> Technopolis Group: Mid –term Evaluation of the National Strategy and of the National RD&I Plan 2007-2013, Final Report, 23 January, 2012.

<sup>6</sup> “Rapidly improving, but many of the research institutes and university research groups still don’t perform well, even though there was a significant slug of extra money between 2005 and 2008. The money did not necessarily get distributed to the best people, and academic positions don’t necessarily go to the best people either. Some academics tend to hold several powerful positions at once, and this results in potential conflicts of interest. Scientific nepotism still exists. We need more input from Romanian scientists abroad and an influx of the best international practices. I know

Scientometric criteria were mostly applied for the project proposals evaluation within the Excellence Programme in 2005. In 2011, new criteria, very demanding and setting high standards, were used in evaluation of the applications for projects financed through the national programme IDIAS. These criteria sets requiring ISI indexed articles and books available at minimum 3 to 12 European or OECD Universities' libraries, were the same for all projects proposals, no matter the scientific area they may have belonged to. This undifferentiated approach brought forth protests and criticism, especially from the arts, social and humanists scientists (3, 11, 12).

Romanian Government has approved new standards and methodologies for evaluation in social sciences, having in view specific indicators for each field of social sciences, in order to implement the requirements of the National Education Law (number 1/ 2011). While the literature suggests that the application of bibliometric techniques is at least questionable in a number of social science disciplines, it seems that, according to the Romanian criteria, a social scientist should be evaluated by very exigent scientometric criteria.

The minimal standards regarding the scientific performance required for designation of academic titles and distinctions in higher education, professional degrees and ability certificate for scientific fields were published in three Ministerial Orders pertaining to the Ministry of Education, Youth and Sports<sup>7</sup>. These ministerial acts take into consideration scientific work published in journals indexed in international recognized data bases, as well as books and book / volume chapters, conference proceedings published by international prestigious publishing houses.

It is noteworthy that the indicators used for the appraisal of economic scientists research activity – necessary for being designated with academic or research degree – are very different compared to other social science fields. While for the other social disciplines the indicators applied are numerous (between 20 for Psychology and 22 for Juridical and Military sciences, some of them more easier to be accomplished), the criteria for Economics and Business Administration evaluation are restrictive, based on publications of high originality in ISI indexed journals with Impact Factor higher than 0,25, or, in other journals indexed in prestigious special data bases. In order to be appreciated for conference participation, the author needs to present the evaluation reports of the scientific referees that evaluate the paper before publishing the proceedings (with a prestigious publishing house). Moreover, the author must prove that his paper, directly presented at international conferences, has been commented within the Conference works, by at least a scientific referee designated by organizers and acknowledged in the Conference program. Self-citations, or half-self citations are not considered; other citations have to be made in ISI or other journals indexed in at least 3 international data-base, or in books and volumes published at internationally acknowledged publishing houses and only in English, French, German, Italian or Spanish.

Specific historical context of the economic science evolution in Romania cannot and shouldn't be overlooked. Given the political impact over this scientific field before 1989, through the requirements regarding the research themes and the restrictions imposed to international collaborations and publications, the collaboration of the Romanian scientist from economic and social field with the international one were very poor. Even if the situation has significantly improved within the last years, the evaluations criteria are too exigent compared to the past evolution and, even, to those imposed to economic researchers in other European countries. Time is needed for proper alignment to the new standards and exigency.

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how science needs to be managed. I know the nuts and bolts of a scientific career and how to recognize the best research, worthy of funding from public resources. I am also a big fan of private research. People, who were used to getting money, even though their results were humdrum, are angry. They know they can't convince me that what they are doing is important if it isn't. I hope that most of the dynamic scientific community supports my attitude"( Interview of minister of Education, Research, Youth and Sport, Daniel Funeriu for the NatureNews , 12 January 2011).

<sup>7</sup> Order 4478 / 23 iunie 2011 for mathematics, natural, engineer and biomedical sciences, Order 4691 / 26 July 2011 for social sciences, Order 4692 / 29 July 2011 for humanists and arts.

Social sciences should be considered not only of intrinsic scientific merit in itself but as an indispensable tool for improving the quality life and as an engine for economic recovery and growth. Therefore, the spending of public funds in this field of sciences must be justified not only by scientific scientometric indicators but also by the quality of answers to the needs of economy and society. The educational impact of the social and economic research on the individuals and society could be greater when we take into consideration research results published in national review than the articles published in prestigious international reviews.

One obvious way to accomplish this requirement and introduce a real evaluation in the Romanian social science is to use an adequate system of indicators, combining scientometric indicators with other qualitative indicators that could measure national impact and visibility of research results for the present and for the future.

Consequently, new procedures must be built based on strengths and weaknesses of existing system of evaluation with enhanced dialogues between scientists and policy and social science managers, using bottom up and top down procedures of evaluation. Mutual learning from experiences used by different other countries could help in this process.

It may be difficult to evaluate the return of social sciences in strict economic terms but collateral, intangible benefits, discovering many business opportunities or ways for economic and social activity improving, recommendations for increasing the living standard of the people need to be taken into account when we evaluate social sciences output.

On the other side, social scientists, especially those from the economic and social fields, must change their behavior and demonstrate flexibility and an increasing capacity for adopting reactively and proactively to the new conditions and demands of the economy and society, especially in this difficult period of economic crisis.

### 3. Conclusions

1. Setting guidelines and standards, delineating integrated system of evaluation criteria for scientific research have been meant to encourage researchers to improve the quality and visibility of their scientific contributions.

2. The literature of evaluation in the S&T field and the experience of other advanced countries urge caution in indiscriminate and excessive use of scientometric evaluation criteria, especially regarding social sciences research. Bibliometric, SSCI based evaluations, even if recently more reasonable and relevant, remain partial and misleading, as they would neglect the integrative picture of the economic and social science, with its important contributions to understanding and serve their national human communities and societies.

3. With the view of shrinking the gap between the national and European R&D performance, of convergence towards the quality of the European scientific output, a complex set of procedures, standards, criteria and principles, internationally applied, have been adopted within the Romanian research system.

4. The evaluation criteria for social sciences are not fully adapted to the specific context of the Romanian scientific culture and community, to the specific of the social science area. The evaluation methodology and procedures contain very exigent and inadequate scientometric criteria for Social Sciences and the most exigent of them are for Economic Sciences.

5. It is, therefore, strongly recommended in the literature, that the bibliometric evaluation of SS be supplemented by other means of evaluation. Even though they involve higher costs, efforts and time, they would carry more relevance and reliability, avoiding the scientific research behavior alteration that would be detrimental to the very social science mission.

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