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A welcome to methodological pragmatism



1. Introduction

In their contribution to this issue of *Journal of Informetrics*, 'A farewell to the MNCS and like size-independent indicators', Giovanni Abramo and Ciriaco Andrea D'Angelo open up new and interesting *viae* for the study of scientific productivity. They combine publication and citation frequencies with data representing economic resources for research in a proposed singular indicator, the 'Fractional Scientific Strength (FSS)'. At the same time, they call on all of us to flee from Troy and abandon every traditional indicator that measures the average citation impact relative to the number of publications.

I welcome the development of indicators that combine input and output in research. However, I do not agree to that we should close the door behind us to the traditional indicators. I will explain my disagreement before I return to a constructive discussion of the complicated task of measuring scientific productivity.

2. Methodological pragmatism

The idea that a single indicator can replace, or be regarded as supreme to, other indicators is against a tradition for methodological pragmatism in scientometrics. I would like to see pragmatism continue. Consequently, I welcome the 'FSS' indicator without abandoning the alternatives. As pragmatists, we usually agree that the use of proper scientometric indicators depends on the purpose of the assessment, the level of their use and the available data. More than one indicator or one data set may be needed to give a more comprehensive and multidimensional view of the research performance. These ideas have recently been expressed in principles 2, 4, 6, 8 and 10 in the so-called 'Leiden Manifesto' (Hicks, Wouters, Waltman, de Rijcke, & Rafols, 2015).

Methodological pragmatism in scientometrics is probably, I would think, in understanding with a more basic philosophical pragmatism: what we see or measure, is not "reality". It is no more than what our chosen instruments can achieve for us. Philosophical and methodological pragmatism seems only natural in the quite new research tradition of scientometrics, since it mainly works with 'second hand', incomplete and commercially restricted data that are produced for the primary purpose of bibliographic information retrieval in library systems. I find methodological pragmatism present in almost all pioneering works in scientometrics. My own first lessons came from Narin and Carpenter's (1975, 1985) detailed accounts of how they constructed the scientometric indicators for the National Science Foundation's earliest *Science and Engineering Indicator Reports*. They left no doubt about the limitations of the data and how different journal sets and measurements could change the picture.

Any branding of indicators is against pragmatism. Nonetheless, branding occurs from time to time in this semi-commercial field of scientometrics. The most recent example is the branding of 'Snowball Metrics' by Elsevier. It has now been officially adopted by Eurocris, the International Organisation for Research Information, in spite of the fact that 'Snowball Metrics' recommends the use of an individual level *h*-index, which is in conflict with principle 7 of the Leiden Manifesto. Another well-known example of branding is the 'Crown Indicator'. Years after the Centre for Science and Technology Studies at Leiden University abandoned it themselves, the name continues to indicate 'advanced' and 'correct' use of scientometrics among research administrators and policy makers. Its more recent replacement, the 'MNCS', should now be replaced again by the 'FSS', argue Abramo and D'Angelo.

Their argument is worth listening to because it takes place in an open discussion in a scientific journal and is far from being commercially motivated. Indeed, both their discussion and the 'FSS' itself are certainly welcome from a pragmatist point of view. What I find to be against pragmatism, however, is their view that there is such a thing as 'true measurement of research efficiency'. Moreover, I cannot see why other indicators should be abandoned.

3. A challenge to production theory

Abramo and D'Angelo argue convincingly that citation indicators based on the ratio to publications “violate an axiom of production theory”: if the output increases under equal inputs, performance cannot be considered to diminish. More specifically, it is a ‘paradox’, as [Abramo and D'Angelo \(2014\)](#) say in an earlier publication, that ‘an organization may worsen its MNCS ranking if it produces an additional article whose normalized impact is below the previous MNCS value’. This argument is nicely illustrated and seems logical in both versions. The MNCS and similar indicators of citation impact certainly fail to represent a measurement of ‘productivity’. Still, one could question whether they were ever meant to do so?

Turning around their argument for a moment, I will add another quote from [Seneca](#) to the one used by Abramo and D'Angelo in their paper: ‘*Non refert quam multos [libros], sed quam bonos habeas*’, or ‘It does not matter how many books you have, but how good they are’ (Epistulae morales ad Lucilium, 45,1). In other words: the MNCS and similar indicators of citation impact can be seen as challenging economic production theory by valuing ‘quality’ or outcome higher than productivity. For many years, there has been a worldwide concern about over-production of publications in the sciences. The argument is that too many publications go uncited – and seem to be unnecessary – in the overwhelming boom of scientific publishing. In this perspective, it can be seen as a quality of the MNCS that the value decreases if another publication with a citation rate below average is added. It follows from the skewed distribution of citations that to be cited below average is the same as never or seldom being cited. My pragmatist conclusion is that we may need size-independent indicators of impact in addition to the more advanced measurement of productivity that Abramo and D'Angelo propose.

4. Advancing the measurement of research productivity

The proposed ‘FSS’ indicator is not a modification of the ‘MNCS’ indicator in the same sense as the ‘MNCS’ indicator was a modification of the ‘Crown Indicator’. The latter modification was a representation of the same data in a modified mathematical formula. The ‘FSS’, however, combines bibliometric data representing publications and their citations with *economic data* representing the resources for research at the same unit. [Abramo and D'Angelo \(2014\)](#) use the number of researchers (full time equivalents) and their differentiated salaries to represent the economic resources made available for research at units of assessments at different levels in the research system, from the individual level up to the institutional.

It is only with the extension to economic data that Abramo and D'Angelo are able to break out of the tradition of measuring citation impact on the ratio of publications. The tradition is to stay within the scientometric data and compare citations with publications, to put it simple. By staying inside, there is at least a little bit of hope for consistent and comparable indicators across fields, institutions and countries as long as the indicators are normalized and the journal sets are cautiously monitored. Is there hope for the same degrees of consistency and comparability as economic data are added to the measurement?

[Abramo and D'Angelo \(2014\)](#) demonstrate that the productivity of Italian universities can be compared by using the ‘FSS’, but it remains complicated and depends on economic data and field classifications of researchers that are only available within the country. This availability is partly due to a situation with a nationally unified system of publicly funded universities, partly to a national performance-based institutional funding model that creates comparable and quality-assured data in a current research information system (CRIS). The Scandinavian countries are in the same situation, which seems promising with regard to combining scientometric data with other data that represent the resources, activities and outcomes of research ([Sivertsen, 2010, 2016](#)). Still, several challenges remain in this newly opened field of using national CRIS data in combination with scientometrics ([Piro, Aksnes, & Rørstad, 2013](#)).

On the international level, European initiatives such as the U-Multirank and Eurostat are having larger problems with consistency and comparability of economic data and indicators. Despite fifty years of developing and applying the Frascati Manual, the OECD is still far from representing the national R&D economies in a comparable way ([Wendt, Aksnes, Sivertsen, & Karlsson, 2011](#)). In this situation, my conclusions will be pragmatic.

5. Conclusions

Although I disagree with their call for abandoning the alternatives, I welcome the introduction of the ‘FSS’ indicator by Abramo and D'Angelo as an important step towards advancing the measurement of research productivity. I hope the indicator will become a strong driver for economists to influence their countries in producing more consistent and comparable R&D resource data at the institutional, national and international level.

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