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THE DANISH BIBLIOMETRIC RESEARCH INDICATOR – BFI

Research publications, research assessment, university funding

Claus Vesterager Pedersen

Background:

In June 2009 a political agreement on a new model for the distribution of basic funding for Danish universities was entered into, with a gradual implementation from 2010-2012. This agreement states that the universities' research publications will be the second most important parameter for the distribution of new basic funding for universities in Denmark based on outcome ("weights and measures"). New basic funding means funding from the so-called Globalisation funds, that released 300 million Danish kroner to universities in 2010 and 270 million Danish kroner to universities in 2011. The distribution model has 4 parameters which are weighted differently (final 2012-weighting):

- **Education** (45 %)
- Research activities measured by **external funding** (20 %)
- Research activities measured by **publication** – BFI (25 %)
- Fully qualified **Ph.D.**'s (10 %)

During the period of implementation, the model will alter the weighting of the 4 parameters from 2010 to 2012 as illustrated below and expressed in percentages of the total budget for each of the 4 parameters:

- 2010: 45-35-10-10
- 2011: 45-30-15-10
- 2012: 45-20-25-10

Considering the amount of money that is released through the globalisation funds, the BFI will be the distribution channel for 30 million Danish kroner in 2010 (10 % of 300 million kroner) and 39 million Danish kroner in 2011 (15 % of 270 million kroner). How much money there will be in the BFI in 2012, will time show, but with the present economic conditions in Denmark it will hardly be strikingly more. On the other hand, if one expects all basic funding to be distributed in a gradual transition through this distribution model in the future, we are talking in the area of 8 billion Danish kroner to be distributed through competitive outcome.

Number of publications:

To give an impression of the total amount of research publications and publication points that have been used to allocate the funds with the BFI, I will mention the figures from 2009-2010:

- 2009: 18.900 publications, generating 21.066,57 points
- 2010: 19.864 publications (5.1 % increase from 2009), generating 21.926,60 points (4.1 % increase from 2009)

You can check all the figures and see the distribution of publications and points between main subject fields, universities and publication types at the homepage of the BFI at http://www.fi.dk/forskning/den-bibliometriske-forskningsindikator/indikator-statistik-2010

What exactly is the BFI?

Before trying to understand the architecture of the BFI and the decisions that constitute it - which I will go through in the following - it is important to realise that the BFI is a quantitative distribution system, as seen above, and not a quality measurement system. The way the BFI has been constructed can give the impression that it is concerned with measuring quality. But it is not, even if BFI does contain elements of quality measurement. To measure quality by publication counting, the BFI would, for instance, have to assume that all articles in a given journal are equal in quality, and that all books published by the same publisher have the same quality, and that articles published in non-recognised publication channels have no scientific value.

The BFI is an administrative tool, a distribution model based on the Danish Agency for Science, Technology and Innovation's count of peer reviewed research publications. Basically the quality of publications written by Danish researchers is defined by Danish researchers themselves, through a rating of peer-reviewed publication channels, i.e. through the establishment of exclusive authoritative lists of journals (about 20.000) and publishers (about 1.600). The idea has been that the "system" should be dynamic, with annual adjustments being made to these authoritative

lists, which takes into consideration the development within the specific research environments. At the same time the system should be transparent and logical, and each university should be able to calculate what amount of money the model will bring each year. Thus, the BFI uses only two levels of recognition: Level 2, the elite level, which only accounts for 20 % of the total world production within the specific expert group, and Level 1, the lower level, which accounts for 80 % of the total world production.

How is the BFI organised?

The rating of the publication channels is carried out by the reporting and rating done by 67 expert groups appointed for the Agency by The Danish Rectors' Conference, Universities Denmark. In fact, by departments and faculties or subject fields at each university which sends at least one delegate to the group. The scientists thus deliver the legitimacy and the professional basis of the BFI in relation to the universities.

The expert groups consist of Professors and Assistant Professors with expertise within the 67 subject areas that have been appointed by the BFI Professional Committee, which as the BFI Steering Committee, has been appointed by the Ministry or the Agency among scientists and administrators and Rectors (Steering Committee). Both committees have encountered considerable troubles from the expert groups. See Fig. 1 for the organisation.

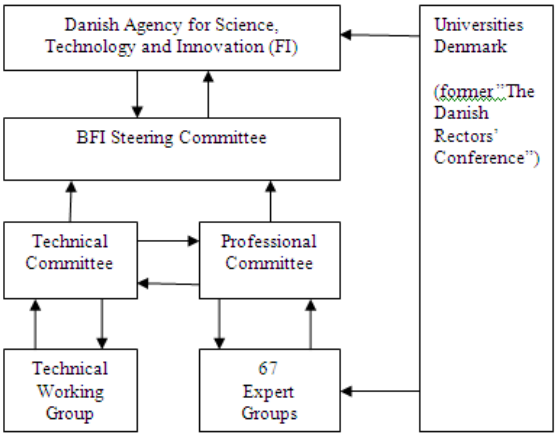

Fig. 1: BFI Organization Chart

The rated publication channels are listed in 2 authority files, one for journals and one for publishers respectively. These lists decide what publishers and what journals are recognized as being worth to publish in, and what level this recognition has – level 1 or level 2. But the authority files also decide what publication channels are not evaluated as containing serious research – they are simply not included in the files. In the rules for rating a journal at level 2, it is stressed that an important measure of scientific quality per se is that a publication channel - a journal - is international in orientation and has a high impact factor. The Danish authority lists can be seen online: http://www.fi.dk/forskning/den-bibliometriske-forskningsindikator/autoritetslister-for-tidsskrifter-og-forlag.

BFI publication types:

It has been a key issue in the BFI to select a limited number of important publication types that should be the firm foundation of research publications in Denmark. The following types and categories are the result of these decisions. This is in other words how you should publish and work as a scientist if you want your university to have a share in the new basic funds in Denmark. Fig. 2 indicates which publication types are the approved and how many points they are worth in the model:

Graded publication types	Points Level 1	Points Level 2	Points Level 1+Level 2 2010-2012
Scientific/scholarly books	5	8	6
Scientific/scholarly articles in journals and book series	1	3	
Scientific/scholarly articles in anthologies (with ISSN)	1	3	
Scientific/scholarly articles in anthologies (with ISBN)	0.5	2	0.75

Not-graded publication types	Points
Ph.D.-theses	2
Doctoral theses	5
Patents	1

Fig. 2: BFI Publication Types

There have been massive complaints from many sides of the Danish research community that the BFI-system will disfavour Danish publications and that Danish as a publication language is substantial within many research areas in Denmark, particularly within the humanities and social sciences. As a result it has been decided to investigate the possibilities for complying with the complaints concerning the publication types "Books" and "Articles in anthologies (with ISBN)", basically to try to give Danish and foreign publishers the same conditions. It will be interesting to see which compromises it will actually be necessary to make. This investigation will be done during 2010-2012 and until then the rating between level 1 and level 2 publication channels has been put out of order. Instead temporarily there has been assigned a medium level in force for both categories.

Ph.D.-theses do get counted in the BFI, but the achieved points are not included in the BFI-funding, as Ph.-D.'s are funded separately. This is one of the more obscure elements of the BFI-concept.

Scientists are rewarded when publishing in certain international publication channels and this is stressed by counting out local publication channels no matter what their quality and content might be. Basically publications from local publication channels will not be included in the BFI. A local publication channel is a journal or a publisher where more than 2/3 of the authors to a research publication come from the same/local institution that publishes the articles or books. It is also mandatory that the peer reviewing of manuscripts are done before publication, and that at least 1 of the peers should be external in relation to the publisher or institution. The peers should at least be on Ph.D.-level.

Scholarly/scientific books, articles in books and articles in journals must have a clear and stated scientific/scholarly aim, they must be published in publication channels (journals or by publishers) that meet the peer review demand and they must have ISBN or ISSN numbers. Scientific/scholarly reports will not count within the BFI unless they are published in acknowledged publication channels. Editorials, commentaries, discussions, foreword, afterword, comments and notes are not recognised as point-releasing scientific publications. Book reviews and articles in encyclopaedias are not recognised, either, no matter their scientific content, level or importance. Conference articles are only included in the BFI, if they are published in a peer reviewed and acknowledged publication channel. Likewise scientific letters and review articles are included if published in acknowledged publication channels. It has been criticized that the noble art of editorship of scientific books and journals is not recognized and rewarded. But so it is.

Collaboration in scientific publishing:

A lot of research is not done on a local or personal basis. Researchers work together with colleagues, both at their own institution and often also at other institutions, national and international. This collaboration is a fundamental issue in research and therefore 2 parameters were brought in to reward publications that are results of external collaboration. If a publication is done in collaboration between researchers from different research institutions, no matter national or international, the amount of points that is awarded the publication in the BFI-scheme should be fractionalised (at the organisational level), and then multiplied by 1.25 as a reward for collaboration. Fractionalisation is done if a publication has more than 1 author and if at least 1 of the authors is an external partner. There is fractionalisation for up to 10 authors. If there are more than 10 authors involved the fractionalisation will still give 1/10 of the possible publication points (and of course multiplied by 1.25 because of the collaboration parameter).

De-duplication will take place and be calculated both within each university's own records and between the universities' joint records so possible errors and defects can be caught. The idea, of course, is that a publication should only be counted once and by that means results in the defined amount of points on a national level.

Patents do give some problems. Because there is great uncertainty on, how and where patents are issued and registered. Patents in the BFI-meaning are publications on patented inventions and basically they must be found in the most acknowledged patent databases, but there is much confusion on how to register patents and what "editions" of the patent that should actually count in the BFI. This still needs to be decided definitively.

Further plans for implementations in the BFI in the coming year are an authority list of recognised conferences and an authority list of recognised book series.

Registration systems for publications:

7 out of 8 Danish universities use the same CRIS (Current Research Information System) to record their local research publications and research activities. It is the PURE system, which is developed by a company named Atira a/s. The last of the universities will presumably start using PURE in the beginning of 2011. The local systems are owned by the universities themselves, and the universities are responsible for the registration of their publications and according their particular rules of registration. It is also the universities' responsibility to validate their own data. It is, however, very important to keep in mind that the universities implemented their research registration systems before the BFI was invented. The universities started the registration of their research for dissemination and promotional reasons and not for monitoring or funding reasons.

It has of course been much easier to add a central, governmental calculator for the research indicator to the local registration systems than to build a completely new system from scratch. The local systems are "simply" harvested by the central instance and the calculator works out the university's publication point share. But make no mistake: it has been a complex task to encompass the various authority lists (journals, publishers, and researchers taken from the local CRIS, and in future also conferences and book series), and

the very complex rules and standards for registration and counting according to the demands of the BFI and the registration practices at the respective universities.

It does give the universities quite a lot of new work. It has complicated the processes unnecessarily and it has been a strain on the originally good intentions. The quality of the records, the validation of the records, the auditing of the records and the affiliations of the authors (researchers) are all elements that need to be focused on, both locally at the universities and centrally by the authorities. There has been assigned a central controller by the Agency to make spot tests of the harvested records from each university and in principal to go through all harvested records to find irregularities. In practice, however, all universities experience errors and deficiencies when the final outcome of the BFI is set (Fig. 3).

My conclusion is that the BFI is not fit for quality measurement, as there are too many parameters that depend on individual decisions, but as a distribution-system for funding the BFI is absolutely usable, though not perfect. But one should of course consider the alternatives.

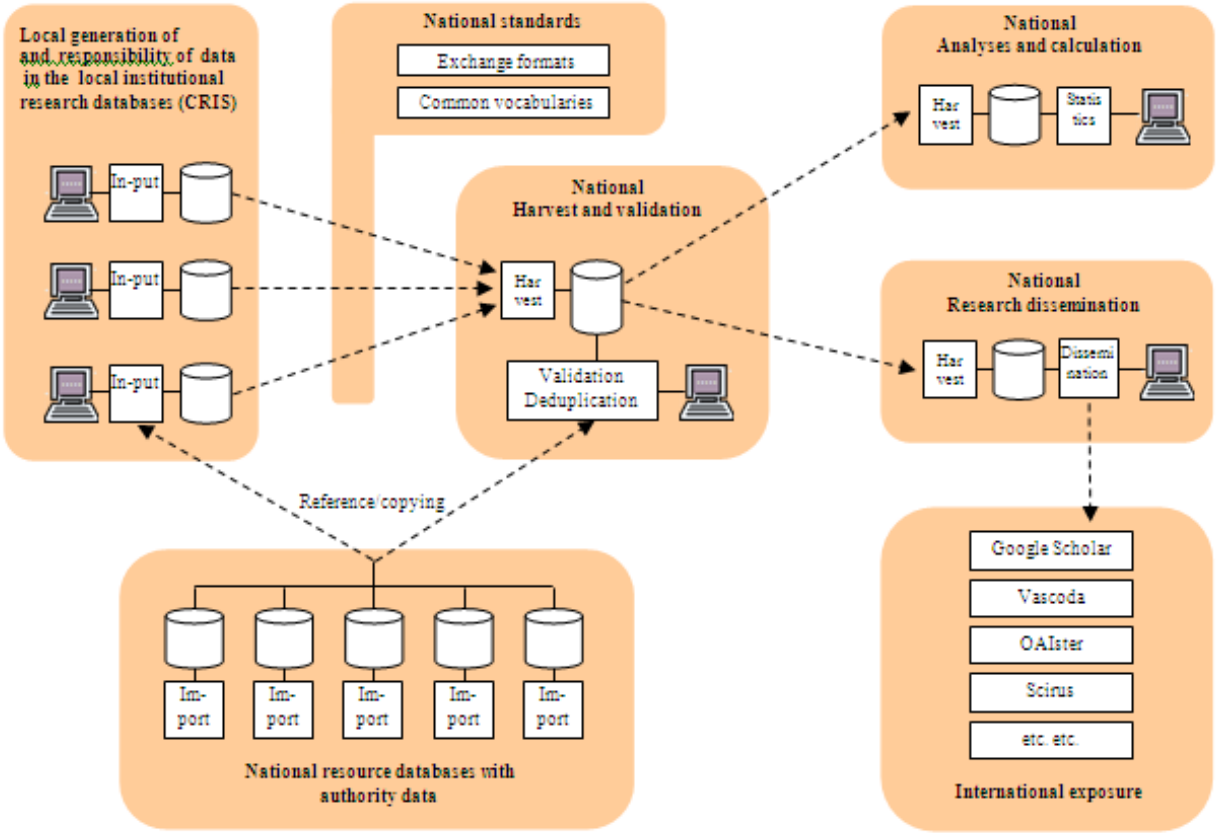

Fig. 3: The BFI Systems Landscape

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