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Expert-based versus citation-based ranking of scholarly and scientific publication channels

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ABSTRACT

The Finnish publication channel quality ranking system was established in 2010. The system is expert-based, where separate panels decide and update the rankings of a set of publications channels allocated to them. The aggregated rankings have a notable role in the allocation of public resources into universities. The purpose of this article is to analyze this national ranking system. The analysis is mainly based on two publicly available databases containing the publication source information and the actual national publication activity information. Using citation-based indicators and other available information with association rule mining, decision trees, and confusion matrices, it is shown that most of the expert-based rankings can be predicted and explained using automatically constructed reference models. Publication channels, for which the Finnish expert-based rank is higher than the estimated one, are mainly characterized by higher publication activity or recent upgrade of the rank. Such findings emphasize the importance of openness of information on a ranking system, with its multifaceted evaluation.

1. Introduction

The quality or impact of a publication channel (i.e., source of publications) can be used for many purposes. Traditionally, the impact of a serial has been used to determine the most important sources of disciplinary knowledge to be acquired for the university libraries – nowadays in digital form. Another, more recent function is to use the research output of universities to evaluate their operational performance through a Performance-based Research Funding System (PRFS). Currently, in many countries, PRFSs have a prominent role in national resource allocation (Abramo & D'Angelo, 2015; Auranen & Nieminen, 2010; Fairclough & Thelwall, 2015). According to Hicks (2012), a PRFS can utilize either an evaluation-based (peer-review) or an indicator-based (bibliometric) model. The prime example of the evaluation-based model was the emergence of the *Research Assessment Exercise* in 1986 and its transformation to *Research Excellence Framework* in England (Wilsdon et al., 2015). For indicator-based models, which are of the main interest here, one has witnessed a transition from the raw numbers of different kinds of publications (e.g., books, articles, and reports) towards their aggregated quality indicators (Haustein & Larivière, 2015). Here an important lesson comes from the *Composite Index* (CI) that was implemented in Australia in 1995, where university funding was based only on the number of publications. However, as shown by Butler (2003), this mostly led to a higher publishing activity in lower quality journals so that the overall impact of the publications dropped. As a

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result, the national PRFS (*Excellence for Research in Australia 2012*) uses both indicators and peer evaluation by an evaluation committee (Vanclay & Bornmann, 2012).

National allocation of research funding using solely an indicator-based model is not common (Hicks, 2012). The PRFS in Flanders (Belgium), as depicted in Verleysen, Ghesquière, and Engels (2014), provides one example, where one of the four pillars of funding for the Flemish universities is based on publications and citations. The Italian research assessment exercise (*Valutazione della Qualita' della Ricerca*) first applied a hybrid peer-review/bibliometrics method during 2004–2010 (Giovanni, Tindaro, & D'Angelo, 2014), and in 2011, introduced a model in which universities were free to choose between peer-reviews and bibliometric indicators as their research evaluation method (Cattaneo, Meoli, & Signori, 2014). The research funding evaluation methodology in Czech (*Metodika hodnocení*) counts all research outputs – among them publications – and then uses aggregated research output points as the basis for the university funding (Good, Vermeulen, Tiefenthaler, & Arnold, 2015). Generally in Europe, as recently summarized by Pruvot, Claeys-Kulik, and Estermann (2015), an output-oriented funding formula as the primary mechanism for research funding is used in England, Finland, Flanders, Ireland, and Poland.

The Nordic system, together with that of Flanders, is distinguished from the other indicator-based PRFS models by the development of open, full coverage national databases in order to record and validate academic publication activity (Verleysen et al., 2014). These databases provide the first basic element of the so-called *Norwegian Model* (NM) that has been described by Ahlgren, Colliander, and Persson (2012), Sivertsen (2010), and Schneider (2009). The main purpose of the NM is to combine (assess) production and quality of publications, without directly using citations. The purpose of the other main components of the model is to create a unified ranking system among various academic disciplines. Finally, the publication points counted using the aggregated ranks determine the university's share in annual government research funding. According to a recent evaluation by Schneider, Aagaard, and Bloch (2015), the NM has proved to serve its purposes in Norway. In particular, in comparison with the above mentioned CI in Australia, the quantity of publications has grown, while the overall quality of publications remained basically the same (Ahlgren et al., 2012; Schneider et al., 2015).

The other two Nordic countries – first Denmark (Schneider, 2009) in 2009, and then Finland (Puuska, 2014, pp. 81–83) in 2010 – have introduced their national PRFSs that follow the NM. Similarly to Norway, the main reason to creating a unified national ranking system in Finland for all relevant publication channels was the difficulty in using available quality indicators to compare the various research and publication cultures of different disciplines (e.g., comparing humanities or social science (SSH) to technology or natural science). The purpose of the Finnish database, *JuFo*[1] is to highlight for the national scientific community the characteristics of all relevant publication channels. Currently, 13% of public university funding in Finland is based on the average weighted sum of quality ranks of all the publications that were produced over a period of three years. The national goal is to target research activity in prestigious international forums, and to enable national evaluation and management of research activities and quality over the years. Hence, *JuFo* serves in Finland both as an available indicator of the quality of publication channels and as a guideline for allocating funding to its national research institutions.

Generally, the quality of a publication channel can be evaluated by an expert in that channel's area of academia (expert-based), or by citation-based indicators of scientific impact (Ahlgren et al., 2012; Ahlgren & Waltman, 2014). The classifications of publication channels in *JuFo* – i.e. the Finnish ranks – are expert-based, like they generally are in the NM as well. Though citation-based indicators can be used as an aid in the NM, the final decisions about the ranks should be made by experts (Sivertsen, 2010). In February 2015, *JuFo* incorporated 29,443 different publication channels, assigning every journal and conference proceeding publication channel to one of 24 expert panels. Each of these 24 panels is composed of experienced and respected Finnish researchers in different scientific fields (all fields can be found in Table A.12). A steering committee allocates publication channels to the panels and provides common ranking rules.

Although the PRFSs of the three Nordic countries following the NM are fairly similar, some crucial differences exist. The Danish and Norwegian PRFSs have the same number of quality ranks: 0 (non-scientific publication channel), 1 (scientific publication channel), and 2 (publication channel with especially great scientific prestige). In both countries, the ranks are updated annually. Publication channels at rank 2 can, at most, account for 20% of the world's publications in a discipline. In Finland, each expert panel must classify all assigned publication channels to one quality category. However, unlike the Norwegian and Danish PRFSs, in Finland, the number of publication channels (not the number of publications) is used to define the quality ranks percentages. Moreover, the Finnish *JuFo* system has one additional rank, (3), which is reserved for the top (at most 5%) of the rank 2 publication channels from each discipline. An additional difference is that in Finland, the ranks of all publication channels in the list are reevaluated only every fourth year. The last reevaluation of all publication channels took place during 2014, and were available in the *JuFo* list in early 2015.

The purpose of this paper is to analyze the expert-based ranks in the *JuFo* list. At the moment, the state covers all costs associated with the publication forum, its management, and the evaluating panels. Furthermore, as argued by the Danish Centre for Studies in Research and Research Policy (2014), one weakness of an indicator like the *JuFo*-rank is the lack of transparency in the nomination process of the steering committee and the panels. As Serenko and Dohan (2011) discovered, an expert's current research interest can strongly influence his or her ranking of publication channels. Therefore, our basic research questions are:

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[1] *JuFo* is the abbreviation of "Julkaisufoorumi", which means "publication forum" in Finnish.