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Estimating the Research Impact of Finnish Business Studies Professors

1. Introduction

Vesa Puttonen (2007) has conducted an interesting attempt at measuring the impact ('vaikutavuus') of Finnish professors in business studies ('liiketoimintaosaaminen'). In his paper, also published in this volume, Puttonen reports the results of three different analyses: first, the number of citations in the Web of Science database to articles that Finnish professors have written in journals included in the same database; second, the number of citations in the google.scholar search engine to the five research publication of each professor that have received the highest number of citations; and third, the number of times a professor appeared in a search on google's general search engine when

'professor' and the name of the person were entered as search terms. While the two first analyses aim at examining the professors' impact on the research community in business studies, the third purports to provide a proxy for their general societal impact.

The analysis carried out by Puttonen (2007) constitutes to the best of our knowledge the first such extensive attempt covering the professors in business studies Finland. The Helsinki School of Economics has earlier published some statistics for its own professors (HSE, 2004), and Korhonen, Tainio and Wallenius (2001) have proposed a method for doing comparisons between university research units, but no similar national analysis has been conducted.

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In this note we will discuss only the part of Puttonen's study that deals with the impact of the publications of Finnish business professors within the international research community and suggest three alternative ways to measure this impact, thus leaving the very difficult and highly contentious issue of how to measure general societal impact outside the scope of this note. The alternative methods will be illustrated with analyses of data on the same 106 Finnish business professors from the same Web of Science data base beginning from the year 1986 that was used by Puttonen. The outcomes of the analyses reveal significant differences depending on the method chosen. We end the note with a general discussion about measurement of research impact.

2. Puttonen's Study

The first analysis carried out by Puttonen (2007) consisted of counting the number of citations between 1986 and the summer of 2006 to articles that Finnish professors have written in journals included in this database. The indexes included all three indexes in the Web of Science database, a commercial service operated by ISI. These are the Social Sciences Citation Index (SSCI), which is the most important one for business studies, but also the Science Citation index (SCI) and the Arts and Humanities citation index (AHCI). To include also the Science Citation index and the Arts and Humanities Citation index in the calculations increases only marginally the total number of citations in this analysis since most authors in business studies tend to publish in journals which fall into the subject domain of SSCI. Nonetheless, it significantly alters the results for those professors who engage in multi-disciplinary work and whose work is cited in journals outside of business studies.

The journals indexed by ISI are generally long-established in their fields. Many universities and business schools as well as research funding bodies are using articles published in ISI's citation indexes as an indicator of the quality of the research carried out by faculty members, thereby providing further incentives for researchers to submit their work to such journals. This creates a positive feedback loop where inclusion in the indexing databases, in itself based on perceived high scientific quality, further strengthens the quality of the included journals by making them even more attractive outlets for authors. Therefore, the number of submissions to ISI journals tends to be high, leading to fierce competition to be published and a rigorous review process before manuscripts are accepted for publication.

Thus, there are several arguments for choosing the number of citations in ISI's data bases to work carried out by Finnish business school professors as a reasonably valid indicator of the impact of their work on the global business research community in general and the parts of this community focusing on publications in established academic journals in particular. In the Web of Science data base, there exists a function that automatically provides the total number of citations to articles that a person has written in journals included in this database. This is the function that apparently has been used in Puttonen's (2007) study. However, we argue that there is no reason to limit an analysis of research impact to only citations to articles published in ISI indexed journals. This excludes the impact of all other research output from the analysis, including the significant contributions that academic books and articles published in journals not included in the data base may have on the field of research. Fortunately,

The Web of Science also contains citations to such publications. In fact some 10–11 million of the 25 million citations added yearly to the database are to such publications (Robertson 2006).

The second analysis that is done by Puttonen (2007) is an attempt at partly addressing some of the limitations of his first analysis. However, we find it somewhat problematic that this analysis was limited to the number of citations in www.scholar.google.com to the five research publications of each professor that had received the highest number of citations only. First, there appears to be no valid reason for limiting the analysis to only five publications rather than the whole research production of the person in question. Second, it might be argued that the lack of ‘quality control’ (i.e. peer assessment of the quality of the publications that are included) in the selection of research publications included in www.scholar.google.com leads to this analysis being a less valid indicator of the impact on international cutting edge academic research. In this respect, the ISI data base is arguably superior to www.scholar.google.com. Third, a web search engine like www.scholar.google.com is likely to mainly include recent citations, since it can only include material which is openly on the web, or made available in digital form to it through agreements with publishers.

Below we suggest three alternative ways to measure research impact, each trying to remedy some of the limitations of Puttonen’s (2007) study and/or go beyond the time periods covered in his investigation.

3. Alternative Ways to Measure Research Impact

The three different analyses described and re-

ported below focus on different time periods and use partly different techniques. In the first analysis we examine the number of ISI-indexed papers citing any research publications by Finnish business professors since 1986, thus providing an analysis of their *historical impact*. In this method we also use the citations to papers published in other channels than ISI indexed journals (current ISI journals for the time period before they were recognized as ISI journals, other journals, conference proceedings, books, book chapters, reports, etc.). This is possible since one can produce a list of all the ISI articles which include a reference to any of this broader corpus of work where the professor in question is the only author or the first co-author.

Authors who have published in a broad range of channels (in particular as books or in journals not indexed by ISI) will thus fare better in this considerably more comprehensive – and in our view more valid – analysis of the impact of individual professors on their fields of research than in the analysis reported by Puttonen (2007). A clear limitation of this approach is that, according to a representative of ISI (Horky, 2007), usually only the first author of co-authored non-ISI publications is indexed. This means that co-authors of non-ISI publications that are cited in ISI, and whose names are not listed as the first in the order of the authors, rarely will be captured by the system. The negative effect of this limitation on the number of citations reported per person is likely to be more severe for scholars whose surname begins with a letter late in the alphabet since the alphabetical order often is used to determine the order of authorship.

Our analyses were carried out during January 21–22, 2007, hence covering a period that goes beyond that in Puttonen’s study by

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some six months. One more difference between the data used by Puttonen (2007) and the present study must be mentioned: while he used the total number of *citations* in the data base to ISI articles (the number automatically reported in the system), we report the *number of articles* in the Web of Science referring to a specific professor's research. In Puttonen's analysis, one ISI article citing several pieces of work (articles) written by a particular professor would thus amount to several citations, while the latter would only count as one in our analysis.

In the second analysis we use the Web of Science citation data from 2001-January 2007 to conduct the same analysis as described above, this time obtaining an estimate of the *recent impact* of Finnish professors in business studies. Since half of the citations for a paper usually occur with 5–6 years of publication, this means that work published in the 1990s and the first few years of this decade in particular influenced the number of citations during 2001-January 2007.

The aim of our third analysis is to provide a rough estimate of the impact of contemporary publications. Providing an estimate of *future impact* is of course extremely difficult and must only be treated as second-guessing the influence of contemporary publications on on-going and future research work. The method that we have chosen consists of multiplying each recently published ISI indexed article with the journal's so called 'impact factor' to arrive at an estimate of their future impact. Our method uses the journal impact factor (the numbers from 2005 were used, the most recent ones available) as a proxy for the estimated impact of an article. The impact factor measures the average citations in any indexed journal to an article published in a particular journal during a time

window of two years after the publication. The expected number of citations over a longer time frame is much higher than the impact factor, but the time spread differs a lot for disciplines. In comparing authors in the same discipline using the impact factor as such should not be any serious problem. We chose to include articles published by an author in ISI journals since 2003 as the basis for the estimate.

Since a significant number of (especially European) business journals has been added to the Web of Science (SSCI) data base during recent years for which no impact factor has been calculated yet, we used the median impact factor for all SSCI journals (0.696 in 2005) as a crude estimate of the future impact of articles published in such journals.

An obvious limitation of this method to estimate future impact is that it excludes other publications, such as articles in journals not included in Web of Science and academic books. We are well aware of the fact that in particular academic books may have substantial research value and sometimes become classics that shape whole fields for years to come, but to predict the future impact of a particular book is close to impossible and books are therefore excluded from our third analysis.

Before proceeding to reporting the results there are two particular challenges involved in using the data base that need to be mentioned. First, the data base only includes the initials for each author. As there were several Finnish business professors whose surname and initial(s) were identical to those of other authors included in the data base, when doing our three analyses we did our utmost to ascertain that only work actually published by a particular business professor was counted. This involved checking the affiliations of the authors and double-check-

ing publications against the list of publications available on home pages or obtained directly from the professors. Second, some female professors have changed names during the time of their careers. Therefore, we ran separate analy-

ses on their maiden names, new surnames and a combination of the two.

Table 1 contains the outcomes of the five analyses for Finnish professors in business studies that were among the 'top 20' in the two re-

TABLE 1. Citation analyses of research by Finnish professors in business studies (the 'top five' for each analysis are marked with grey color, the rank order of the 'top twenty' for each analysis is presented)

	ISI citations to ISI articles 1986-2006 (Puttonen)	Rank	google.sc. citations to five publications (Puttonen)	Rank	1986-2007 ISI articles citing one professor	Rank	2001-2007 ISI articles citing one professor	Rank	2003-Future Total Impact Factor	Rank
Wallenius Jyrki	454	1	374	6	440	3	228	3	3.418	6
Vepsäläinen Ari	178	2	248	11	228	5	85	8	1.022	
Keloharju Matti	135	3	682	3	139	8	128	6	4.934	5
Grönroos Christian	121	4	1712	1	951	1	506	1	1.457	15
Björkman Ingmar	100	5	199	14	178	6	138	5	5.38	4
Suominen Matti	66	6	177	16	76	13	43	15	1.932	12
Ropo Arja	61	7	123	20	111	9	72	9	0.622	
Strandvik Tore	57	8	423	5	86	12	49	12	0.635	
Sundgren Stefan	47	9	n/a		54	18	38	18	0	
Möller Kristian	43	10	310	8	149	7	107	7	7.465	3
Vaara Eero	42	11	n/a		45		45	14	13.377	1
Puttonen Vesa	39	12	n/a		40		12		0.696	
Larimo Jorma	36	13	n/a		53	19	40	17	2.285	9
Halinen-Kaila Aino	35	14	346	7	87	11	67	10	1.964	11
Hearn Jeff	34	15	531	4	688	2	286	2	1.485	14
Kasanen Eero	30	16	183	15	66	16	35	20	0	
Kock Sören	30	17	148	18	53	19	47	18	0.303	
Liljeblom Eva	30	18	n/a		40		7		0.696	
Liljander Veronica	27	19	276	9	102	10	66	11	0	
Suutari Vesa	26	20	n/a		49		42	16	1.244	18
Sveiby Karl-Erik	n/a		1351	2	239	4	169	4	0	
Malmi Teemu	n/a		260	10	25		23		0	
Lukka Kari	n/a		238	12	48		23		0	
Ahtola Olli	n/a		222	13	56	17	10		0	
Granlund Markus	n/a		168	17	3		1		0	
Piekkari Rebecca	n/a		125	19	41		33		2.572	8
Uusitalo Liisa	n/a		n/a		70	15	19		0	
Tienari Janne	n/a		n/a		35		35	20	10.748	2
Kallio Markku	n/a		n/a		71	14	21		0.696	
Lindell Martin	n/a		n/a		58	16	37	19	0	
Niittykangas Hannu	n/a		n/a		9		6		2.699	7
Rehn Alf	n/a		n/a		8		8		2.217	10
Martikainen Minna	n/a		n/a		7		5		1.514	13
Seristö Hannu	n/a		n/a		9		9		1.326	16
Lilja Kari	n/a		n/a		43		24		1.278	17
Niskanen Jyrki	n/a		n/a		12		8		1.222	19
Vesalainen Jukka	n/a		n/a		7		6		1.174	20

As can be seen from Table 1, there are significant differences across the five different analyses.

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search impact analyses conducted by Puttonen (2007) and in any of our three analyses. It may be noted that we have not done any validation of the figures presented by Puttonen. Unfortunately, we were unable to include the results of Puttonen's two analyses for those professors listed in Table 1 whose results were not reported in his article.

4. Discussion

In this note we have discussed the part of Puttonen's (2007) study that deals with the impact of research done by Finnish business professors within the international research community and we have suggested three alternative ways to measure this impact. When comparing our results with those of Puttonen (2007) it becomes clear that the method chosen has a strong influence on the results. This has also been demonstrated in a recent comparison of citation counts produced from Web of Science, Google Scholar and Scopus for 25 researchers in information science (Meho 2007). We argue that our analysis of the total number of times Finnish professors' work has been cited in ISI journals is a more valid estimate of their research impact than only counting citations to papers previously published in SSCI journals or the number of times five pieces of work have been cited in www.scholar.google.com as reported in Puttonen's (2007) study.

However, it is clear that there is no single ideal method, rather different methods emphasizing different aspects of an academic's scientific impact. Thus, the different methods should ideally be used in parallel to provide a more complete picture and the limitations of each method must be acknowledged. To combine the results of different analyses to one index is like-

ly to lead to potentially misleading conclusions. We would also like to caution against all *too* much emphasis being placed on the measurement of the global academic research impact of the work done by Finnish business professors if this is done at the expense of paying attention also to their contribution in university teaching, in the production of pedagogical material, in doctoral training, in management education, in the publication of practitioner-oriented papers, in corporate development, in policy-oriented work, in the activities of national and international academic institutions, and in the general development of society at large.

Any study has a number of limitations that at the same time point to possibilities for further research, including our own study. In addition to the issues that we have already raised above, let us suggest some limitations in both Puttonen's and our analyses. First, the studies only encompassed a sample of Finnish professors in business studies (see Puttonen, 2007), excluding among others professors in management information systems. Second, apart from this being a relatively easy way to define the population, there is no inherent reason to exclude Finnish business scholars who don't hold a professorship. Third, the analyses include citations by scholars to their own work which – albeit relatively few – could be eliminated in future studies. Fourth, no difference has been made between citations to research publications written by a sole author compared to co-authored publications. Fifth, alternatives to the Web of Science data base may be used to measure more broadly the academic impact of a researcher's work. Finally, to safeguard against possible mistakes in the data bases used and in how the analyses have been conducted, the studied academics themselves may be given the opportu-

nity to check the preliminary results for themselves and to suggest corrections. ■

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