Counting the Citations: A Comparison of Web of Science and Google Scholar in the Field of Business and Management

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Abstract:.

Assessing the quality of the knowledge produced by business and management academics is increasing being metricated. Moreover, emphasis is being placed on the impact of the research rather than simply where it is published. The main metric for impact is the number of citations a paper receives. Traditionally this data has come from the ISI Web of Science but research has shown that this has poor coverage in the social sciences. A newer and different source for citations is Google Scholar. In this paper we compare the two on a dataset of over 1200 publications from a UK Business School. The results show that Web of Science is indeed poor in the area of management and that Google Scholar, whilst somewhat unreliable, has a much better coverage. The conclusion is that Web of Science should not be used for measuring research impact in management.

Keywords: Citations, Google Scholar, research impact, Web of Science

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Introduction

Assessing researchers' productivity and impact is increasingly being metricated and the number of citations is one of the main measures that is used. This occurs at an individual level in promotion and hiring decisions and increasingly at an institutional level in evaluating whole departments and universities. In the UK, the Research Excellence Framework (REF) intends to use citation analysis along with peer review in future decisions about the allocation of research funding. There are many complex issues involved in using metrics for this purpose and the Higher Education Funding Council for England (HEFCE) has commissioned several reports and is currently undertaking a pilot exercise.

One of the major problems, especially in the social science, is the source of the citations. The primary database has conventionally been Thompson's ISI Web of Science (WoS) which records all citations from papers in about 8,700 journals. Whilst this coverage is reasonable in many of the sciences it is acknowledged to be limited in social science, partly because many journals are not included and partly because much research is published in books and conferences which are not covered at all. In recent years alternatives have been developed that work in a similar manner, e.g., Scopus, but one of the main rivals is Google Scholar (GS). This works in a different fashion by searching the internet and other digital repositories to find citations in a wide range of sources.

Several studies have compared the two sources in general (Jacso, 2005), and in particular disciplines (Bakkalbasi, Bauer, Glover, & Wang, 2006; Bar-Ilan, 2008; Meho & Yang, 2007), while HEFCE's commissioned reports have concentrated mainly on the sciences because of the known problems in the social science. Their pilot exercise, for example, includes almost no social science subjects (HEFCE, 2008b). No one that we are aware of has looked specifically at the business and management literature in terms of a direct comparison between Web of Science and Google Scholar. There has been other scientometric analysis of business and management, for example journal rankings (Harzing & Van der Wal, 2009; J. Mingers & Harzing, 2007), factors affecting citations received by a paper (J. Mingers & Burrell, 2006), and statistical models of citation behaviour (John Mingers & Xu, 2010).

So, the purpose of this paper is to investigate the extent to which WoS and GS do in fact record research outputs and citations in business and management, and to discover whether there are any particular patterns in their coverage or lack of it. To do this we have taken all the publications of academics at a UK Business School over the period 2001-2007 (the period of the RAE), together with a selection from earlier years, and processed them through WoS and GS. In the first section, after a review of the literature on this area, we also discuss the results of several surveys and reports carried out in the UK based on the submissions to the 2001 Research Assessment Exercise (RAE).

Web of Science and Google Scholar

General studies

In the past the main, and indeed only, significant source of citation data were the ISI Citation Indices that have now become known as the Web of Science. This covers over 12,000, primarily English-language, journals (roughly 2,600 are social science) out of approximately 22,500 refereed journals listed in Ulrich's Periodicals Directory (it is difficult to classify these journals – see Tenopir (2004)). It is beginning to include conference proceedings but does not include reports or books.. WoS records every paper published in these journals together with their citations and then allows access in a variety of ways including citation reports on journals and individual authors.

In recent years a range of bibliometric databases have emerged, some discipline specific such as the ACM Digital Library and some generic such as Elsevier's Scopus. These are of three types: i) those that involve searching the full text of the document for citations where the text may be contained in the database (e.g., Emerald full text or Scirus) or may be home pages and repositories on the web (e.g., Google Scholar); ii) those that allow the user to search the cited reference field of the document (e.g., EBSCO products); and iii) those like WoS that are primarily designed for capturing citations (e.g., Scopus). Several studies have been carried out comparing these different sources often in different disciplines and Meho and Yang (2007) provide a good overview. In this study we limit ourselves to comparing WoS with GS specifically in the discipline of business and management.

The two databases have very different modes of operation. WoS has a clearly specified list of journals and records all the citations from those journals. Its coverage is generally considered to be good in many of the natural sciences but poor in the social sciences and humanities (HEFCE, 2008a; Mahdi, D'Este, & Neely, 2008; Moed & Visser, 2008). It has tools that help with the unique identification of authors – one of the major problems in collecting accurate citations. In contrast, GS has a scope and reliability that is in general unknown. It searches web pages and also has access to the websites of certain publishers and can sometimes provide full text but the exact details remain secret. The results generally have a wide coverage but can include many works that are not specifically research oriented, e.g., teaching notes, discussions and reports. It is relatively difficult to pin down a specific author, especially if they have a common name, and often the bibliographic details of the citing sources are wrong or incomplete hence getting accurate results is extremely time consuming.

Meho and Yang (2007), in their study of the publications of a School of Library and Information Science, found that 42% of GS citations came from journals, 34% from conference papers, 10% from dissertations and theses and 14% from other sources. They found 2023 citations to their source documents (including only journal items and conference papers from 1996-2005) in WoS, 2301 in Scopus and 4181 in GS. Combining WoS and Scopus produced 2733 unique citations while including those from GS pushed the total up to 5285. Thus, WoS produced only 48% of the citations in GS, and only 38% of the citations generated by a combination of all three. Walters (2007) studied 155 core articles in the area of later-life migration across a range of citation databases. GS had the greatest coverage (93%) and WoS next best with 73%. Whilst this study did not look at citations, it did examine the range of sources used by GS in terms of publishers (sometimes a source of criticism (Jacso, 2005; C. Tenopir, 2005)) and found no undue bias. Ma et al (2009) report a study using the Chinese version of Google Scholar.

Whilst it is clear that WoS is worse than GS in social science this is not the case in natural science. Bar-Ilan (2008) evaluated the h-index, a measure of research productivity based on citations (Hirsch, 2005; J. Mingers, 2008), for 40 highly-cited Israeli scientists (based on an ISI list which introduces some bias). In all subject areas except mathematics and computer

science WoS produced significantly *more* citations than GS. This is probably attributable to the importance of conference proceedings in computer science.

Studies on the UK

The Centre for Science and Technology Studies at Leiden (CWTS) has presented several commissioned reports both for HEFCE and for the ESRC. In 2008 they analysed the submissions to the 2001 RAE (Moed, Visser, & Buter, 2008), looking in the main at the science subjects. They did however do some analysis across all units of assessment. Table 1 shows the coverage of outputs in WoS. We can see that economics has the best coverage with 68% of its total outputs in WoS rising to 78% of the journal papers. However, B&M generally has only 38% covered and accounting and finance a mere 22%. The latter result is because a significant number of high quality accounting and finance journals are not included in WoS.

Table 1 about here

A further CWTS report (Moed & Visser, 2008) specifically compared WoS with Scopus, a citation index launched recently by Elsevier. The comparative results can also be seen in Table 1 with Scopus having a better coverage, especially in accounting and finance. The results are still generally under 50% however.

Norris and Oppenheim (Norris & Oppenheim, 2007) also evaluated bibliometric databases for the ESRC concentrating on the social sciences. They worked at the level of journals and identified 4,594 clear and unique journal titles containing a total of 33,533 submitted papers. Table 2 shows the proportions of these journals that are included in three databases – WoS, Scopus and Cambridge Scientific Abstracts (CSA) Illumina.

Table 2 about here

Google Scholar (GS) was not evaluated in terms of individual UoAs, only in aggregate. A random sample 380 journals across all subjects were searched for in GS. Of these, 4% found no matching records, 10% found citation-only records – i.e., only citations in other papers bibliographies, while 86% found websites listing the journal.

The results for WoS are not inconsistent with those in Table 1, although at the journal level a lower % was found in economics and a significantly higher % in accounting. One possible explanation for this is that the economics papers are more concentrated in the main journals that are included in WoS, while in accounting they are more scattered into journals not

included. The Scopus results are again better than the WoS ones. GS has a much greater overall coverage although as has been discussed its scope and reliability are uncertain. The researchers also looked at the mean citations per paper for a sample of articles with the results shown (the figure for GS was 17.7). Clearly CSA was very out of line with few citations and GS produced significantly more because of its wider base of sources.

Mahdi et al (2008) conducted an analysis of the 2001 RAE to see to what extent citations correlated with the outcomes of the RAE. Their general conclusions were that there was a reasonable degree of correlation in some subjects in the sciences, but that the coverage of WoS in the social sciences and humanities was quite problematic. While 89% of outputs in bio-medical sciences were found in WoS, the corresponding figures for social science, and arts and humanities were 35% and 13%.

Table 3 about here

The more detailed results are shown in Table 3. We can immediately see an anomaly with Table 1 since both are supposedly measuring the % submitted papers found in WoS by UoA. The figures are significantly different, being higher in Mahdi et al, and we can find no explanation for this partly because Mahdi et al give very little description of their actual methodology. The results also give mean citations per paper (cpp) for the two UoAs which had at least 20 institutions with at least 20 matching papers. It was also found that economics and business and management were subjects where there was a relatively high correlation between citation rates and RAE ranking.

Evidence Ltd (2004) conducted research for ESRC producing a bibliometric profile for selected disciplines including business and management, accounting and economics. The main results are shown in Table 4. It is worrying that once again the results are not particularly close to those in Tables 1 and 3. This no doubt reflects in part the difficulties of unambiguously identifying individual papers in these databases, and differing practices over what to do with ambiguous references, but it is noticeable that there is not even agreement on the total number of submitted outputs to the RAE.

Table 4 about here

The research also looked in detail at the number of cites per paper for those papers that could be found in WoS but only for the departments graded as 4, 5 or 5*. The number of citations is obviously time dependent so these figures will be an average across the period of the RAE, i.e, papers published in 1995 (the start date) would have five years of citations, those published in 2000 only one year. These figures are higher than those in Table 3 because they only include the 4 and above departments. Accounting and finance is particularly low, partly because so few journals are included in WoS thus restricting the number of citations that can be found.

Citation rates normalised to the rates for the disciplinary field were also calculated (the

"Leiden methodology" (van Raan, 2003)). In this approach, results above 1.0 show that the publications are generating more citations than the average for the field. The figures for business and management were 1.47 (4-rated departments), 1.90 (5-rated) and 2.27 (5*-rated) showing both high impact and that the impact increases with the RAE grade. The equivalent figures for accounting are: 0.28, 0.82 and 1.07 showing that it is not simply the lack of WoS journals – accounting departments, especially at the lower end, gain relatively very few citations.

Assessing the outputs of three UK Business Schools

The data we have analysed consisted of over 4,600 research outputs produced by staff at three UK business school primarily from 2001 to 2007 although including some from earlier years. The three schools are of similar sizes but different characteristics. School A is relatively new as a business school but is at a world-leading university and scored very highly in the RAE. School B is also relatively new, at a traditional university, and has expanded considerably in recent years. School C is at a 1960s university and is moving from being mainly teaching oriented to being research intensive. B and C are in the top third of UK business schools. A summary of the schools is provided in Table 5. Details about the number and types of publications is in Table 6. It is interesting to note the very high number of authors involved with the papers compared with the number of staff actually submitted in the RAE. This shows that the majority of papers have multiple authors, and that these are commonly located in other institutions.

Table 5 about here

Each publication was individually looked up in GS and WoS (where it was a journal paper). This is a very time-consuming exercise, especially for GS, since the quality of the data is poor – there are often multiple entries for a single item because the forms of reference are inconsistent or inaccurate. Table 6 shows the main results. We have included all publication types even though many would not be submitted to a REF. We will initially look at the results overall, then discuss differences between the schools.

We can see that the majority of the outputs are journal papers (45%) with the next category being conference papers (22%). This implies that 55% of the outputs are immediately excluded from analysis in WoS. Looking first at the GS coverage, we found 66% of all the publications including 89% of the journal papers – a very significant proportion. Surprisingly perhaps, given the high presence of publishers' websites, only 74% of books and 76% of edited books were found. Other areas of low coverage were conferences and reports. In contrast, WoS would only cover journal papers and only found 48% of those in the sample. On some occasions the journal was apparently on the WoS list but the actual paper did not appear. This was generally found to be because the journal was not part of WoS at the time that the paper was published, sometimes because there was a gap in the journal history.

Table 6 about here

Moving to citations, GS found a considerable number for all publication types. The mean citations per paper were highest for books (32.2) and edited books (30.4) with the figure for journal papers being 14.7. WoS found 8434 citations for the 1004 papers it included, giving a cpp of 8.4. We also looked to see if these proportions had changed over time but in both cases there were year-to-year variations but no apparent trend. Thus it is not the case that either source is improving its coverage. It could be argued that if the purpose of using these measures is to compare departments or research centres then it doesn't really matter about the absolute level of coverage – it would be the same for all. However, this assumes either that the coverage rates are the same for all subject areas, or that all departments will have the same mix of subject areas so that differences would not matter. We can throw some light on this by considering the extent to which these general results differ between Schools.

Looking firstly at journal articles, we can see a significant difference in cpp between the schools. In GS, School A has a cpp of 21.5 (which is very high) compared with 10.9 and 10.2 for B and C. The results are similar but not identical with WoS where the figures are 11.4, 7.6 and 5.2 respectively. Thus, using GS, A is twice as good as B and C, which are almost identical; while using WoS, A has less of an advantage and there is a clear difference between B and C. Looking at the relative coverage, all three are very similar in GS (88%, 88%, 92%) but in WoS, B has significantly less (50%, 43%, 49%). Overall, if we are only interested in relative rather than absolute levels, then both GS and WoS show School A to be the best by a distance, but they disagree between B and C. Looking at the other types of publications where there cannot be a comparison, the main feature is that A and C have very similar values for cpp in all categories but that B is generally lower. Looking at cpp for all outputs, the differences between the schools narrows (16.3, 9.2, 8.8).

The research of a business school tends to cover a wide range of subject areas and not all of them are directly classified as business and management. The publications we are analysing can be split into different areas or fields depending on how the journals are classified within WoS. The results are shown in Table 7 where we can see that the papers come from nine different subjects, from agricultural economics to mathematics and information systems. This is very important if the Leiden methodology is used as it normalises citations per paper to the mean for the appropriate field for the paper, but how does one determine how many fields there should be and what they are? For example, should business and management be classified as one field or are there sub-fields within it which have significantly different citation behaviours? In Table 6 we have taken all the papers and classified them into a field based on the definitions and journals from Web of Science. We have included in this journals that are not themselves included in WoS. We have then amalgamated 62 sub-categories into 9 major ones.

Table 7 about here

An ANOVA shows that the three main effects (subject, school and source) are all significant at less than 1%. Also, the interaction between school and source, and between school and

subject are significant but that between source and subject is not.

Considering the cpp's across subjects, we can see that there are considerable differences, from 28.8/12.1 in business and 28.1/8.4 in IS and computer science down to 9.4/4.2 in agriculture and 10.7/5.8 in engineering. This certainly suggests that there are significant difference in subjects within business and management overall. Caution must be exercised as this is only a relatively small sample covering three business schools. It could be that these schools are particularly good or bad at these subjects in comparison with business schools generally, but the differences are so large that this is unlikely to explain the full effect. This suggests that any form of the Leiden methodology would need to be normed against sub-disciplines within management, not management as a whole, as different schools may have different mixes of subjects..

Comparing the sources, generally, the cpp for WoS is under half that of GS but there is quite a degree of variability. It is lowest in economics (29%) and highest in mathematics and statistics (55%). Clearly in some instances there are small sample numbers. For the general management field the WoS cpp is 9.9 which is 44% of the GS figure, a ratio that is in general agreement with many of the other evaluations in the literature. Although these interactions are not statistically significant on this sample, it certainly suggests that WoS would treat some subjects particularly badly.

As we would have expected, there were significant differences between the schools, and there was also an interaction with the subjects – for example, School B gets particularly low citations in IS and computer science.

Table 8 about here

At the lowest resolution level we can look at individual members of staff. In Table 8 we have looked individually at all the staff from Business School C to keep the Table to a reasonable size. These appear in order of number of publications and have been anonymised. We can see there is a high degree of variability, especially in cpp, which reflects differences both in papers and citations in the two data sources. Overall, the proportion of papers found is much higher and more consistent in GS, with the mean proportion being 71% against 24%. There are some interesting anomalies which show the wide degree of variability in results that come from WoS. Person 4 has 55 outputs but only 4% appear in WoS with zero citations. This is because they are mainly conference papers and reports. In contrast, person 11 has a very high level of cpp in WoS, as much as in GS, with 13 cites per paper. Although only 8% of their papers are in WoS they are all relatively highly cited.

Conclusions

This study has limitations in that it considers the publications of only three UK business schools, albeit reasonably representative ones, and in some of the sub-fields there are relatively few publications. Nevertheless, the results seem fairly clear.

The knowledge produced by academic researchers is increasingly being judged not just in terms of where it is published but in terms of what impact it is having. Currently, the major metric for impact is the number of citations that papers, authors, departments or journals receive. This, however, depends on the source from which the citations are counted. The traditional citation index – the Web of Science – is reasonable in the sciences but has poor coverage of social science. In this paper we have compared WoS with a more recent, and rather different, competitor – Google Scholar – on the publications of three university business schools. The results show that WoS picks up less than half of the journals, papers and citations found by GS. Moreover, the results differ significantly between subject areas within business and management making it difficult to compare departments or individuals that might have different subject mixes.

Google Scholar, on the other hand, suffers from unreliable data and a lack of transparency about its sources but overall it provides a more comprehensive and less subject-dependent citation resource. The conclusion is that at this point in time citation-based evaluation, especially using the Leiden cites per paper metric, is certainly not feasible using Web of Science. More consistent results could be gained from Google Scholar but here there are significant problems of data reliability and transparency.

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Table 1 CWTS analysis of WoS coverage of RAE2001 outputs

	Submitted outputs	**% of outputs that are journal papers**	**% of outputs that are in WoS**	**% journal papers that are in WoS**	**% of outputs that are in Scopus**
Economics	2,879	86.2%	67.5%	78.3%	72.0%
Business & Management	9,746	81.8%	37.9%	46.3%	45.5%
Library & Information Management	1,259	59.0%	31.7%	53.7%	34.4%
Accounting and Finance	779	85.2%	21.7%	25.5%	34.9%

Table 2 Norris and Oppenheim data analysis of the RAE2001

	% journals in WoS	**% journals in Scopus**	**% journals in CSA**
Economics	55.5%	71.7%	55.3%
Business & Management	41.7%	54.8%	54.5%
Accounting and Finance	41.4%	53.6%	47.3%
Mean citations per article	13.7	14.5	3.1

Table 3 Mahdi et al analysis of RAE2001

	% outputs in WoS	**Mean cites per paper (> 20 match)**	**Spearman correlation**
Economics	79.5%	5.46	0.677
Business & Management	54.8%	4.12	0.782
Library & Information Management	59.0%		
Accounting and Finance	33.0%		

Table 4 Evidence Ltd analysis of RAE2001

	Submitted outputs	**% of outputs that are journal papers**	**% of outputs that are in WoS**	**% journal papers that are in WoS**	**Mean cpp for 4, 5 and 5* departments**
Economics	3255	76%	47%	62%	8.0
Business & Management	9,942	80%	31%	38%	6.3
Accounting and Finance	811	82%	17%	20%	3.9

Table 5 Summary of the three schools

	Years covered by publications	**No. of staff entered in the 2008 RAE**	**No. of authors involved in the publications**	**Total no. of research publications**
School A	1981-2008	45	816	1933
School B	1984-2009	39	675	1455
School C	1980-2008	39	461	1212

Table 6 GS and WoS Citations by Publication Type.

Publication Types	Number n	% of outputs	No. of Pubs. found in GS	No of Pubs found in WoS	% GS	% WoK	No. of Citations found in GS	No. of Citations found in WoS	GS Citation Per Paper (cpp)	WoS Citation Per Paper (cpp)
Total Books	**95**	**2.1**	**70**				**2,257**		**32.24**	
Books A	45	2.3	38		84.4		1,285		33.8	
Books B	31	2.1	21		67.7		567		27.0	
Books C	19	1.6	11		57.9		405		36.8	
Total Edited Books	**76**	**1.7**	**58**				**1,763**		**30.40**	
Edited Books A	48	2.5	39		81.3		1,394		35.7	
Edited Books B	16	1.1	11		68.8		56		5.1	
Edited Books C	12	1.0	8		66.7		313		39.1	
TotalBook Chapters	**619**	**13.4**	**287**				**1,946**		**6.78**	
Book Chapters A	326	16.9	149		45.7		1,178		7.9	
Book Chapters B	184	12.6	74		40.2		289		3.9	
Book Chapters C	109	9.0	64		58.7		479		7.5	
Total Journal Articles	**2,109**	**45.8**	**1,882**	**1,004**			**27,606**	**8,434**	**14.67**	**8.40**
Journal Articles A	801	41.4	705	403	88.0	50.3	15,167	4,554	21.5	11.3
Journal Articles B	715	49.1	629	309	88.0	43.2	6,831	2,361	10.9	7.6
Journal Articles C	593	48.9	548	292	92.4	49.2	5,608	1,519	10.2	5.2
Total Conference Papers	**1,013**	**22.0**	**340**				**848**		**2.49**	
Conference Papers A	298	15.4	73		24.5		151		2.1	
Conference Papers B	356	24.5	99		27.8		240		2.4	
Conference Papers C	359	29.6	168		46.8		457		2.7	
Total Working Papers	**407**	**8.8**	**286**				**1,535**		**5.37**	
Working Papers A	317	16.4	235		74.1		1,340		5.7	
Working Papers B	5	0.3	1		20.0		0		0.0	
Working Papers C	85	7.0	50		58.8		195		3.9	
Total Reports	**171**	**3.7**	**59**				**491**		**8.32**	

Reports A	79	4.1	32		40.5		306		9.6	
Reports B	62	4.3	14		22.6		61		4.4	
Reports C	30	2.5	13		43.3		124		9.5	
Total Others	**110**	**2.4**	**41**				**133**		**3.24**	
Others A	19	1.0	10		52.6		77		7.7	
Others B	86	5.9	27		31.4		37		1.4	
Others C	5	0.4	4		80.0		19		4.8	
TOTALS	**4,600**		**3,023**	**1,004**			**36,579**	**8,434**	**12.1**	**8.4**
TOTAL A	1,933	100.0	1,281	403	66.3	50.3	20,898	4,554	16.3	11.3
TOTAL B	1,455	100.0	876	309	60.2	43.2	8,081	2,361	9.2	7.6
TOTAL C	1,212	100.0	866	292	71.5	49.2	7,600	1,519	8.8	5.2

Table 7 Coverage by field (subject area)

(some fields with few publications, e.g., chemistry, have been suppressed)

Subject	No. of Outputs	No. of GS Citations	No. of WoS Citations	GS Citation Per Output (cpp)	WoS Citation Per Output (cpp)	WoS/GS %
AGRICULTURE, ENVIRONMENT, NATURAL RESOURCES	**180**	**1684**	**759**	**9.4**	**4.2**	**45**
A	35	530	202	15.1	5.8	38
B	35	370	231	10.6	6.6	62
C	110	784	326	7.1	3.0	42
ENGINEERING	**69**	**738**	**398**	**10.7**	**5.8**	**54**
A	17	315	164	18.5	9.6	52
B	37	319	169	8.6	4.6	53
C	15	104	65	6.9	4.3	62
ECONOMICS	**170**	**2313**	**681**	**13.6**	**4.0**	**29**
A	68	1366	371	20.1	5.5	27
B	41	346	116	8.4	2.8	34
C	61	601	194	9.9	3.2	32
OPERATIONAL RESEARCH & MANAGEMENT SCIENCE	**137**	**2367**	**1162**	**17.3**	**8.5**	**49**
A	28	565	272	20.2	9.7	48
B	14	294	161	21.0	11.5	55
C	95	1508	729	15.7	7.7	49
APPLIED MATHEMATICS & STATISTICS	**74**	**1329**	**737**	**18.0**	**10.0**	**55**
A	25	905	515	36.2	20.6	57
B	12	67	53	5.6	4.4	79
C	37	357	169	9.7	4.6	47

MANAGEMENT, TOURISM, PUBLIC SECTOR, INDUSTRIAL RELATIONS	**498**	**11260**	**4937**	**22.6**	**9.9**	**44**
A	192	6214	2738	32.4	14.3	44
B	160	2759	1282	17.2	8.0	46
C	146	2287	917	15.7	6.3	40
SOCIAL SCIENCES	**167**	**2146**	**771**	**12.9**	**4.6**	**36**
A	68	1280	457	18.8	6.7	36
B	62	571	224	9.2	3.6	39
C	37	295	90	8.0	2.4	30
INFORMATION SYSTEMS & COMPUTER SCIENCE	**96**	**2693**	**806**	**28.1**	**8.4**	**30**
A	34	1200	529	35.3	15.6	44
B	21	161	72	7.7	3.4	45
C	41	1332	205	32.5	5.0	15
BUSINESS	**190**	**5480**	**2300**	**28.8**	**12.1**	**42**
A	108	4658	2031	43.1	18.8	44
B	47	663	252	14.1	5.4	38
C	35	159	17	4.5	0.5	11

Table 8 Cites per paper for all academics from School C (anonymised)

Researcher.	Pubs. Per Researcher	% in GS	% in WoS	GS cpp	WoS cpp
1	109	91.74	40.37	31.51	12.34
2	75	93.33	57.33	11.10	6.40
3	60	70.00	13.33	5.07	2.38
4	55	54.55	3.64	1.20	0.00
5	50	58.00	6.00	3.55	4.67
6	48	58.33	14.58	1.32	1.00
7	45	86.67	68.89	8.51	4.94
8	42	71.43	21.43	1.53	0.67
9	41	87.80	39.02	5.08	1.81
10	37	70.27	32.43	1.77	1.00
11	37	51.35	8.11	13.11	13.00
12	36	55.56	2.78	4.10	0.00
13	36	69.44	19.44	2.96	1.00
14	34	52.94	17.65	5.56	1.83
15	30	53.33	16.67	1.75	0.80
16	29	72.41	20.69	7.86	3.33
17	26	73.08	34.62	15.74	0.00
18	26	80.77	7.69	2.81	0.00
19	25	72.00	32.00	9.78	5.38
20	24	75.00	16.67	14.50	11.00
21	23	52.17	8.70	4.17	1.50
22	23	60.87	4.35	1.71	2.00
23	23	69.57	0.00	0.75	0.00
24	21	61.90	9.52	1.46	0.00
25	21	76.19	19.05	4.13	0.00
26	20	70.00	10.00	8.29	1.00

27	20	95.00	55.00	3.74	2.18
28	20	70.00	25.00	6.71	7.00
29	19	68.42	0.00	4.77	0.00
30	17	70.59	41.18	8.17	3.57
31	16	62.50	6.25	0.10	0.00
32	15	93.33	53.33	19.64	8.00
33	13	84.62	46.15	7.36	6.33
34	12	91.67	8.33	4.82	0.00
35	11	45.45	0.00	0.20	0.00
36	10	100.00	70.00	2.50	0.43
37	10	30.00	10.00	0.33	0.00
38	9	33.33	0.00	0.00	0.00
39	8	75.00	25.00	0.17	0.00
40	8	62.50	0.00	15.60	0.00
41	7	28.57	0.00	0.50	0.00
42	6	83.33	0.00	1.40	0.00
43	6	66.67	50.00	1.25	1.67
44	4	100.00	25.00	3.75	0.00
45	3	100.00	33.33	4.33	0.00
46	2	100.00	50.00	7.00	0.00
	1212	**71.45**	**24.09**	**8.78**	**5.20**