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Abstract:

Publication and citation rankings have become major indicators of the scientific worth of universities and countries, and determine to a large extent the career of individual scholars. We argue that such rankings do not effectively measure research quality, which should be the essence of evaluation. For that reason, an alternative ranking is developed as a quality indicator, based on membership on academic editorial boards of professional journals. It turns out that especially the ranking of individual scholars is far from objective. The results differ markedly, depending on whether research quantity or research quality is considered. Even quantity rankings are not objective; two citation rankings, based on different samples, produce entirely different results. It follows that any career decisions based on rankings are dominated by chance and do not reflect research quality. Instead of propagating a ranking based on board membership as the gold standard, we suggest that committees make use of this quality indicator to find members who, in turn, evaluate the research quality of individual scholars.

Keywords: Rankings, Universities, Scholars, Publications, Citations

JEL Classification: H43, L15, O38

INTRODUCTION

Rankings in terms of publications and citations have become widely accepted as indicators of scientific worth of universities and whole countries (e.g. Groot and Garcia-Valderrama, 2006; Guan and Ma, 2007; Moed et al., 1985; Nederhof and van Raan, 1993; Tijssen and van Wijk, 1999). Rankings also determine to a significant extent the career of individual scholars (e.g. Ventura and Mombru, 2006). Such rankings are *quantitative*; they indicate the position of a scholar, university or country relative to others. On the other hand, *quality* can be considered the essence of scientific research (e.g. Johnes, 1988). It should not so much matter how many publications have been produced, and how many citations have been accumulated, but rather what new insights have been produced and how valuable these are for society i.e. whether the research is useful, satisfies stated or implied needs, is free of deficiencies, and meets more general, social requirements (see e.g. Reedijk, 1998). An effort has been made to include quality aspects in rankings. Most importantly, only those publications and citations are counted which appear in scientific journals of "acceptable" quality, but at the same time publications in books, or for policy purposes are excluded, even though they may well contain important scientific information. A further step is to consider "impact" factors which take into account how highly ranked a journal is in which a publication or citation appears. Nevertheless, the resulting rankings take the quality aspects of research activity into account to a limited extent only. For simplicity, in the following the ranking based on publications and citations will be called "*quantitative*". It will be compared to what will be called a "*qualitative*" ranking based on *membership in the scientific boards of academic journals* which consider the reputation and recognition of scholars among their peers. Scholarly reputation depends on a great many factors, but the qualitative aspect is certainly central[1].

This paper argues that the current bibliometric rankings, based on *publications* and *citations,* should be looked at much more carefully than is the rule today. Publication and citation rankings[2] have become a major, and sometimes even the only, indicator of

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[1] Quantitative and qualitative rankings are not strictly separable as both contain elements of the other. The distinction is solely made for reasons of simplicity.

[2] Examples of prominent rankings are (1) ISI Web of Knowledge Journal Citation Report   (The Thomson Corporation, 2008b), (2) ISI Web of Knowledge Essential Science Indicators (The Thomson Corporation, 2008a), (3) IDEAS Ranking (IDEAS and RePEc, 2008), (4) Academic Ranking of World Universities

the scientific worth of universities and countries, and determine to a large extent the career of individual scholars. Whether a person gets a position as an assistant professor at a university, whether he or she receives tenure and is promoted to full professor, or whether he or she gets research funding, depends to a large extent on their publication and citation record, as published in the various rankings[3]. We show that the various rankings produce quite different results, depending on what underlying data are used and, in particular, what proxy is used to capture aspects of scientific quality. For that reason, an alternative ranking is developed as a quality indicator, based on *membership on academic editorial boards* of professional journals. This ranking may be argued to constitute a good approximation of the appreciation, and hence the quality, attributed by professional peers.

A major result of our empirical study is that the ranking of individual scholars is far from consistent. The decisive factor is the kind of indicator used. The results differ markedly, depending on whether publications, citations or membership on scientific boards of professional journals are considered. Due to the high level of aggregation, the ranking of countries and institutions is less affected than the ranking of individual scholars by the type of ranking that has been employed. It follows that, if career decisions are made based on one particular ranking, the result is haphazard and does not correspond to the high standards of decision-making desirable for determining academic careers.

Section 2 gives an overview of the rankings currently in use, based on publications and citations, and identifies their shortcomings. How, and to what extent, quality is captured by an alternative definition of scientific worth, namely membership on editorial boards, is discussed in section 3. Section 4 presents rankings based on editorial board membership for a sample of 115 economics journals. The corresponding rankings are compared to current rankings in section 5, and it is shown that they deviate in important respects. The last section argues that, due to the substantial instability of scientific rankings, much more care should be taken when using them for decision-making, in particular with respect to the careers of individual scholars.

(Shanghai Jiao Tong University, 2007), (5) WU Journal Rating (Wirtschaftsuniversität Wien, 2008), (5) Handelsblatt Ranking (Handelsblatt, 2007) etc.

[3] A prominent and well documented case is that of the Research Assessment Exercise in the United Kingdom, which uses the list of journals identified by Diamond (1989) (see Lee, 2007) .

CURRENT SCIENTIFIC RANKINGS

Evaluating scientific quality is a notoriously difficult problem. "One such difficulty is that the production of research typically involves multiple inputs and multiple outputs, which makes it problematic to use standard parametric/regression techniques. Another, more serious problem is that minimal 'engineering' knowledge is usually available about the precise interrelationship between the research inputs that are used and the research outputs that are produced" (Cherchye and Abeele, 2005: 496). Ideally, real experts in the field should scrutinize published scientific results. In practice, however, committees with general competence, rather than specialists, often evaluate primary research data. These committees tend to resort to secondary criteria[4], and it is hardly surprising that today's dominant ranking principle for evaluating research focuses on quantities, which appear to be objective indicators directly related to published science[5]. When the number of *publications*, and the number of *citations*[6] are collected, an effort is also made to take the importance, or the quality, of what is published into account.

The *publication measures* normally categorize according to what scientific publications they appear in. Thus, for example, most rankings disregard book publications, publications for the public in general, publications in handbooks and other collections of articles, as well as non-refereed journals (Johnes, 1988; Reedijk, 1998). Publications in refereed journals are categorized according to their prominence, which is measured by impact factors (see, for example, the extensive set of corresponding measures used by IDEAS in RePEc). However, these rankings do not reflect the research quality of a person or an institution. For example, they neglect the fact that even in journals with a high impact factor, many papers will never get cited. Seglen

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[4] Rigby and Edler (2005) analyzed to what degree bibliometric information of 169 research groups in economics, econometrics and business administration relates to assessment results of three evaluation committees. More than half of the variance of the overall quality judgments of the committees can be predicted by using a handful of bibliometric variables, notably number of publications in top-class and in excellent international refereed journals, number of international proceedings and number of Dutch journal articles.

[5] An excellent overview of the problems and pitfalls of using citation statistics is given in Adler, Ewing, & Taylor (2008).

[6] Many journal rankings according to citations have been undertaken (e.g. Cheng et al., 1995; Diamond, 1989; Laband and Piette, 1994; Liebowitz and Palmer, 1984; Paul, 2004; Podsakoff et al., 2005; Sombatsompop et al., 2004).

(1994) points out that only a weak correlation exists between the impact factor of a journal and the individual papers in that journal (mean r = 0.32; range 0.05-0.66). He shows that 15% of the articles account for 50% of the impact factor of a journal. Further, based on a sample of 56 research programmes Rinia et al. (1998) demonstrate that the impact of journals in which is published by a programme does not correlate with the quality of these programmes as perceived by peers. Thus, the impact of articles is not detectably influenced by the impact of the journal in which they are published, since the citation rates of an article determine the impact factor of a journal, but not the reverse (Seglen, 1997). The attempt to capture a qualitative aspect in current rankings depends on *citations*. Citations in more prominent journals (where prominence is again measured in terms of citations) receive a higher weight in the rankings than those in lesser reviews. Thus, the procedure is recursive. This whole process originally started with journal analyses, but nowadays has been extended to include countries, universities, institutes and even individual researchers. In a sense, the academic world has gradually become obsessed with impact factors. Citation records are considered a proxy for the ability to do quality research, not only by authors, librarians and journal publishers, but also by science policy makers (e.g. Nederhof and van Raan, 1993). According to this view, citations represent evidence that the person, the journal, the institute, or the country cited has carried out work that is viewed as relevant to the current research frontier, and useful to those attempting to extend the frontier (Diamond, 1986). However, to the extent that citations inadequately account for scientific quality, the corresponding rankings distort the informative function they claim to provide

There are three major shortcomings of using citations as indicators of scientific quality.

First, they do not take into account whether a scholar's contribution is positive, thus furthering the course of scientific knowledge, whether it is neutral or whether it hinders scientific progress. The latter is the case if it promotes an unproductive or even wrong approach, theory, method or result, which either serves as a research basis for other scholars, or is used by the public for policy purposes or guidance. If qualitative aspects were taken seriously, unproductive citations would need to be given a zero rating, and counter-productive citations a negative weight. This is a very difficult pursuit, but nevertheless we should not allow it to divert us from the fundamental task of trying to measure the scientific activity of seeking "truth" (irrespective of how it is defined).

There is a second important reason why counting the number of citations may lead to distortions. Scholars are human beings subject to the same influences as other people. Following fashion or herding behavior are examples of such influences (Banerjee, 1992; Bikhchandani et al., 1992; Chamley and Gale, 1994), where scholars quote papers simply because they have been cited by other researchers. Citing a particular paper then does not necessarily reveal its relevance for the development of science, but only says something about its "academic popularity". Empirical research is consistent with this conclusion. Simkin and Roychowdhury (2005; 2006; 2007) show that the probability of a scholar being cited is affected by the number of citations he or she already has. This has been called the "Matthew Effect" in science (Merton, 1968). Insiders are well aware of this tendency, especially in modern academia where academics are forced to publish, or risk ending their career. Receiving a high number of citations does not necessarily imply "scientific" genius, but is consistent with the result of a random process. This leads to the emergence of "star" papers and authors (Baccini and Barabesi, 2008; Barabasi and Albert, 1999; Bonitz et al., 1999; Faria, 2005), whose prominence is not totally unlike that of social celebrities, whose only claim to fame is that they are famous, but few know or care how they reached stardom. In the case of celebrities, this is of little relevance because their main function is to entertain. But in the case of science, committed to the search for "truth", such citations should be put into a different category; they should not count as positive contributions.

Third, the fact that a particular work has been cited does not mean that it has been read. While no scholar would be foolish enough to publicly admit that he or she cited articles without having studied them (or forgot the exact or approximate content), there is now empirical evidence that this does occur to a significant extent. One relevant indicator of that practice is of identical misprints turning up repeatedly in citations, suggesting that the respective authors did not read the text cited. Such misprints are most likely to occur when the authors copied from reference lists contained in other papers. On the basis of a careful statistical analysis, Simkin and Roychowdhury (2005) conclude that about 70-90 percent of scientific citations are copied from the lists of references used in other papers, i.e. 70-90 percent of the cited papers have not been read by the authors.

The list of shortcomings could easily be extended further: Different citation habits of authors in different fields and sub-fields; the selectivity of citations by authors (e.g. easily available papers are cited more often); errors made by authors in citation lists;

mistakenly counting and classifying citations and accrediting them to journals and authors; the inclusion of self-citations (especially by determining the journal impact factor[7]; or strategic citations behavior. Due to these shortcomings in using citations as reliable indicators of scientific quality[8], there is good reason to think about alternative approaches. The next section discusses the possibility of taking quality into account by considering the reputation of scholars among their peers which is approximated by counting the membership in scientific editorial boards.

The editorial board of a professional journal plays a considerable role, both in the dissemination of information and in its evaluation by colleagues. "It appears reasonable that these positions are held by persons who have the confidence and trust of their colleagues in the journal's areas of coverage for the journal to be successful in attracting quality submissions." (Kaufman, 1984: 1190). In this respect, the editorial board constitute the "true" experts in the field, and being appointed as an editorial board member is not only a great honor, but can also be seen as an indicator of scientific *quality*.

The board fulfils two different functions: (1) it assists the editors in choosing the most suitable articles for the respective scientific field. (2) Membership on the board is purely honorific and reflects one's standing in the profession as evaluated by one's peers. Honorary members are often chosen to signal the orientation of the review (e.g. the specific discipline or whether its emphasis is on theoretical or empirical work). More importantly, journals want to profit from the reputation of honorary board members (Kaufman, 1984). The more distinguished these members are within their discipline, the higher the journal's reputation, since renowned scholars are not expected to join the board of poor quality journals (and were they to do so, their own reputation

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[7] Some editors freely admit that they induce authors to cite as many publications in their journal as possible in order to raise their impact factor (Garfield, 1997).

[8] Moed et al. (1985) argued that citation counts indicate "impact" rather than quality. Impact is defined as actual influence on surrounding research activities. Even though publications must have a certain basic quality in order to generate impact, other factors determine impact as well, like the state of the art of the scientific field concerned, the visibility of journals or the extent to which researchers carry out public relations tasks. Further, Moed et al. (1985) make a distinction between short and long-term impact. Short-term impact refers to the impact of researchers at the research front up to a few years after publication of their research results. Long-term impact refers to the "durability" of research and can only be determined after a (very) long time. However, this period is often too long for science policy, which is concerned with evaluation of recent research.

and the journal's reputation would decline). Both when board members contribute to editorial decisions and when they are mainly, or only, honorary members, the choice of members is based on *quality*. A (chief) editor wants to have scholars at hand who help him or her make the best possible decisions, and disreputable persons or persons lacking expert knowledge are useless. In equilibrium, those scholars represented on boards have a high professional reputation, and therefore membership on boards can be taken to be a reasonable approximation to the quality of a scholar as judged by his or her peers.[9] Gibbons and Fish (1991: 364) take it as a matter of course: "Certainly, the more editorial boards an economist (is) on, the more prestigious the economist".

Board membership is, however, not solely guided by considerations of quality. In particular, board membership may be influenced by the need for "appropriate" representation, not necessarily highly correlated with scholarly quality. This holds in particular for "home journals" closely related to a specific department or university (such as the Oxford Economic Papers) and for journals owned by professional associations, which have to ensure that they reflect, at least to some extent, their members' diversity with respect to gender, fields of interest, schools of thinking, regions and nationalities. Therefore, neither "home" nor association journals are considered in what follows.[10]

RANKING BASED ON MEMBERSHIP OF EDITORIAL BOARDS

Sample

In order to analyze the extent of instability between various rankings of scholars, institutions and countries, we selected a sample of journals, which are considered to have a high reputation within the field of economics. For this purpose, we used the lists of two well-known journal rankings, the ISI Web of Knowledge Journal Citation Report (The Thomson Corporation, 2008b) and the Handelsblatt Ranking (Handelsblatt, 2007). The ISI Journal Citation Report is often considered to be an objective ranking, as it is based on citations. From 175 journals listed in the subject category "economics", we selected all journals with an impact factor ≥ 0.9, i.e. 67 journals (excluding 10 "home" and association journals). The Handelsblatt Ranking, a very popular ranking in German

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[9] This procedure has already been put forward in the past and undertaken for small and special sets of journals by Kaufman (1984) for finance faculties, Kurtz and Boone (1988) for marketing faculties, and Gibbons (1990) for statistics faculties.

[10] We define a home journal as a journal whose editorial board is affiliated to the same institution.

speaking countries that is often used in making career decisions, can be viewed as more subjective since it is not only based on citations, but also on general impressions of scientists doing economic research. From the 220 economics journals, we selected all journals ranked as AA+, A+, A, B+, and B, i.e. 95 journals (excluding 17 "home" and association journals). As both rankings overlap to a large extent, our final sample covers 115 journals (excluding 19 "home" and association journals).[11]

We consulted the homepage of each journal and collected the names[12] of 4855 persons who serve as editors, co-editors, or board members. In order to identify multiple board memberships, the data were checked by consulting each person's personal website. Any misspellings of the names of persons, institutions, and countries were corrected, and first names and current institutions of employment were added. The final sample covers 3783 different persons; 546 persons (14%) serve as board members or editors of more than one journal.[13] As with previous editorial rankings, 55 percent of these persons are affiliated with US-based academic institutions (Hodgson and Rothman, 1999).

Following Gibbons and Fish (1991), the absolute number of memberships on editorial boards was calculated ($\sum$ Board Membership). As the board size varies from 3 to 232 (e.g. *Management Science*), we also report a relative measure of membership by counting weighted board positions. It may be considered more prestigious to be a member of a small board rather than a large board. The weight of a position within a particular journal is calculated by dividing the position by the absolute number of similar positions offered within the same journal ($\sum$ Significance).

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[11] Other studies use a much smaller number of journals. For instance, Stigler et al.   (Stigler et al., 1995) examine 9 leading core journals in economics. In a recent study, Hodgson and Rothman (Hodgson and Rothman, 1999: 165 f.) take "the 30 most visible and well-known economics journals" into consideration. In the subject category "Economics", the ISI Web of Knowledge consider about the same number of journals as we do, i.e. 191 journals in 2008. Other sources list a larger number. For instance, the Judge Institute of Management Studies (1994) compiled a list of 1,431 management and social science journals, of which 231 have words based on "econ" (such as "economy", "economics" or "econometrics") in their title.

[12] This compares to 757 persons in Hodgson and Rothman (Hodgson and Rothman, 1999).

[13] The sample, including "home" and association journals, covers 3983 different persons; 600 persons (15%) serve as board members or editors of more than one journal.

Definition of board membership

Various definitions of "member of a scientific editorial board" are possible: (1) the broadest possible definition of *editor* includes all positions, i.e. editors, co-editors and board members.[14] (2) The *broad* definition only includes co-editor and board member positions. (3) The *narrow* definition solely includes board member positions. We take two considerations into account with regard to the measurement of research quality that we favor and as discussed above, and use the *broad definition* in what follows[15]. First, the editor definition has the disadvantage that editor titles have different meanings in different journals. For example, with some journals the editor is largely concerned with the practical management of the journal and less with its academic content. This meaning does not measure "research quality". Second, the narrow definition may exclude too many persons playing an active academic role in shaping the journal. Between the journals, there is a smooth transition between the descriptive categories co-editor and board member. For example, in some journals the whole board consists of co-editors or advisory editors. As different definitions result in different rankings, we checked for possible biases (see Appendix A, Table I). It turns out that different definitions of board membership do not bias the rankings of scientists, institutions, or countries.

Board membership ranking results

The ranking of Scholars. Table 1 presents the results of the scholar ranking according to the number of boards on which they serve. The table shows all scholars who hold 4

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[14] Among journals, the terms "editors, "co-editors" and "board members" can be understood in many ways. The lack of uniformity of terms makes the identification of similar positions problematic. In order to distinguish between different types, we used the following terminology: (1) We defined the following as "editors": Editor, Managing Editor, Book Review Editor, Contributing Editors, Foreign Editor, Chairman, Founding Editor, Production Editor, Review Editor, Conference Editor, Patron, Coordinating Editor, Debates and Controversies Editor, European Editor, Guest Editor, Publishing Editor, Replication Section Editor, Software Editor and Software Review Editor. Persons who are not a part of the scientific community, i.e. without publications, were excluded (e.g. managing editors from the publisher). (2) We defined the following as "co-editors": Co-Editor, Co-Chairman and Vice-President. (3) We defined the following as "board members": Board Member, Advisory Editor, Executive Council, Panel Member, Scientific Committee, Honorary Editor and Honorary Advisory Editor.

[15] The ranking of the broadest editor definition, and of the narrow definition, have a high correlation with the broad definition.

and more board positions. We document the number of positions per scholar ($\sum$ Board Membership) and the resulting quality ranking according to this number (Quality Ranking 1 with a maximum rank of 7), as well as the significance of these board positions per scholar ($\sum$ Significance) and the resulting quality ranking according to the significance (Quality Ranking 2 with a maximum rank of 382). The two measures are then combined in order to reach a more definite ranking: The combined quality rankings per scholar (Combined Quality Ranking 1 & 2 with a maximum rank of 389) is derived by using the absolute number of board positions as a first sorting criterion ($\sum$ Board Membership) and then the significance of these positions as a second sorting criterion ($\sum$ Significance). Scholars with equal scores in both criteria, i.e. $\sum$ Board Membership and $\sum$ Significance, receive the same ranking.

The ranking of scholars in Table 1 shows three Nobel-Prize winners among the first ten scholars – Kenneth Arrow, Reinhard Selten and Vernon Smith - but also some lesser-known persons. The representation of Nobel Prize winners can be taken as an indication that board membership does indeed reflect quality aspects of research. On the other hand, the large number of lesser-known scholars gives a first hint that rankings based on the number of board positions are not necessarily related to quality. A ranking according to the absolute number of editorial board positions (Ranking 1) draws different quality conclusions than a ranking according to the sum of the relative weights of these positions (Ranking 2). Figure 1 gives a graphical overview of how the two quality rankings are related.

Table 1 about here

The figure contrasts the ranking of a scholar according to the absolute number of memberships on editorial boards (Quality Ranking 1) with the ranking of a scholar according to the significance of these positions (Quality Ranking 2). The graph reveals that a high number of board positions does not necessarily imply that these positions are of high significance. For example, the several scholars ranked third according to the number of board positions (Quality Ranking 1), may be ranked very well (with a rank around 12) to quite poorly (with a rank around 98) according to the significance of these positions (Quality Ranking 2). Similarly, the several scholars ranked sixth according to the number of board positions (Quality Ranking 1), may be ranked high (with a rank around 4) to quite low (with a rank around 379) according to the significance of these

positions (Quality Ranking 2). Figure 1 confirms that a ranking of individual scholars is highly dependent on the type of ranking used.

Figure 1 about here

University ranking. Table 2 presents the results of the university ranking. The table shows the top ranked 20 universities according to the number of board positions. We document the number of positions per university ($\sum$ Board Membership) and the resulting quality ranking (Quality Ranking 1 with a maximum rank of 48), the significance of these positions per university ($\sum$ Significance) and the resulting quality ranking (Quality Ranking 2 with a maximum rank of 398). The combined quality ranking (Combined Quality Ranking 1 & 2 with a maximum rank of 403) is specified by taking the number of positions held as a first sorting criterion ($\sum$ Board Membership), and the significance of these positions as a second sorting criterion ($\sum$ Significance). Table 2 further documents the number of board positions per faculty member ($\sum$ Faculty Member) and the resulting quality ranking (Quality Ranking 3). Department size was measured as the number of economists within a faculty (Roessler, 2004).

It comes as no great surprise that Harvard University and Stanford University are at the top of the list when looking at the results according to the number of board positions (Quality Ranking 1), and are similar to previous rankings based on editorial boards (Gibbons and Fish, 1991), or based on quantity measures like publications or citations. A ranking according to the significance of board positions (Ranking 2) would change the former results to some degree, with MIT and Harvard University at the top. Even more changes occur if the ranking is according to the number of board positions per faculty member. This ranking would result in the Federal Reserve Bank (not included in table 2) and the University of Washington being at the top. Figure 2 gives a graphical overview of the consistency of Quality Ranking 1 and Quality Ranking 2.

Table 2 about here

The figure compares the ranking of a university according to the number of board positions (Quality Ranking 1) with the ranking of a university according to significance of these positions (Quality Ranking 2). The results in Figure 2 indicate that a university ranking seems to be more reliable than a ranking of individual scholars: In most cases, a

high number of board positions reflect the high significance of these positions. For example, the university ranked first according to the number of board positions (Quality Ranking 1), is ranked second according to the significance of these positions (Quality Ranking 2). Similarly, the several universities with rank 26 according to the number of board positions (Quality Ranking 1), are ranked from 26 to 41 according to the significance of these positions (Quality Ranking 2). Thus, the results suggest that a university ranking is less dependent on the ranking type used than are the rankings of individual scholars.

Figure 2 about here

Country ranking. Table 3 presents the results of the country ranking. The table documents the first 20 countries according to the number of board positions held by scholars active in the various countries. It shows the number of positions per country ($\sum$ Board Membership) and the resulting quality ranking (Quality Ranking 1 with a maximum rank of 29), as well as the significance of these positions per country ($\sum$ Significance) and the resulting quality ranking (Quality Ranking 2 with a maximum rank of 37). The combined Quality Ranking 1 & 2 (with a maximum rank of 50) is constructed by using the absolute number of positions as a first sorting criterion ($\sum$ Board Membership), and the significance of positions as a second sorting criterion ($\sum$ Significance). Table 3 also shows the number of board positions per 1 million inhabitants ($\sum$ per 1 million inhabitants) and the resulting quality ranking (Quality Ranking 3).

The results of the country ranking using the various measures are quite similar. A ranking according to the number of positions (Quality Ranking 1) as well as a ranking according to significance of board positions (Quality Ranking 2) results in the USA, the UK and Canada being on top. A ranking based on the number of positions per 1 million inhabitants hardly changes the former results: The USA is still at the top and the UK comes second. However, Israel, and not Canada, comes third.

Table 3 about here

Figure 3 contrasts the ranking of a country according to the number of board positions (Quality Ranking 1) with the ranking of a country according to the significance of board positions (Quality Ranking 2). Both rankings are highly

correlated: A high number of board positions per country reflect the high significance of these positions. Thus, a ranking of countries is quite independent of which of the two measures are used.

Figure 3 about here

COMPARISON WITH RANKINGS BASED ON PUBLICATIONS AND CITATIONS

This section compares the results of the board ranking with the results of previous rankings based on publications (IDEAS and RePEc, 2008), citations (The Thomson Corporation, 2008a), or on weighted quantity aspects (Shanghai Jiao Tong University, 2007). For this comparison, we rely only on the specified combined quality rankings (Combined Quality Ranking 1 & 2), which use the number of board positions as a first sorting criterion and – only if necessary - the significance of these positions as a second sorting criterion. Underlying this is the assumption that the existence of a board position indicates the existence of a "true" expert in the field. Therefore, absolute figures are a sufficient proxy of scientific quality, while normalized figures may include additional aspects which do not measure quality aspects. Further, the use of normalized figures often results in an indefinite number of rankings (see, for example, the extensive set of normalized rankings used by IDEAS in RePEc).

Rankings of Individual Scholars

Comparison with the ISI Citation Ranking. At the scholar level, Figure 4 contrasts the ranking of a scholar according to membership on editorial boards (Combined Quality Ranking 1 & 2) with the ranking of a scholar according to the ISI Citation Ranking (with a maximum rank of 200), which includes the Top-200 economists according to the number of Web of Science citations (The Thomson Corporation, 2008a). The Web of Science data base considers all citations from articles published in refereed scholarly journals in the areas of science, social science, arts & humanities, and chemistry. However, the data base only takes into account journals which have been elected as members of the Web of Science data base. According to the results in Figure 4, ranking consistency is definitely not observed: First, *no* scholar is listed in the Top 10 of both types of rankings. Second, the majority of scholars identified through board memberships – even those scholars with higher rankings - are not mentioned in the ISI citation ranking. Third, it seems to be the general rule that scholars listed in the ISI

ranking in the foremost rankings are listed last in a quality ranking, or are not even listed in a quality ranking.

Figure 4 about here

Comparison with the IDEAS Paper Ranking. Figure 5 compares the ranking of a scholar according to membership on editorial boards (Combined Quality Ranking 1 & 2) with the ranking according to the IDEAS Paper Ranking (with a maximum rank of 1000), which includes the Top-1000 economists according to the number of journal articles, books and published working papers (IDEAS and RePEc, 2008). The IDEAS data base considers 344,000 journal articles from leading economics journals, 2,700 economics books and 237,000 economics working papers. The data base only takes the journals, books and working papers of members into account. Membership is voluntary but has to be registered. According to the results in Figure 5, ranking consistency is again not observed: *No* scholar is listed in the Top 30 of both types of rankings. According to our data and analysis, it appears to be a *general rule* that individual scholars listed at the top of the IDEAS paper ranking are listed *last* in our quality ranking. This is consistent with the fact that most scholars are identified in one but not in both rankings.

Figure 5 about here

Comparison with the IDEAS Citation Ranking. Figure 6 compares the ranking of a scholar according to membership on editorial boards (Combined Quality Ranking 1 & 2) with the ranking according to the IDEAS Citation Ranking (with a maximum rank of 1000), which includes the Top-1000 economists according to the number of citations (IDEAS and RePEc, 2008). The IDEAS data base considers all citations from refereed journal articles, books and working papers electronically published in the IDEAS data base. As before, ranking consistency is definitely not observed for individual scholars.

Figure 6 about here

Appendix B looks at the relationship between the rankings of individual scholars based on quantitative measures, i.e. the number of citations or publications counted, dependent on the data base. As in previous cases, much of the ranking of individual scholars depends on exactly what measure is used.

To summarize: our analysis suggests that different rankings come to very different conclusions with respect to the performance of a particular scholar. Basing the promotion of scholars and funding decisions for their work on a quantitative measure, in the form of the number of publications or citations, is unwarranted. Membership on the editorial board of academic journals may be a better proxy for research *quality* but so much also depends on what specific measure is used (in our case Quality Ranking 1 or Quality Ranking 2).

University Rankings

Comparison with the ISI Citation Ranking. At the university level, Figure 7 compares the ranking of a university according to membership on editorial boards (Combined Quality Ranking 1 & 2) with the ranking of a university according to the ISI Citation Ranking (with a maximum rank of 100), which includes the Top-100 economics and business universities according to the number of Web of Science citations (The Thomson Corporation, 2008a). As with individual scholars, the Web of Science data base considers all citations from articles published in refereed scholarly journals in the areas of science, social science, arts & humanities, and chemicus; however, only from selected journals. Figure 7 shows that the results between quantity and quality rankings are more consistent for universities than for individual scholars. For example, at least 8 of the Top-10 universities listed in the board ranking are listed in the Top-10 of the ISI ranking. However, many universities listed well in the board ranking are not even mentioned in the ISI ranking. The overlap between the two types of rankings is small, especially for the middle rankings.

Figure 7 about here

Comparison with the Shanghai Ranking. Figure 8 compares the university ranking according to membership on editorial boards (Combined Quality Ranking 1 & 2) with the Shanghai Reputation Ranking (with a maximum rank of 100), which includes the Top-100 universities according to weighted quantity aspects like publications, citations, Nobel Prize winners etc. (Shanghai Jiao Tong University, 2007). There is little consistency between the two rankings: Many universities listed high according to the board ranking are not mentioned in the Shanghai Ranking.

Figure 8 about here

Figure IV of Appendix B looks at the relationship between the quantity-based rankings of ISI and Shanghai. Again they hardly overlap, as more than half of all institutions are only considered in one but not in both rankings.

For universities, rankings on the basis of different measures come to quite different conclusions with respect to the specific research "performance" of a university. However, compared with the almost non-existent overlap of the rankings for individual scholars, the rankings at the university level are considerably more consistent. This finding is in line with the results of Rinia et al. (1998). The authors show that different measures of research performance, i.e. bibliometric measures and peer-review measures, generally show the strongest correlation on aggregate levels like on the team level.

Rankings of Countries

Comparison with the ISI Citation Ranking. Figure 9 compares the ranking of a country according to membership on editorial boards (Combined Quality Ranking 1 & 2) with its ranking according to the ISI Citation Ranking (with a maximum rank of 81), which includes all countries according to the number of Web of Science citations (The Thomson Corporation, 2008a). According to Figure 9, the results for quantity and quality rankings are quite consistent. Those countries included in both rankings are evaluated in a similar way.

Figure 9 about here

Comparison with the ISI Paper Ranking. Figure 10 compares the ranking of a country according to membership on editorial boards (Combined Quality Ranking 1 & 2) with the ranking of a country according to the ISI Paper Ranking (with a maximum rank of 81), which includes all countries according to the number of published Web of Science publications. The results are close to those in Figure 9.

Figure 10 about here

Finally, the overlap of the two quantity rankings is nearly perfect (no figure). Thus, at the country level, different rankings come to quite similar conclusions with respect to the specific research performance of a country.

WHAT TO CONCLUDE?

We have argued that both citations and publications measure scientific focus on quantity whereas editorial boards focus more on scientific quality. The results of the empirical analysis indicate that the results of quantity rankings *do not* match the results of quality rankings based on membership on editorial boards. Especially for individual scholars, our study suggests that rankings based on quantity are *incommensurable* with rankings based on quality. Further, it has been demonstrated that the various rankings based on quantity are highly questionable. They are unable to capture "true" quantity, as the citation rankings based on different samples come to entirely different results.

This paper presents one possible approach for identifying *research quality*, namely the editorial board membership of scholars, presumably based on reputation and recognition by peers. But these rankings based on board membership also have their limitations. The aggregate measures of board membership for universities and countries are fairly consistent with other rankings. However, this is not the case at all for the ranking of individual scholars. The scientific board ranking computed in this paper should certainly not be considered a clearly superior alternative to rankings based on publications, citations or other quantity related measures.

One of the major conclusions of the analysis undertaken is that for the career decisions of individual scholars bibliometric rankings should be used with utmost care: "Crude rankings (…) cannot be helpful to the policy maker" (Johnes, 1988: 177). We have shown that the various rankings of individual researchers depend on the specific measurement approaches taken and are inconsistent with each other. The inconsistency also applies to the ranking based on membership in editorial boards computed in this paper. The situation is somewhat better for the aggregate measures relating to whole universities and countries.

Instead of suggesting that the board ranking is used as the gold standard to evaluate research, we suggest that committees should make *use of this information to find experts who help them to evaluate research quality based on a direct evaluation of the content of the publications*. Compared to the secondary information contained in rankings, experts are more reliable consultants when it comes to promotion, hiring, or funding decisions. Experts are embedded in a research field, have the insight that is needed to assess primary research data, and have valuable information concerning a scholar's past. This knowledge helps them to evaluate the prospective *future*

performance of an individual scholar, university or country. In contrast to second-hand bibliometric information, e.g. the counting of impact factors, papers, or citations, this information is cheaper, richer, more detailed and arguably tends to be more accurate. Expert consulting therefore makes it possible to promote scholars whose research fulfils stated or implied needs, is free of major deficiencies, and meets more general, social requirements. Moreover, experts are able to take into consideration how trustworthy a particular scholar is – an aspect totally absent from bibliometric rankings. This conclusion is in line with the findings of Nederhof and van Raan (1993) who compared the results of a bibliometric analysis of the research performance of six economics research groups with those of a simultaneous peer review study. "According to the peers, bibliometric analysis does provide a useful check and sidelight on conventional content-based peer review. Excessive reliance on these measures, however, needs to be avoided (Nederhof and van Raan, 1993: 388)".

Expert consulting was a common practice in the research community before it was claimed that expert judgments might be biased, and therefore inferior to seemingly "objective" measures such as the number of publications and citations. However, the findings of this study, as well as other studies, cast reasonable doubt as to whether bibliometric rankings are really so much better. Experts may well be biased with regard to some candidates, but on the whole the reasoned evaluation by peers is likely to produce a better evaluation of research than a strong, or even exclusive, reliance on bibliometric measures. Experts with sound judgment can be found by using indicators of their research quality as assessed by their peers. We suggest that membership on the editorial board of professional journals may be useful for that purpose. Such indicators may assist committees with general competence to find suitable experts. Such a search procedure enhances the possibility of working with persons who are less biased and are therefore able to approximate neutral and objective decisions about research quality.

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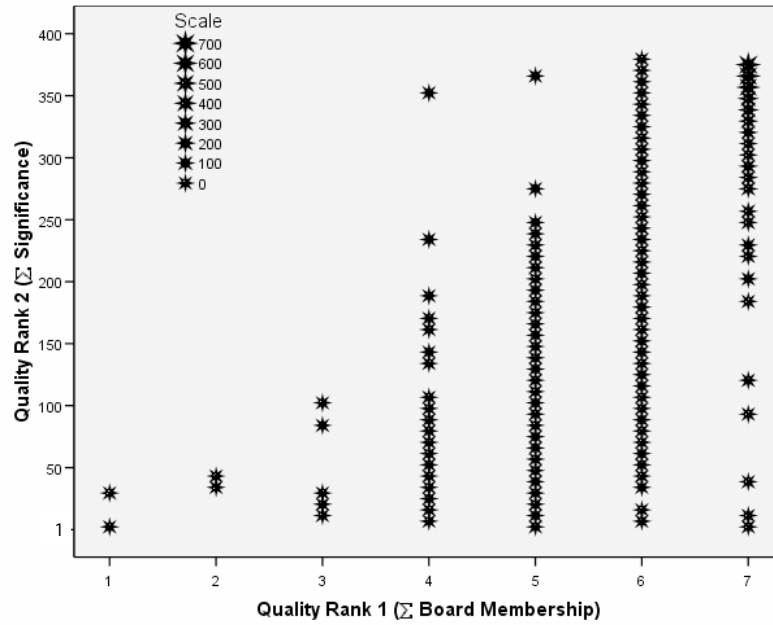
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FIGURES

FIGURE 1

Ranking Comparison of Individual Scholars according to Quality Ranking 1 (Σ Board Membership) and Quality Ranking 2 (Σ Significance)
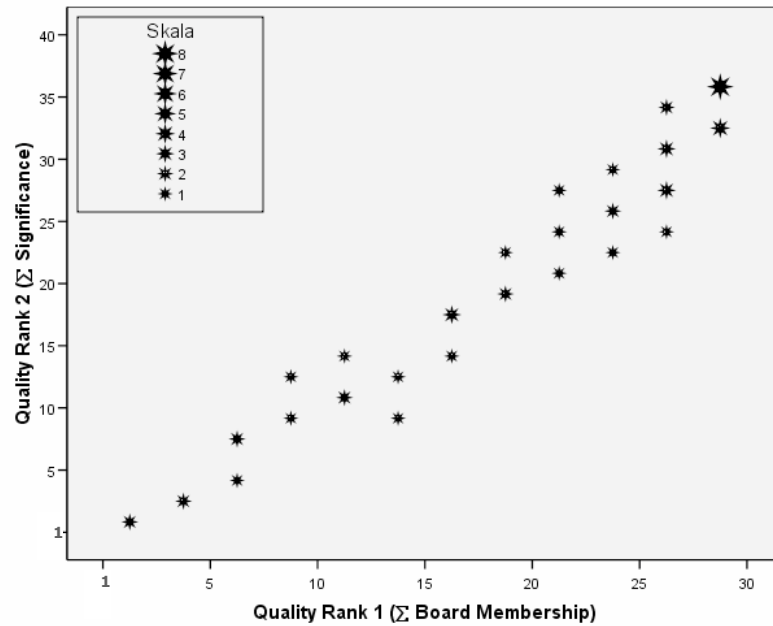

FIGURE 2

Ranking Comparison of Universities according to Quality Ranking 1 (Σ Board Membership) and Quality Ranking 2 (Σ Significance)
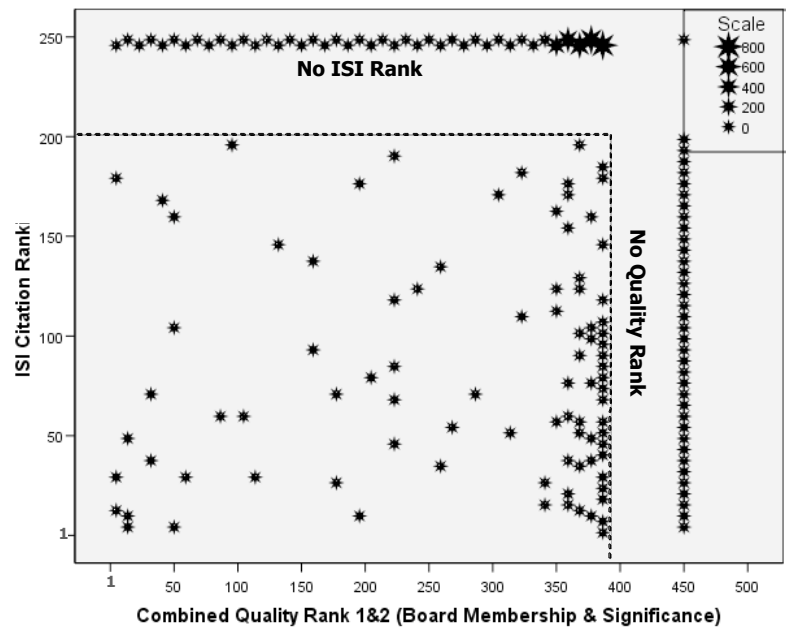
FIGURE 3

Ranking Comparison of Countries according to Quality Ranking 1 (∑ Board
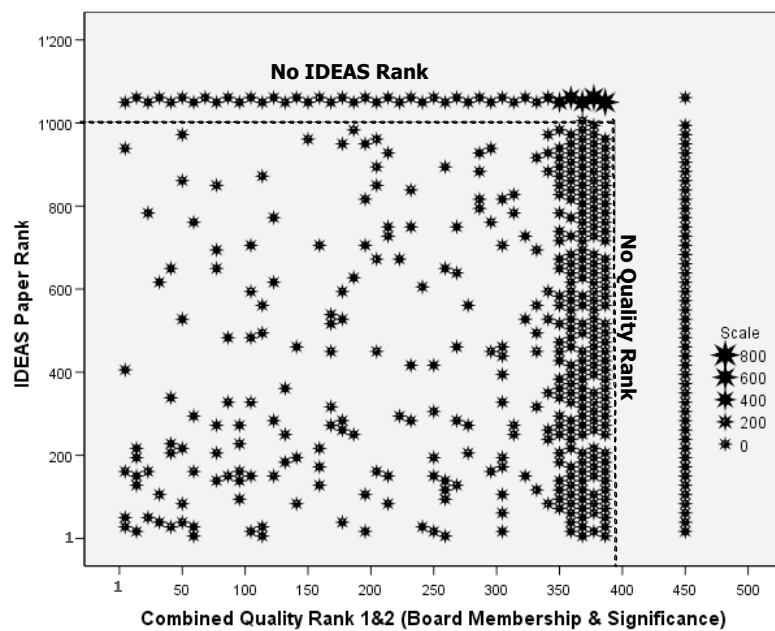Membership) and Quality Ranking 2 (∑ Significance)

FIGURE 4

Individual Scholars: Consistency of the Board Ranking with the ISI Citation Ranking
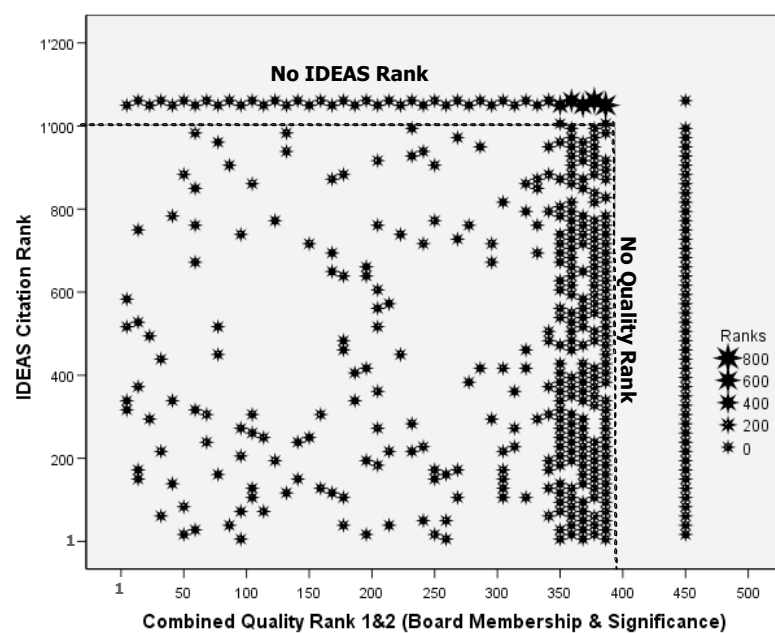
FIGURE 5
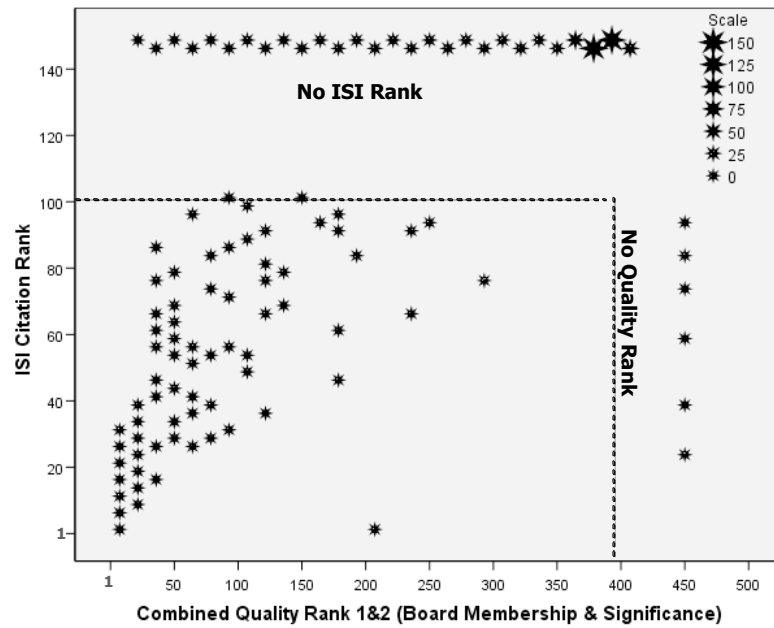Individual Scholars: Consistency of the Board Ranking with the IDEAS Paper Ranking

FIGURE 6
Individual Scholars: Consistency of the Board Ranking with the IDEAS Citation Ranking
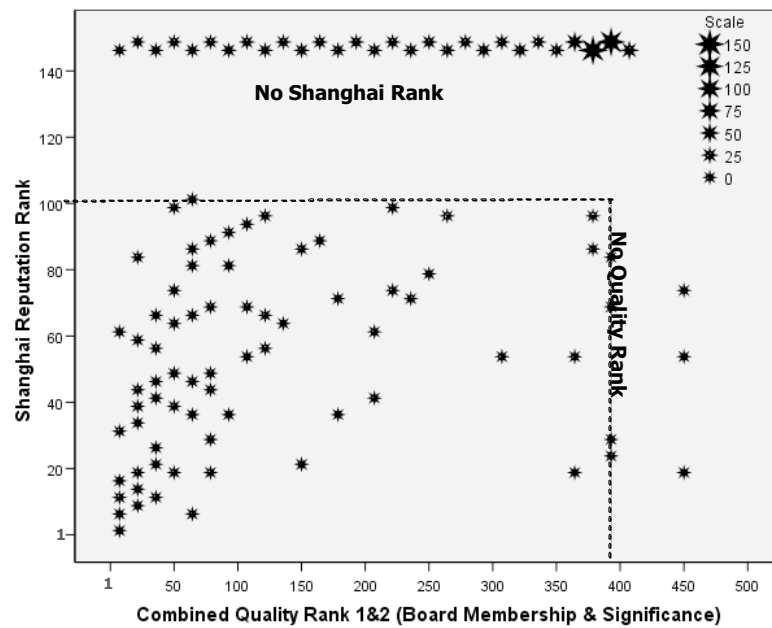
FIGURE 7
Universities: Consistency of the Board Ranking with the ISI Citation Ranking
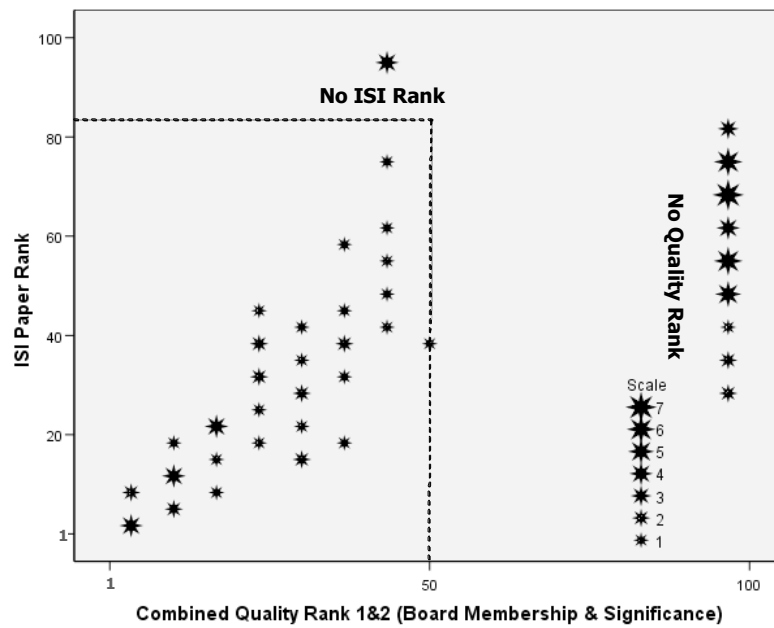

FIGURE 8
Universities: Consistency of the Board Ranking with the Shanghai Reputation Ranking
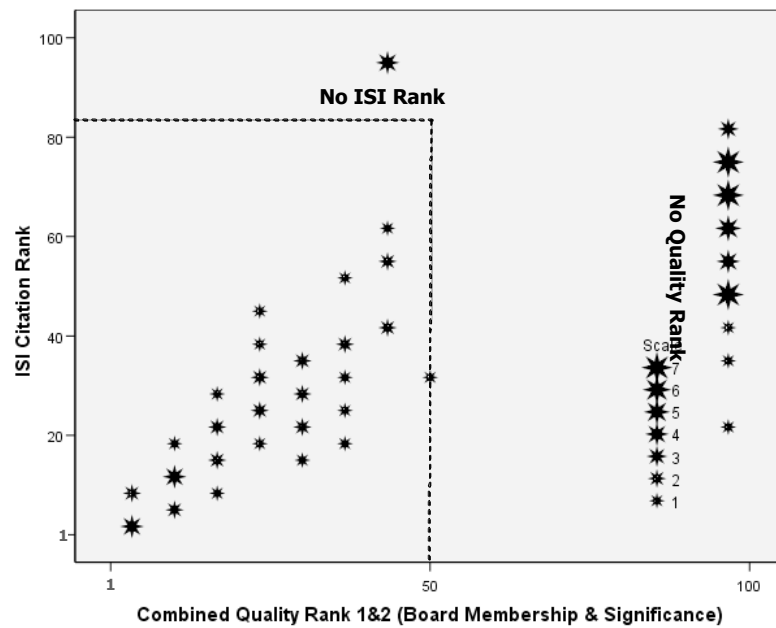
FIGURE 9
Countries: Consistency of the Board Ranking with the ISI Paper Ranking

FIGURE 10
Countries: Consistency of the Board Ranking with the ISI Citation Ranking

TABLES

TABLE 1
Editorial Boards according to Individual Scholars

Name	∑ Board Membership	Quality Ranking 1 (Range: 1-7)	∑ Significance	Quality Ranking 2 (Range: 1-382)	Combined Quality Ranking 1&2 (Range: 1-389)
Jonathan Temple	7	1	0.731	2	1
Kenneth Arrow	7	1	0.138	28	2
John List	6	2	0.133	31	3
Reinhard Selten	6	2	0.114	42	4
David Sappington	5	3	0.167	12	5
Edward Glaeser	5	3	0.154	18	6
Jacques-François Thisse	5	3	0.146	23	7
Debraj Ray	5	3	0.136	30	8
Han Bleichrodt	5	3	0.125	34	9
Jacob Goeree	5	3	0.092	87	10
Vernon L. Smith	5	3	0.090	98	11
William Easterly	4	4	0.190	8	12
Christopher Taber	4	4	0.162	14	13
Mark Gertler	4	4	0.158	15	14
Daron Acemoglu	4	4	0.157	16	15
Francesco Caselli	4	4	0.153	19	16
Janet Currie	4	4	0.148	21	17
Dora Costa	4	4	0.146	22	18
Henry Overman	4	4	0.140	26	19
Hanming Fang	4	4	0.131	32	20
Marc Rysman	4	4	0.125	36	21
Frank Schorfheide	4	4	0.119	39	22
Peter Robinson	4	4	0.118	41	23
Andrew Atkeson	4	4	0.111	46	24
Graham Elliott	4	4	0.108	48	25
Daniel McMillen	4	4	0.108	49	26
David Martimort	4	4	0.102	60	27
Raghuram Rajan	4	4	0.099	66	28
Burton Hollifield	4	4	0.098	68	29
Aviv Nevo	4	4	0.097	72	30
Jason Shogren	4	4	0.095	78	31
Andrew Metrick	4	4	0.092	90	32
Steven Kou	4	4	0.090	100	33
Mark Machina	4	4	0.089	105	34
Hervé Moulin	4	4	0.077	136	35
Steffen Huck	4	4	0.077	141	36
William Thomson	4	4	0.070	164	37
Teck-Hua Ho	4	4	0.069	168	38
Rachel Croson	4	4	0.069	169	39
Rakesh Vohra	4	4	0.064	193	40
Scott Stern	4	4	0.055	234	41
Ashish Arora	4	4	0.028	351	43

The table includes all persons with 4 or more board memberships (according to the broad definition).

TABLE 2
Editorial Boards according to Universities

Name	∑ Board Member-ship	Quality Ranking 1 (Range: 1-48)	∑ Signifi cance	Quality Ranking 2 (Range: 1-398)	Combined Quality Ranking 1&2 (Range: 1-403)	∑ per Faculty Member	Quality Ranking 3
Harvard University	100	1	2.57	2	1	0.83	28
Stanford University	98	2	2.30	4	2	1.07	10
University of Pennsylvania	79	3	1.85	9	3	1.01	12
Northwestern University	77	4	2.09	6	4	1.13	9
London School of Econ. & Polit. Sci	76	5	2.81	5	6	1.04	11
MIT	76	5	2.16	1	5	1.17	8
New York University	76	5	2.01	7	7	0.93	18
University of Chicago	72	6	0.77	8	8	0.77	34
University of California Berkeley	69	7	1.69	10	9	0.74	37
Duke University	64	8	2.43	3	10	1.45	3
Columbia University	64	8	1.50	12	11	0.75	35
Carnegie Mellon University	56	9	1.02	21	12	1.37	4
University of California LA	50	10	1.34	13	13	0.71	39
Yale University	50	10	1.34	15	14	0.83	27
Princeton University	49	11	1.53	11	15	0.94	17
University of Michigan	49	11	1.11	20	16	0.74	36
University of Wisconsin	47	12	1.34	14	17	0.89	23
University of Washington	46	13	1.21	18	18	1.70	2
Cornell University	44	14	1.17	19	19	0.67	48
University of Texas	39	15	0.74	33	20	0.91	20

The table shows the first 20 universities according to the number of board positions (according to the broad definition).

TABLE 3
Editorial Boards according to Countries

Name	∑ Board Membership	Quality Ranking 1 (Range: 1-29)	∑ Significance	Quality Ranking 2 (Range: 1-37)	Combined Quality Ranking 1&2 (Range: 1-50)	∑ per 1 Mil. inhabitants	Quality Ranking 3 (Range: 1-50)
USA	2421	1	61.75	1	1	8.04	1
UK	480	2	16.62	2	2	7.90	2
Canada	159	3	4.35	3	3	4.76	7
France	145	4	3.80	4	4	2.28	18
Germany	118	5	3.32	5	5	1.43	21
Netherlands	94	6	2.42	7	7	5.67	5
Australia	86	7	2.78	6	6	4.21	13
Japan	55	8	1.55	8	8	0.43	29
Italy	49	9	1.18	11	11	0.84	25
Israel	44	10	1.13	12	12	7.00	3
Spain	45	11	1.12	10	10	1.04	22
Belgium	42	12	1.26	13	13	4.23	12
Sweden	40	13	1.39	9	9	4.43	9
Switzerland	33	14	0.98	14	14	4.37	11
Austria	27	15	0.69	18	18	3.29	16
Finland	23	16	0.78	17	17	4.39	10
Denmark	23	16	0.79	16	16	4.21	14
Norway	22	17	0.89	15	15	4.75	8
China	21	18	0.57	19	19	0.02	47
India	21	18	0.45	20	20	0.02	48

The table documents the first 20 countries according to the number of board positions (according to the broad definition).

APPENDIX A

Table 1 compares the rankings of scholars, institutions and countries according to the number of board positions, calculated using the broad definition of board membership favored by us with the rankings of scholars, universities and countries according to the number of board positions, calculated with different definitions of board membership. The *broad* definition includes co-editor and board member positions. Different definitions of board membership are: (1) the *editor* definition includes editors, co-editors and board members. (2) the *narrow* definition solely includes board member positions. (3) the *broad* definition *with "home"* and *association* journals includes the co-editor and board member positions of a sample, which also includes "home" and association journals. We document (a) the *Pearson correlation* for the absolute number of memberships on editorial boards calculated with different definitions ($\sum$ Board Membership) and (b) the *Spearman-Rho correlation* for the rankings calculated with different definitions (Quality Ranking).[16]

TABLE I
Sensitivity Analysis of different definitions of board membership

Broad definition	Editor definition	Narrow definition	Broad definition with home and affiliation journals
(N=4209 positions)	(N=4568 positions)	(N=3836 positions)	(N=4447 positions)
Scientist Rankings			
(N=3515 individuals)	(N=3783 individuals)	(N=3276 individuals)	(N=3691 individuals)
$\sum$ Board Membership[1]	.87**	.97**	.95**
Quality Ranking [2]	.89**	.97**	.87**
University Rankings			
(N=754 institutions)	(N=754 institutions)	(N=754 institutions)	(N=754 institutions)
$\sum$ Board Membership[1]	.99**	.99**	.99**
Quality Ranking [2]	.94**	.92**	.96**
Country Rankings			
(N=50 countries)	(N=50 countries)	(N=50 countries)	(N=50 countries)
$\sum$ Board Membership[1]	1.00**	1.00**	1.00**
Quality Ranking [2]	.98**	.99**	.95**

[1] Pearson Correlation
[2] Spearman-Rho Correlation
** sig. 0.01%

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[16] Ranks were specified using the absolute number of membership on editorial boards as a first sorting criterion ($\sum$ Board Membership) and the significance of board positions as a second sorting criterion ($\sum$ Significance). "Significance" is the sum of board positions, whereas each board position is divided by the number of similar positions offered by a journal.

The results in Table I show that rankings calculated with different definitions of board membership are highly correlated with rankings calculated with the broad definition of board membership. The smallest Spearman-Rho correlation amounts to 0.87** and the highest is 0.99**. The number of board positions calculated with different definitions has a high correlation with the number of positions calculated with the broad definition. The smallest Pearson correlation amounts to 0.87** and the highest is 1.00**. Thus, the definition of board membership does not bias the rankings of scholars, universities, or countries. For simplicity, we only consider the broad definition of board membership.

APPENDIX B

Figure I compares the ranking of a scholar in the ISI citation ranking (for more information see p. 12) with his or her ranking in the IDEAS citation ranking (for more information see p. 13). The figure shows that the overlap between the two citation rankings is small. Most scholars are listed in one but not in both rankings. Many scholars listed in the ISI ranking at the top are listed in the IDEAS ranking at the bottom.

FIGURE I
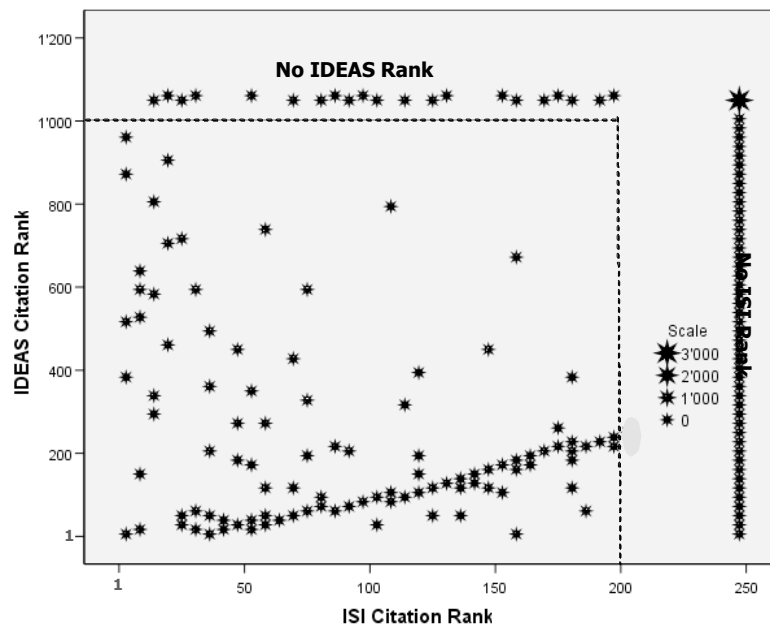Individual Scholars: Consistency of the ISI Citation Ranking with the IDEAS Citation Ranking

Figure II compares the ranking of a scholar in the ISI citation ranking (for more information see p. 12) with his or her ranking in the IDEAS paper ranking (for more information see p. 13). The same general picture emerges. Again, scholars listed in the ISI citation ranking at the top are listed in the IDEAS paper ranking *at the bottom*.

FIGURE II
Individual Scholars: Consistency of the ISI Citation Ranking with the IDEAS Paper
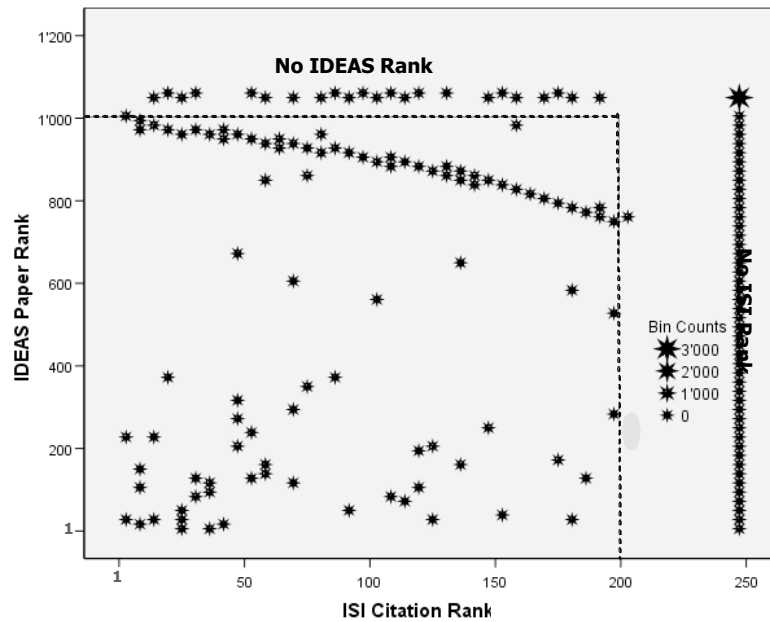Ranking

Figure III compares the ranking of a scholar in the IDEAS citation ranking (for more information see p. 13) with his or her ranking in the IDEAS paper ranking (for more information see p. 13). The figure suggests that the ranking of individual scholars depends to a large extent on the ranking method used, and is far from an "objective" evaluation.

FIGURE III
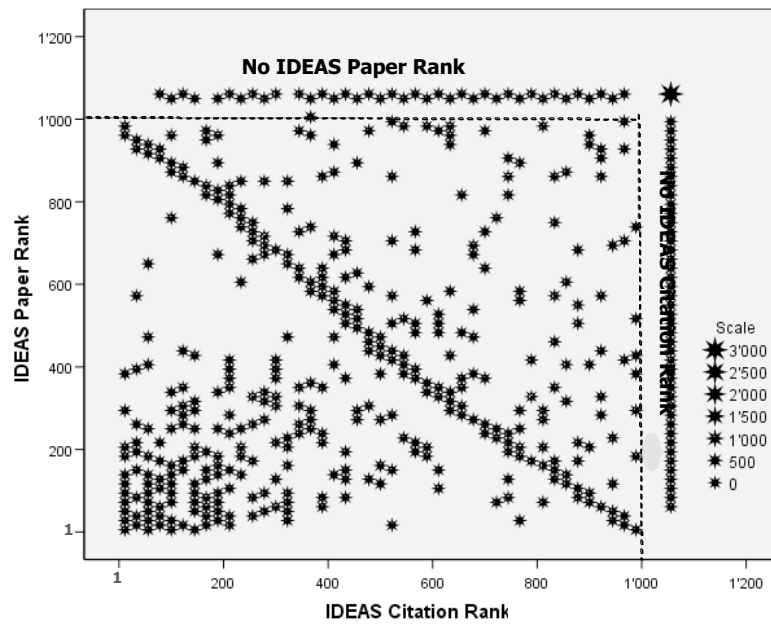Individual Scholars: Consistency of the IDEAS Citation Ranking with the IDEAS Paper Ranking

Figure IV compares the ranking of a university according to ISI citations (for more information see p. 14) with the ranking of a university in the Shanghai study (for more information see p. 14). The overlap between the two quantity rankings is not larger than the overlap between the quality and quantity rankings: More than half of all institutions are only considered in one ranking but not in both rankings.

FIGURE IV
Universities: Consistency of the ISI Citation Ranking with the Shanghai Reputation
Ranking