

Diskussionspapier des
Instituts für Organisationsökonomik

1/2010

A Citation Based Ranking of German-speaking
Researchers in Business Administration
with Data of Google Scholar

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Discussion Paper of the
Institute for Organisational Economics

**Diskussionspapier des
Instituts für Organisationsökonomik
1/2010**

Oktober 2010

ISSN 2191-2475

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Abstract

The quantitative evaluation of research performance in business administration has recently gained some attention in German-speaking countries. This holds especially for rankings of persons, which are discussed controversially. Rankings of academics can be constructed in two different ways, either based on journal rankings or based on citations. Despite citation based rankings promise some fundamental advantages, they are still not common in German-speaking business administration. However, the choice of the underlying data base is crucial. This paper argues that for German-speaking researchers in business administration (as an example for a non-English speaking scientific community in the social sciences) Google Scholar is an appropriate data base. Unfortunately, it contains some structural errors that require diligent corrections. With that in mind, all 1,572 members of the German Academic Association for Business Research (VHB, membership data by 2007) are ranked according to the citations of their recent publications (2005-2009). Obviously the citations follow a Pareto distribution amongst the scholars with large rank differences only at the top. The results are compared to those of the Handelsblatt-BWL-Ranking which is the most prominent journal based ranking of German-speaking academics in this discipline. It becomes clear that differences in method lead to different results.

JEL-Codes: I23, I20, A11, C81, I29, M00

Ein zitationsbasiertes Ranking von deutschsprachigen Forschern der Betriebswirtschaftslehre mit Daten von Google Scholar

Zusammenfassung

Die Messung von Forschungsleistungen mittels quantitativer Indikatoren hat in der deutschsprachigen Betriebswirtschaftslehre an Bedeutung gewonnen. Im Fokus des Interesses wie auch der Kritik stehen insbesondere Personenrankings, für deren Erstellung zwei Ansätze zur Verfügung stehen, entweder aufbauend auf einem Zeitschriftenranking oder direkt auf die individuellen Zitationen bezogen. Obwohl zitationsbasierte Personenrankings konzeptionelle Vorteile gegenüber zeitschriftenbasierten Rankings aufweisen, sind sie in der deutschsprachigen Betriebswirtschaftslehre bislang eher ungebräuchlich. Dabei kommt der verwendeten Datengrundlage eine entscheidende Bedeutung zu. In diesem Beitrag wird argumentiert, dass für die deutschsprachige BWL (als Beispiel für eine nicht genuin englischsprachige Sozialwissenschaft) Google Scholar eine geeignete Grundlage bilden kann. Angesichts einiger struktureller Fehler in Google Scholar erfordert die Erstellung eines Rankings allerdings eine sorgfältige Durchsicht und Nachkorrektur des Datensatzes. Auf diese Weise wurden die insgesamt 1.572 Mitglieder des Verbands der Hochschullehrer für Betriebswirtschaft (VHB, Mitgliederverzeichnis 2007) entsprechend der Zitationen ihrer aktuellen Veröffentlichungen (2005-2009) gerankt. Dabei fällt auf, dass die Zitationen höchst ungleich verteilt sind und einer Pareto-Verteilung entsprechen. Die Ergebnisse werden mit denen des Handelsblatt-BWL-Rankings verglichen, wobei deutlich wird, dass methodische Unterschiede auch zu anderen Resultaten führen.

Im Internet unter:

http://www.wiwi.uni-muenster.de/io/forschen/downloads/DP-IO_01_2010.pdf

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A Citation Based Ranking of German-speaking Researchers in Business Administration with Data of Google Scholar*

1. Citations as an Indicator for Research Performance

1.1 Research Performance and Its Measurability

The quantitative evaluation of research performance has gained more and more attention in the field of business administration in German-speaking countries and is debated controversially. The field of business administration is representative for many sciences and humanities where performance in research and teaching is accessed to be measured by quantitative and interpersonally comparable means. Germany's excellence initiative to promote leading universities, management by objectives within the universities and procedures for the appointment of professors are all indications for that development.

From a managerial point of view the importance of output measurement is not surprising. Managing of scarce resources requires the assessment of output in one or another way since without it neither effectiveness nor efficiency could be strived for. The successful management of a chair, a department, the university or even the system of higher education in the whole country requires the setting of goals to reach and a method of controlling the results. Traditionally this was done by peer review or in a more or less implicit manner. Bibliometrics, however, can be an interpersonally comparable method to support decision making in academia by adding an additional and more objective dimension of measurement.

From an economist's perspective science (including social sciences) is about competition for reputation within the scientific community. Scholars strive for knowledge and try to spread their findings into the community. Citations are viewed as a proxy for impact, significance and utility (cf. Garfield 1979, pp. 62 et seq.). Excellence in science includes both, new findings and their publication. Even a genius thought does not imply academic progress until it reaches its audience. Within the scientific community reputation is earned by the acknowledgement of the findings by colleagues. The impact of a scholar's work therefore reflects his or her reputation. Publishing the scientific findings in an academic journal or book leads to positive externalities, since it enhances the progress of fellow researchers in the scientific community.

* We thank Aline Blankertz for her assistance with the citation database.

Rankings are a way to measure and compare the performance of individual scholars, departments, universities, academic journals or even whole disciplines or countries to describe their position in the scientific community. They can be constructed by different means and try to quantify the impact of academic work (cf. Dilger 2010). Rankings of persons concentrate on the publications of individual scholars and bring them in an order according to a certain key performance indicator. However, the adequacy of rankings as such is highly controversial in business administration, at least in the German-speaking countries (see Albers 2009 for critique).

1.2 Journal Based versus Citation Based Rankings of Academics

Journal based rankings evaluate and compare publications according to the journals they have been published in. Currently, journal based rankings of academics are the most common ranking form for business administration and economics. Publications are weighted by the journals they are published in. The journal weights are in most cases derived from citation rates (impact factors), questionnaires (e.g. VHB JOURQUAL) or by a combination of different methods and journal lists (e.g. the Handelsblatt journal list underlying the Handelsblatt-BWL-Ranking). Despite its popularity this approach has been criticised for several reasons (cf. Müller 2010).

First, this approach takes only journal publications into account and ignores monographs and edited volumes as well as articles on academic web portals (such as SSRN). Books are neglected due to the methodological structure of journal based rankings although they still form important contributions to academic progress in the social sciences (cf. Adler/Harzing 2009, Griffith/Cavusgil/Xu 2008). This is in particular the case for business administration in German-speaking countries.

Second, impact factors reflect only the number of citations of an average article within a specific journal (and within some years, normally two after the publications, which could be too short for the social sciences). In journal based rankings this average score is assigned to an individual paper despite the fact that the citations of the individual articles within one journal are highly heterogeneous. The impact factor of a certain journal is only weakly correlated to the impact of a specific article within it. The citations of an article have influence on the impact factor of the journal, but not the other way round (cf. Seglen 1994, 1997). Even top tier journals contain a lot of articles that only gain very little or none attention (cf. Frey/Rost 2010). Inversely, this means that the impact of really outstanding papers is underscored if

valued with the average citations of the journal. This is not only true for journal weights based on bibliometrical measures. If the underlying journal list of a ranking of persons is produced via questionnaires (such as VHB-JOURQUAL, which is the official journal ranking of the German Academic Association for Business Research) the problem stays the same: The overall prestige of the journal is attributed to every individual paper. However, papers do form the reputation of the journal but not the reverse, or as Chang/McAleer/Oxley (2010, p. 3) put it: “Publish a paper in a great journal, the journal makes you great; publish a great paper in a journal, you make the journal great.”

Third, journal based rankings tend to produce results only for a very small group of top researchers. The research performance of the majority of professors who do not publish in top tier journals cannot be accessed properly by this way.

With regard to these objections against journal based rankings the alternative of citation based rankings might be a more comprehensive way to quantify research performance of German-speaking scholars in business administration. In citation based rankings the research performance of an academic is directly measured by the citations his or her work collects. This method matches very closely with the above-mentioned concept of scientific competition and reputation since the citation of a paper means to acknowledge its content. Instead of looking in which medium a finding is published, its reception is used as the central indicator of quality. In a citation based ranking the citations are looked up for every publication individually. The journals, as an intermediate layer with distorting averages, are not taken into account because the impact of any publication is measured separately.

Another important advantage of citation based rankings lies in the fact that they are not necessarily limited to journal publications. Because the measurement is carried out directly at the individual paper, citations on monographs, chapters in edited volumes as well as online publications can be taken into account. The arbitrary neglect of monographs and edited volumes aligned to journal based rankings can be overcome. The scope of the analysis might still be a problem of the database, but it is no longer limited by the method of the ranking.

However, citation based rankings have their very own limitations. First, they have higher requirements on the underlying database and the effort needed to collect the relevant data. In practical terms, every publication of every considered scholar requires an own database request. Second, in contrast to journal rankings, the underlying data change quickly. Old publi-

citations gather new citations over the time. A new edition of a citation based rankings requires a completely new data request because the old papers still get cited.

2. The Method

2.1 Google Scholar as a Data Source

In contrast to other well known databases such as SCI, SSCI, SCI-X or Scopus, Google Scholar searches all types of publications and can be used free of charge. Not only academic journals, but also academic books, such as monographs and edited volumes, and papers published online are included. That means citations of such publications can be tracked as well as citations within those sources will be taken into account (cf. Jacsó 2008). The competitive advantage or disadvantage Google Scholar has against its competitors depends on the research culture and citation characteristics of the academic discipline that is to be measured, the relevant scope Google Scholar can provide in that discipline and the performance of its competitors. In disciplines such as medicine or natural sciences, where nearly all relevant publications appear in journals listed in the SCI, the broader scope of Google Scholar might not be of any advantage. However, for business administration, at least in German-speaking countries, this is the crucial point indeed. Google delivers a much better coverage in citation tracking than any of its competing alternatives (cf. Breuer 2009). It is far from perfect, but since a comprehensive German (or European) citation data base still does not exist (cf. Dilger 2000), it seems to be the best alternative available.

In contrast to the SSCI, Google Scholar allows queries with fully spelled Christian names instead of initials. This is of high practical relevance because it limits the problems with distorting results due to different persons with the same surname. Such false matches have to be eliminated by hand, which is very costly in terms of time and error-prone nonetheless. Avoiding them from the beginning makes it more practical to create a ranking.

Similar to SSCI, Google Scholar offers search categories in the US version of the Advanced Scholar Search. That further minimises the practical problem of false matches that otherwise would have to be eliminated by hand. Unfortunately, this feature is not working completely yet. There are still plenty of publications not sorted under any of the categories. So if this function is used to search only in certain disciplines, books that are not categorised get sorted out even if they belong to the searched field.

A further grave problem is the lack of transparency how Google Scholar gets its data. There is no documentation on what the sources of the data are, what is included and what is not. Apart from that, Google Scholar includes self citations.¹ The above-mentioned concept of citations as a sign for academic reputation requires that a paper gets cited by someone else, not just the author him- or herself. Self-citations allow a manipulation of the citations by the author. One could push up one's own results by citing one's own articles, especially since citations by the internet without any quality control also count. This, however, is not expected to be a large problem at the current time. Since citation based rankings are new to business administration in German-speaking countries, there are no incentives for such behaviour up to the present. At least for a first edition, this problem might be more of a theoretical than practical nature.

Much discussed in the literature is the insufficient data quality of Google Scholar. Due to its broad scope and automatic procedures to search the web and other databases for citations, from time to time nonsensical or non-scholarly citations appear. This problem is well known but rather limited (estimated at maximally 8 percent of citations, see Vaughan/Shaw 2008).

Another severe distortion of the database occurs when books are reprinted in new editions. Google Scholar does not differentiate between different editions of the same books and assigns in every case the year of the last edition as the year of publication. If the query is limited to a certain time period (like 2005 to 2009 in the following ranking), this leads to serious problems: A book may have been published in the first edition long before the enquired time period and could gather citations from year to year since then. If a new edition is published within the enquired period, this year is displayed as the year of publication. The citations, however, are not differentiated between the two editions. It looks as if the book accumulates citations from times before its publication. Within the search mechanism of Google Scholar only the publishing period can be limited but not that of the citations. This disparity has far-reaching consequences, since very successful books gather a lot of citations and are reprinted in new editions over a long time. The real impact of such a blockbuster cannot be measured for a certain period but only over the full time span from the point of first appearance to today. If a search is limited to recent years, a new edition within the searched period gets falsely attributed all the citations since its first edition long before this period.

Despite its massive consequences, this problem has not been discussed in the literature yet. To avoid distortions in the following ranking, books with more than one edition are treated like

¹ This is true in spite of claims by Google to the contrary, cf. Henrekson/Waldenström (2008).

there was only the first one. This seems to be the most adequate way to deal with the problem since the major findings are usually presented in the first edition of a book. Unaltered reprints do not form new academic output and new updated editions normally do not contain as much new content as the first edition. That means that in the ranking books are only counted if the first edition was published within the searched time period. New editions of books, which were first published before the searched period, are not taken into account because they would otherwise carry all the old citations as explained.

The main purpose of Google Scholar is not citation analysis anyway. So additional software is helpful to manage the queries and calculate the citation metrics. This can be done with Publish or Perish, which delivers rather comprehensive citation metrics and can be obtained free of charge.²

2.2 Object of the Enquiry

The following ranking shall be a rather comprehensive ranking of German-speaking scholars of business administration. Therefore the register of members of the German Academic Association for Business Research (Verband der Hochschullehrer für Betriebswirtschaft, VHB) was used as a source of data. It contains active, German-speaking professors and researchers at German and international universities or research institutions as well as retired professors. A professor emeritus might still be, especially as long he or she pays membership fees, an active member in the scientific community and keep on researching and publishing when retiring (perhaps involuntarily according to German labour law). In contrast to the Handelsblatt-BWL-Ranking (see Müller/Storbeck 2009) we enquire the research performance of both active and retired professors. However, professors who are not members of the VHB are not included in this ranking. The edition of the register of members from 2007 is the basis for the names of the enquired scholars.

The aim of this study is to scan the citations of recent publications. The ranking shall reflect the current state of research and give an overview of the most active and visible or at least most cited German-speaking researchers of business administration. Therefore a time span of five years was chosen. Only publications from the years 2005 to 2009 are considered.

The queries in Google Scholar (the English version, whereas the German one does not offer these categories) are constricted on the search categories 'Business, Administration, Finance,

² A download is possible via www.harzing.com/pop.htm (last request on 18th of October 2010).

and Economics' and 'Social Sciences, Arts, and Humanities'. The queries were executed between 3rd and 5th of January 2010. So they only count citations from the same time period. In the end, the whole ranking consists of 1,572 enquired persons with 872 of them having more than zero citations.

Co-authorships were counted on a strict pro-rata basis by $1/n$. To our view this is the most straightforward approach since alternatives such as that chosen by the Handelsblatt-BWL-Ranking seem to be kind of arbitrary (see Müller/Storbeck 2009 for the method and Müller 2010 for a critique).

2.3 Quality of Data and Manual Corrections

A manual review of the collected data is obliged because of two main objections that cannot be addressed by the ex-ante design of the queries: There may be different scholars with identical Christian name and surname. This is as well the case within the register of members of the VHB as on the much broader scope in Google Scholar. The results of the queries in Google Scholar have to be matched with the publication list that is usually published on the website of the scholars.

Beside this, the above-mentioned problem concerning the different editions of books compels a manual review. Within the results of every query the publishing dates of every book have to be checked. Only if the first edition of a book was published within the defined time span of 2005 to 2009, the citations should be counted. Books with older dates of first appearance (and just the last re-edition within the period) have to be excluded because at least some of their citations are from older times and would otherwise distort the results (see above).

The problem of unscientific citations only occurred very sporadically and is not seen as a major distortion. There are some nonsensical citations or citations from non-academic texts (cf. Harzing/van der Wal 2008) but they form a kind of statistical noise and do not distort the results systematically in one or another direction. A different problem is posed by students' theses (e.g. bachelor or master thesis) that get published online and as books-on-demand and often cite textbooks. Students' theses account for about 20 percent of the citations of text books. For a professor to have a lot of graduates is rather a measure of performance in teaching than in research. The citations in students' theses are however only taken into account if they are published as books-on-demand and have got ordinary ISINs, so by definition they are books and as such a source of citations. In the top ranks, however, textbooks do not have a

substantial influence on the ranking order anyway and apart from them citations from students' theses occur very rarely.

Google Scholar does not exclude self citations, which may in future become a problem of citation based rankings on this data source (see above). Currently, there is neither an option in Google Scholar or in referring software such as Publish or Perish nor any useful ex-post correction method to exclude them. For our first analysis, however, this tends to be no major problem because there is no special incentive to cite oneself.

3. Results

3.1 Top Ranks and Pareto Distribution

It is not surprising that the distribution of the citations of academics follows Pareto's law (cf. Pareto 1964, pp. 299 et seq., Hardy 2010). The distribution of citations amongst the scholars is highly unequal. Figure 1 shows the whole sample of 1,572 persons:

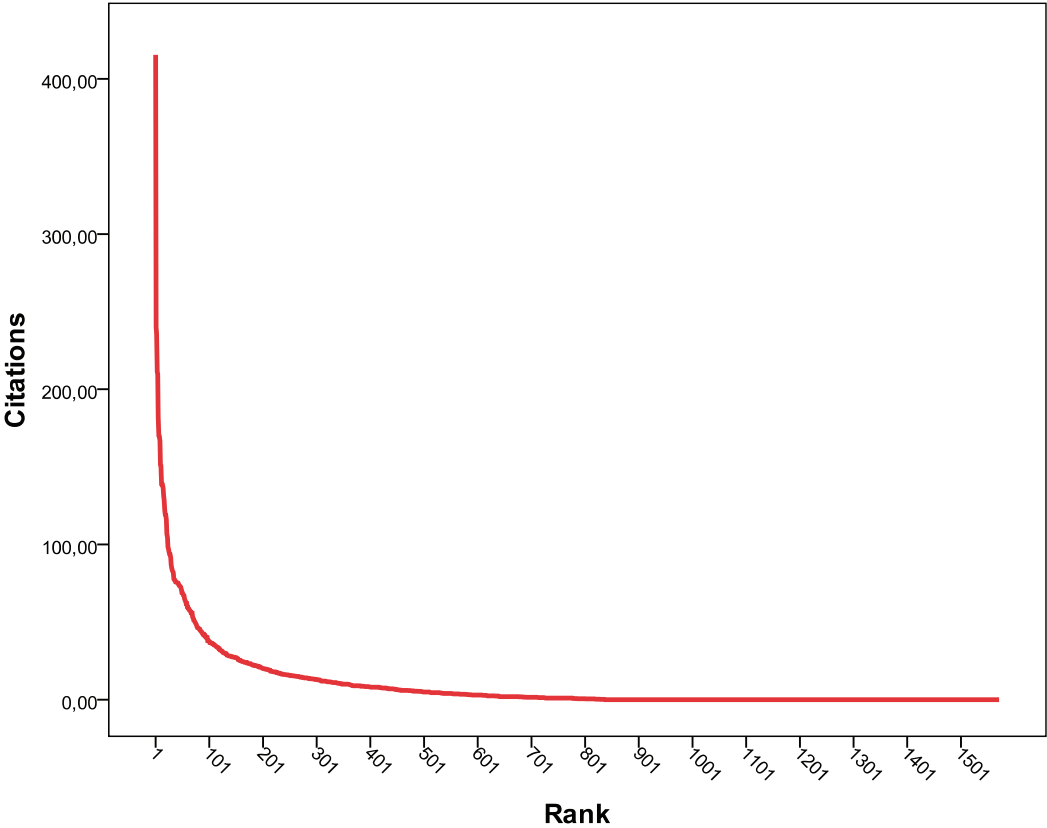


Figure 1: Distribution of citations

872 of all the scholars accumulate more than zero citations within the inquired time period. While the majority of researchers get cited more or less occasionally a relative small group of scholars accumulate most of the citations in the sample. Within the tail of the distribution the differences between the ranks become more and more insignificant, while the disparity to the leading group is striking. The extreme unequal distribution can also be expressed in concentration rates (Table 1). The first 20% of the scholars (314 persons) account for 85.32 percent of all the citations within the sample.

CR ₃	5.83 %
CR ₅	8.58 %
CR ₁₀	14.07 %
CR _{314(=20%)}	85.32 %

Table 1: Concentration rates

With respect to the privacy of the surveyed scholars only the top 10 are mentioned by name. Table 2 shows that the differences between the ranks are quite distinct in the top ranks and tend to narrow. It is notable that half of the professors in the top 10 hold chairs outside Germany and three of ten are employed outside the German-speaking part of the world. This is a difference to the Handelsblatt-BWL-Ranking that was limited to professors within Germany, Austria and Switzerland.

R		Publ.	Cit.
1	Christian Leuz (University of Chicago)	33	415.43
2	Hartmut Stadtler (University of Hamburg)	14	240.00
3	Martin Weber (University of Mannheim)	47	235.85
4	Christian Homburg (University of Mannheim)	38	211.34
5	Erik E. Lehmann (University of Augsburg)	34	209.66
6	Dirk Matten (York University Toronto)	35	182.07
7	Joachim Henkel (TU Munich)	10	170.00
8	Klaus G. Grunert (Aarhus University)	39	169.68
9	Oliver Gassmann (University of St. Gallen)	36	166.75
10	Andreas Herrmann (University of St. Gallen)	37	151.31

Table 2: Top 10 ranked by citations

3.2 Comparison with the Handelsblatt-BWL-Ranking

The Handelsblatt-BWL-Ranking is currently the leading research ranking of German professors in business administration and follows the journal based approach (see above). Since our ranking is based on citations and in view of some previous studies (see Müller 2010), one would expect major deviations between the outcomes of the two rankings. Therefore the ranks of the top researchers of both rankings are compared in Table 3.

R(GS)		R(HB)
1	Christian Leuz (University of Chicago)	-
2	Hartmut Stadtler (University of Hamburg)	59
3	Martin Weber (University of Mannheim)	5
4	Christian Homburg (University of Mannheim)	1
5	Erik E. Lehmann (University of Augsburg)	46
6	Dirk Matten (York University Toronto)	-
7	Joachim Henkel (TU Munich)	31
8	Klaus G. Grunert (Aarhus University)	-
9	Oliver Gassmann (University of St. Gallen)	36
10	Andreas Herrmann (University of St. Gallen)	8

Table 3: Ranks of the top 10 of this ranking in the Handelsblatt-BWL-Ranking

Three researchers are within the top 10 in both rankings. The other persons from the top ten of this ranking receive either relative good but not top ranks within the Handelsblatt-metric as well or have been excluded by the different design of the ranking (the Handelsblatt-BWL-Ranking does not include German-speaking professors with chairs at non-German-speaking universities).

The comparison can also be done the other way round. Table 4 delivers the ranks in our ranking for the top ten of the Handelsblatt-BWL-Ranking:

R(HB)		R(GS)
1	Christian Homburg (University of Mannheim)	4
2	Ulrich Lichtenthaler (WHU Vallendar)	18
3	Adamantios Diamantopoulos (University of Vienna)	11
4	Martin Högl (WHU Vallendar)	13
5	Martin Weber (University of Mannheim)	3
6	Armin Scholl (University of Jena)	16
7	Nils Boysen (University of Jena)	97
8	Andreas Herrmann (University of St. Gallen)	10
9	Dirk Sliwka (University at Cologne)	24
10	Stephan M. Wagner (ETH Zurich)	20

Table 4: Ranks of the top 10 of the Handelsblatt-BWL-Ranking in this ranking

4. Conclusions

This study shows that the construction of a citation based ranking of German-speaking academics in business administration is both an interesting and a difficult task. In general terms, citation based rankings have substantial advantages compared to journal based alternatives. They allow enlarging the scope towards monographs, edited volumes and academic internet publications. Besides that, they measure the impact of every publication on its own and avoid mean values on a journal level.

The choice of the data base, however, is crucial and depends on the specifications and characteristics of the ranking project. For German-speaking business administration we argued that Google Scholar is a well applicable source of readily available data. Nevertheless, its technical shortcomings necessitate diligent review and manual corrections. With that in mind, we constructed a ranking of German-speaking academics in business administration according to the impact of their recent publications (2005-2009). The comparison of the results with those of the Handelsblatt-BWL-Ranking, that follows the journal based approach, shows, that differences in methods lead to different results.

A problem of citation based rankings with Google Scholar in particular might be caused by self-citations. Rankings will create incentives in monetary and non-monetary forms and thus seduce scholars to cite their own work (or to induce their students to do so). However, because of the novelty of this ranking approach, we do not consider it to be a problem at this point in time.

The citation data collected in this project give room to a variety of follow-up questions. The comprehensive information of the members list of the VHB could be used to study critical factors for success such as age, career, education or position in the faculty. Besides that, the comparison of rankings is an important and difficult task. Since different methods lead to different results, the question of validity is essential and to be discussed in future.

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Bisher erschienen:

Diskussionspapiere des Instituts für Organisationsökonomik

DP-IO 1/2010: A Citation Based Ranking of German-speaking Researchers in Business Administration with Data of Google Scholar
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Oktober 2010



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