Which factors drive the decision to opt out of individual research rankings? An empirical study of academic resistance to change ☆

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ABSTRACT

Quantitative measures of research output, especially bibliometric measures, have not only been introduced within research funding systems in many countries, but they are also increasingly used in the media to construct rankings of universities, faculties and even individual scientists. In almost all countries, in which significant attempts have been made to quantify research output, parts of the scientific community have criticized the specific procedures used or even protested against them. In 2012, a significant fraction of German business scholars has even opted out of the most important German research ranking for business and economics which is conducted by the Germany's leading business daily *Handelsblatt*. Using this example, we show that observed resistance to change can consistently be explained by observable factors related to individual cost and benefits of the concerned researchers. We present empirical evidence consistent with the hypothesis that those scholars for whom the costs of a change in evaluation methods exceed the expected benefits are more likely to boycott the ranking exercise.

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1. Introduction

Since the early 1980s the ideas of New Public Management (NPM) have permeated the practices of public administration in most industrialized countries (see Hood, 1991). According to Ferlie et al. (1996) NPM involves introducing the "three Ms" into public services: markets, managers and measurement. The underlying idea is to increase the efficiency of public services and institutions through the use of market-oriented management methods (Ferlie et al., 1996). An integral part of these methods is performance measurement (Behn, 2003), which is seen as a prerequisite for an efficient allocation of public funds across various public tasks and services.

The methods of NPM have also quickly found their way into university systems in many industrial countries around the globe (see, e.g., Whitley and Glaser, 2007; Paredeise et al., 2009; Schubert, 2010; OECD, 2011; Tahar and Boutellier, 2013). An early example is the UK's Research Assessment Exercise (RAE) (see, e.g., Barker, 2007), which was introduced in 1986 and has later been replaced by the Research Excellence Framework (REF), following the 2008 RAE (see, e.g., Smith et al., 2011; Rebora and Turri, 2013). Since then, many countries introduced performance-based research funding systems. These systems define how performance is measured and which share of the funds is allocated according to performance. Especially in highly developed countries university funding systems nowadays often make use of some form of performance-based research funding systems, although to a quite different extent (see, e.g., Geuna and Martin, 2003; Auranen and Nieminen, 2010; Hicks, 2012; Benavente et al., 2012). In many sciences it has become standard to evaluate universities, university departments as well as individual scientists based on bibliometric measures (see, e.g., Schmoch and Schubert, 2009; Saisana et al., 2011). Moreover,

various international rankings are available, maybe most prominent among them the *Shanghai Ranking*,[2] which is – similar to many other ranking exercises – also criticized (see, e.g., Billaut et al., 2010; Docampo, 2011, 2013).

As is probably true for any institutional and cultural change, the increasing attempts to quantify and compare research output, based on a huge variety of methodologies, have initiated a vivid debate on the pros and cons of this tendency. In a nutshell, the advocates argue that the measurement of research output leads to a higher degree of transparency, thereby leading to more rational and objective hiring (and salary) decisions and research fund allocations (see, e.g., van Raan, 2005). In contrast, critiques range from the appropriate choice of relevant issues in general (publications, prizes, attracted research funds – see, e.g., Saisana et al., 2011), general questions of methodology (see, e.g., Paruolo et al., 2013), publication outlets (journals, contributed volumes, monographs, textbooks), the appropriate measures (article/page counts versus citations), weighting issues such as the relative importance of various journals (see, e.g., Laband, 1985; Oswald, 2007), adverse incentive effects of the applied procedures (see, e.g., Johnes, 1988; Butler, 2003; Weingart, 2005; Rafols et al., 2012; Musselin, 2013) to general suspicions about the measurability of research output based on bibliometric data (see, e.g., Hopwood, 2008; Frey and Rost, 2010).

Based on these critiques, various universities, faculties, individual researchers as well as academic societies have protested against the use of quantitative measures of research output ever since they have been introduced. Referring to the early bibliometric attempts to evaluate research institutions in the United Kingdom by Martin and Irvine (1983), Weingart (2005) notes that the reaction of the concerned scientists were quite predictable: "they challenged the possibility of the enterprise on methodological grounds, and they threatened to take the analysts to court because they feared that the results would have adverse effects." While the situation has changed significantly since then and quantitative measures of research output have gained more acceptance, there is still considerable opposition to the use of these measures. In 2006, as many as 26 Canadian universities protested against a university ranking conducted by *Maclean's Magazine*. One year later, 60 U.S. liberal arts colleges refused to participate in a survey on which the *U.S. News & World Report Ranking* is based (Enserink, 2007). One of the most influential university rankings in Germany, conducted by the *Centre for Higher Education Development* (CHE), was recently boycotted by various German universities. Moreover, several German academic societies (such as, e.g., the *German Association of Sociologists*) appealed to their members not to cooperate with the CHE anymore.

A recent and prominent example of such a protest against a research ranking was the public opposition by about 300 German business scholars against the so-called *Handelsblatt* rankings of business scholars. Since 2007 Germany's leading business daily, *Handelsblatt*, regularly publishes rankings of economics and business departments as well as of individual researchers. For individual scholars, three different rankings are published: one based on scientists' lifetime achievement, one based on recent publications within the last five years, and another one for young scholars under 40 years of age. The rankings, which are based on weighted publication counts, have quickly gained public attention and they also play a significant role in departments' hiring decisions. When the publication of new rankings for business scholars was announced in September 2012, two retired business professors, Alfred Kieser (Zeppelin University Friedrichshafen) and Margit Osterloh (University of Zurich), initiated a boycott of the rankings

and asked fellow scientists to withdraw from the rankings by declaring vis-à-vis *Handelsblatt* that they do not want to be listed in any of the rankings (see Kieser and Osterloh, 2012).

In their appeal for a boycott of the rankings Kieser and Osterloh (2012) outline five reasons for their opposition to the rankings[3]: first, they criticize that the *Handelsblatt* rankings focus only on research while other important activities such as teaching and administrative services would be neglected. Secondly, they argue that journal rankings can only poorly measure an article's true quality. At best, a journal ranking would provide information on the average quality of papers published in a given journal, according to the journal's classification as A, B, C or D. Thirdly, the rankings would be systematically biased with respect to the various sub-disciplines. Hence, Kieser and Osterloh (2012) called for more differentiation between the different sub-disciplines of business to account for differences in publication cultures, e.g., between accounting and taxation vis-à-vis marketing. Fourthly, the rankings were argued to provide incentives for scientists to conduct and to publish more incremental research at the cost of innovation. In addition, universities were feared to hire researchers to improve their ranking position and neglect other important aspects in their recruitment. And fifthly, the rankings would provide adverse incentives with respect to the type of conducted research, as it is typically rather difficult to publish research about local or regional topics in leading international journals. However, these topics might be of superior interest to society as a whole. Hence, the rankings would provide the wrong incentives from society's point of view, as they would punish scientists who analyze local issues that are more difficult to publish.

Until 31 August 2012, the reference date of the 2012 ranking, 287 scholars followed the boycott initiative and declared vis-à-vis *Handelsblatt* that they would not want to be listed. As a number of scientists had withdrawn from the rankings for various reasons even before the recent boycott initiative was started, the total number of scientists who are not participating amounts to 352 scientists. It should be noted though that the vast majority of those who withdrew from the ranking would not have been listed in any of the three individual rankings in any case. Only 32 of the 352 scholars or 9.1% of the boycotting group would have made it into any of the three individual rankings. This compares to 330 different scientists, which are ranked in at least one of the three rankings, out of a total of 2684 (12.3%) non-boycotting scientists in the Handelsblatt database.

One suspicion publicly voiced against the boycott initiative has been that the concerns expressed by Kieser and Osterloh (2012) were only camouflaging the true motives for boycotting the rankings which were more selfish, namely the opposition against any movement toward larger transparency. In fact, as one referee has expressed it, "no wonder that the opt-outs oppose the Handelsblatt ranking, for them it is the only rational thing to do: they feel very cozy in their 'chairs' with not much pressure to work at all." Given these contrasting views, we consider it a valuable exercise to elicit some observable factors that drive the individual boycott decision.

Let us also state though that, even if the true motives for the individual boycott decision may be different for some scientists than the ones publicly cited, we see some merit in the arguments put forward by Kieser and Osterloh (2012). Especially their last three arguments (3–5) are very valid points of critique in our view that have also been raised elsewhere. Nevertheless, we still think that the Handelsblatt rankings are a valuable exercise to increase transparency, especially given that universities in Germany are

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[2] See: http://www.shanghairanking.com/.

[3] The open boycott letter to the *Handelsblatt* (in German) and the list of signatures can be found at: http://handelsblattranking.wordpress.com/2012/08/29/handelsblatt-ranking.

almost completely financed by the taxpayer, as long as one keeps the rankings' shortcomings in mind when interpreting them. Moreover, we consider it perfectly legitimate for the free press to evaluate publicly funded institutions, including universities, and to assemble lists of what a newspaper considers to be a nation's top scientists.

We refrain here from further discussing or commenting on the quality and validity of the arguments put forward by Kieser and Osterloh (2012). A vivid discussion of their arguments can be found in various Internet blogs.[4] Instead, we aim at identifying factors that might have affected the individual boycott decision by applying empirical methods, as this analysis may provide some deeper insights into the microeconomics of the resistance to organizational and cultural change. In order to analyze whether there is any correlation between individual research performance on the one hand and opposition against the rankings on the other hand, we have conducted an empirical analysis of the factors that drive the decision to opt out of research rankings.

Before we engage in our exercise, however, let us clarify that we cannot perfectly distinguish between (a) the economic explanation that those who have to lose most from any transparency increasing reform are most likely to oppose these reforms and (b) an alternative explanation suggested by one referee, namely that those researchers who oppose the rankings do so because of the concerns voiced by Kieser and Osterloh (2012), but they just coincidentally also happen to be poor researchers who would likely lose out from increased transparency. As with every empirical analysis, it is always possible, at least in theory, that some unobservable factors perfectly correlate with observed characteristics. However, we believe that this is a fundamental problem of empirical social sciences and we see no specific reason why the problem is more severe for our analysis than for any other empirical analysis.

In the following, we study, based on an anonymized version of the *Handelsblatt* dataset, which factors might have driven the individual boycott decision, thereby providing an insight into the political economy of research rankings. By focusing on factors related to the individual costs and benefits of participating in the ranking, we study whether the cost-benefit-approach is helpful in explaining the individual opt-out decision. As it turns out, our empirical analysis is consistent with the hypothesis that the opt-out decision has been affected by individual cost-benefit evaluations.

The remainder of the paper is organized as follows: Section 2 will provide some more details of the concerned *Handelsblatt* research rankings and the mentioned boycott initiative. Section 3 contains some theoretical considerations to derive testable hypotheses, before Section 4 describes the empirical analysis and its results. Section 5 finally summarizes and concludes.

2. Some further facts about the *Handelsblatt* ranking and its boycott

Internationally, performance rankings of universities and faculties have become quite popular in the media. Since 1983, the magazine *U.S. News & World Report* has been publishing various university rankings.[5] Comparable rankings, initiated and published by media organizations, nowadays exist in at least a dozen of countries (Enserink, 2007). In contrast to performance-based research funding systems, media rankings are often guided by the idea to provide information to aspiring students about which universities provide the best education. Still, measures of research performance are nevertheless often part of media-initiated rankings.

Table 1
Number of journals and weights in the *Handelsblatt* rankings for business scholars.

Weight	1.0	0.7	0.5	0.4	0.3	0.2	0.1
Number of journals	19	65	119	128	167	234	215

In stark contrast, there has traditionally been relatively little systematic evaluation of researchers in Germany (see, e.g., Schubert, 2010; Schmoch and Schubert, 2010), and the rare occasions where evaluations have taken place have typically been based on opinions by valued colleagues. Relatedly, social scientists in the German speaking community (Austria, Germany, Switzerland) have only started in the past two decades to increasingly publish in English-language journals on a large scale instead of contributing to collected volumes or writing books (see, e.g., Graber et al., 2008; Krapf and Schläpfer, 2011). While in economics the internationalization process has started in the 1980s, business scholars are trailing behind and many business and management scholars are still struggling with the internationalization process that is currently still taking place in the business departments of German universities.

In this environment, the *Handelsblatt* started in 2007 to regularly rank economics departments as well as individual economists based on their publication records. In 2009, the first (and until recently only) research ranking of business departments and scholars in Austria, Germany, and Switzerland was published. The rankings explicitly focus on the scientific contributions of both individual researchers and faculties. In order to construct these rankings, journal articles are weighed firstly by the number of authors (by $1/n$, where n is the number of authors) and secondly by a quality weight p which depends on the publication outlet. Hence, every author obtains a score of p/n for every journal article to which (s)he has contributed. Books, contributions to books and articles in journals that are not listed are not taken into account, in general due to a lack of an external screening procedure by independent and anonymous referees of these publication outlets.[6]

The quality weight of a journal is, in principle, based on its impact factor. The journal list contains 947 journals, and the impact of the journals is judged on the basis of three different sources: (1) the journal list published by the Erasmus Research Institute of Management (EJL), (2) the survey-based ranking issued by the German Academic Association for Business research (VHB-JOURQUAL 2.1)[7] and (3) the list of business and management journals listed in the Social Sciences Citation Index (SSCI) and the Science Citation Index (SCI).[8] Based on these sources, business journals are classified into one of the impact classes summarized in Table 1.

Based on these quality-weighed publication records *Handelsblatt* publishes four rankings for the field of business:

(1) The top 25 business departments in Austria, Germany and Switzerland, based on the aggregate score for the papers published by the department's researchers within the last 10 years,
(2) The top 250 business scientists, based on their lifetime achievement,
(3) The top 100 business scientists, based on papers published within the last 5 years,
(4) The top 100 business researchers in the age class below 40 years.

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[4] See especially http://handelsblattranking.wordpress.com/ as well as http://blog.handelsblatt.com/.

[5] See: http://www.usnews.com/rankings.

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[6] For a discussion of the merits of the referee system in economics and a documentation of recent trends, see Gans (2000), Frey (2003), Azar (2005) and Ellison (2002, 2011).

[7] For details see Schrader and Hennig-Thurau (2009).

[8] For further details (in German) see: http://www.handelsblatt.com/politik/oekonomie/bwl-ranking/-bwl-ranking-2012-bwl-ranking-2012-methodik-und-zeitschriftenliste/6758368.html.

As mentioned earlier, the rankings have been heavily criticized among some business scholars. One argument put forward by many business scholars has been that ranking scientists by their journal publication record will bias incentives toward journal publications away from other valuable activities such as teaching, book publications, or consulting.[9] Although in Germany the *Handelsblatt* ranking is not used for university funding, departments' and scientists' prestige and the status among their peers might be affected by the *Handelsblatt* rankings. Another criticism has been that a lot of highly innovative research may not find its way into highly ranked journals exactly because of its innovativeness. Hence, the rankings would provide strong incentives to focus on mainstream research.

3. Theoretical considerations

The opposition against the introduction of quantitative measures of research output might be considered an example for the microeconomics of the resistance to change, which is a long and broadly discussed issue in both social psychology (see, e.g., Rousseau, 1999) and management (see, e.g., Jaffe, 1994)[10] and also a vividly discussed issue in the theory of political economy. While the management literature has a strong focus on explaining change and its management within organizations, the social psychology literature largely focuses on personalities and the social context of change. There is also some related behavioral economics literature on resistance to change, based on so-called anomalies such as the status quo bias (see, e.g., Kahneman et al., 1991).

The political economy literature explains reluctance to change by individual costs and benefits, in line with rather standard economic theory (such as, e.g., Krusell and Ríos-Rull, 1996). This cost-benefit type of approach has also been used to explain the persistence of norms and policies (see, e.g., Coate and Morris, 1999). The basic idea of this approach is that individuals oppose change and prefer the status quo if the costs of change exceed the expected benefits. However, the literature has yet failed to deliver reliable empirical evidence on the question which of the mentioned theories are capable of explaining the opposition to quantitative measures of academic research performance.

We suggest that boycotting research rankings has different individual costs and benefits for different scientists, depending, certainly among other things, on observable characteristics.

Firstly we conjecture that the individual cost of a boycott depends on an academic's research performance. Scholars with good publication records lose an opportunity for (high) public visibility – if they make it into any of the three individual rankings – once they boycott the rankings. Put differently, they lose a marketing opportunity for themselves. It is, for example, not rare that scholars mention ranking positions in their academic CV. In contrast, scholars with poor publication records have not much to lose. Hence, they have very little costs of boycotting a top-250 ranking in which they would not have been included anyhow. Quite in contrast, it may be more pleasant

to argue that one has boycotted the ranking for methodological reasons than to admit that one has not made it into the top 250 or top 100 if researchers are asked about their ranking position. In addition, by publicly announcing one's boycott decision one may even induce colleagues from somewhat distant disciplines into believing that the boycotter would have been ranked. Hence, scientists who are not ranked may even have a benefit of boycotting the ranking as it makes it less transparent that they would not have made it into the rankings anyhow.

Hence, a testable hypothesis is that scientists with better publication record are less likely to boycott the rankings.

Secondly, being publicly honored as a good researcher is more important for scholars who do not have tenure, as it can help their career, while it is less important for scholars already tenured. Hence, younger scholars, which are less likely to be tenured, are likely to have a higher individual cost of boycotting the ranking and, thereby, foregoing this advertising opportunity than their older colleagues.

In addition, younger scholars have more to lose from a boycott, as there is a special ranking for scholars below the age of 40. Hence, for any scholar the likelihood of being ranked in any of the three rankings is, ceteris paribus, higher for younger scholars.

Hence, another hypothesis that can be tested is that older scholars are more likely to withdraw than younger scholars, because (a) older scholars are more likely to be tenured so that a boycott carries lower costs in terms of missed self-advertising opportunities and according career perspectives, and (b) older scholars are more likely to find it difficult to adjust to the cultural change which is taking place in German business schools, as they have been longer exposed to the traditional culture and also larger specific investments into the old business research style and culture.

We also suspect that researchers that have been academically socialized in the US or in the UK are less likely to oppose the ranking, as research evaluations are more common in these two countries. Put differently, their specific investment into the old German-style research culture and style should be lower than for scholars socialized in Germany. While we cannot identify all scholars who pursued their graduate studies in the US and UK, we can identify scholars holding a Ph.D. instead of a German-style doctor. Hence, we test whether the suffix "Ph.D." instead of the prefix "Dr." has any explanatory power.

Finally, we test whether different specializations have any impact on the likelihood to boycott the rankings, as Kieser and Osterloh (2012) suggested that some sub-disciplines are systematically disadvantaged by the journals' concrete weighting factors. Note, however, that we have only included subfields in which at least 1% of the sample is active and that many scientists are working in more than one field of specialization (e.g., in logistics and operations research or in strategic and international management). The classification of subfields has not been undertaken by ourselves, but was taken from the *Handelsblatt* database.

4. Empirical analysis

The *Handelsblatt* database for the rankings of business scholars and departments consists of 3036 individual academic business scholars as of September 2012, including the ones who are not publicly listed in the end. However, as information on the scientist's age is only available for a subset of 1167 scientists, we decided to focus on the scientists' academic age (academic age). Information on the academic age, which is defined as the time (in years) elapsed since the scientist obtained his or her doctorate or Ph.D., is available for 2578 scientists. However, as some other observations are missing for a further 363 scientists, the total database we employed for our analysis has been reduced to 2215 scientists for

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[9] It should be noted that publicly available teaching evaluations of university lecturers and professors exist in Germany even longer than the Handelsblatt Ranking. Since November 2005 the internet page www.meinprof.de publishes teaching rankings of individuals and institutions, based on evaluations by students. Similar rankings are available for Austria and Switzerland. Although these rankings focus exclusively on teaching, no comparable boycott initiative evolved. However, there has been a vivid discussion about the treatment of offending comments which made it even to the courts.

[10] The management literature on organizational change is even enriched by journals especially dedicated to organizational change such as the *Journal of Organizational Change Management* or *Industrial and Corporate Change*.

Table 2
Descriptive statistics.

Variable	Mean	Std. dev.	Min	Max	Median	Obs
Boycott	0.11	0.32	0.00	1.00	0.00	2215
Age	42.37	9.44	26.00	70.00	41.00	1167
HB points total	1.64	2.35	0.01	32.48	0.80	2215
HB points A$^+$	0.12	0.51	0.00	11.25	0.00	2215
HB points A$^+$/A	0.46	1.08	0.00	17.08	0.00	2215
Annual HB points	0.18	0.23	0.00	2.76	0.11	2215
Points per publ.	0.16	0.09	0.00	0.80	0.14	2215
Number publ.	10.24	13.64	1.00	157.00	6.00	2215
Academic age	12.66	9.67	1.00	46.00	10.00	2215
Female	0.19	0.40	0.00	1.00	0.00	2215
Ph.D.	0.05	0.21	0.00	1.00	0.00	2215
Professor	0.61	0.49	0.00	1.00	1.00	2215
Marketing	0.06	0.23	0.00	1.00	0.00	2215
Banking & finance	0.07	0.26	0.00	1.00	0.00	2215
Entrepreneurship	0.01	0.11	0.00	1.00	0.00	2215
Production	0.03	0.17	0.00	1.00	0.00	2215
Logistics	0.02	0.14	0.00	1.00	0.00	2215
Business organization	0.04	0.18	0.00	1.00	0.00	2215
Human resources	0.03	0.16	0.00	1.00	0.00	2215
General management	0.01	0.09	0.00	1.00	0.00	2215
Information systems	0.03	0.17	0.00	1.00	0.00	2215
Operations research	0.02	0.15	0.00	1.00	0.00	2215
Technology & innovation	0.04	0.19	0.00	1.00	0.00	2215
Sustainability management	0.01	0.09	0.00	1.00	0.00	2215
Accounting	0.03	0.17	0.00	1.00	0.00	2215
SME management	0.01	0.08	0.00	1.00	0.00	2215
Strategic management	0.02	0.15	0.00	1.00	0.00	2215
Insurance management	0.01	0.08	0.00	1.00	0.00	2215
International management	0.02	0.12	0.00	1.00	0.00	2215
Business taxation	0.01	0.12	0.00	1.00	0.00	2215

which all observations are available. The number of publications is the number of contributions in any of the 947 academic journals that are listed in the *Handelsblatt* database. Table 2 provides some descriptive statistics for these 2215 scientists.

Once we split the dataset into two groups – the scientists having withdrawn from the ranking ($n = 250$) on the one hand, and the ones having not withdrawn ($n = 1965$) on the other – the descriptive statistics are given in Table 3.

Table 3
Separate descriptive statistics for ranking participants (ranking opponents).

Variable	Mean	Std. dev.	Min	Max	Median	Obs
Boycott	0.00 (1.00)	0.00 (0.00)	0 (1)	0 (1)	0 (1)	1965 (250)
Age	41.66 (47.60)	9.34 (8.52)	26 (29)	70 (70)	40 (47)	1029 (138)
HB points total	1.64 (1.67)	2.40 (1.94)	0.01 (0.05)	32.48 (13.42)	0.77 (1.02)	1965 (250)
HB points A$^+$	0.12 (0.06)	0.54 (0.21)	0 (0)	11.25 (1.58)	0.00 (0.00)	1965 (250)
HB points A$^+$/A	0.47 (0.33)	1.11 (0.77)	0 (0)	17.08 (5.38)	0.00 (0.00)	1965 (250)
Annual HB points	0.16 (0.11)	0.18 (0.16)	0 (0)	1.84 (1.66)	0.10 (0.06)	1965 (250)
Points per publ.	0.16 (0.14)	0.10 (0.07)	0.01 (0.04)	0.80 (0.50)	0.14 (0.12)	1965 (250)
Number publ.	10.03 (11.91)	13.78 (12.48)	1 (1)	157 (111)	5 (8)	1965 (250)
Academic age	10.83 (18.96)	9.41 (9.11)	1 (3)	46 (44)	8 (9)	1965 (250)
Female	0.20 (0.15)	0.40 (0.36)	0 (0)	1 (1)	0 (0)	1965 (250)
Ph.D.	0.05 (0.02)	0.22 (0.14)	0 (0)	1 (1)	0 (0)	1965 (250)
Professor	0.58 (0.90)	0.49 (0.30)	0 (0)	1 (1)	1 (1)	1965 (250)
Marketing	0.06 (0.06)	0.23 (0.24)	0 (0)	1 (1)	0 (0)	1965 (250)
Banking & finance	0.08 (0.04)	0.26 (0.19)	0 (0)	1 (1)	0 (0)	1965 (250)
Entrepreneurship	0.01 (0.01)	0.11 (0.11)	0 (0)	1 (1)	0 (0)	1965 (250)
Production	0.03 (0.03)	0.17 (0.18)	0 (0)	1 (1)	0 (0)	1965 (250)
Logistics	0.02 (0.01)	0.15 (0.09)	0 (0)	1 (1)	0 (0)	1965 (250)
Business organization	0.03 (0.08)	0.17 (0.27)	0 (0)	1 (1)	0 (0)	1965 (250)
Human resources	0.02 (0.05)	0.15 (0.22)	0 (0)	1 (1)	0 (0)	1965 (250)
General management	0.01 (0.01)	0.09 (0.09)	0 (0)	1 (1)	0 (0)	1965 (250)
Information systems	0.03 (0.01)	0.18 (0.09)	0 (0)	1 (1)	0 (0)	1965 (250)
Operations research	0.03 (0.00)	0.16 (0.06)	0 (0)	1 (1)	0 (0)	1965 (250)
Technology and innovation	0.03 (0.08)	0.17 (0.26)	0 (0)	1 (1)	0 (0)	1965 (250)
Sustainability management	0.01 (0.00)	0.10 (0.06)	0 (0)	1 (1)	0 (0)	1965 (250)
Accounting	0.03 (0.05)	0.16 (0.21)	0 (0)	1 (1)	0 (0)	1965 (250)
SME management	0.01 (0.01)	0.08 (0.09)	0 (0)	1 (1)	0 (0)	1965 (250)
Strategic management	0.02 (0.04)	0.14 (0.21)	0 (0)	1 (1)	0 (0)	1965 (250)
Insurance management	0.01 (0.00)	0.08 (0.00)	0 (0)	1 (1)	0 (0)	1965 (250)
International management	0.01 (0.02)	0.12 (0.15)	0 (0)	1 (1)	0 (0)	1965 (250)
Business taxation	0.01 (0.02)	0.11 (0.15)	0 (0)	1 (1)	0 (0)	1965 (250)

Table 4
Logit regression results for probability of boycott.

Variable	Estimate I	Std. error I	Estimate II	Std. error II
(Intercept)	−2.78***	0.21	−2.73***	0.19
HB points total	−0.11**	0.04	−0.11**	0.04
Academic age	0.07***	0.01	0.07***	0.01
Points per publication	−2.72**	1.07	−2.70**	1.05
Female	−0.04	0.20		
Ph.D.	−0.85*	0.49	−0.91*	0.49
Young professor	0.35	0.31		
Elderly professor	0.37**	0.16	0.37**	0.16
Marketing	−0.08	0.31		
Banking & finance	−0.74*	0.38	−0.75**	0.37
Entrepreneurship	−0.20	0.67		
Production	0.39	0.47		
Logistics	−0.97	0.81		
Business organization	0.75**	0.32	0.90***	0.30
Human resources	0.47	0.37		
General management	−0.13	0.80		
Information systems	−1.51**	0.74	−1.48**	0.73
Operations research	−1.92*	1.04	−1.80*	1.03
Technology and innovation	1.34***	0.31	1.35	0.30
Sustainability management	−1.06	1.05		
Accounting	0.32	0.35		
SME management	−0.32	0.87		
Strategic management	0.74*	0.39	0.84**	0.38
Insurance management	−13.6	367.57		
International management	0.58	0.49		
Business taxation	0.11	0.50		
Residual deviance	1355.3		1367.2	
Degrees of freedom	2189		2203	
Nagelkerke's pseudo R^2	0.18		0.17	

Note: *** significant at 1% level, ** significant at 5% level, * significant at 10% level, $n = 2215$

Table 3 reveals that ranking participants have published less than the ranking opponents both in terms of the number of journal articles (number publ.) and in terms of the total points achieved (HB points total), even though the latter is statistically insignificant. Note, however, that apart from "HB points total" the differences between means for all other variables are statistically significant, as *t*-tests reveal. Hence, Table 3 also shows that ranking opponents have published less in A⁺- and A-journals and that ranking opponents tend be older (age) and already have a longer academic career (academic age). Accordingly, while ranking opponents tend to have a longer publication record, their average score per year of their scientific life (annual HB points) is lower than the comparative figure for ranking participants.

Since it is well possible that various factors had an influence on the opt-out-decision at the same time, a more sophisticated multivariate analysis is necessary. Since our explanatory variable is a dummy variable which can only take the values of one (boycott) or zero (no boycott) the linear regression model is not applicable here. Instead, we employ a binary logit model to identify factors significantly related to the decision to boycott the ranking. The logit approach explains the probabilities of the outcome of the variable to be explained as a function of covariates, using a logistic link-function. Different from linear regression models, logit models are estimated using maximum likelihood procedures.

In a first specification we explain the probability of a boycott by a constant and almost all variables listed in Table 3: the total points of a given researcher (HB points total), the time (in years) elapsed since the researcher has received his doctorate degree or Ph.D. (academic age), the average score of a researcher's publication (points per publ.), whether he or she holds a Ph.D., gender (female = 1) and his or her specialization. We also control for being professor and even distinguish between young professors (under the age of 40) and elderly professors (above 40). Table 4 summarizes the results of two regression analyses.

While regression I makes use of all available variables that are not too correlated (such as "HB points total" and "number publ."), regression II uses only those variables that have turned out to be statistically significant in regression I.[11] The results of the two regressions clearly support our hypotheses: First, a withdrawal from the ranking is the less likely the more publication points a scholar has achieved over his or her academic career. Second, the more reputed the average outlet is, in which a scholar published his or her papers, the less likely he or she is to boycott the ranking. Third, more senior scholars are more likely to boycott the ranking than younger ones. Gender does not appear to play any role. The role of holding a professorship depends on the age of a professor. While we find no significant effect for younger professors, professors in the age of 40 and older exhibit a significantly higher probability to boycott the ranking than non-professors. One might attribute this finding to two different causes. First, it may be taken as an indication that younger scholars have already adapted to the idea of evaluating research performance through bibliographic measures. Second, younger scholars are more actively competing for vacant positions and thus have higher costs of opting out. We also find researchers holding a Ph.D. to be less likely to support the boycott than researchers with a German-style doctorate. Finally, while researchers specializing in banking & finance, operations research and information systems are less likely to follow the boycott, business academics in the fields of business organization, technology & innovation and strategic management are more likely to do so. One might speculate this to be due to different publication cultures in these subfields of business administration. Banking & finance, operations research and information systems belong to the research fields where quantitative methods are used extensively and where

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[11] By comparing residual deviances of the two models using the chi-square statistics we find model I to be no significant improvement to the less restricted model II. Thus, excluding the insignificant variables is justified.

Table 5
Marginal effects of variable changes (Δ).

Variable	Coeff.	Marginal effect	Mean/median	Std. dev./change Δ	Marginal effect of Δ
HB points total	−0.11	−0.008	1.64	2.35	−0.019
Academic age	0.07	0.005	12.66	9.67	0.053
HP points per publ.	−2.70	−0.203	0.16	0.09	−0.019
Ph.D.	−0.91	−0.068	0		
Elderly professor	0.37	0.028	0		
Banking & finance	−0.75	−0.056	0		
Business organization	0.90	0.068	0		
Information systems	−1.48	−0.111	0		
Operations research	−1.80	−0.135	0		
Technology and innovation	1.35	0.101	0		
Strategic management	0.84	0.063	0		

research topics are often not closely linked to national specifics. As a consequence, in these fields the scientific discussion is to a great extent taking place in international journals. As these journals are often included in the *Handelsblatt* journal list, scholars from these fields are less likely to boycott the *Handelsblatt* ranking. The opposite effect seems to be at work in subdisciplines which focus more on qualitative (instead of quantitative) research and which face more international heterogeneity.

One may argue that overall number of HB points may be less important than the number of publications in top-tier journals, at least for hiring and funding committees. However, as (i) total HB points, (ii) HB points only in A$^+$-journals and (iii) HB points in both A$^+$/A-journals are highly correlated, adding these variables to the regression equation renders all these variables insignificant due to multicollinearity. We therefore refrain from using these variables in one and the same regression. When using HB points A$^+$ instead of total HB points the coefficient turns out to be negative but is insignificant. When using HB points A/A$^+$ the coefficient is negative and significant. In both variants the qualitative results for the other control variables remain stable. As the estimation using total HB points as explanatory variable delivers the lowest value of the Akaike information criterion, we stick to this variant of the regression.

While the results reported in Table 4 indicate the nature or direction of the different effects and their statistical significances, we cannot directly infer much about their magnitudes or their economic significance. In order to learn more about the latter, marginal effects have to be calculated. However, in contrast to linear regression models, the marginal effects of the covariates depend on the level of the variables themselves in our regressions. Thus, the marginal effects can only be evaluated at pre-defined values of the covariates. It is common to evaluate marginal effects at the sample means of the covariates and to report the marginal effect of one standard deviation of the referring covariate. For the dummy variables, however, the marginal effect is the change of the dummy from zero to one. Furthermore, we only calculate marginal effects for those variables that are statistically significant, and we based the calculations on regression model II, which only includes the variables that have turned out to be statistically significant. The results are summarized in Table 5.

To put Table 5 into context, it should be noted that 11% of the scientists in our sample (for whom all variables have been available) participated in the boycott. Evaluated at the mean of all respective variables (or median for the dummy variables), the probability that the so-constructed "average" business scientist opts out of the rankings is 8.0%.

As reported in Table 5, an increase of the total publication score (HB points total) by one standard deviation (2.35 points)[12]

decreases the probability that a scientist will withdraw from the rankings by 1.9 percentage points. Alternatively, an increase in the total publication score by one HB point decreases a scientist's boycott probability by 0.8 percentage points. Similarly, an increase of a scientist's average score per publication by one standard deviation (0.09) decreases his or her boycott probability by 1.9 percentage points. Note that based on a sample mean of 0.16 an increase of 0.09 points is a relative increase of more than 50%. In contrast, an increase in the time span of one's academic career by one standard deviation (9.7 years) increases the probability of a withdrawal from the rankings by 5.3 percentage points. Holding a Ph.D. decreases the individual boycott probability by 6.8 percentage points. Elderly professors have a 2.8 percentage points higher probability of opting out.

We also find comparatively strong effects for researchers from the earlier mentioned fields of specialization. Especially in the subfields of operations research (−13.5 percentage points) and information systems (−11.1 percentage points) researchers are much less likely opting out of the *Handelsblatt* ranking. Even in the field of banking & finance the effect is still substantial (−5.6 percentage points). We also find massive effects in the fields of specialization with higher opting out probabilities. The strongest effect can be detected in the field of technology & innovation (10.1 percentage points). However, even in the fields of business organization and strategic management the effects are of considerable size.

Overall, we can conclude that the detected determinants of the decision to opt out of the *Handelsblatt* ranking are not only statistically significant, but also of relevance in absolute terms.

5. Discussion and conclusions

The increased usage of quantitative measures of research performance of universities, faculties and individual researchers has initiated a highly controversial debate on the pros and cons of the employed indicators among scientists. In many countries, these debates culminated in protests and even boycotts. In this paper we presented empirical evidence from the recent boycott initiative of German business scholars toward the well-recognized *Handelsblatt* rankings indicating that scientists' decisions to boycott rankings may not always be driven by theoretical concerns about the employed quantitative measures and methods. At least to a significant extent the observable resistance to cultural and institutional changes and the hostility vis-à-vis public research evaluation exercises and greater transparency about individual research performance can be explained by factors related to the individual costs and expected benefits of the concerned researchers. Our analysis indicates that scientists who have little to gain from the change of academic culture that is currently taking place in German business schools are more likely to boycott the *Handelsblatt* rankings. These are (i) scholars who are more senior (already have a longer

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[12] Note that 1 point corresponds to a single-authored paper in one of the 19 A$^+$- and A-journals on the *Handelsblatt* journal list.

academic career), (ii) scientists who have been either less successful or less eager to publish their research in internationally well renowned journals with high impact factors, and (iii) scientists who have already been appointed to a professorship. In contrast, academics having obtained a Ph.D. (instead of a German-style doctorate) are less prone to supporting the boycott. Finally, researchers specializing in various more quantitatively oriented subjects (such as finance and operations research) are less likely to boycott the ranking, while researchers in some less quantitatively oriented subjects (such as business organization) are more likely supporting the boycott.

While our empirical analysis is primarily concerned with the case of cultural change in the German-speaking community of business scholars, we believe that the basic results can easily be generalized. Individuals expecting to lose more and to gain less from cultural change are more likely to oppose changes and reforms than those which (expect to) perform well in the changing environment.

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