# How Much Does Journal Reputation Tell Us About the Academic Interest and Relevance of Economic Research?

Empirical Analysis and Implications for Environmental Economic Research

Traditional measures of research output in economics are only weakly related to academic interest as measured by the frequency of article citations. By their construction, they encourage a narrow disciplinary orientation and punish original, relevant, and innovative work.

How Much Does Journal Reputation Tell Us About the Academic Interest and Relevance of Economic Research? Empirical Analysis and Implications for Environmental Economic Research *GAIA* 19/2 (2010): 140–145

### Abstract

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Unlike in other disciplines, research output in economics is commonly measured based on the disciplinary reputation of the journals in which an author has published. Here, I examine how much output measures based on journal reputation tell us about the academic interest and relevance of economic papers as measured by frequency of citation. Using data from the 2008 Handelsblatt ranking of economists in German speaking countries and interdisciplinary citation data from the Web of Science, I find that researcher scores based on journal reputation explain only about 30 percent of the variation (variance) in article citations. When the top 10 (20) percent of the researchers according to journal reputation scores are excluded, the percentage of explained variation in citation frequency drops to 8 (3) percent. Furthermore, using environmental economics journals as an example, I show that the traditional output measures strongly discourage applied and interdisciplinary economic research. The findings confirm that the traditional output measures provide incentives for narrow economic work even if that work is of interest to only few other researchers. Responsible hiring committees and funding institutions should take these problems seriously and re-consider existing standards in the evaluation of economic research.

### Keywords

citation index, incentives, interdisciplinarity, publication, research evaluation, scientometrics

**Contact:** *PD Dr. Felix Schläpfer* | University of Zurich | Socioeconomic Institute | Hottingerstr. 10 | 8032 Zurich | Switzerland | Tel.: +41 44 6344595 | E-Mail: felix.schlaepfer@soi.uzh.ch The use of citation frequency for measuring researcher productivity is being increasingly criticised (e.g., Adler et al. 2008). Key issues with citations-based measures include their limited potential to reflect an article's interest and relevance outside academia as well as the problem that these measures can provide incentives for unproductive herd behaviour and "citation cartels" in research. Furthermore, it is often argued that the coverage of sources by the existing citation databases is not sufficiently objective or comprehensive (e.g., Winiwarter and Luhmann 2009). These issues are of even greater concern where evaluations are based on citation measures at the journal level (impact factors) rather than on individual article citations (Mocikat 2009).

In a reply to Winiwarter and Luhmann as well as Mocikat, Nentwich (2009) acknowledges important problems with citations-based measures of research output but also argues that some of the criticism misses the mark. Most importantly, perhaps, the resulting incentives for publishing in a (internationally) visible and accessible form can be seen as inherently desirable, and the relevance and translation for the world outside academia may be seen as a separate problem on which competing measures may not fare any better. In addition, Nentwich (p. 281) suggests that the "distorting mirror of citations" can promote reflection on how scientific output is measured and may thus be a positive trigger of change.

Can citations-based measures be a healthy challenge to existing standards in academic research? One way to look into this is by empirically comparing the implications of alternative approaches in research evaluation. A field of inquiry where research output is *not* measured based on article citations is economics. In economics, the measurement of research output relies on the number of articles and a rating of the journals in which these articles are published. In this system, a small number of authoritative insiders define journal quality and reputation and at the same time act as gatekeepers who decide what is accepted for publication in the most reputable journals (Laband and Tollison 2003, Oswald 2007). Hence, the career relevance of an individual article is defined by the reputation of the journal in which it is pub-



lished – quite regardless of its fate in the scientific community. Consequently, any rational economist should focus on publishing in high-reputation journals – and sacrifice the objectives of relevance and interest (as measured by future citations) in his or her research. Of course, one would expect that the researchers who publish most successfully in terms of journal reputation are also those who are most relevant and interesting. However, if there are tradeoffs between the two objectives, it could also happen that research output based on *journal reputation* is only weakly, if at all, associated with output based on *citations*. This is a testable hypothesis. If it is confirmed, the finding would imply that the incentives introduced by the existing output measures do not encourage interesting and widely relevant work. Originating from a time when citation data were unavailable, these output measures would thus be highly insufficient from a societal perspective.

Here, I examine this hypothesis empirically. Specifically, I investigate the relationship between a well-known traditional measure of researcher output based on journal reputation – the *Handelsblatt* ranking of economists in German-speaking countries<sup>1</sup> – with the same authors' citation rates in *Web-of-Science*-listed journals, both for the year 2008. The following specific questions are addressed:

- **1.** How much of the variation in researchers' number of citations is explained by their score based on journal reputation?
- **2** How strong is the association between researcher *rank* based on citations and researcher rank based on journal reputation scores?

# Economic Journal Weighting Schemes and Resulting Incentives

In economics, a variety of journal weighting schemes have been proposed (see, e.g., Kodrzycki and Yu 2006). The *Handelsblatt* ranking 2008, in weighting the journals, borrowed from the two probably most established European journal rankings at that time, the "Tinbergen list" and the weighting scheme developed by Combes and Linnemer (2003).

The Tinbergen list, developed by the Tinbergen Institute in Rotterdam, The Netherlands, classifies journals as "generally accepted top-level journals" (AA), "very good journals covering economics in general and the top journals in each field" (A), and "good journals for all research fields within the Tinbergen Institute". On its website, which also displays the resulting journal weights, the institute describes the classification as follows:<sup>2</sup>

"The classification is based on objective rankings, supported by the judgement of experts. Important inputs have been: SSCI and SCI impact factors, the ranking by Kalaitzidakis, P. et al. 2003. 'Ranking of Academic Journals and Institutions in Economics', *Journal of the European Economic Association:* 1 (6), pp. 1346–66, and a more recent 'within economics' ranking by Kodrzycki, Y. and P. Yu (2006) 'New Approaches to Ranking Economics Journals', *Contributions to Economic Analysis & Policy:* Vol. 5: Iss. 1, Article 24. (...) The two articles mentioned above correct the SSCI scores for self-citation, average number and size of pages of the journal, age of the journal and the impact factor of the journal in which articles have been cited. In this way a more reliable impact factor has been reached for journals in economics."

The weighting scheme by Combes and Linnemer (2003) was developed for the European Economic Association (EEA) to rank the leading European economics departments (Combes and Linnemer 2003, p. 4):

"We built an original journal weighting scheme denoted CL that weights all *EconLit* journals from 1 to 1/12. (...) we divided the *EconLit* journals in six groups. First, top journals are significantly differentiated from other ones with a weight equal to 1. A weight of 8/12 only is given to the next 16 journals. Then, a series of 39 journals are weighted 6/12, 68 journals 4/12, 138 journals 2/12 and all remaining journals 1/12 (...).

Our choices, which could be discussed endlessly as more than 800 journals are considered, tried to be consistent with citation/ impact indicators when they are available. We do not think, however, that these have to be followed blindly. Independently of the journal average quality, the number of citations can vary from one field to the other and from a young journal to an older one. To counter this kind of effects, in any case, we tried to put at least 6/12 to any journal which is a leader in its field. Conversely, we did not put 8/12 or more to a journal too specialized."

Evidently, this description is not very precise about when exactly the impact factors were not "followed blindly".<sup>3</sup> Moreover, the use of reputation scores as a sole or main measure of research output may produce a number of problematic incentives beyond those of measures based on article citations (i. e., the blindness to relevance outside academia and the reward for "fashionable" topics, in review stage or after publication). At least four additional problems can be identified:<sup>4</sup>

handelsblatt-ranking-vwl-was-sich-2010-an-der-methodik-geaendert-hat;2537789. Preliminary analyses of the new data show that the author ranks are very similar to those of the previous ranking. The conclusions of this paper remain valid for this latest edition of the ranking.

- 2 www.tinbergen.nl/research-institute/journal-classification.php
- 3 Based on all 125 journals included both in the 2008 *Handelsblatt* ranking and the 2008 journal citation reports (category "Economics"), the two-year impact factor explains only 20 percent and the five-year impact factor 26 percent of the *Handelsblatt* journal weights.
- 4 Partly, these incentives apply to journal (as opposed to individual) citation scores as well.

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<sup>1</sup> Since 2010, the Handelsblatt ranking is based on the database Forschungsmonitoring which has been enacted by the Verein für Socialpolitik (German Economic Association) and is administered by the Swiss Economic Institute of the Swiss Federal Institute of Technology ETH (Konjunkturforschungsstelle, KOF) according to guidelines set by the newspaper Handelsblatt. The ranking is thus officially endorsed by a large academic association and a large publicly funded research institution. The latest (March 2010) edition of the ranking is based on a larger number of journals than the 2008 edition (all journals included in the database EconLit and "important statistics journals and some interdisciplinary journals like Nature and Science") and a modified weighting scheme: www.handelsblatt.com/politik/wwl-ranking/

*First,* journal reputation may be a very noisy signal of the quality of *individual articles.* Previous research has demonstrated a large overlap of article citation rates among journals with higher and lower reputations (Laband and Tollison 2003, Starbuck 2005, Oswald 2007). Measurement based on journal reputation thus provides powerful incentives for wasteful investments in repeated submissions to top journals.

*Second*, it is well known that papers can be purposefully written to please the editors and reviewers of the journal to which they are submitted. Articles are more likely to be accepted in highly ranked economics journals if they largely support, rather than challenge, received wisdom (Frey 2003). Hence, measures based on journal reputation may discourage innovative work that may not be accepted in highly ranked journals but would be frequently cited (even in a "lower" journal).

*Third,* as many economists perceive technicality and mathematical sophistication as signals of high-quality research, journal reputation scores may reflect and promote those qualities.<sup>5</sup>

**Finally**, since articles published in journals of related disciplines are not "counted", the economic output measures foster disciplinary orientation in publishing. (As a matter of fact, the authors of some economic weighting schemes seem to have quite willingly cultivated a narrow disciplinary orientation.<sup>6</sup>)

In sum, output measures based on journal reputation may provide incentives for economic research that is technically sophisticated, supportive of prior work, and close to the core of the discipline – at a possible expense of relevance, interest, originality, and innovation.

### **Data and Measures**

### **Output Measure Based on Journal Scores**

In September 2008, the German newspaper *Handelsblatt* published the 2008 edition of its ranking of the "top 200" active economists at research institutions in Germany, Austria, and Switzerland, based on their lifetime publication output. Additionally, the newspaper listed the "top 100" researchers based on articles published or accepted in 2004 through August 1, 2008.

The *Handelsblatt* ranking was based on research output in 220 journals in the fields of economics and statistics, weighted

5 In discussing the origins of the recent economic crisis, Paul Krugman (2009) argues that "the economics profession went astray because economists, as a group, mistook beauty, clad in impressive-looking mathematics, for truth".

6 Liebowitz and Palmer (1984, p. 82) who analyse the influence of economic journals state: "Economists, being a rather narrow-minded and self-centered group, are probably more concerned with a journal's impact on the economic profession (than on other disciplines)".

according to a combination of the two schemes described above. Five top journals obtained the value 1, the remaining journals obtained values between 0.67 and 0.2 points.<sup>7</sup> Short research notes and comments counted half the value of regular articles. Book reviews, replies, and corrections were not counted.

The journal score received by the author of an article was calculated by the formula 2p/(n+1), where *p* is the point value of the journal and *n* the number of authors of the article. Points were summed over articles to obtain a researcher's total score. The dataset relies on researcher-reported article lists. The article lists of all researchers (with journal points of each article) were published on the Internet, such that misrepresentation was unlikely.

### **Output Measure Based on Citations**

For all authors listed in the *Handelsblatt* rankings, the 2008 citation data were researched from the *Web of Science* database in May 2009, using the "search" and "cited reference search" tools.<sup>8,9</sup> Where an author's work could not be unambiguously identified by his or her last name and initial(s), we used his or her publication list to exclude articles from other authors. In cases where we could proceed with the efficient "cited reference search" tool (as no or only few papers from other authors with identical name and initials had to be manually excluded), the citation numbers also include citations to articles that are not listed themselves in the *Web of Science*. In the remaining cases, where we used the "search" tool, the citations include only those to articles referenced in the *Web of Science*. Due to resource constraints, and since the citations to non-*Web-of-Science*-listed publications are only a small fraction of the total, we tolerated this (unsystematic) measurement error.

### Results

# Relationship Between Score Based on Journal Reputation and Score Based on Number of Citations

Figure 1a shows scatter plots of the "top 200" researchers' numbers of citations in 2008 and their *lifetime* scores (all articles) based on journal reputation as published in the *Handelsblatt* ranking. Visual inspection suggests that the correlation between the two measures is relatively weak. Many of the "top" researchers in the *Handelsblatt* ranking are cited relatively rarely. On the other hand, there are some apparent "second rate" researchers whose work apparently makes a substantive impact on the literature.

To quantify how much of the variation in citations can be explained by the *Handelsblatt* scores, the citation measure was re-



<sup>7</sup> A list with the journals considered 2008 and their scores is available from the author on request.

<sup>8</sup> The analysis is based on the citation data of a single year since the random variation of individual citation numbers over time (years) tends to be small. Nevertheless, using data from several consecutive years might be appropriate to remove some of the random variation in future research.

<sup>9</sup> http://thomsonreuters.com/products\_services/science/science\_products/a-z/ web\_of\_science

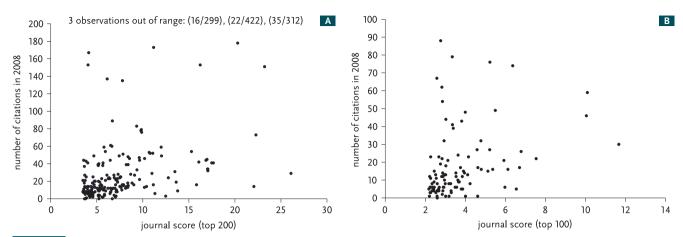
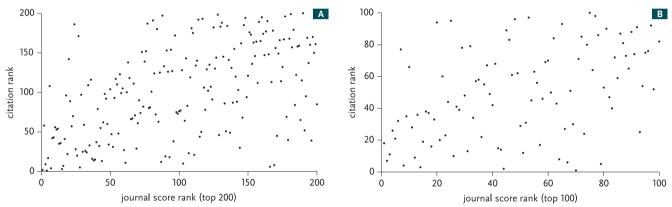


FIGURE 1: Economists represented in the Handelsblatt ranking 2008: relationship between journal reputation score and number of citations in 2008. A) total journal score and citations to all articles; B) journal score based on articles published in 2004 to August 1, 2008 and citations to articles published in 2004 to 2008.



**FIGURE 2:** Economists represented in the *Handelsblatt* ranking 2008: relationship between researcher rank based on journal reputation score and researcher rank based on citations. **A)** ranks based on total journal score and on citations to all articles; **B)** ranks based on journal score for articles published in 2004 to August 1, 2008 and on citations to articles published in 2004 to 2008.

gressed on the journal score to obtain the  $R^2$  values (explained variation in the linear model) and the respective P values (from testing the restriction that the coefficient on "journal score" is zero). The data were not log-transformed due to the occurrence of zero values in the citation variable. (The original data are available from the author on request.)

Table 1 (p. 144, upper part) summarises these results. In the linear model, the journal reputation score explains 30.7 percent of the variation in citation rates. However, much of this explanatory power is due to a small number of top researchers. When the top 10 (20) percent of researchers (based on *Handelsblatt* scores) are omitted, the percentage of explained variation drops to 7.8 (3.3) percent. Hence, if the *Handelsblatt* ranking is used to compare the research output of candidates within the lower 80 percent of the distribution, relevance and interest as measured by citations is almost completely discounted.

One might object that *lifetime* journal scores may be only weakly correlated with 2008 citations, since older articles might not be cited any more in 2008 (although articles citing those articles might still be). To entertain this possibility, I also examined the relationship between journal scores from publications in 2004 through August 1, 2008 and citations to articles published in 2004 through 2008 (figure 1b). The percentages of explained variation are even somewhat smaller (table 1, lower part).

# Relationship Between Rank Based on Journal Reputation Scores and Rank Based on Citations

How do these numbers translate into researcher ranks? For illustrative purposes, I also plotted rank based on journal scores (*Handelsblatt* rank) against rank based on citations (figure 2)<sup>10</sup>.

The *Handelsblatt* ranks based on *lifetime* journal score and 2008 citations to *all articles* are shown in figure 2a. The data for the journal score based on articles published in 2004 through August 1, 2008 and the citations in 2008 to articles published in 2004 through 2008 are shown in figure 2b. Again, the scatter plots show that the *Handelsblatt* ranks are a very poor predictor of researcher ranks based on number of citations.

10 Where two or more researchers had received identical numbers of citations, the ranks were assigned based on journal scores. (Alternatively, one could assign equal ranks without changing the overall pattern of the results.) 
 TABLE 1:
 Economists represented in the Handelsblatt ranking 2008:

 proportion of variation in Web of Science citations explained by Handelsblatt
 journal reputation scores (R<sup>2</sup> values and P values from linear regression models).

sample	n	R <sup>2</sup>	Р
all articles			
■ full sample	200	0.307	< 0.001
top 10 percent omitted	180	0.078	0.001
top 20 percent omitted	160	0.033	0.021
articles in 2004 to 2008			
■ full sample	100	0.108	< 0.001
top 10 percent of scores omitted	90	0.066	0.014
top 20 percent of scores omitted	80	0.025	0.163

## Implications for Disciplinary and Interdisciplinary Environmental Research

Concerning the focus of this journal, it is easy to show that the traditional economic standard in measuring research output also has adverse implications specifically for economists interested in disciplinary and interdisciplinary environmental research. In addition to the problem that contributions in many journals of other disciplines are ignored in the traditional output measures (see above), the disciplinary and interdisciplinary environmental economics journals which publish mainly applied work are greatly underweighted relative to their overall impact on the literature as measured by their impact factors.<sup>11</sup>

This is illustrated in table 2 for the 13 environmental economics journals included in the 2008 *Handelsblatt* ranking. For example, the journal *Ecological Economics* ranks among the top 15 percent of the economics journals in terms of its five-year *Web of Science* impact. Nevertheless, the journal received a very low score in the disciplinary rankings, including the *Handelsblatt* ranking described above, where the journal weight of 0.2 suggests a rank somewhere in the bottom 25 percent of the economics journals. Among the environmental economics journals, only those three ranking highest (according to the traditional measures) receive weights that are approximately proportionate to their impacts on the literature. (Incidentally, those three are journals with a preference for theoretical and highly technical articles.)

The implications for economists interested in disciplinary and interdisciplinary environmental research are straightforward:

- **1.** Don't do research in environmental economics since, all else equal, the reputation of the resulting papers will be much lower than in other fields.
- 2. If you nevertheless decide to pursue environmental economic research, make it theoretical and highly technical since otherwise you are less likely to publish it in a respectable journal.
- 3. Don't write publications for a broad environmental science audience (like that of the journal *Environmental Science & Tech*-

*nology*, for instance), since those articles will not count if you apply for a position at a traditional economics department or for funding of competitive economic research grants.

These incentives are clearly not encouraging talented researchers to pursue applied environmental economic research that worries about cumbersome institutional details, realism of assumptions, or unwieldy distributional concerns. To the contrary, it seems reasonable to argue that the preference for highly abstract theoretical research at the core of the discipline, which is supported by the disciplinary standard, is a major reason for the limited contribution and success of the economic discipline in major environmental debates of our time.

## Conclusion

Article citations – the standard measure of research output in many disciplines – are increasingly questioned as a sole indicator of research quality. The present study argues that journal reputation – the standard measure of research quality in economics – is even more problematic as a sole indicator of research output.

The empirical analysis shows that, at the level of the individual researcher, there is a lack of consistent relationship between the standard measure of research output and citation rates. The result confirms the hypothesis that the pursuit of reputation as currently measured conflicts with the objective of academic relevance and interest (as measured by citations). Moreover, at the level of the journals, reputation within the discipline has very little to do with the impact on the literature as measured by total citations. The relatively high impact of many environmental economics journals, for instance, contrasts sharply with their low reputation in the discipline. Together, these findings support the hypothesis that the standard measure of research output in economics does not adequately reflect the academic interest of economic research as measured by citation frequency.

In addition, the standard measures based on journal reputation not only fail to adequately measure an individual researcher's output. More importantly, due to tradeoffs between academic reputation and relevance they introduce powerful incentives *against* interesting and relevant work. They provide incentives for investments in detached theory, unfruitful technical sophistication, disciplinary isolation, and academic followership, which tend to be rewarded by that standard.

The experience of the financial crisis suggests that the existing merit system produces economic research that does not adequately address relevant real world issues (e.g., Krugman 2009). If society is to further rely on economic advice in solving important economic and environmental problems, it needs to make sure that the assessment of economic research is not only based on the internal standard of an arguably complacent discipline but on (multiple) standards that also reflect the relevance and plausibility of the research for an interdisciplinary academic audience. One such standard is interdisciplinary article citations.



<sup>11</sup> A similar argument applies to other fields of applied and interdisciplinary research fields such as health economics.

journal	Combes/Linneme	r <sup>a</sup> Tinbergen list <sup>b</sup>	Handelsblatt	t ranking 2008 <sup>c</sup>	Web of Science journal citation report 2008 <sup>d</sup>			
	<b>weight</b> (0.08-1)	<b>rating</b> (B to AA)	<b>weight</b> (0.1–1)	<b>rank</b> (1-220°)	impact factor (5-year)	<b>rank</b> (1-208)	impact factor (2-year)	<b>rank</b> (1-208)
Journal of Environmental Economics and Mana	gement 0.5	А	0.5	36	2.6	24	1.7	27
Land Economics	0.5	В	0.4	62	1.7	52	1.0	73
American Journal of Agricultural Economics	0.5	В	0.4	62	1.5	67	1.0	78
Energy Economics	0.33	В	0.3	97	2.7	21	2.2	15
Environment and Planning A	0.33	В	0.3	97	2.2	_f	1.8	_f
Ecological Economics	0.17	В	0.2	161	2.4	25	1.9	19
Resource and Energy Economics	0.17	В	0.2	161	2.0	37	1.1	69
Energy Journal	0.17	_	0.2	161	1.9	44	1.7	28
European Review of Agricultural Economics	0.2	В	0.2	161	1.7	53	1.0	74
Environmental and Resource Economics	0.33	_	0.2	161	1.5	70	1.1	70
Journal of Agricultural Economics	0.33	-	0.2	161	1.3	81	1.3	54
Agricultural Economics	0.17	-	0.2	161	0.9	111	0.5	149
Environment and Development Economics	0.08	-	0.2	161	0.9	_f	0.8	_f

TABLE 2: Environmental economics journals represented in the Handelsblatt ranking 2008: traditional economic journal weights and Web of Science impact factors.

a Combes and Linnemer (2003) | b www.tinbergen.nl/research-institute/journal-classification.php | c The Handelsblatt 2010 ranks are available at www.handelsblatt.com/ \_t=dgtool,id=15,obj=1;singleclip. The results are slightly different; however, the ranks still do not resemble those based on impact factors. | d http://thomsonreuters. com/products\_services/science/science\_products/a-z/web\_of\_science | e Entries are means of the rank bracket into which a journal falls. (Rank brackets for weights 0.5, 0.4, 0.3, 0.2, and 0.1 are: 26-45, 46-78, 79-115, 116-206, 207-220.) | f Journal not included/ranked in "Economics" category.

Key players who can influence these standards include hiring committees at universities as well as national and international public research funding institutions (Nentwich 2009). Responsible individuals in these institutions should re-examine existing practices in research evaluation and abandon the heavy reliance on subjective disciplinary measures of journal reputation in the evaluation of economic research. If these institutions do not (or cannot) initiate the necessary changes, the changes would need to be encouraged by the governments funding the research institutions.

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