



ANALYSIS

Environmental and ecological economics: A citation analysis

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Abstract

This study looks at two distinct questions: ‘What have been the most influential journal articles in environmental economics and ecological economics over the 10-year period 1994–2003?’; and ‘How much overlap is there between the fields of environmental and ecological economics?’ We examine the references in all articles published in *JEEM* and *Ecological Economics (EE)* over this period. For each of these two fields, a list of the top articles and top journals cited by articles published in *JEEM* and *EE* is presented. We also present some results based on our study of the *ISI Journal Citation Reports*. We find that there is a significant overlap between the two fields at the journal level — the two journals cite similar journals. There is a correlation of 0.34 between the number of citations received by the journals that are most cited and the correlation is even higher if journal self-citation is excluded. The main differences are that ecological economics tends to cite (but not be cited by) general natural science journals more often than environmental economics does, environmental economics cites more heavily from journals rather than other publications, and citations in environmental economics are more concentrated on particular journals and individual publications. However, there is much less similarity at the level of individual articles. Non-market valuation articles dominate the most cited articles in *JEEM* while green accounting, sustainability, and the environmental Kuznets curve are all prominent topics in *EE*.

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1. Introduction and literature review

Costanza et al. (2004) assess which publications have been most influential on the field of ecological economics and which ecological economics publications have had the widest influence. In this paper we expand that analysis to cover two additional principal questions: ‘Which have been the journal articles that have been most influential on the related mainstream

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economic field of environmental and resource economics?'; and 'To what extent are environmental and resource economics and ecological economics distinct areas of scientific endeavor and in what ways do they differ?'

A special issue of *JEEM* in 2000 celebrated the first 25 years of that journal and included a number of surveys of the papers published in *JEEM* and their influence on the profession (e.g. Fisher and Ward, 2000; Smith, 2000; Kolstad, 2000). These studies allow an assessment of the influence of the journal on economics and science and scholarship in general. Although *JEEM* is the premier journal in environmental and resource economics, many important articles in the field will have been published in other journals.² Therefore, the type of analysis carried out by Fisher and Ward (2000) and Smith (2000) will not capture all the most important articles in environmental and resource economics. It also does not differentiate between citation inside the field and outside the field and so does not capture the set of articles that have been the most influential on the field itself. These comments are not criticisms as these papers did not set out to answer these questions.

Costanza et al. (2004) treat the journal *Ecological Economics* (*EE*) as a representative sample of work in the field of ecological economics and measure which publications were most influential on that work. This is captured by a list of the papers most cited in papers published in *EE*. In this paper we use the articles published in *JEEM* over the period of 1994–2003 as a sample of high quality research in environmental economics. If a paper appeared in *JEEM* one would assume that it must be an environmental economics article. However, *JEEM* also publishes work in resource economics (Fisher and Ward, 2000) — perhaps half the total articles. According to Fisher and Ward, the proportion of resource economics articles has in fact increased over time from less than half in the early years to more than half in recent years. *JEEM* has the highest citation impact score of any specialist environmental or resource economics journal.³ There-

fore, we take the articles published in *JEEM* as a representative sample of high quality research in mainstream environmental and resource economics.

We examine the references in all articles published in *JEEM* and *EE*. This can determine which individual publications as well as which journals have had the greatest influence on the two fields. The list of articles is not censored or truncated by only counting articles published in certain journals as in most citation analyses in economics (e.g. Kolstad, 2000) nor restricted to particular topics. We compare 10 years of data from *JEEM* and *EE*. What are the most influential articles in 1994–2003? How much overlap is there between the two fields? Are they distinctive? Or are they largely overlapping and “sociological” rather than “epistemological” communities?

Typically, citation analysis has been used in economics in order to rank departments of economics, economics journals, and individual economists rather than to trace the influence of particular papers (e.g. Burton and Phimister, 1995; Coupé, 2003; Dusansky and Vernon, 1998; Kalaitzidakis et al., 2003; Laband and Piette, 1994; Scott and Mitias, 1996; Palacios-Huerta and Volij, 2004). Using citation analysis to understand the nature of a field or to trace the influence of particular ideas and articles is rare in economics but common in other fields, including some closely related fields (e.g. Dombrow and Turnbull, 2004). In fact, the articles in *JEEM* by Smith (2000) and Kolstad (2000) as well as Fuchs (2000) seem to be the only ones in economics that we could find in the *ISI Citation Index* in the last few years that look at the citations to specific papers rather than citation counts of individuals, departments, etc. Cahlik (2000) uses some of the more sophisticated scientometric tools – co-citation analysis and co-word analysis – to look at research foci in economics. The co-word analysis only succeeds in dividing economics articles in the top 13 journals into micro- and macro-economic articles and the co-citation analysis is extremely preliminary. The rudimentary nature of this study highlights the lack of any other such research in economics.

Fisher and Ward (2000) looked at trends in the topics of articles published in *JEEM* from 1974 to 1997. Smith (2000) lists the 10 most cited articles published in *JEEM* on the topic of non-market

² Kolstad (2000) reviews some energy and resource articles published in other selected economics journals.

³ *Ecological Economics* has a higher citation impact score than *JEEM* in some years including 2003, but on other measures *JEEM* scores higher.

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