

Is Environmental Management Accounting a Discipline? A Bibliometric Literature Review

Rahmi Handayani¹, Wirmie Eka Putra², Afrizal³

¹⁻³ Universitas Jambi, Indonesia

*Corresponding Author: Handayani.rahmi@gmail.com

Article History

Received: 05-08-2024

Revised: 30-08-2024

Published: 05-09-2024

Kata Kunci: *Manajemen Lingkungan, Akuntansi, Akuntansi Manajemen Lingkungan, Perkembangan, Disiplin, Analisis Bibliometrik*

Keywords: *Environmental management, Accounting, Environmental management accounting, Development, Discipline, Bibliometric analysis*

ABSTRAK

Penelitian ini bertujuan menelaah literatur mengenai Environmental Management Accounting (EMA) dan memberikan gambaran kuantitatif atas literatur akademik maupun profesional yang membentuk bidang tersebut untuk menilai apakah EMA telah berkembang sebagai suatu disiplin ilmu. Berdasarkan analisis bibliometrik terhadap 814 publikasi (396 di antaranya terbit di jurnal akademik) dalam bahasa Inggris, Jerman, dan Prancis sebelum tahun 2012, ditemukan bahwa meskipun jumlah publikasi terus meningkat, sebagian besar masih diterbitkan di luar jurnal akuntansi arus utama seperti dalam jurnal non-akuntansi, buku, dan laporan. Tren terbaru menunjukkan munculnya jurnal khusus akuntansi lingkungan dan keberlanjutan, namun rendahnya jumlah publikasi dengan sitasi tinggi dari sedikit penulis menandakan bahwa EMA masih tergolong disiplin muda dan belum sepenuhnya mapan dalam penelitian akuntansi dan manajemen arus utama.

ABSTRACT

The purpose of this paper is to investigate the body of literature on environmental management accounting (EMA) and provides a quantitative overview of the academic as well as the professional literature constituting the field. By doing so, the paper discusses whether EMA has developed as a discipline. Design/methodology/approach. Based on a database containing 814 (396 of them published in academic journals) publications in English, German and French with a publication date prior to 2012 a bibliometric analysis is conducted. Data on the publications, journals, authors and citations were collected, double-checked and examined by applying bibliometric measures. Findings The bibliometric analysis identifies trends in EMA research publications which show that EMA has developed as a young discipline, but is still faces

challenges to get better established in mainstream accounting and management research. Although the publication number is growing, a substantial part of the publications have been published outside mainstream accounting journals in non-accounting journals, books and reports. A recent trend towards establishing specialised environmental (and sustainability) accounting journals is also rendered apparent. The low number of highly cited publications of few authors, however, indicates that EMA is still to become a mainstream field of research. Originality/value The paper discusses with the help of bibliometric analysis and measures whether EMA has developed as a discipline and whether it has become part of mainstream accounting research.

INTRODUCTION

Environmental accounting, and particularly environmental management accounting (EMA), has gained considerable attention in academia as well as among international organisations, professional accounting organisations, and in corporate practice. This attention is reflected in a large body of academic literature, including scientific journal articles, books and working papers. Recently, various specialized journals have evolved and mainstream accounting and management journals have accepted publications in the field. Furthermore, EMA has become an increasingly popular topic for international organisations like the UN Division on Sustainable Development (UNSD), or national and international accounting institutions like the Association of Chartered Accountants (ACCA), the Institute for Chartered Accountants of England and Wales (ICAEW), the Canadian Institute of Chartered Accountants (CICA), or the International Federation of Accountants (IFAC), which have published various reports and issued recommendations and guidelines.

Nevertheless, the topic has not been accepted without controversy. Some researchers observe that the field has grown considerably, having emerged from a “twenty-year niche issue” to a widely recognized topic (Bennett *et al.*, 2011; Parker, 2011). Others seem to have chosen to ignore the relevance of the field *per se*. The fact that EMA publications in major accounting journals are still rare underpins this view (Schaltegger and Burritt, 2006; Burritt and Schaltegger, 2010; Lodhia, 2010). The significance of acceptance of EMA research as an acknowledged accounting discipline should not be underestimated. As “mainstream” science, EMA research would be found within the current professional scientific discussion and thus in specialized as well as mainstream professional peer reviewed journals. Whereas specialized journals support in depth investigation and specialized knowledge development, mainstream journals support the broader acceptance of topics and methods in the professional community and the integration in broader accounting research developments. Clearly, there are also other modes of exchange

such as conferences, workshops, books, and private exchanges between researchers by email. However, these cannot be examined and analysed reliably and reproducibly.

Another feature of an acknowledged discipline and mainstream science is scepticism as a part of the scientific discussion (Watkins, 1984). When exercised through formal scientific circles such as the peer review process, scepticism is essential for the functioning of science as it yields an erratic path towards eventual truth. By keeping topics or a discipline outside mainstream journals, i.e. by choosing to not exercise legitimate scientific scepticism in widely acknowledged discussion fora and journals, other researchers block this path. It needs to be noted, though, that “mainstream” cannot be equated with “consensus” (Lehrer and Wagner, 1981). A vitally important part of mainstream science is the recognition of “odd” ideas by isolated individuals that get tossed into the mix. Mostly they do not work out and eventually get discarded; sometimes they become established and move into what is effectively a professional consensus. Sometimes contrasting ideas remain a focus for consideration for a long time before later developments eventually bring a resolution; and there are many open questions not yet resolved. Thus, controversial discussions may become mainstream as such, without being subject to consensus between the researchers. It is also important to shed light on the controversy between (rather than within) EMA and mainstream accounting and management research. Following the disputes among researchers in the field over the validity of preliminary (i.e. untested) data, hypotheses, and (tentative) models delivers additional detail on the development of EMA as these matters need further study to determine their reliability.

This paper investigates how EMA research publications by academics, practitioners and policy makers, i.e. by the accounting profession (Evans *et al.*, 2011), have developed. Based on several comments of renowned academics who indicated that academic accounting research has become increasingly detached from practice and society (Guthrie *et al.*, 2011; Hopwood, 2007, 2008, 2009; Baldvinsdottir *et al.*, 2010; Malmi and Granlund, 2009; Owen, 2008), and given the substantial development in academic journals as well as the visible involvement of professional accounting organisations and international organisations, this paper considers both, academic and professional contributions to EMA. This literature review takes a systematic approach by applying acknowledged bibliometric methods (De Bellis, 2009; De Solla Price, 1974; Garfield, 1955; Jokic and Ball, 2006; Rider, 1944) to analyse past developments and to serve as a basis for recommendations for future research. The paper is structured as follows: after a short description of the scope of research. What EMA encompasses, and a discussion of the existing literature reviews on EMA and the remaining gap for a broad review (Section 2), the chosen bibliometric approach is explained in Section 3. Section 4 reviews the descriptive statistical results with regard to the development of the number and type of publications, authorship, and citations. This analysis is supported by bibliometric evaluation (Bradford, 1985; Garfield, 1955; De Bellis, 2009; Cole and Cole, 1972) and measures. Section 5 discusses the results, analyses them and draws conclusions for further research.

METHOD

The bibliography on EMA was compiled starting with nearly 100 papers on EMA found in earlier literature reviews and complemented by more recent publications in journals and by academic book publishers who have already published in the area of EMA. The search focused on publications on the corporate level and EMA.

Table 1. Sustainability accounting

English keywords	French keywords	German keywords
Carbon accounting	Comptabilite'environmentale	Abfallrechnungswesen (incl.
Environmental	Contro'le de	Abfallkostenrechnung)
accounting	gestionenvironmental	Controlling
Environmental management		
accounting	Comptabilite'verte	Information management
Ecological accounting	Comptabilite'carbone	Investitionsrechnung
Eco-control	Comptabilite'e'cologique	Materialflusskostenrechnung
Full cost accounting		O'ko-Controlling
Green accounting		Nachhaltigkeitscontrolling
Material flow cost accounting (incl. mass balance accounting)		Rechnungslegung (incl. o'kologisches Rechnungswesen)

The keywords used are Environmental controlling, Sustainability balanced scorecard, Environmental information management, Total cost assessment, Environmental cost accounting, Triple bottom line accounting, Environmental accounting, Waste accounting, Water accounting. Publications in the three major (globally and in Europe) languages – English, French and German – were considered, covering a total of 44 percent of the population of the European Union member states and 41 percent of the population in the OECD countries (<http://stats.oecd.org/Index.aspX>). By means of snowball sampling (Biernacki and Waldorf, 1981) the references of these first 100 publications were reviewed to identify further EMA publications. This way 497 journal articles, working papers, reports and books were collected. The enlarged bibliography was complemented further with the following process:

1. Systematic search of papers in 89 academic journals listed in Appendix 1. The research was conducted with the four major databases: ebsco, proquest, science direct and emerald.

2. The search was also conducted on social science research network (SSRN) with the keywords listed in Table II, and on the proquest search for PhD theses.
3. Crosschecking the accessible publication lists of established research institutes such as the Centre for Social and Environmental Accounting Research (CSEAR) in St. Andrews, UK, the Centre for Accounting, Governance and Sustainability (CAGS), Adelaide, Australia and the Centre for Sustainability Management (CSM) in Luneburg, Germany, etc.

EXcluded from the scope of this research were publications with a main focus on external reporting, auditing, national environmental accounting, or social accounting in a more narrow sense, dealing with social issues only and not covering environmental topics. Furthermore, company reports, including environmental and sustainability reports, advertisement brochures of accounting firms and the like were not considered. As a result of this literature search a robust bibliographic database of English, French and German publications between 1973 and (including) 2011 was collected with the following characteristics: 814 EMA publications in total, including peer-reviewed journal papers, reports, books, and book chapters; written by 658 authors; of the 814 publications 396 are journal papers; published in 89 peer-reviewed and academic journals; and of which only 17 have been published in the *Financial Times* list of highly recognized management journals (FT, 2010): 14 publications in *Accounting, Organizations and Society*, and three publications in the *Journal of Business Ethics*.

Thus, comprehensive data triangulation was achieved by snowball sampling, journal search, database query and internet-based search. To avoid repetition, working papers which have been developed to a publication until the end of 2011 were not considered; only the final publication was counted. The analysis of the data required several decisions. First, a publication was not attributed to one single country as co-authors are often from different countries. Instead the contributions of authors were counted with regard to the country of their home institutions. Second, the type of publication was decided on basis of whether it is a single publication with a professional publisher, a publication as part of a series of books a journal with regular issues for various years and an ISSN, or a report or working paper issued by a professional accounting or consulting institution. This categorization is not always straight forward, as for example the publication by Freedman and Jaggi (2010), *Advances in Environmental Accounting and Management*, shows. Even the publisher Emerald uses two different descriptions by grouping the publication under “book series” while promoting it with: “The journal has three main objectives” (Emerald, 2011). Whatever the reasons for this discrepancy are, for the purposes of this bibliometric research this publication is classified as a book in a series of books as it has been published irregularly over the years.

Data was collated using Microsoft excel[®] on a number of work sheets as to allow for an extensive analysis. The data analysed include: historical development of the volume of publications by year; type of publications, e.g. scientific papers, reports, etc.; number of publications per author; number of authors per publication; and number of citations.

RESULTS AND DISCUSSION

1. Historical development of EMA publications

Environmental accounting can be considered a “rare orchid” topic playing a negligible niche role until 1990 in terms of academic publications, although the first books and papers (in AOS) were published in the 1970s. Figure 1 shows the development of the total number of EMA publications split up in journal and other publications (including books, book chapter, working papers and reports). In terms of the number of publications the field remains negligibly small until 1990 (below three publications per annum) and then “explodes” with a strong increase until 1997 (up to more than 40 publications per annum) and a much smaller average increase between 1997 and 2011. Since 1997 the development has been characterized by strong outlays with lows particularly in 2004, 2007 and 2009 and with peaks in 2002, 2006, 2008 and 2010.

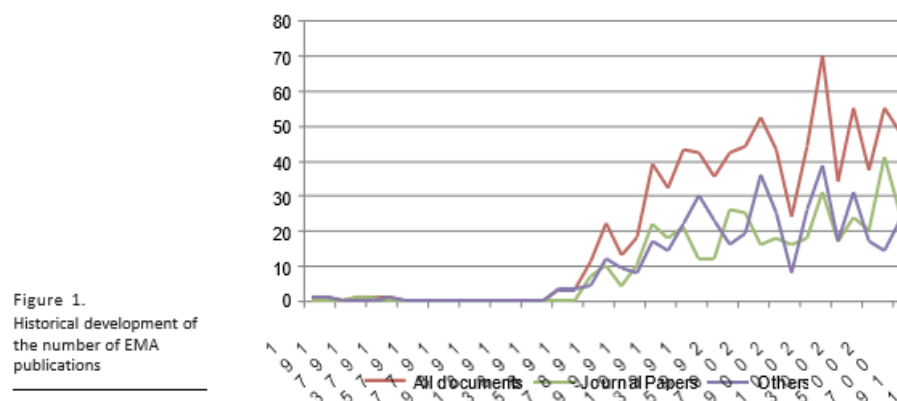


Figura 1. Historical Development of the number of EMA Publication

2. Journals Contributing To EMA

Academic journals play an important role in the development of a discipline as they reflect topical priorities of academic discussion and fundamental researches well as the acknowledgement in the respective scientific community. The only accounting journal in the *Financial Times* list of highly acknowledged journals which has published on environmental accounting until 2011 is *Accounting, Organizations and Society* with 14 publications between 1976 and 2011 (Table III). Among the top ranked journals (A or A* qualified) the *Accounting, Auditing and Accountability Journal (AAAJ)* has published most on environmental management accounting, followed by *Accounting Forum* and *Critical Perspectives on Accounting*. AAAJ has issued several special issues on the subject (1991, 1997, 2002, 2007, 2010), contributing substantially to the peak of literature in those years (Figure 1). Also environmental and

sustainability management journals play a major role in EMA Research. *The Journal of Cleaner Production*, *Business Strategy and the Environment*, and *Greener Management International* are among the main contributors to EMA publications. Many publications in these journals take a broader view on environmental accounting by highlighting obstacles of introducing EMA, use of EMA information for strategic purposes, etc.

Placed between these two groups is the German journal *Controlling*, which focuses on management control and the use of accounting information. This is also the only non-English-speaking journal among the academic journals with a major number of EMA publications. The third group of journals with a large share of the total EMA journal publications are more specific social and environmental accounting journals (Table IV) such as *Social and Environmental Accounting*, and *Journal of the Asia Pacific Centre for Environmental Accountability*. Albeit specialized on environmental accounting, they are fairly young and often have fewer issues per year, which so far results in a lower total number of EMA publications than other, long-established journals.

Table 2. Publications On EMA

Journal name	Topic	Publications	Country
Accounting, Auditing and Accountability Journal	Accounting	33	Australia
Journal of Cleaner Production	Environmental management	32	USA
Accounting Forum	Accounting	25	Australia
Critical Perspectives on Accounting	Accounting	22	UK
Journal of the Asia Pacific Centre for Environmental Accountability	Environmental accounting	21	Australia
Controlling	Management accounting and control	26	Germany
Business Strategy and the Environment	Environmental management	17	UK
Accounting Organisations and Society	Accounting	14	UK
Table III.	Journals with most		

An interesting observation can be drawn by applying another method of bibliometric analysis – Bradford's law. Bradford (1985) described a pattern and predicts the distribution of publications in core, related, and sporadically related journals. He postulated that the number of publications in core journals, i.e. these journals where most publications in one field are found, is the same as the number of publications found in the next related journals. In our sample of 396 publications in 89 scientific journals, the first 132 publications are concentrated in five journals (Table III), the next 130 publications are found in (the following) 12 journals and the remaining 121 publications are scattered among further 66 (hardly related) journals. These numbers reveal an under representation of related and slightly related journals compared to the number of core journals.

Whereas an over-proportionality of related journals could have been expected due to the interdisciplinary nature of EMA, the distribution of publications suggests that the core area is

represented more strongly and plays a more active role compared to the whole research field and other scientific disciplines in general. As Table IV shows this is even more the case with specialized journals in environmental and sustainability accounting (e.g. *Issues in Social and Environmental Accounting* started in 2007, *Sustainability Accounting, Management and Policy Journal* started in 2010). With the exception of the *Social and Environmental Accountability Journal* most of the specialized journals have started more recently, thus indicating that a shift of the total number of publications towards specialized journals may be expected in the future.

3. Authorship

Authors in any field of research have an impact of how this field is shaped. According to the Ortega hypothesis (Cole and Cole, 1972) scientific progress is based on the work of a small percentage and number of researchers and authors in each field. For the research field of EMA, only 15 (2.2 percent) out of 658 authors contribute towards 341 (42 percent) publications out of the 814 publications (Table VI). The proportion of authors to the overall contribution to the field remains similar when only journal publications are analysed. Again, 15 (3.8 percent) authors contribute to 172 (44 percent) of the 396 academic publications (Table V). This can also be attributed to the high number of “one-off” authors who conduct their research in related areas and often have one single publication in the field of EMA.

Several further observations can be made by looking at the major contributors in the field. The order of the authors with most journal papers (Table V) is somewhat counter intuitive. Since this review focuses on environmental management accounting literature, it appears surprising that Rob Gray and Jan Bebbington are in the lead group, given that their work deals broadly with the critical perspective of social accounting (see Burritt and Schaltegger, 2010 for a taxonomy of sustainability accounting). This observation can, however, be explained with Gray and Bebbington’s earlier work, when they produced numerous environmental accounting publications with case studies within various organisations and the analysis of company-internal processes and approaches Table VI, on the other hand, presents the major contributors to the overall volume of publications. The order of authors in this table differs from the previous, with Martin Bennett and Christine Jasch in the leading group. The difference between the two tables can be explained with the stronger focus of some of the researchers on practice-oriented topics, whereas others have concentrated on purely academic research and academic journal publications.

The number of authors was also investigated with regard to the bibliometric indicator of co-authorship. de Solla Price (1981) first observed for a developing research area an increase in multiple authorship of publication over time. Later research supports this empirically in various fields (Cronin, 2001). The average number of authors in the 396 EMA journal publications was 1.74, with 51 percent of the publications having two or more authors and 16 percent having three or more authors. This number (1.74) is above it appears surprising that Rob Gray and Jan Bebbington are in the lead group, given that their work deals broadly with the critical perspective of social

accounting (see Burritt and Schaltegger, 2010 for a taxonomy of sustainability accounting). This observation can, however, be explained with Gray and Bebbington's earlier work, when they produced numerous environmental accounting publications with case studies within various organisations and the analysis of company-internal processes and approaches.

Table 3. Number Of EMA Publications In Specialized Environmental

Journal name	Publications	Started	Country	Table IV. Number of EMA publications in specialized environmental
Journal of the Asia Pacific Centre for Environmental Accountability	21	1995	Australia	
Social and Environmental Accountability Journal	14	1981	UK	
Issues in Social and Environmental Accounting	7	2007	Indonesia	
Sustainability Accounting, Management and Policy	4	2010	Australia	

Table VI, on the other hand, presents the major contributors to the overall volume of publications. The order of authors in this table differs from the previous, with Martin Bennett and Christine Jasch in the leading group. The difference between the two tables can be explained with the stronger focus of some of the researchers on practice-oriented topics, whereas others have concentrated on purely academic research and academic journal publications. The number of authors was also investigated with regard to the bibliometric indicator of co-authorship. de Solla Price (1981) first observed for a developing research area an increase in multiple authorship of publication over time. Later research supports this empirically in various fields (Cronin, 2001). The average number of authors in the 396 EMA journal publications was 1.74, with 51 percent of the publications having two or more authors and 16 percent having three or more authors. This number (1.74) is above average across all research areas, 1.45 being the average for 2000 (Jokic and Ball, 2006). With more than 20 percent above the average, this deviation may be attributed to the interdisciplinary character of EMA. In fact, an analysis of the publications in the *American Journal of Sociology* carried out in 2000 (Jokic and Ball, 2006) revealed that 45 percent of the publications had more than one author, which is lower than in our sample. Similarly, Kyvik (2003) observed that 43 percent of the scientific Norwegian publications in social sciences had more than one author, an even lower figure.

Table 4. The Ten Major Contributor Of Publication Journal Papers On EMA



Author	Number of academic journal papers
Stefan Schaltegger	26
Robert Gray	24
Jan Bebbington	20
Roger Burritt	19
Reg Mathews	13
Glen Lehman	9
Edeltraud Guenther	8
Christine Jasch	7
David Owen	7
Ian Thomson	7

Table V.
The ten major contributors in published journal papers on EMA

Note: Out of 397 authors with paper contributions

Table 5. The Ten Major Contributor Of Publication On EMA In Total

Author	Number of publications
Stefan Schaltegger	68
Roger Burritt	47
Robert Gray	36
Jan Bebbington	30
Martin Bennett	26
Christine Jasch	25
Reg Mathews	15
Edeltraud Guenther	15
Peter James	15
Tobias Hahn	13

Table VI.
The ten major contributors of publications on EMA in total

Note: Out of 658 authors

4. Publications By Countries

Another bibliometric approach to analysing the development of EMA as a discipline deals with “geographic hotspots” of EMA research. This was done by counting the number of authors for each country in which the institutional affiliation of the researcher is located. For the analysis only authors with two or more publications were considered in order to exclude authors with a marginal attachment to EMA research. Table VII and VIII summarise the results of this analysis. Overall, Europe, particularly the UK and Germany, is leading in total volume of publications. Other countries such as Italy, the Netherlands, Denmark or Spain have a more sporadic record of publications. Recently, the Asia-Pacific region has been very productive, with numerous publications by Australian researchers and Japan catching up for the last couple of years. The first EMA publications outside of Europe, Australia, New Zealand, and the USA were authored by Japanese academics and released in 2001. Compared to scientific management and accounting publications in general, EMA seems to be underrepresented in the USA (Table VII). The fact that the USA is in the list of the most contributing countries with authors having published two or more papers in EMA can be explained by the observation that

many US contributions were produced by the US Environmental Protection Agency, the World Resource Institute and Tellus Institute, i.e. by the few organisations who were linked to the United Nations Division for Sustainable Development (UNSD) EMA project in the 1990s. The current relatively narrow geographic spread of research does not support comparative empirical studies on a broad multinational basis.

Another interesting aspect is the strong journal focus of researchers in New Zealand and Australia (74 percent and 67 percent journal publications) compared to the low journal coverage in Japan (10 percent), France (16 percent), Austria (26 percent), the Netherlands (34 percent) and Germany (37 percent). In these countries, books and edited volumes seem to play an important role.

Table VIII also shows that some countries like the UK and Germany have a broad basis of academics contributing to EMA (26 authors, each with two or more publications) whereas the research in France and Japan relies on fewer researchers (ten and seven, not shown in Table VIII). The total productivity per author with two or more publications on the other hand is highest in the UK, Germany and Australia with 6.3-7.5 publications per author. This productivity figure, shown in the third column in Table VIII, is calculated as the total number of publications (second column in Table VII) divided by the number of contributors (third column in Table VIII). The journal publication productivity (last column in Table VIII) is derived the same way by dividing the figures in the third column in Table VII by the fourth in Table VIII. The ranking in productivity is basically the same for journals as for publications in total in spite of the large differences between these countries in the preferred publication media (e.g. Australia with 67 percent of all EMA publications being journal publications compared to Germany with 37 percent journal publications). The above geographic hotspots are also reflected by the place of origin of the leading journals in EMA (Tables III and IV). Five of the ten most influential journals in the field are UK-based and three are Australian-based.

Table 6. Hotspots Of EMA Research By Number Of Publications

Country	Total contribution (no.)	Journal papers (no.)	Journal publications in percentage of total (%)
UK	197	99	50
Germany	191	72	37
Australia	122	82	67
USA	60	27	45
France	44	7	16
Japan	31	3	10
Canada	29	12	41
The Netherlands	29	10	34
Austria	27	7	26
New Zealand	23	17	74

Table VII.
Hotspots of EMA
research by number
of publications

5. Most cited EMA publications

Citations are a measure of how often a publication has been referred to and thus how influential it is. A higher citation score of EMA publications shows that the EMA contents of the publications have been received and discussed intensely in the scientific community. As of March 2012, 15 documents have been cited over a 100 times in Google Scholar (Table IX). The citation scores of ISI Web of Knowledge and Scopus were also collected in March 2012. A dash in Tables IX and X indicates that a publication was not found in the ISI Web of Knowledge or Scopus database, whereas a zero indicates that it is in the database but has not been cited so far.

The two most cited publications are books written by the four most active contributors to the field of EMA. Considering the authors, the most influential author in environmental and social accounting is Professor Rob Gray who has five publications among the 15 top cited publications on EMA. This is even more obvious when considering journal papers only (Table IX). The citation numbers were obtained from Google Scholar, ISI Web of Knowledge (ISI WoK) and Scopus. Due to the nature of ISI WoK and Scopus, the figures are much lower than those in Google Scholar, although they display a similar trend. One of the major observations is that only 27 articles have one or more citations in ISI WoK, of which only six papers have ten or more citations. This may be an indication that EMA is still a research area which is not very well linked into other, more conventional, and often cited research areas. However, looking at the most recent development between 2011 and 2012 shows a steep 67 percent citation increase of the top ten publications from 2116 (September 2011) to 3455 (December 2012).

Also a notable observation revealed by the citation analysis is that like other (established) fields of research, only few scientists contribute to scientific progress in the field (Garfield's law; De Bellis, 2009). In EMA, of the 650 authors, only the 43 most productive authors have five or more (often co-authored) cited publications. However, given the large number of authors with a single publication on EMA (488; 74.1 percent), the contribution of the large majority to the field is still essential for the progress of the discipline. This observation may be explained with the interdisciplinary nature of EMA: it combines knowledge in the fields of business administration, accounting, environmental management, etc. Although a relatively small group of leading authors has been shaping the research area, they tend to involve and motivate different co-authors (such PhD students) to contribute to EMA research.

CONCLUSIONS

This paper investigates whether Environmental Management Accounting (EMA) has developed as a discipline and entered mainstream research through a bibliometric analysis of relevant publications. The findings show that EMA is increasingly recognised as an accounting discipline, though it remains young and not yet fully established in mainstream accounting and management research. Publication numbers are growing across journals, books, and reports, with mainstream journals showing more uptake, albeit often through special issues. The emergence of specialised sustainability journals signals disciplinary development, yet EMA

articles still represent only a fraction of their content. Authorship patterns confirm that a small core group of authors dominate the field, while many new researchers contribute only a few papers, reflecting both growth and fragility. Geographically, research is concentrated in the UK, Germany, and Australia, with recent contributions from Asia and some developing countries, though global spread remains limited and the USA is underrepresented. Citation analysis reveals few highly cited works, underscoring the need for stronger integration into mainstream accounting and management journals. Overall, EMA is evolving rapidly, gaining recognition and expanding its author base, but faces challenges before achieving full mainstream status.

DAFTAR PUSTAKA

- Baldvinsdottir, G., Mitchell, F. and Nørreklit, H. (2010), "Issues in the relationship between theory and practice in management accounting", *Management Accounting Research*, Vol. 21 No. 2, pp. 79-82.
- Bebbington, J. and Gray, R. (2001), "An account of sustainability: failure, success and a reconceptualization", *Critical Perspectives on Accounting*, Vol. 12 No. 5, pp. 557-588.
- Bennett, M., Rikhardsson, P. and Schaltegger, S. (2003), *Environmental Management Accounting: Purpose and Progress*, Kluwer, Dordrecht.
- Bennett, M., Schaltegger, S. and Zvezdov, D. (2011), "Environmental management accounting", in Abdel-Kader, M. (Ed.), *Review of Management Accounting Research*, Palgrave Macmillan, Basingstoke, pp. 53-84.
- Biernacki, P. and Waldorf, D. (1981), "Snowball sampling: problems and techniques of chain referral sampling", *Sociological Methods and Research*, Vol. 10, pp. 141-163.
- Bradford, S.C. (1985), "Sources of information on specific subjects", *Journal of Information Science*, Vol. 10 No. 4, pp. 173-180.
- Branco, M.C. and Delgado, C. (2009), "Research on social and environmental accounting in Southern European countries", *Revista española de financiación y contabilidad*, Vol. 38 No. 144, pp. 663-675.
- Brown, J. and Fraser, M. (2006), "Approaches and perspectives in social and environmental accounting: an overview of the conceptual landscape", *Business Strategy and the Environment*, Vol. 15 No. 2, pp. 103-117.
- Burritt, R. and Schaltegger, S. (2010), "Sustainability accounting and reporting: fad or trend?", *Accounting, Auditing and Accountability Journal*, Vol. 23 No. 7, pp. 829-846.
- Burritt, R., Herzig, C. and Tadeo, B.D. (2009), "Environmental management accounting for cleaner production: the case of a Philippine rice mill", *Journal of Cleaner Production*, Vol. 17 No. 4, pp. 431-439.
- Burritt, R., Schaltegger, S. and Zvezdov, D. (2011a), "Carbon management accounting: explaining practice in leading German companies", *Australian Accounting Review*, Vol. 21 No. 56, pp. 80-98.

- Burritt, R., Schaltegger, S., Bennett, M., Pohjola, T. and Csutora, M. (Eds) (2011b), *Environmental Management Accounting and Supply Chain Management*, Springer, Dordrecht.
- C. and Soltys, S. (2007), "Social accounting research: an Australasian perspective", *Accounting Forum*, Vol. 31, pp. 73-89.
- Cole, J.R. and Cole, S. (1972), "The Ortega hypothesis: citation analysis suggests that only a few scientists contribute to scientific progress", *Science*, Vol. 27 No. 178, pp. 368-375.
- Cronin, B. (2001), "Hyperauthorship: a postmodern perversion or evidence of a structural shift in scholarly communication practices?", *Journal of the American Society for Information Science and Technology*, Vol. 52 No. 7, pp. 558-569.
- Cullen, D. and Whelan, C. (2006), "Environmental management accounting: the state of play", *Journal of Business and Economics Research*, Vol. 4 No. 10, pp. 1-4.
- De Bellis, N. (2009), *Bibliometrics and Citation Analysis*, Scarecrow Press, Lanham, MD. Deegan,
- de Solla Price, D. (1981), "The analysis of scientometric matrices for policy implications", *Scientometrics*, Vol. 3 No. 1, pp. 47-53.
- De Solla Price, D.J. (1974), *Little Science, Big Science*, Suhrkamp, Berlin. Emerald (2011), *Advances in Environmental Accounting and Management*, Emerald, available at: www.emeraldinsight.com/products/books/series.htm?id=1/4479-3598 (accessed 27 June 2011).
- Evans, E., Burritt, R. and Guthrie, J. (2011), *Bridging the Gap Between Academic Accounting Research and Professional Practice*, The Institute of Chartered Accountants in Australia, Sydney.
- Figge, F. and Hahn, T. (2004), "Sustainable value added – measuring corporate contributions to sustainability beyond eco-efficiency", *Ecological Economics*, Vol. 48 No. 2, pp. 173-187.
- Figge, F., Hahn, T., Schaltegger, S. and Wagner, M. (2002), "The sustainability balanced scorecard: linking sustainability management to business strategy", *Business Strategy and the Environment*, Vol. 11 No. 5, pp. 269-284.
- Freedman, M. and Jaggi, B. (2010), *Advances in Environmental Accounting & Management*, Emerald, London.
- Friedlander, M.W. (1995), *At the Fringes of Science*, Westview Press, Boulder, CO.
- FT (2010), "FT business school rankings", available at: <http://rankings.ft.com/businessschoolrankings/> (accessed 27 June 2011).
- Schaltegger, S. and Burritt, R. (2000), *Contemporary Environmental Accounting: Issues, Concept and Practice*, Greenleaf, Sheffield.
- Schaltegger, S. and Burritt, R. (2006), "Corporate sustainability accounting: a nightmare or a dream coming true?", *Business Strategy and the Environment*, Vol. 15 No. 5, pp. 1-4.

- Schaltegger, S. and Csutora, M. (2012), "Carbon management accounting: challenges and approaches", *Journal of Cleaner Production*, Vol. 36, November, pp. 1-16.
- Schaltegger, S., Bennett, M. and Burritt, R. (2005), *Sustainability Accounting and Reporting*, Kluwer, Dordrecht.
- Schaltegger, S., Bennett, M., Burritt, R. and Jasch, C. (2008), *Environmental Accounting for Cleaner Production*, Springer, Dordrecht.
- Schaltegger, S., Müller, K. and Hindrichsen, H. (1996), *Corporate Environmental Accounting*, Wiley, London.
- Thomson, I. (2007), "Mapping the terrain of sustainability accounting", in Unerman, J., Bebbington, J. and O'Dwyer, B. (Eds), *Sustainability Accounting and Accountability*, Routledge, New York, NY, pp. 19-36.
- Tyteca, D. (1996), "On the measurement of the environmental performance of firms – a literature review and a productive efficiency perspective", *Journal of Environmental Management*, Vol. 46 No. 3, pp. 281-308.
- UNSD (2002), *Environmental Management Accounting: Policies and Linkages*, UNDS, New York, NY.
- UNEP (2009), *Corporate Water Accounting*, UNEP, Geneva.
- Verfaillie, H.A., Bidwell, R. and Cowe, R. (2000), *Measuring Eco-efficiency: A Guide to Reporting Company Performance*, World Business Council for Sustainable Development, Geneva.
- Viere, T., Schaltegger, S. and van Enden, J. (2007), "Supply chain information in environmental management accounting – the case of a Vietnamese coffee exporter", *Issues in Social and Environmental Accounting*, Vol. 1 No. 2, pp. 296-310.
- Watkins, J.W.N. (1984), *Science and Scepticism*, Princeton University Press, Princeton, NJ.