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The effects of open access on un-published documents: A case study of economics working papers

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ABSTRACT

The use of scholarly publications that have not been formally published in e.g. journals is widespread in some fields. In the past they have been disseminated through various channels of informal communication. However, the Internet has enabled dissemination of these un-published and often unrefereed publications to a much wider audience. This is particularly interesting seen in relation to the highly disputed open access advantage as the potential advantage for low visibility publications has not been given much attention in the literature. The present study examines the role of working papers in economics during a 10-year period (1996–2005). It shows that working papers are increasingly becoming visible in the field specific databases. The impact of working papers is relatively low; however, high impact working paper series have citation rate levels similar to the low impact journals in the field. There is no tendency to an increase in impact during the 10 years which is the case for the high impact journals. Consequently, the result of this study does not provide evidence of an open access advantage for working papers in economics.

1. Introduction

Open access (OA) based data sources provide new opportunities for performing citation analysis. They are interesting as an alternative to the traditional citation databases primarily due to coverage. OA based data sources are not restricted to journal articles as the traditional citation databases implying that some disciplines characterised by many e.g. working papers and monographs may be better analysed using a data source based on OA resources. However, the coverage of OA is not easily determined. The traditional citation indexes provide information on the indexing policy and the tools to examine it. OA based data sources may have an indexing policy but not necessarily and even if they do it can only be determined through cumbersome empirical investigations. OA based data sources are often based on authors self-archiving their work. This implies that the data source to a large extent is influenced by the incentives of individuals to make their work more or less visible by choosing to provide OA or not.

A perceived major benefit for authors making their publications available OA is the higher number of citations to OA publications presumably due to higher visibility and/or access. Lawrence (2001) analysed the effects of OA on citation impact for a sample of conference documents and found freely available papers to have greater impact. However, his study was restricted only to computer science which made it difficult to generalise. This effect, "the open access advantage" has since been confirmed on larger samples by Antelman (2004); Harnad and Brody (2004); Hajjem et al. (2005a); Hajjem, Harnad and Gingras (2005); Metcalfe (2005) and Henneken et al. (2006). However, one should be careful making causal arguments as pointed out by e.g. Craig, Plume, McVeigh, Pringle, and Amin (2007) stressing that in order to conclude that OA publication causes more

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citations, we need data to illustrate causation, not just association. The increased number of citations could be caused by other factors than the increased visibility of the work as stressed in the work by Kurtz et al. (2005), Davis and Fromerth (2007), Moed (2007), Davis (2009), Davis, Lewenstein, Simon, Booth, and Connolly (2008) and Norris, Oppenheim, and Rowland (2008). Other possibilities are self-selection bias caused by authors promoting their best work and early view-effect as online publication date for OA papers is often earlier than the print publication date. Moed (2007) estimates the effect of two factors, "early view" and "quality bias". The two sets of papers, OA and non-OA, show no significant difference in citation rates when he controls for the effects of these factors. Davis and Fromerth (2007) find that the OA advantage is not a result of more citations to all the OA papers but rather of self-selection (authors select their best papers to self-archive). Gaule and Maystre (2008) find a very small open access effect which to a great extent is due to a self-selection effect rather than a diffusion effect.

The existing analyses of the open access advantage have mainly focused on comparing citation data for archived and not archived journal articles (e.g. Metcalfe, 2006; Moed, 2007; Norris et al., 2008) or OA and non-OA articles in hybrid journals (Davis, 2009; Eysenbach, 2006). Little attention has been paid to comparing citation data for publications in earlier stages than the journal article. Some of the studies include earlier versions of the publication when determining the OA status of a publication as they do not distinguish between various versions of publications (e.g. Antelman, 2004; Norris et al., 2008). Others include citations to these publications as means to ensure a fixed time window for the citations (e.g. Moed, 2007). Although earlier versions of the journal publications can be included in a pool with the journal articles the focus is on the journal article version of publications. Few related studies exist. As already mentioned, Lawrence (2001) found evidence of an open access advantage of computer science conference proceedings. However, in computer science conference papers are considered the final product (Goodrum, McCain, Lawrence, & Giles, 2001; Kling & McKim, 1999) and are often even more prestigious than journals. Schwarz and Kennicutt (2004) and Metcalfe (2006) did studies in the field of astronomy finding evidence of an open access advantage for conference proceedings, although the citation rates are very low regardless of being available open access or not. However, results by Kurtz and Henneken (2007) show no evidence of an open access advantage within the same field for journal articles which is explained by Harnad (2006) as a result of astronomy being a special case because "all active, publishing researchers already have online access to all relevant journal articles".

The open access advantage of publications in earlier stages than the formal publication is particularly interesting as such publications have had limited visibility before the Internet enabled wider dissemination. The Internet has made it possible to disseminate the earlier versions of publications worldwide and research is made available on e.g. personal and institutional websites. Consequently, there has been a growth in both the number Meadows (1998: 164) and forms (Farace, 1997). The aim of this study is to investigate if un-published economics literature increases in numbers, visibility and consequently citations over a 10-year period. The study can contribute to the ongoing discussion of open access advantage as this study focuses on a different publication type than the existing studies and includes the perspective of the development of a potential open access advantage over time (the developments over time have recently been included in a study by Davis (2009)). Furthermore, the study contributes to the discussion of weighting schemes of publications. An increased amount of grey literature and the easy access may result in a collapse of the distinction between published and un-published literature (Banks, 2006a) which may be cause for concern in terms of the measures typically used to analyse research (e.g. citation rates). In addition, such a collapse would result in increasing recognition and thus citations rates. Should the distinction be collapsing equal credit should be assigned to un-published and published publications.

The paper is structured as follows: the next section describes and discusses the chosen methods followed by the results. Finally, the paper is completed with a discussion and conclusion.

2. Methods

Economics was chosen for the case study because the working paper (WP) is a central document type within this field. The tradition of paper manuscript publication in economics goes back to the 1960s (Kling, Spector, & McKim, 2002) and their importance within the field is well established within the literature (Pierce, 1992; Robinson & Poston, 2004; Whitley, 1991; Zhang, 2007).

The present study includes two separate analyses. First, the share of grey literature of the publications was determined by calculating the percentage of publications in field specific databases made up by working papers. Two major economics databases were used: EconLit, which includes primarily books, WPs and journal articles and RePEc, which is an open access based resource. In EconLit the analyses could be done delineating to specific publication years and thus provide data on the development during the last two or three decades. In RePEC it was possible to delineate to publications updated within the last year (and the data collection took place 2 January 2008) and consequently, this data must be compared with the data on 2007 from EconLit. This analysis provides evidence of visibility and does consequently not provide evidence for the actual numbers and shares of WPs.

Secondly, a sample of economics WP series from 1996 to 2005 (about 2000 WPs in total) was analysed to detect a possible increase in citations to WPs (the WP series were made available open access continuously over a period from 1998 to 2000). A list of the included WPs is available in Table 1. The citation window was set to 3 years and consequently for a WP from 1996 citations from 1996 to 1998 was included. The WPs were looked up individually in the citation indexes as there is no consistent assignment of cited works for WPs.

Impact factors (IFs) tend to increase in general over time and thus a reference sample was needed. The reference sample consisted of 30 randomly selected journals in the economics subject category in JCR®. Some journals may be included or

Table 1
Overview of included working papers.

Working papers	Publications included in the study
Boston College Working Papers in Economics	305
Cambridge Working Papers in Economics	372
Centre for Economic Policy Research, Research School of Social Sciences, Australian National University	169
Federal Reserve Bank of Minneapolis. Working Papers	80
Harvard Institute of Economic Research Working Papers	35
School of Finance and Economics, University of Technology, Sydney	88
Universitat de Barcelona. Espai de Recerca en Economia. Working Papers in Economics	145
University of California at Los Angeles (UCLA). Economics Working papers	99
University of Copenhagen. Department of Economics. Discussion papers.	251
University of Rochester. RCER Working Papers.	103

Table 2
Overview of included journals.

Journals	Articles included in the study
Bulletin of Indonesian Economic Studies	163
Canadian Journal of Economics	670
Contemporary Economic Policy	421
Ecological Economics	1013
Econometrica	594
Economic Development and Cultural Change	358
Economic Development Quarterly	270
Economic Geography	191
Economic Journal	779
Economica	342
Ekonomicky Casopis	580
Health Economics	491
Hitotsubashi Journal of Economics	654
International Economic Review	102
Jahrbücher für Nationalökonomie und Statistik	431
Journal of Development Economics	672
Journal of Econometrics	861
Journal of Economic Literature	179
Journal of Economic Theory	951
Journal of Economics & Management Strategy	240
Journal of Environmental Economics and Management	484
Journal of Evolutionary Economics	230
Journal of Industrial Economics	242
Journal of International Economics	550
Journal of Labor Economics	337
Journal of Real Estate Finance and Economics	358
Oxford Bulletin of Economics and Statistics	375
Review of Income and Wealth	280
Scandinavian Journal of Economics	346
South African Journal of Economics	372

excluded from the subject category (alternatively moved to another subject category) during the investigated period and thus the sample is drawn among the journals present in the subject category throughout the entire period. The sample consists of about 1/3 of the population (some journals are only present in the beginning of their indexed period with an exceptionally limited number of publications and are thus not suited to be included). The journal impact factors (JIFs) for journals were computed correspondingly to the computation of WP IFs. Citations to all publications were included in the numerator, however, only the following publication types were included in the denominator: article, review, letter, note. Preferably, only citations to articles in numerator are included but due to the indexing policy of the citation indexes, citations to all publication types are included in the numerator. A list of the included journals is available in Table 2.

The development over time in IF of journals and WP series is analysed graphically. The journals as well as the WP series are separated in two according to impact factor. This is due to the fundamentally very different development over time by high impact and low impact journals which will be evident in the next section.

3. Results

Fig. 1 shows an increase in the relative size of WPs. Their percentage of the publications in EconLit has increased from about 7 percent in 1980 to about 16 percent in 2006. This study analyses data in the 10-year period from 1996 to 2005 and in this period the share of working papers is increasing from about 10 percent to 16 percent.

Consequently, working papers make up an increasing share of the publications indexed in EconLit, although the figures in Fig. 1 are made up by a distribution of WPs that differs among different subject areas. It is evident in Table 3 that the

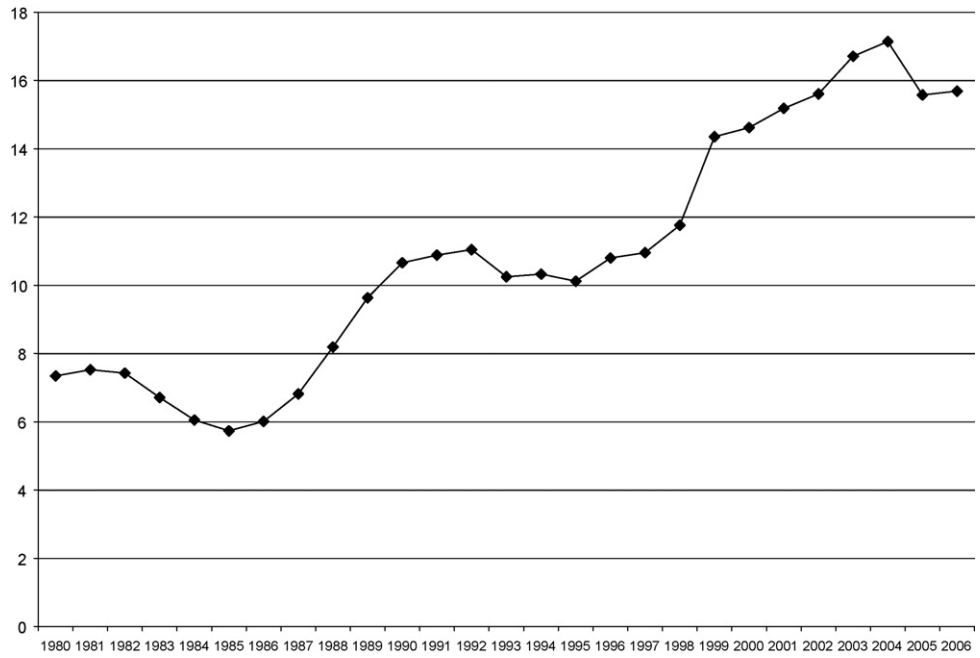

Fig. 1. WPs as a share of the total publications in EconLit. Percentages are shown as moving averages of 3 years.

importance of WPs varies substantially. For some subject areas the percentage of WPs is as low as 3 percent whereas in others it is as high as 38 percent.

Furthermore, Table 3 shows that the percentages of WPs in RePEc and thus the importance are much higher in RePEC. The WPs make up from 67 to 97 percent of the publications indexed in the database. Consequently, the share of WPs in RePEC is from 2 to more than 25 times higher than in EconLit and thus WPs are much more visible in the open access based resource. It should be noted that some of the subject areas with the highest percentages of WPs in EconLit could be one of the lowest in RePEc. An example of such subject area is Law & Economics with 11 percent WPs in EconLit and 92 in RePEc. Mathematical and Quantative Methods have the highest share in EconLit (38) but one of the lowest in RePEc (76). These relative differences are due to the different indexing policies of EconLit and RePEc. EconLit includes selected WP series listed on RePEc. RePEc includes WP series as well as WPs not necessarily in WP series. An author can self-archive several versions of the same WP and in some cases there as many as 5 or more versions of the same WP. Although there are relative differences between the two databases it is clear that RePEc is dominated by WPs. The important question is then if this visibility results in an increased attention and thus citations.

Fig. 2 depicts the development of average impact factors of 10 WP series. For reasons of comparison the figure also includes the IFs of 30 economics journals. IFs are calculated using diachronous IFs with a 1-year publication period and a 3-year citation period. The JIFs are shown excluding journal self-citations to ensure a reasonable comparison. The WPs are

Table 3
Percentages of WPs in EconLit (2007) and RePEc (2007).

Subject areas	EconLit	RePEc
General Economics and Teaching	11	72
Schools of Economic Thought and Methodology	3	67
Mathematical and Quantitative Methods	38	76
Microeconomics	17	87
Macroeconomics and Monetary Economics	17	85
International Economics	13	90
Financial Economics	10	91
Public Economics	17	87
Health, Education, and Welfare	13	87
Labor and Demographic Economics	15	81
Law and Economics	11	92
Industrial Organization	8	84
Business Administration and Business Economics; Marketing; Accounting	5	83
Economic History	14	97
Economic Development, Technological Change, and Growth	7	83
Economic Systems	3	86
Agricultural and Natural Resource Economics; Environmental and Ecological Economics	7	85
Urban, Rural, and Regional Economics	6	89

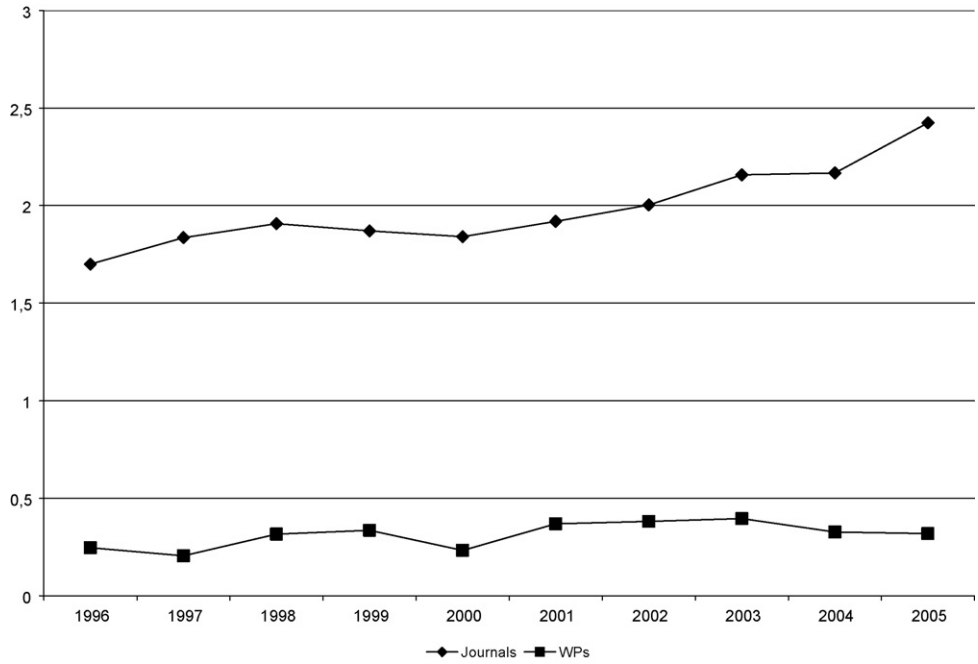

Fig. 2. Impact factors of WP series and journals.

not included as source documents in the citation indexes and consequently the citation rates of WPs are calculated excluding self-citations. There is a clear tendency of the journals to increase their average impact factor through this 10-year period and the WP series have little or no increase. However, this comparison is not quite reasonable as there are huge differences between low impact and high impact journals and WP series.

Fig. 3 depicts the development of average impact factors of WP series separated in two groups: high impact WP series (1210 WPs in total) and low impact WP series (752 WPs in total). For reasons of comparison the figure also includes the IFs of economics journals also separated in two groups: high JIF journals (5298 publications in total) and low JIF journals (8238

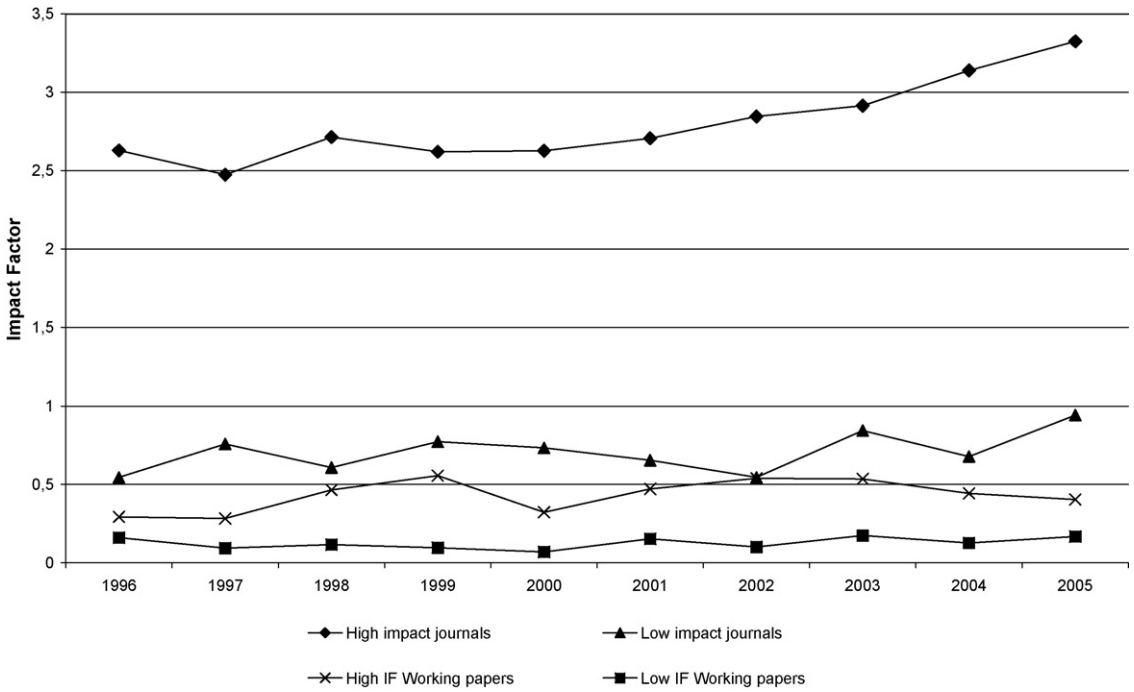

Fig. 3. Impact factors of WP series and journals divided into low and high impact.

publications in total). The division is made on the basis of the average IF of both WP series and journals. The set of journals is split in two at an average JIF of about 1.5 and the WP series are split at an average IF of about .3.

The key issue in this figure is not the difference in level of IFs but rather the development over time. It is evident that the high impact journals increase their IFs considerably. The IFs of the low impact journals do not experience the same increase, if any increase at all. The citation numbers of the low impact journals are smaller causing greater fluctuations which make it more difficult to determine the magnitude of a possible increase in JIF. However, Fig. 3 depicts the development in impact of high impact working paper series to be equivalent at best to that of low impact journals. Furthermore, the impact of low impact WP series is stable over time with a diminutive increase at best. During this 10-year period all of the included WP series were made available OA (some over the period of a few years), however, the increased visibility did not result in a dramatic increase in citation rates. The possible slight increase is not impressive, especially in comparison to that of the traditional journals.

4. Discussion and conclusion

The results of this study relate to the literature on credit assigning and open access advantage. Consequently, these two themes form the structure of this discussion.

Bibliometric assessment of research performance is based on the research output of those being assessed, regardless of the exercise being based on publication or citation analysis. Research output forms the basis, and thus an operational definition of the term is required as it can be defined in numerous ways. Research output can be defined relatively restricted as the number of research articles, notes, letters and reviews published in journals covered by the citation indexes (e.g. Van Raan, 2004). A broader definition of research output is all peer-reviewed journal articles (e.g. Neri & Rodgers, 2006; Rodgers & Neri, 2007) and an even more including definition is journal articles, contributions to books and monographs (e.g. Van der Meulen & Leydesdorff, 1991). However, research output can be defined to entail other channels of publishing. Scholars can disseminate their research via non-scholarly publications directed at the general public (termed the "fourth literature of social science" by Hicks (1999, 2004)). Another publishing channel is the so-called grey or gray literature.

Grey literature is generally not peer reviewed but can be and un-refereed publications are not necessarily grey. The term grey literature is used as means to describe a rather heterogenic group of documents sharing some characteristics determined by the definition of the term. Grey literature is included in the UNISIST model of scientific and technical communication as formal, un-published communication (UNISIST, 1971) and furthermore the revision of the model from 2003 includes preprint databases as distributors of grey literature (Søndergaard, Andersen, & Hjørland, 2003). Numerous definitions of grey literature exist, although, the definitions by the International Conferences on Grey Literature are often used (e.g. Benzies, Premji, Hayden, & Serrett, 2006; Søndergaard et al., 2003). The Sixth International Conference on Grey Literature defines grey literature as "Information produced on all levels of government, academics, business and industry in electronic and print formats not controlled by commercial publishing, i.e. where publishing is not the primary activity of the producing body." (www.greynet.org, accessed April 2008). Some definitions of grey literature are tied to the lack of accessibility of the publications (Auger, 1998). Grey scientific and technical literature includes conference literature, technical reports, theses, dissertations, patents and government publications (Walker & Hurt, 1990). Grey literature also includes working papers (Auger, 1998) and within the last few decades electronic preprint archives have become an important dissemination channel for grey literature (Luzi, 1998) although distribution of preprints is well-known in studies of dissemination of research going back to Garvey and Griffith (1963).

Bibliometrics for evaluation purposes typically distinguishes between refereed and un-refereed documents and/or published and un-published documents. Un-refereed and un-published documents would rarely receive the same recognition. Grey literature is generally not peer-reviewed (Banks, 2006b) which causes Archambault and Vignola-Gagné (2004) to note: "caution must be the watchword here, because this type of literature should be considered at least in part as an SSH [social sciences and humanities] dissemination medium outside the academic community instead of a scientific communication medium". Moreover, Meadows (1998: 164) notes that the "refereed journal articles and scholarly monographs are still regarded as the definitive statements of the results of research projects". Consequently, grey literature and un-refereed documents are typically excluded from assessments of research performance. However, in assessment of research performance research output has been defined including both other scholarly and non-scholarly publications. As means to perform bibliometric analyses of the humanities Moed, Luwel, and Nederhof (2002) includes all publications reported by the members of faculty and then divide into substantial research contributions, small contributions, publications for the general public and other types of publications. Nederhof and van Raan (1993) divides into articles, books, book chapters and other types of publication. Ho (1998) includes all publications and applies a weighting scheme in which forms of grey literature are assigned weights of 2 percent or less of an international journal article.

The little recognition of grey literature is apparent in citation analyses as grey literature is typically not heavily cited (Alberani, Pietrangeli and Mazza ,1990; Nederhof & Noyons, 1992; Pelzer & Wiese, 2003; Salman et al., 2007); although there are field differences in the use of grey literature (Pelzer & Wiese, 2003).

The results of this study also reveal low citation rates of the WPs and there is no clear tendency to an increase over time. However, there are no signs of a decrease over time either as found by Lisée, Larivière, and Archambault (2008) in the case of conference proceedings. Furthermore, the results of this study indicate that there is a relatively modest difference in citation rates of low impact journals and high impact WP series. The difference between the two in citation rates seems to be relatively stable throughout the 10-year period, although with some fluctuations. The clear-cut boundary between published

and un-published publications as well as refereed and un-refereed publications seems less clear-cut as measured by citation rates. Kling and McKim (2000) and Kling (2004) stress that scholarly publishing is a continuum in the paper-only world as well as in the electronic and scholarly communication varies considerably across fields. Field specific weighting schemes could be worth considering as means to capture differences across fields in the recognition of specific publication types. Economics appears to be a field with relatively high recognition of working paper even though it is typically un-refereed and a form of grey literature.

The second theme of this discussion, the open access advantage, needs an initial clarification of the relations to other measures of usage. The supposed increase in the number of citations received by open access publications compared to (similar) non-OA publications must be kept separated from other measures of usage. Open access would, all other things equal, have a greater potential audience. It would at least be difficult to imagine a smaller audience for a specific journal article if self-archived in an open access repository. An example of other measures of usage is number of downloads (e.g. Bollen and van de Sompel, 2008; Bollen, Marko, & Van de Sompel, 2006). The number of citations and the number of downloads are not necessarily causally related meaning that increased potential audience and thus readership does not necessarily imply a greater number of citations. However, there may relations between the measures in general (e.g. Brody, Harnad, & Carr, 2006; Perneger, 2004). Davis et al. (2008) isolates the effects of OA for OA-articles and non-OA articles and finds that OA-articles are more downloaded than non-OA articles in the same journals. They are, however, not more cited (although a study with a longer citation window would have been preferred).

A confirmation of the open access advantage (especially if the size of the effect would be found to be large) would have implications on the fundamental theories of scholarly communication and bibliometrics. It would imply that scholars cite specific publications simply because they are easily available which lend support to theories of citing that emphasize the behaviour of scholars as a balance between cost and benefit and consequently, question both the normative theory of citing and other theories that are based on the principle of least effort (the reader is referred to Nicolaisen, 2007 for a recent review of theories of citing).

The great challenge of studies of open access is the determination of causation. A study that illustrates association is much simpler to perform but do not prove or disprove the existence of the open access advantage. In order to determine causation a study must control for the effect of other variables such as early view and quality bias. Furthermore, determining the status of a publication as being OA or non-OA is not a trivial task. A publication can be made OA in numerous ways and the publication can exist in an earlier version maybe even with a different title. Finally, there are issues of field specific variations which complicate studies across fields. Adding all these time consuming challenges it is tedious work to determine causation of a potentially very small effect. Furthermore, a considerable data material is necessary to be able to control for the many variables (see e.g. Norris et al., 2008 as an example of a study including more than 4600 articles and yet not having enough to determine the cause).

This study does not claim to determine causation but rather point to potential developments over time in the citation rates of open access publications that have not previously been focus of attention. Firstly, the development over time does not indicate that the WP series have received more citations due to the transformation from print to online version during the years 1998–2000. Should there be a positive tendency; the size of the effect is diminutive. Secondly, the relative constant citation rates of these WP series are noteworthy as this type of publication has been almost invisible and very hard to obtain before the Internet. One would imagine that the effect would be considerable for these publications as they have had limited visibility. This is, however, in accordance with the results found by Schwarz and Kennicutt (2004) on the open access advantage of conference proceedings. They stress that increased visibility is not necessarily a guarantee of increased citation rates.

> [P]reprint posting increases the relative visibility of non-peer-reviewed papers by a comparable factor, but the factor-of-20 difference between proceedings papers and ApJ [The Astrophysical Journal] papers remains the same regardless of whether the respective papers are posted on astro-ph [the arXive electronic preprint server] or not. This should serve as a caution to anyone who might believe that preprint posting alone is sufficient to assure that a paper is widely recognized and cited.

It is worth keeping in mind, however, that citations is not the only measure of usage. As already stated, the tradition and importance of working papers in economics is well documented. Nonetheless, when turning working papers into journal articles authors tend to prefer published documents over un-published documents in their reference lists (Frandsen & Wouters, 2009). This indicates that although used and often cited authors may prefer to cite peer reviewed articles if possible which then again may imply that readership is to be kept separate from citation rates. Open access may increase readership but not citation rates as argued by e.g. Craig et al. (2007) and Davis et al. (2008). Although, the open access advantage defined in terms of citation rates is the present focus, it can be argued that increased readership is as important as citation rates (Bognolo, 2008; Latronico, 2008). Lucas and Willinsky (in press) even agitate for open access from a perspective of democracy. Although, analyses of the use of open access based resources in various stages of a research project are indeed interesting, it is beyond the scope of this study.

Summing up, the results of this study have shown that the impact of working papers is relatively low in the field of economics. It is worth noting, however, that high impact working papers have levels of citation rates similar to the low impact journals. There is no clear tendency to an increase in impact during the 10 years, which is the clear tendency of the high impact journals. Consequently, the result of this study does not provide evidence of an open access advantage for working papers in economics. The results of this study do raise the question of field specific weighting schemes of

publications as publications that typically receive little or no credit in bibliometric assessment of research performance may be highly recognised in some fields.

Appendix A. High impact journals

	Average number of publications	Average number of citations	Average number of citations excluding self-citations	Average JIF	Average JIF excluding journal self-citations
Ecological Economics	101.3	287	195.1	3.07	1.86
Econometrica	59.4	272.4	280	5.19	4.71
Economic Geography	19.1	76.8	79.3	4.58	4.18
Economic Journal	77.9	232.2	236	3.34	3.05
Health Economics	65.4	270.2	252.6	4.70	3.88
International Economic Review	49.1	88	84.4	2.02	1.71
Journal of Development Economics	67.2	104.3	106	1.73	1.56
Journal of Econometrics	86.1	236.7	235.1	3.19	2.77
Journal of Economic Literature	17.9	209.5	219.7	12.80	12.35
Journal of Economic Theory	95.1	181.9	154.2	2.13	1.64
Journal of Economics & Management Strategy	24	38	38.5	1.78	1.56
Journal of Environmental Economics and Management	48.4	124.7	128.8	2.92	2.61
Journal of Industrial Economics	24.2	46.9	47.1	2.09	1.98
Journal of International Economics	55	174.6	173.7	3.53	3.11
Journal of Labor Economics	33.7	80.7	83.5	2.65	2.50

Appendix B. Low impact journals

	Average number of publications	Average number of citations	Average number of citations excluding self-citations	Average JIF	Average JIF excluding journal self-citations
Bulletin of Indonesian Economic Studies	16.3	42.8	11	3.02	0.69
Canadian Journal of Economics	67	41.1	42	0.86	0.76
Contemporary Economic Policy	42.1	34.9	35.5	0.92	0.84
Economic Development and cultural Change	35.8	38.6	38.7	1.22	1.11
Economic Development Quarterly	27	34.5	21.8	1.36	0.82
Economica	34.2	34.8	38.8	1.19	1.15
Ekonomicky Casopis	58	17.3	2.4	0.34	0.04
Hitotsubashi Journal of Economics	10.2	1.9	1.2	0.24	0.12
Jahrbücher für Nationalökonomie und Statistik	43.1	7.7	3.5	0.20	0.08
Journal of Evolutionary Economics	23	26.8	23.6	1.26	1.00
Journal of Real Estate Finance and Economics	35.8	45.4	35.1	1.42	1.00
Oxford Bulletin of Economics and Statistics	37.5	49.2	50.8	1.53	1.31
Review of Income and Wealth	28	26.9	23.9	1.04	0.87
Scandinavian Journal of Economics	34.6	35.9	38	1.16	1.11
South African Journal of Economics	37.2	21.9	7.8	0.61	0.19

Appendix C. Working papers

	Average number of publications	Average number of citations	Average IF	High impact working papers = 1
Boston College Working Papers in Economics	30.5	9.3	0.30	1
Cambridge Working Papers in Economics	37.2	14.2	0.38	1
Centre for Economic Policy Research, Research School of Social Sciences, Australian National University	16.9	3.6	0.21	0
Federal Reserve Bank of Minneapolis. Working papers	8	4.7	0.59	1
Harvard Institute of Economic Research Working Papers	3.5	1.92	0.55	1
School of Finance and Economics, University of Technology, Sydney	8.8	0.6	0.07	0
Universitat de Barcelona. Espai de Recerca en Economia. Working Papers in Economics	14.5	0.5	0.01	0
University of California at Los Angeles (UCLA). Economics Working Papers	9.9	1.5	0.15	0
University of Copenhagen. Department of Economics. Discussion Papers	25.1	3.7	0.15	0
University of Rochester. RCER Working Papers	10.30	4.4	0.43	1

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