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Collision of lions and butterflies or mutual neglect - outside the Anglo-American domain, too? The publication and citation behaviour of economic geographers and geographical economists compared

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Abstract:

This paper compares the publication and citation behaviour of economic geographers and geographical economists. Based on a unique data set and consciously limited to researchers in the German-speaking world, empirical analyses show more parallels than expected. Convergence of scholars from both disciplines over time can be observed, as younger papers are more similar to each other than older ones. Publication together with foreign scholars is also becoming more frequent. Joint publications of both disciplines are still a rare, but increasing phenomenon. There seems to be a cooperation dividend if the lion and the butterfly write joint articles.

Keywords: publications, citations, economic geography, geographical economics.

JEL Classifications: Y80 R10

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1. Introduction

Relations between economic geography proper (a sub-discipline of geography) and geographical economics (a sub-discipline of economics) have been the subject of discipline-centred debate (see, e.g. Clark 1998, Marchioni 2004, Martin and Sunley 2001, Overman 2004, Rodríguez-Pose 2011), all the more since the self-proclaimed "economic geographer" Paul Krugman was awarded the Nobel Prize (Krugman, no year; Sternberg 2009). Content-based cooperation makes sense in view of the variety of subject-related references; nevertheless, economists ("lions" according to Duranton and Rodríguez-Pose 2005) and geographers ("butterflies") cooperate relatively rarely in the possible arenas of literature, methodologies, joint publications, or conferences. And that, despite the fact that many books as well as new and successful journals (such as the Journal of Economic Geography; see Wrigley and Overman 2010, Puga and Wrigley 2006) are explicitly dedicated to precisely this cooperation between the two disciplines.

One of the most significant expressions of cooperation in research takes the form of publications and citations. When geographical economists (hereinafter referred to as GEs) publish articles together with economic geographers (EGs) or respectively cite authors of the other discipline in publications, this can be taken as the best evidence of mutual acknowledgement between the disciplines, since citations are the currency used for payment in the academic community (Laband and Piette 1994). The strategic significance of publications in highly-respected journals and the number of citations has long been acknowledged in economics, but also in economic geography for some years now (Yeung 2002).

This paper compares the publication and citation behaviour of EGs and GEs based on a unique data set. The analysis is consciously limited to researchers in the German-speaking world (covering Germany, Switzerland, Austria and Luxembourg), but incorporates all articles indexed in the Web of Science (WoS) databases SSCI and SCI and published by all of these researchers, provided they were employed at a university on the cut-off date of August 1, 2010. 772 SSCI or SCI papers and 4,266 associated citations of 178 EGs and GEs are included. The analysis therefore goes deeper for the

countries covered than a recent approach on the dialogue between both disciplines by Brakman et al. (2011), which represents an important step in the right direction, but is limited to the data of only one (albeit very important) journal. The focus on the German-speaking world is not motivated by the fact that some German geographical economists like Alfred Weber and Johann Heinrich von Thünen or some economic geographers like Walter Christaller have become renowned in mainstay Anglo-American research. This focus is motivated by two assumptions: that the German-speaking world is representative for other languages/worlds outside the Anglo-American one and that the differences between the German-speaking world and the Anglo-American one are significant when it comes to publication and citation behaviour.

The paper aims to answer the following research questions: Do the two disciplines differ in terms of the frequency of publication and citation? Can differences be established in the frequency of joint publications with co-authors outside the German-speaking world? What marks out the journals in which GEs and EGs publish? How frequently and with what effects are there joint publications, i.e., is there "mutual neglect" and "non-debate" (Brakman et al. 2011, Duranton and Rodríguez-Pose 2005) outside the Anglo-American world, too? How have these aspects changed over time? The analysis therefore complements more recent studies of the publication and citation behaviour of scholars from both disciplines who concentrate explicitly or implicitly on the Anglo-American world (e.g., Brakman et al. 2011, Bodman 2010). Such analyses of countries where a language other than English is spoken have so far been rare (e.g., Rodríguez-Pose 2006) and might be useful given the increasing share of authors from non-English speaking countries in SSCI-journals of the named disciplines.

In addition to differences in the publication and citation behaviour, our empirical analyses show some parallels between the two disciplines. The differences in terms of the frequency of publication and citation are slight. A convergence of scholars from both disciplines over time can be observed, as younger scholars are more similar to each other in this respect than those of the older generation for whom journal articles were/are less important than other forms of publication. Publication together

with foreign scholars (of the same discipline or not) becomes more frequent. Equally, more and more German-speaking EGs are trying to have their articles published in high-calibre international journals (of both disciplines) – and with increasing success. Joint publications of both disciplines are still a rare, but increasing phenomenon. Such joint publications show higher citation values on average and are more often published in journals with higher impact factors. There seems to be a cooperation dividend if a lion and a butterfly (Duranton and Rodríguez-Pose 2005) write a joint article.

The rest of the article is structured as follows. Section 2 outlines the debate about the dialogue between GEs and EGs and summarises empirical studies performed to date on the publication and citation behaviour of scholars of both disciplines. Section 3 presents the data and bibliometric indicators. Section 4 explores the publication output, the citation behaviour and the joint publications of EGs and GEs in the German-speaking countries both from a static as well as a dynamic perspective. Section 5 discusses the empirical results, draws conclusions and develops some recommendations for further research.

2. The tale of lions and butterflies

2.1. "Common ground" and "close dialogue" vs. EGs as the prey of economists – the debate

The last two decades have been marked by many issues about which economists (and GEs in particular) and geographers (and EGs in particular) alike have a certain amount to say at the scientific level: Globalisation and regionalisation, regional consequences (and causes) of the financial crisis, urbanisation in general and megacities in particular are some of them. The changes in the global economic and political framework such as the fall of the iron curtain and the economic rise of many, particularly Asian, emerging countries have led to the creation of new research tasks for scholars who can and want to combine economic capabilities with spatial knowledge. This is exactly the interface between geographical economists and economic geographers.

Despite these numerous overlaps in subject areas, the relationship between the two disciplines is one of tension and ignorance. Economists who see many 'common grounds' why a given dialogue seemed to have great potential (such as Sjöberg and Sjöholm 2002) are just as much a minority among economists as those EGs who complain of a lack of great untapped potential for cooperation between the two disciplines (e.g. Sternberg 2009) are a minority among their own kind. This is all the more astounding as there are actually various indications that the two disciplines are approaching one another. This is demonstrated for example by two relatively young journals created for precisely this purpose: the "Journal of Economic Geography" and the "Spatial Economic Analysis" journal. Various conferences and compilations have also achieved their declared aim of bringing economic geographers and economists together, e.g., from the economic geography perspective the "Oxford Handbook of Economic Geography" by Clark et al. (2000) or, from the regional economic perspective, the "Handbook of Urban and Regional Economics" by Henderson and Thisse (2004). The fact that the economist Paul Krugman calls himself an economic geographer – which is the subject of much heated criticism from proper EGs – and was awarded the Nobel Prize for economics, as well as the title of the 2009 World Development Report published by the World Bank ("Reshaping Economic Geography"), an institution dominated by economists, may both be taken as indications of the relevance of cooperation between the two disciplines.

A more realistic picture of the relationship between the two disciplines, I feel, is outlined by the geographical economist Duranton and the economic geographer Rodríguez-Posé (2005, 1695) when they refer to a debate within and between the two disciplines that left its mark in several special issues of highly-respected journals of both disciplines. The majority opinion of EGs is perhaps best expressed by the statement of Amin and Thrift (2000, 8), two highly influential British EGs, who said EGs "would be fooling [themselves] if [they] believe that [they] can lie down with the lion and become anything more than [its] (addendum author) prey". Mainstream economists on the other hand showed very little interest in this debate and many of them weren't even aware of it. Duranton and Rodríguez-Posé (2005, 1695) see the most extreme collisions between EGs and GEs in the publication

process – and incomprehension and ignorance in other fields. "Geographers had long lost their interest in lions [… and they] had left the circus altogether in search for more appealing and exciting performers". "Geographers had become butterflies, freely flying the fields of knowledge with the aim of tasting the best from every flower they visit". Nevertheless both disciplines "are not really colliding and there is great scope for dialogue. […but] the barriers to dialogue are still significant […], there are still mundane, practical obstacles preventing the development of a meaningful dialogue between the two disciplines." These obstacles in the publication processes included the very different organisation of the two disciplines (e.g., acceptance rates in journals, citation patterns) and the different perception of what is viewed as accepted research (see ibid., 1701ff).

2.2. Empirical evidence from the Anglo-American world: the publication and citation behaviour

Publication and citation behaviour are the best evidence both of the relationship between two academic fields and of the differences in their understanding of what constitutes research. This is where the differences between the two disciplines appear to be largest or, the other way round, the requirements the greatest if closer research cooperation between them were to be considered a good idea. According to Duranton and Rodríguez-Pose (2005, 1700), "it is in the refereeing for mainstream journals in both disciplines […] that economists and geographers truly collide". There has been a whole range of empirical studies recently on the characteristics of both disciplines in the publication process. Foster et al. (2007) show in their study of economic geography articles in 24 "major English-language geography journals" a growing propensity of EGs to publish outside the discipline, e.g. in economic journals. Empirical results on the relationship between both disciplines emphasise "mutual neglect" of both disciplines but geographers cross-reference more than economists (see Brakman et al. 2011). Bodman (2010) demonstrates that in recent decades economic geography has become one of the most frequently published and cited sub-disciplines of human geography and of geography as a whole; Monk and Monk (2007) even describe it as the "rising star of the social sciences" (see also Richards et al. 2009).

Astonishingly, there are hardly any bibliometric studies on GEs, with the exception of Isserman's (2004) analysis of regional science publications, although there are a great many bibliometric studies on economists in the English-speaking world in general (see, e.g. Kalaitzidakis et al. 1999, Combes and Linnemer 2003, Kalaitzidakis et al. 2010, Chang et al. 2011).

2.3. The situation in the German-speaking world

The statements made so far, however, have related almost exclusively to publications by EGs and GEs from the Anglo-American world and to journals, most of which also come from the same domain. This paper's focus on the German-speaking world is not solely attributable to the fact that there has been little empirical analysis of it to date. What is more important are two plausible assumptions: first, different results on the publication and citation pattern could be expected to those in the Anglo-American linguistic domain and, second, the German-speaking world shows several parallels to other non-English speaking communities like the Spanish one, the Portuguese one or the French one. Starting with the latter argument the economic geographers and regional economists in each of these non-English speaking worlds have the possibility to publish in journals in their own language (although their number is decreasing), so that there is an increasing, but not an absolute need to publish in the Anglo-American world. Thus, this paper's focus on the German-speaking world may show some results that are transferable to other non-English speaking worlds, too. As for differences between the German-speaking world and the Anglo-Saxon one, two aspects are worth mentioning. First, the extent of collision or mutual ignorance between the two sub-disciplines in the German-speaking world could be significantly smaller than outside this domain as a result of the still influential great tradition of the German School of Location Theory, with more joint publications between GEs and EGs being a possible consequence. Second, the continuity of individuals and institutions in economic geography and geographical economics within the German-speaking domain is greater than elsewhere. The budget cuts, in some cases drastic, at US and UK universities in recent years to the detriment of both disciplines have so far not been replicated with the same intensity in the German-speaking world, in spite of cuts made at individual institutions. Besides these and other

differences between the German-speaking and the Anglo-American linguistic domains not mentioned here (significantly different teaching loads, e.g. would make a comparison between EG of both language worlds rather unfair), there are of course also systematic differences between the two disciplines, regardless of the linguistic domain, that have to be taken into consideration in the interpretation of any differences in publication behaviour. Examples of this include the greater significance of monographies and non-refereed journals, and the larger number of journals published entirely (or partially) in the language of a given country in the field of economic geography compared with geographical economics.

Of course, when analysing non-English speaking countries and journals, the international significance of the journals in question is a particularly important factor. There are considerable differences between the two disciplines in the German-speaking world. There are currently around 15 scientific geographical journals in the German-speaking world with their focus on human or economic geography that publish articles either exclusively or partially in German. That means German-speaking scholars in the fields of human geography/economic geography have far more possibilities for having their work published in their native tongue than those available to (geographical) economists. Two of these journals ("Geographische Zeitschrift", "Zeitschrift für Wirtschaftsgeographie") are currently indexed in the Journal Citation Record 2010 of the WoS. Bajerski (2011, 305) shows unsurprisingly that such journals "are used almost exclusively for scientific communication within their own country and within their own language" even if they do publish at least some articles in English. In total, the SSCI currently indexes 4 geographical journals published in the German-speaking world (of a total of 65 in the SSCI category "geography") that are more or less focused on human geography or even economic geography.

German-language journals in the field of economics are (or have become) extremely rare and, in the opinion of German-speaking economists themselves, have lost a lot of ground on English-language journals in terms of reputation (see Bräuninger et al. 2011). In the sub-population of GEs, and with the

exception of three journals ("Jahrbuch für Regionalwissenschaft", "Raumforschung und Raumordnung", "Informationen zur Raumentwicklung"), such journals no longer exist. The Journal Citation Report 2010, which publishes annually the bibliometric measures of the journals indexed in the WoS, includes three at least partially German-language journals in the category "economics" (which consists of a total of 304 journals), of which none is devoted to geographical economics.

Quantitative analyses of publication and citation indicators are very rare in economic geography for the German-speaking world, as for geography in general (exceptions include Bajerski 2011, Bosman 2009, but not focused on *economic* geography journals). There has at least been a person-based ranking of EGs in the German-speaking world since 2006 that is updated every two years called ZitArt (see www.wigeo.uni-hannover.de/zitart.html), but that only contains rankings of individuals without any further analyses. The subject of publication and citation output among GEs in the German-speaking world is similarly under-researched, although there has been a range of such studies on economics *in general* in the German-speaking world, too (e.g. Ursprung and Zimmer 2007, Graber et al. 2008, Schläpfer and Schneider 2010). Although there are considerable concentrations of GEs at some universities (e.g. in Vienna, Kassel, Kiel), their number and their subjectively felt influence on publication activities has declined in recent decades, at least when the once considerable global influence of the location theorists from the German-speaking world is taken as the yardstick. One of the few recent empirical studies attempts to position German-speaking researchers within urban and regional research (including many geographical economists but also some economic geographers, see Royuela et al. 2006). They demonstrate that German researchers in this field are the second-most productive of any continental European country, but far behind, for example, their contemporaries in the US and the UK. Maier's (2005) survey-based study on the relevance and reputation of regional science journals makes clear that German-speaking journals only play a minor role worldwide, even among scholars in the German-speaking world. Also relating to regional scientists, but not the German-speaking world, and relating to 13 regional science journals, Isserman (2004, 119) only includes one researcher active in the German-speaking world in his list of the top 105 "all-time leaders

of regional science" according to journal article citations – and even then it is an economic geographer, not a geographical economist!

There are roughly 50 geography institutes at universities in the German-speaking world with about 800 researchers, the great majority of which are NOT working in the field of economic geography (see the Dittmann 2011). Around 125 of them are currently estimated to be proper economic geographers. It is more difficult to estimate for geographical economists but it is more than plausible to assume that the proportion of GEs among all economists at universities in the German-speaking world is smaller than the proportion of EGs among all geographers at universities in the same region. .

3. Method, data and definitions

Following Brakman et al. (2011) we distinguish between geographical economists and economic geographers. Drawing the line between GEs and EGs is a difficult task, but one that is very important for the results of a person-based bibliometric analysis. Other empirical studies on similar subjects that are also based on WoS data circumvent the problem of identifying individuals as EGs or GEs by taking the publication of an article in a particular journal as the basis for concluding the author's discipline. According to that rationale, all authors publishing in an economic geography journal would be EGs (so argues Bodman 2010). This kind of approach underestimates the output of EGs because proper EGs (who had once been awarded a degree as economic geographers) of course also publish in non-economic geography journals – and it overestimates their output because economic geography journals also publish contributions from researchers who are definitely not EGs. Same applies to GEs. That is why a different approach is taken here (cf. Sternberg and Litzenberger 2005).

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Researchers in the German-speaking world are classified as EGs or GEs based on individual (person-related) characteristics. EGs are all persons whose main occupation is as an academic employee (including staff funded by external means), professors (not assistant lecturers or private teachers) and emeritus professors who held or were assigned to chairs for economic geography or – in a very few

cases – for economic and cultural geography / social geography or human geography. The relevant 50 or so university institutes are contained in the bi-annually published "Geographisches Taschenbuch" (see Dittmann 2011 for the most recent edition) directory together with their members of staff. The data was supplemented by current information gained from websites of the individual institutes. In total, 106 persons at 42 institutes in 39 cities in Germany, Switzerland, Austria and Luxembourg fulfilled these criteria at the cut-off date. 22 of these 106 researchers do not have a single WoS-indexed publication according to the criteria defined below. That leaves 84 persons who were therefore included in the analysis. The data is NOT based on the "work-done-at" method as the intention is to measure the publication output at as recent a cut-off date as possible. The "work-done-at" method would lack a reference system enabling searches for individual persons working at a particular place (specifically their current place of work) at a current cut-off date.

It was rather more difficult to separate out the GEs. A way had to be found to identify the typically smaller section of the larger community of economists who research spatial aspects. The best and most pragmatic solution for the German-speaking world was to use the Directory of the members of the German-speaking section of the European Regional Science Association (RSA), of the Gesellschaft für Regionalforschung (Society for Regional Research - GfR), as of 1-8-2010. As Brakman et al. (2011) argue, this sub-field of regional science provides a meeting ground for economists and geographers (and regional planners, sociologists) who have a common interest in spatially relevant economic analyses. This analysis only takes into consideration those individuals listed in the GfR directory who are economists (not those of other disciplines, including geographers). Similar to the approach taken with the EGs, the analysis also only takes into consideration persons who were active at a university in one of the four countries at the cut-off date. A total of 72 persons from 35 institutes fulfilled these criteria, of whom 46 had at least one article listed in the SSCI/SCI.

Publication and citation data for both groups of researcher stems from the WoS (SSCI, SCI) database and the Journals Citation Reports (JCR) as available on August 1, 2010. This approach was based on a

range of research and content-oriented arguments which demonstrate that the aforementioned databases only record journals which fulfil the main quality criteria of scientific publications (cf. Rousseau 2002). The two databases include a great number of journals in total (in the SSCI for 2010: 2,731; in the SCI: 8,073), but of course not all those available worldwide. All publication data of the WoS was checked and corrected where necessary taking as a basis the homepages of the respective researchers' university institutes, as it is not uncommon for the WoS databases to contain spelling mistakes in cases of non-English author names or article titles. An additional source of information for data relating to the EGs was the comprehensive data contained in ZitArt, the publication and citation data bank for EGs in German-speaking countries (see www.wigeo.uni-hannover.de/zitart.html).

In contrast to many other empirical studies on the publication and citation output of both disciplines, the career-based publication and citation output of every researcher is taken into consideration here; in other words, *all* SSCI/SCI journal articles are considered (no limitations in terms of subject category or age of article or journal). Thus, if an author from one discipline publishes in journals of another discipline or in acknowledged interdisciplinary journals, these publications are also taken into consideration because the analysis includes all SSCI and SCI publications, not just those in the category "geography" and "economics", which avoids problems in selecting a small number of SSCI or SCI journals. In the data set all publications covered by the SSCI and/or the SCI on the cut-off date of August 1, 2010, are included of which at least one author fulfils the criterion of an EG or GE according to the standards as previously defined, and that have the character of an "article" or "review article" in the terminology of the WoS. Table 1 shows the distribution of the total of 178 researchers, 772 articles and 4,266 citation used in the analysis across the two disciplines. For each of the three criteria, EGs account for about three fifths of the total.

Tab 1: shares of disciplines in the data set

Discipline	Authors		Articles		Citations	
	No	%	No	%*	No	%*
Economic geographers	106	59.6	464	60.1	2,647	62.0
Regional economists	72	40.4	308	39.9	1,619	38.0
All	178	100.0	772	100.0	4,266	100.0

There are no statistically significant differences between the two disciplines in terms of the gender quotients and the ages of the researchers, although EGs were an average of three years younger than the GEs at the time the data was collated (see Table 2)

Tab 2: Characteristics of authors

Author Characteristics	EG		GE		Total	
	Number	%	Number	%	Number	%
Gender						
Male	85	80.2	60	83.3	145	81.5
Female	21	19.8	12	16.7	33	18.5
Age (born …)						
Before 1945	29	27.3	20	32.3	49	29.3
1945 – 1959	24	22.9	26	41.9	50	29.9
1960 – 1974	40	38.1	11	16.7	51	30.5
After 1974	12	11.4	5	8.1	17	10.2
Avg author age (in 2010)	53.0		57.6		54.7	
Avg author age (publication year)	43.4		45.6		44.1	

Publication measures alone only provide information about the number of publications. Conclusions about their importance or quality can only be drawn implicitly, at best, as a reflection of the quality of the journals in question. Under certain preconditions, citation measures can guarantee this in a direct form. They are based on the number of citations of an article in journals. The underlying assumption is that the quality of an article is higher the more often it is cited. This argument outweighs the disadvantages of citation measures, such as the danger of citation cartels, the varying periods between publications and citation, and implicit favouring of major disciplines (cf. for example Coupé 2002, Joint Committee on Quantitative Assessment of Research 2008).

Each citation analysis needs to define the "citing publications" in which the counted citations are to be identified (here: all the journal articles indexed by the SSCI or the SCI), the "counting period" which specifies the publication dates of the considered citing publications (all years until August 1, 2010), the "source publications" which are deemed to represent admissible citable scientific work (all SCI/SSCI-indexed journal articles), and the "publication period" (corresponds to the citation period) which specifies the publication dates of the considered source publications (see Ursprung and Zimmer 2007, 1987f.).

If an article has multiple authors each author is accorded an equal weighting. Self-citation remains unconsidered, although this may lead to distortions, but these distortions do not lead to any significant changes in increasingly important bibliometric measure like the h index (see Bodman 2010). Furthermore, in our data there is no significant correlation between the share of self-citations and the total number of publications per researcher. An article in a journal is only taken into consideration as of the year in which the journal is first indexed in the SSCI/SCI. Impact measures are part of the standard instruments for weighting publications (cf. Rousseau 2002). This analysis uses the synchronous 2-year impact factor that the WoS publishes annually in its Journal Citation Reports (JCR). This impact factor is calculated as the quotient of the number of articles published in a two-year period (denominator) and the number of contributions that cite these articles in the subsequent year in articles published by the same journal or by others covered by the WoS (numerator). Since 2009 the WoS has provided a 5-year impact factor which is more suitable for social sciences like economic geography and geographical economics. As the 5-year impact factor has only been available for a few years (and therefore does not yet provide any data on many journals that were only recently included in the WoS), the 2-year impact factor is used here.

Citations in all articles covered by the SSCI or the SCI are taken into consideration, in other words specifically not only those that were published in certain journals. This is a more accurate reflection of the inter-disciplinary nature of many economic geography or geographical economics articles and subjects. Additionally, it may be testimony to the quality of the academic works of a researcher if his/her articles have been published by a broad range of journals rather than all by the same journal. A variability measure has therefore been created that records the range of different journals publishing the articles of a given author. The values of this variability are calculated as the quotient of the number of articles published by an EG or a GE and the number of different journals in which these articles appeared (extreme value n - all contributions appeared in the same journal – and 1 - each journal appears only once, where n represents the total number of journal contributions by the author).

4. Publication and citation behaviour of EGs and geographical economists

4.1. Publications

The journals give an important initial insight into the publication behaviour of both disciplines. Table 3 breaks the SSCI/SCI journal articles of the 106 EGs and the 72 GEs down according to the frequency of the journals. The differences between the journal frequencies of the two disciplines are noticeable. What immediately catches the eye is that the distribution of the articles across the number of the EG journals is a little less equal, even if the journal "Geographische Zeitschrift", which is used almost exclusively by EGs, with all its 110 articles is ignored: the remaining 394 EG articles are spread across 96 different journals, whereas the 310 articles authored by GEs are spread across 95 different journals. "Geographische Zeitschrift" has been indexed by the SSCI for a very long time, meaning its articles have been counted for a very long time, while other very old journals have only recently been indexed. The journals written (partially) in German and published in Germany are significantly over-represented among EGs. This is partly related to the fact, that both cited impact factors are mostly lower for the journals that tend to be used more by EGs. However, EGs are just as active as GEs, and in some cases considerably more so, in some journals with very high impact factors (e.g., "Environment & Planning A", "Research Policy", "Technovation" and particularly in "Journal of Economic Geography"). As is common with all social sciences, the 5-year impact factor of most journals is higher than their 2-year impact factor because it takes longer for a new article to be cited than in the natural sciences, for example. No significant differences were observed between the two disciplines in terms of the difference between the 2-year and 5-year impact factors, i.e., EGs do not cite articles any faster (or slower) than GEs. Fourth, some journals are used (just as) intensively by both disciplines, such as "Regional Studies", "Urban Studies" or "Research Policy", but journals that are either used by EGs only (e.g., "Zeitschrift für Wirtschaftsgeographie", TESG or "Geographische Zeitschrift") or by GEs only (e.g., "Papers in Regional Science", "Journal of Urban Economics") dominate, including all journals that publish entirely or partially in German.

Tab. 3: Top 30 journals by number of articles and discipline of the author(s)

Rank	Journal title	Journal language	Impact factor 2010		No of articles		
			2 year	5 year	EG	GE	Total
1	Geographische Zeitschrift*	German-English	0,23	0,21	105	5	110
2	Environment & Planning A	English	2,07	2,42	26	18	44
3	Regional Studies	English	1,26	2,21	19	20	39
4	European Planning Studies	English	0,65	1,18	32	5	37
5	Annals of Regional Science	English	1,01	0,98	9	20	29
6	Jahrbücher für. Nationalökonomie und Statistik*	English	0,34	0,34	0	26	26
7	Mitteilungen Österreichische Geogr. Gesellsch.*	German	0.38[a]	0.74[a]	21	0	21
8	Tijdschrift Economische Sociale Geographie	English-Dutch	0,8	0,97	17	2	19
	Zeitschrift für. Wirtschaftsgeographie*	German-English	0,24	…	19	0	19
10	Papers in Regional Science	English	1,24	1,64	4	12	16
11	Urban Studies	English	1,51	2,31	7	7	14
12	Mountain Research and Development	English	0,48	0,83	13	0	13
13	Fleischwirtschaft*	German	0,13	0,1	11	0	11
	Int J of Urban and Regional Research	English	1,4	2,01	4	7	11
15	Berichte über Landwirtschaft*	German	0,13	0,1	8	2	10
	J of Urban Economics	English	2,89	2,61	0	10	10
	Regional Science and Urban Economics	English	0,89	1,61	2	8	10
	Research Policy	English	2,51	4,24	5	5	10
	Small Business Economics	English	1,55	2,06	5	5	10
20	Erdkunde*	English*	0,45	…	9	0	9
	Geographical Analysis	English	1,5	2,47	8	1	9
	J of Regional Science	English	1,03	1,39	4	5	9
	Technovation	English	2,99	2,78	4	5	9
24	Int J of Technology Management	English	0,52	0,76	4	3	7
	Int Regional Science Review	English	0,67	1,66	2	5	7
	J of Economic Geography	English	3,66	4,49	6	1	7
	Progress in Planning	English	1,06	1,1	3	4	7
	World Poultry Science Journal	English*	1,48	1,91	7	0	7
29	Economic Geography	English	3,03	3,19	3	3	6
	European Urban and Regional Studies	English	1,22	1,6	5	1	6

Data source: SSCI/SCI as of august 1, 2010, Journals Citation Report 2010

* these journals for many years had only accepted papers in German; only recently some of them publish some or all papers in English

[a] data for 2009; this journal does not appear in the 2010 JCR; …: no data as this journal was only recently indexed in WoS

In terms of their journal publication output, the two disciplines are more similar at first glance than expected (see Table 4). True, GEs have slightly more journals per capita based on the career-based perspective and publish slightly more in journals with higher impact factors, but these differences are not statistically significant even at the 10% level. The differences are only statistically significant for

three variables. EGs publish articles almost twice as often in journals that the WoS assigns to the category "geography" as GEs do in their 'natural' category, "economics". GEs publish far more often in completely English-language journals than EGs do. Finally, more than half of EGs are sole authors of their articles, whereas GE articles are far more frequently written by teams of authors.

Tab. 4: Indicators of career-based publication output by discipline

Characteristics	EG	GE
Number of SSCI/SCI articles	5,99	6,85
Number of articles weighted by impact factor	7,94	10,26
Share of articles in 'home' category (%)*[a]	73,47	39,02
Avg 2 year impact factor 2005-2009	1,21	1,4
Share articles in non-German journals (%)*	64,21	86,74
Share single author articles (%)*	52,05	32,54
Variability (no of articles/no of journals)	1,47	1,33
Avg age of articles in 2010 (years as of 2010)	10,76	14,24

*: significant difference between mean values at 10%-level
[a] home category refers to the subject category "geography" of the WoS for economic geographers and to "economics" for geographical economists

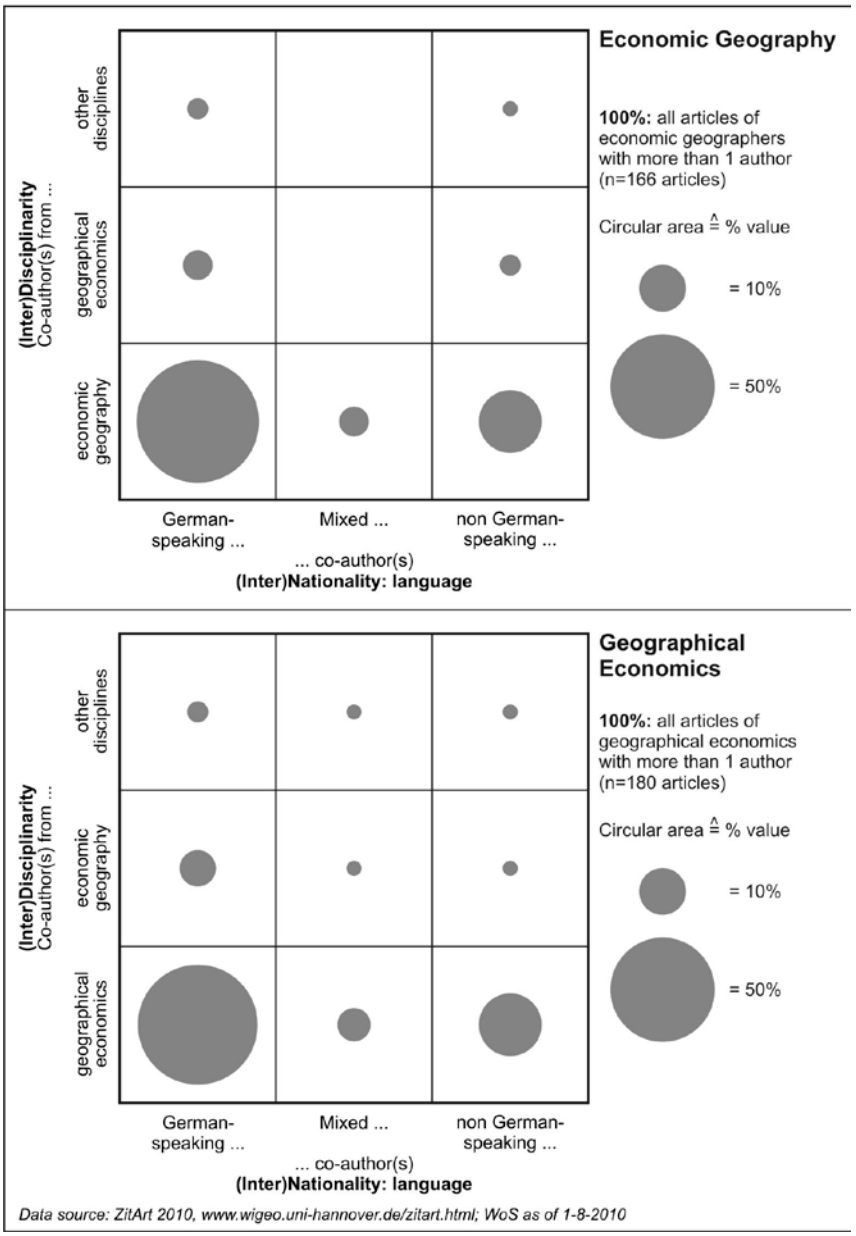
Publishing in English-speaking journals is becoming an increasingly important platform for researchers of both disciplines to build up a reputation. The previous table showed that the tendency among GEs from the German-speaking world to publish in English-language journals is greater than among EGs. A more direct possibility for a researcher from the German-speaking world to be noticed in the Anglo-American community would be to become involved in joint publications with researchers from this domain. Since our data set contains both the discipline and the location (affiliation in 2010), two questions can be answered: How frequently do authors of the two disciplines publish in collaboration with authors from the English-speaking world and how often does it involve interdisciplinary author teams?

In the complete sample, just over half the articles (390 out of 772 articles) had at least two authors. Of that amount …

- 167 articles had solely economic geography authors, of which 75% had German-speaking co-authors only,
- 180 articles had solely geographical economic authors, of which had 74% German-speaking co-authors only,
- 43 articles had a mix of EG and GE authors, of which had 63% German-speaking co-authors only.

In total therefore (including the single-author articles), 87% of all 772 articles were written exclusively by authors from German-speaking countries. The corresponding proportion for single-discipline articles (with several authors) is almost identical for both disciplines, but considerably smaller for interdisciplinary articles (at least one author from GE AND from EG). When interdisciplinary teams of authors of GEs and EGs come together, the authors *relatively* frequently come from a German-speaking AND a non-German speaking (usually English-speaking) country (see figure 1).

Figure 1: Joint publications across disciplines and languages



Joint publications by EGs and GEs are relatively rare. 390 out of the 772 articles have at least two authors of which at least one is a German-speaking EG or a German-speaking GE. Of these 390 articles, 43 (11%) have at least one EG AND one GE among their authors. This is really a rare event, particularly as it only refers to a very small number of researchers (in both disciplines!). Of the 106 German-speaking EGs, only eight (7.5%) have at least one publication with an author from the other discipline. Among the 72 German-speaking GEs this proportion is even lower (five individuals, i.e. 6.9%). But this also means that the few GEs / EGs who publish together with representatives of the other discipline do so very often: The eight aforementioned EGs account for 31 of the 43 joint articles (i.e., 3.9 joint articles per German-speaking EG); the five GEs account for 12 of the 43 joint articles (2.4 joint articles per German-speaking GE).

4.2. Citations

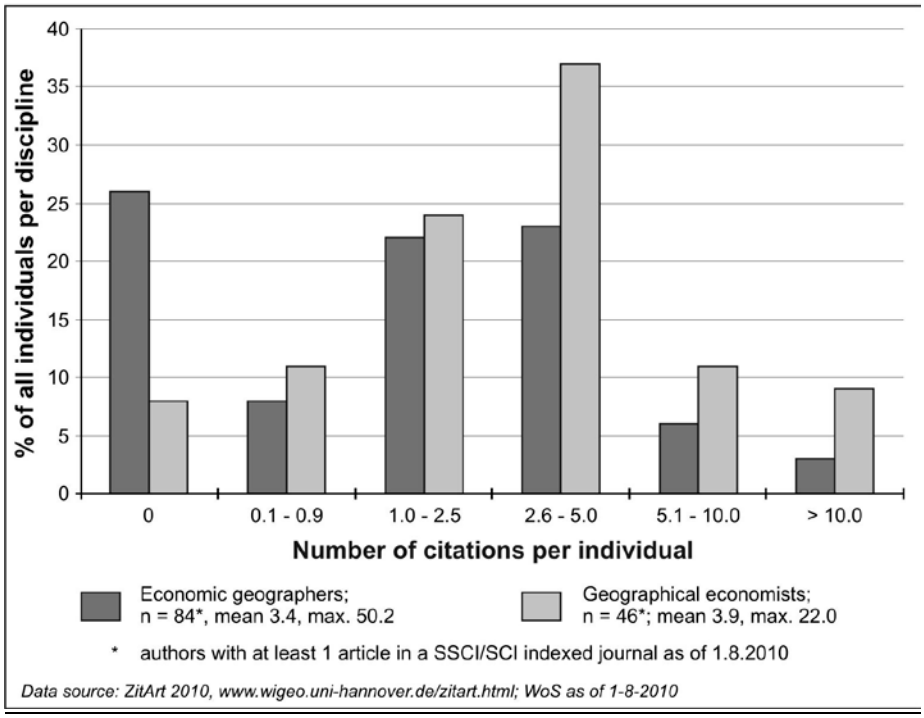
Table 5 shows selected indicators of the career-based citation output by researcher and by discipline. The GEs fare slightly better across all citation indicators than the EGs, although none of the differences is statistically significant. In contradiction to previous assumptions, there is no statiscal correlation between the age of the paper year of publication) and the number of cites; consequently I have not weighted the citation variable by the age of the paper.

Tab. 5: Indicators of career-based citation output by researcher and discipline

Characteristics	EG	GE
Number of citations/author	33,68	36,28
Number of citations weighted by 2year impact factor	71,58	73,7
Share of articles with no citations (%)	34,71	29,77
Number of citations/article	3,39	3,95
h-index	2,02	2,61

The distribution of citations per article differs considerably between the two disciplines (see figure 2). Almost a quarter of the articles by EGs have not a single citation (only 8% among the GEs) and the articles with higher citation counts are significantly over-represented among the GEs.

Figure 2: Number of citations per article by discipline



Previous analyses have based the classification as EG or GE on the discipline of the researcher. In the case of articles with several authors in particular, possibly even from both of the disciplines we are interested in here, it makes more sense to assign the articles themselves to the disciplines, however still based upon the discipline of the authors (and not assigning a journal as a whole to one discipline). We differentiate between three types of articles in the total sample of 772:

- an EG article only has EGs as its authors, or the co-authors are NOT GEs (n=443)
- a GE article only has GEs as its authors, or the co-authors are NOT EGs (n=286)
- a mixed article has at least one GE and one EG as its authors, plus, possibly, other authors from other disciplines (n=43).

Table 6 shows that there are no statistically significant differences between EG articles and GE articles in terms of the three citation indicators. The total number of citations value for GE articles is slightly higher, which may be attributable to the statistically significantly greater age (at the 10% level) of the GE articles. By contrast, the number of citations per article and year (since publication) is higher for EG articles. The average 2-year impact factors for the years 2005-2009 for the relevant journals are higher for the GE articles than for the EG articles, although the differences are not statistically significant.

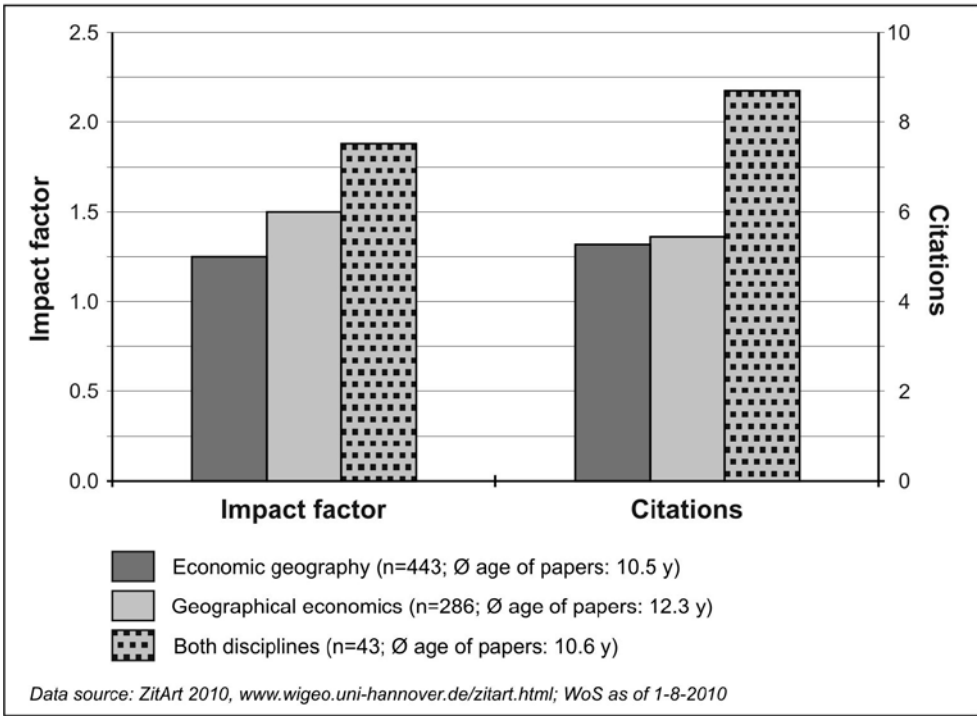
Table 6: Indicators of career-based citation output by article and discipline

Characteristics	EG articles[a]	GE articles[b]	Mixed articles[c]
Avg number of citations/article	5,27	5,44	8,7
Avg number of citations/article and year since publication	0,78	0,7	1,3
Share of articles with no citations (%)	36,6	30,4	9,3
Avg age of article (as of 2010) in years*	10,8	12,41	10,67
Avg 2 year impact factor of journal 2005-2009	1,25	1,5	1,86

[a]: all authors are economic geographers or others, but no geographical economists
[b]: all authors are geographical economists or others, but no economic geographers
[c]: at least one author is a GE AND at least one author is an EG
*: significant difference between mean values 10%-level

Figure 3 shows the impact factors of the relevant journals (average value 2005-2009) and the number of citations for the three aforementioned types of articles. It is plain to see that there is a cooperation dividend when researchers from both disciplines form interdisciplinary teams of authors: The mean number of citations of such joint articles by GEs and EGs is considerably higher than that of single-discipline articles (8.7 citations vs. 5.3 and 5.4 citations, resp.) The 2-year impact factors of the articles with authors from both disciplines are also higher.

Figure 3: Types of articles by impact factor and citations



Data source: ZitArt 2010, www.wigeo.uni-hannover.de/zitart.html; WoS as of 1-8-2010

This kind of cooperation dividend appears also to apply when German-speaking EGs publish together with researchers from non-German speaking countries. Finally it might be of interest to know which articles included in the data set are actually cited most – and how this citation pattern is related to the three articles categories. Tab. 7 shows the Top 30 articles according to the total number of WoS citations as of August 1, 2010. As for the journals the results significantly differ from those of Table 2: not a single journal published in Germany appears among the top 30 papers! Of course, the absolute number of citations of the highly ranked articles is much lower than for authors of the Anglo-American world (see, e.g., Foster et al. 2007). The total number of different authors in this list is rather small. Referring to the three article categories four of the mixed articles (out of 43) belong to the Top 30, i.e. 9.5%, while only 5.4% of all 772 articles belong to the mixed category. However, these mixed articles do not reach the highest ranks in this table.

Tab. 7: 30 most cited papers of economic geographers and geographical economists of the German-speaking world as of August 1, 2010

Title	Author(s)	Journal	Year	Times cited		Discipline of the author(s)*
				All	Self-citations	
Cool projects, boring institutions: temporary collaboration in social context	Grabher G	Regional Studies	2002	110	5	EG
The project ecology of advertising: tasks, talents and teams	Grabher G	Regional Studies	2002	100	5	EG
Ecologies of creativity: the village, the group, and the heterarchic organisation of the British advertising industry	Grabher G	Environment and Planning A	2001	90	6	EG
Toward a relational economic geography	Glückler J, Bathelt H	Journal of Economic Geography	2003	83	9	EG
Legal form, growth and exit of west German firms - Empirical results for manufacturing, construction, trade and service industries	Stahl K, Harhoff D, Woywode M	Journal of Industrial Economics	1998	58	1	GE
Organizing diversity: evolutionary theory, network analysis and postsocialism	Grabher G, Stark D	Regional Studies	1997	57	0	EG
Differentiated products, consumer search, and locational oligopoly	Stahl K	Journal of Economic Geography	1982	54	3	GE
Who cooperates on R&D?	Fritsch M, Lukas R	Research Policy	2002	53	2	GE
Science-industry interaction in the process of innovation: the importance of boundary-crossing between systems	Tödtling F, Kaufmann A	Research Policy	2001	50	4	GE
Growth regimes over time and space	Fritsch M, Audretsch D	Regional Studies	2002	46	13	GE
Learning in projects, remembering in networks? Communality, sociality, and connectivity in project ecologies	Grabher G	European Urban and Regional Studies	2004	45	1	EG
The geography of firm births in Germany	Fritsch M, Audretsch D	Regional Studies	1994	45	6	GE
Innovation networks and regional development - evidence from the European Regional Innovation Survey (ERIS)	Sternberg R	European Planning Studies	2000	44	2	EG
Knowledge interactions between universities and industry in Austria: sectoral patterns and determinants	Fischer MM, Schartinger D, Rammer C, Fröhlich J	Research Policy	2002	43	0	Mix
Artificial neural networks - a new approach to modelling interregional telecommunication flows	Fischer MM, Gopal S	Journal of Regional Science	1994	43	11	Mix
Spatial knowledge spillovers and university research: evidence from Austria	Fischer MM, Varga A.	Annals of Regional Science	2003	41	2	Mix
Bad company? The ambiguity of personal knowledge networks	Grabher G, Ibert O	Journal of Econo-mic Geography	2006	36	5	EG
Innovation, regional knowledge spillovers and R&D cooperation	Fritsch M, Franke G	Research Policy	2004	35	1	GE
Effects of new business formation on regional development over time	Fritsch M, Mueller P	Regional Studies	2004	34	9	GE
Bridging uncertainty in management consulting: The mechanisms of trust and networked reputation	Glückler J, Armbruster T	Organizational Studies	2003	34	6	Mix
How to unlock regional economies from path dependency? From learning region to learning cluster	Hassink R	European Planning Studies	2005	33	0	EG
Temporary architectures of learning: knowledge governance in project ecologies	Grabher G	Organizational Studies	2004	33	3	EG
Systems of innovation in traditional industrial regions: The case of Styria in a comparative perspective	Tödtling F, Kaufamann A	Regional Studies	2000	33	4	GE
Do manufacturing firms profit from intraregional innovation linkages? An empirical based answer	Arndt O, Sternberg R	European Planning Studies	2000	31	1	EG
Innovative linkages and proximity: Empirical results from recent surveys of small and medium sized firms in German regions	Sternberg R	Regional Studies	1999	31	2	EG
Territorial or trans-territorial networking: Spatial aspects of technology-oriented co-operation within the German mechanical engineering industry	Grotz R, Braun B	Regional Studies	1997	31	1	EG
Innovation, knowledge creation and systems of innovation	Fischer MM	Annals of Regional Science	2001	29	3	EG
Trading routes, bypasses, and risky intersec-tions: mapping the travels of 'networks' between economic sociology and economic geography	Grabher G	Progress in Human Geography	2006	28	1	EG
Climate change as a threat to tourism in the Alps	Elsasser H	Climate Research	2002	28	0	EG
Organizing the Indonesian clothing industry in the global economy: the role of business networks	Hassler M, Dicken P	Environment & Planning A	2000	28	8	EG

* EG: all authors are economic geographers or others, but no geographical economists; GE: all authors are geographical economists or others, but no economic geographers; mixed: at least one economic geographer and one regional economists belong to the authors

Based upon 772 papers of 106 economic geographers and 72 geographical economists with affiliations in Germany, Switzerland, Austria or Luxemburg at the time of the reference date, younger papers are ranked higher in case of equal number of cites; self-citations refer to cited references that contain an author name that matches the name (at least one) of the author(s) of a citing article

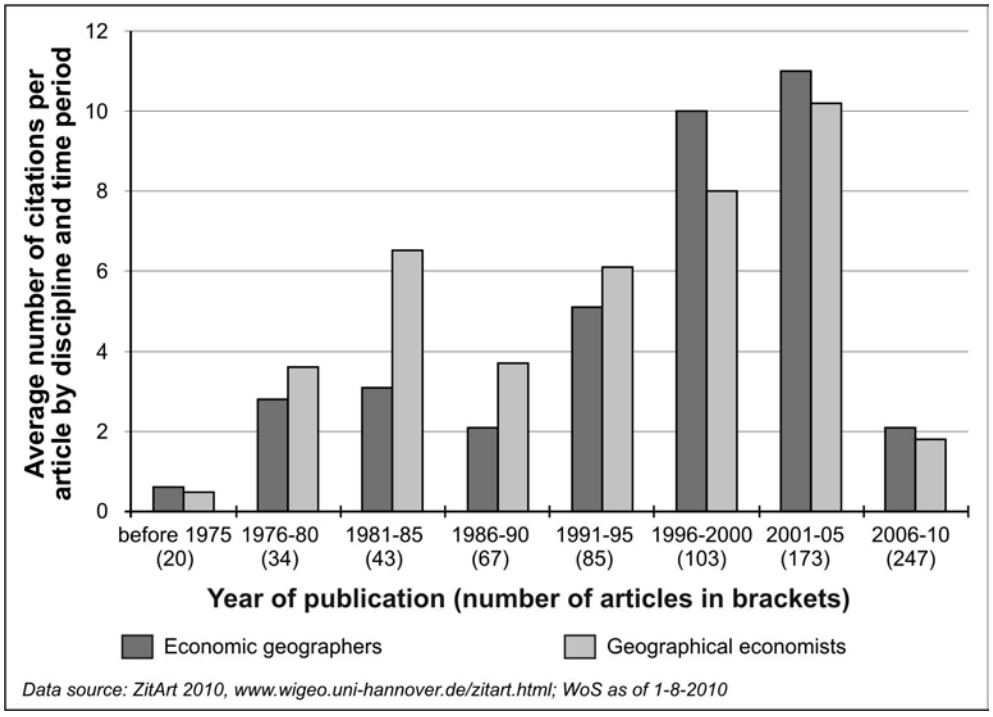
Data source: ISI Web of Science, author's own calculation

4.3. Convergence or divergence?

So far, all analyses have been implicitly static, i.e., the data related to a cut-off date (1.8.2010) even though it was career-based. In this section we intend to analyse how some of the indicators have changed over time (i.e., during the career of the researcher under consideration). It should be noted that the data does not make it possible to analyse the publication behaviour of *all* EGs and GEs from the German-speaking world in a given year (e.g., all EGs and GEs active in the year 1990), rather only those activities from 1990 that originate from the researchers recorded (i.e., active) in August 2010. So the data is quasi-panel in character.

First, the data on citations per paper shows that the EGs have outperformed GEs in recent years. That means the more recent articles by EGs are cited more frequently than the more recent articles by GEs, although the reverse is the case with older articles in both disciplines (see fig. 4)

Figure 4: Number of citations per article by discipline



Second, it is worth comparing subject categories (according to the WoS categorisation) of the journals the researchers of both disciplines publish in. Figures 5 and 6 differentiate between 4 categories of WoS categories: "geography journals" (e.g. "Economic Geography"), journals primarily dedicated to "economics/business/finance" (e.g. "Small Business Economics"), journals explicitly dedicated to EGs AND (geographical) economists (e.g.,"Journal of Economic Geography) and other subject categories (e.g. "Scientometrics"). The extent to which researchers from one discipline publish in journals of

another discipline may be an indicator of actual or perceived differences in reputation. It should be noted that the WoS assigns some journals to several categories.

Figure 5: Economic geographers: development of journal subject categories over time

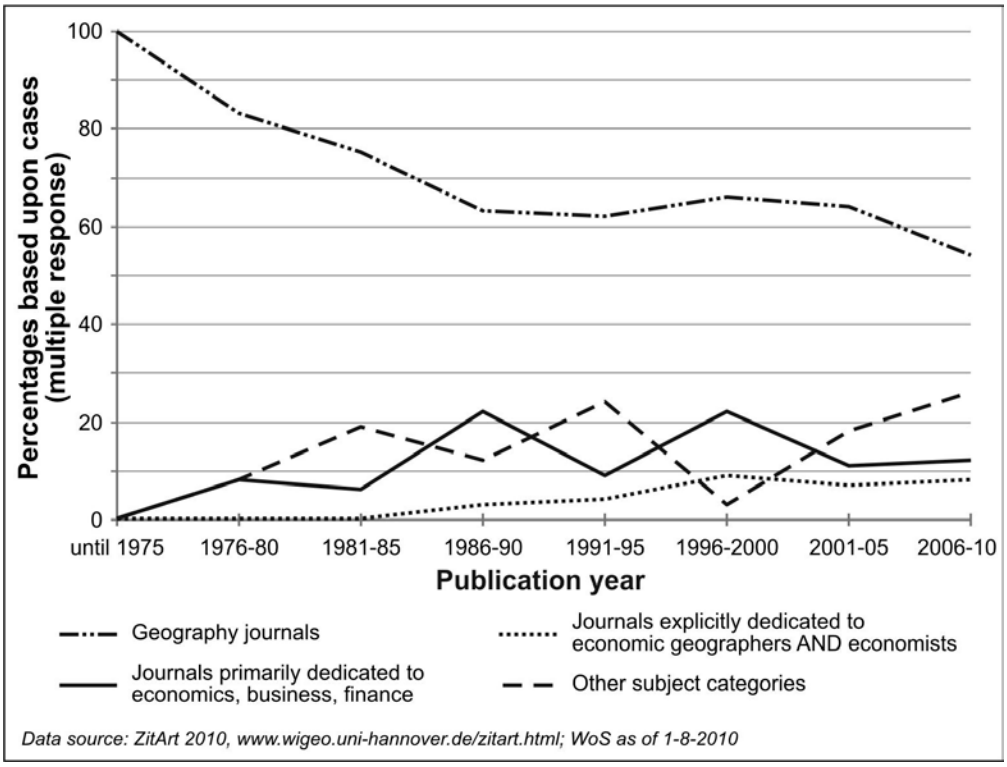
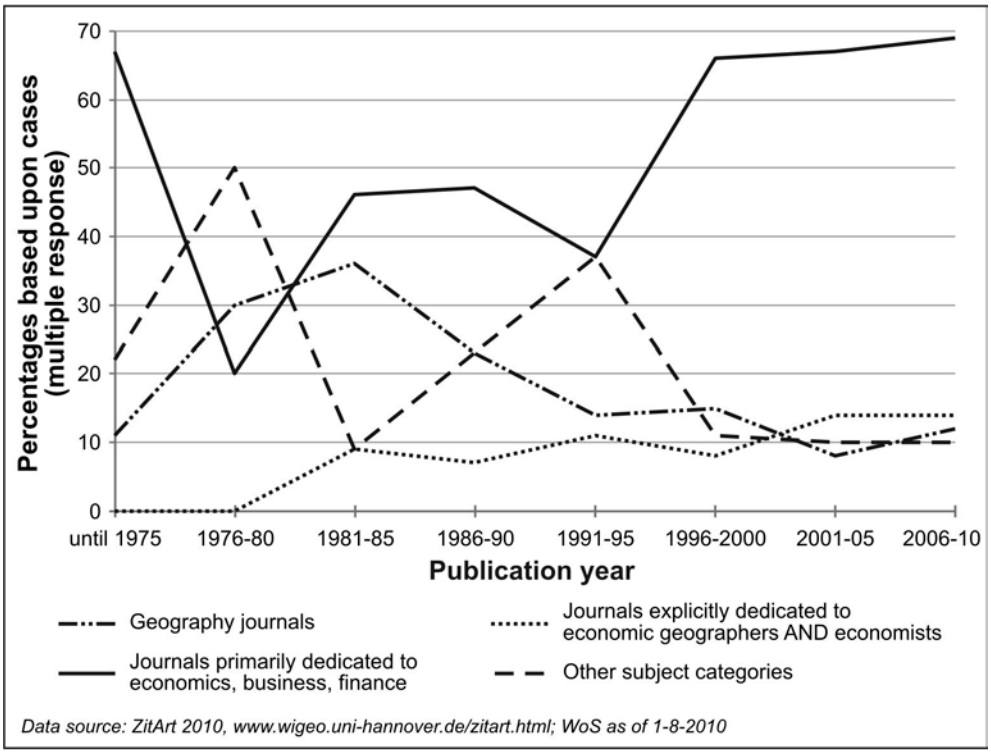


Fig. 5 shows that EGs are actually publishing less and less in geography journals even though the proportion of such articles in the most recent 5-year period is still over 50%. For WoS articles published before 1975 this figure was 100%! The beneficiaries of this shift are the other three categories, most markedly the residual "other categories". Articles in the – still relatively few – journals explicitly dedicated to EGs AND geographical economists have slowly but consistently increased among EGs, but still do not account for 10% of articles.

The corresponding figure for GEs is very different. Articles in the nearest discipline category, in this case "economics/business/finance" dominate here, too, particularly over the past 10 years (see fig. 6), but this dominance has varied considerably over the 5-year periods. Articles in the category "geography" have continuously decreased since the 1980s and now only account for around 10% – the same as the journals explicitly focused on EGs AND GEs, although their proportion has been growing since the 1970s. In a comparison of the two disciplines, the two last figures show that there is a trend among EGs, with a decline in the significance of geography journals and a slight increase among mixed journals. No such trend is to be observed among GEs.

Figure 6: Geographical economists: development of journal subject categories over time



Finally, it is interesting to observe how the proportion of joint articles between EGs and GEs relative to all articles published by both disciplines has changed over time. This proportion has not changed significantly since the start of the 1980s; it has remained at just under 10% of all articles published by EGs and GEs. It is noticeable, however, that there was not a single joint article in the two oldest 5-year periods (i.e., up to 1980) published by the researchers documented in 2010.

5. Discussion of the empirical results, conclusions and further research

With regard to the key questions of this paper, the results can be summarised as follows. The two disciplines differ in terms of the frequency of publication and citation to the benefit of GEs, although EGs have caught up and even overtaken GEs most recently with some citation indicators. There are no systematic differences between the journals in which GEs and EGs publish, but both groups cover very different journals. The results relating to the journals most commonly used by GEs are largely in line with other studies on the publication behaviour of European regional scientists (see Maier 2005). The journals used for older articles (i.e., by older EGs) in particular deviate more strongly because

they publish more frequently in journals only used by geographers, and often only by German geographers.

Joint publications with co-authors from outside the German-speaking world and from other disciplines are an important topic of this paper. Empirical analysis reveals that authors of both disciplines relatively rarely publish articles together with non-German speaking co-authors (only 13% of all articles considered here) and that joint articles by EGs and GEs are far rarer even than that in the German-speaking world. There is a very small group of scholars in both disciplines responsible for almost all of these articles. The large residual group restricts itself to German-language journals and articles. The "mutual neglect" and "non-debate" observed by in the Anglo-American world by Brakman et al. (2011) and Duranton and Rodríguez-Pose (2005) can, to a considerable extent, also be observed in the German-speaking world.

With restrictions, the data allows an answer to the question of whether there are indications for a convergence of the two disciplines in their publication and citation behaviour. There are indeed signs of such convergence. The more recent articles of both disciplines differ less markedly in terms of various bibliometric measures than older articles; in some cases there are no differences to be observed any more. The best indicator of a convergence of the two disciplines in real terms however, joint publication, is still a very rare event – there is no increase in the number of such articles to be observed, neither in absolute nor relative terms. Where they do occur, the articles are far more frequently cited and appear in journals with higher impact factors than other articles. More researchers of both disciplines should bear this cooperation dividend in mind when planning their articles and looking around for co-authors. They could exploit the "common ground" (Sjöberg and Sjöholm 2002, 467) the two disciplines share and when they do cooperate they achieve more in terms of content and strategically than when they publish in isolation. Lions and butterflies do not really collide in the German-speaking world, but they should exploit the cooperation potential better than they have done in the past – not only because of the citation dividend of joint publications. The relationship between

the two disciplines is not always on an equal footing: while lions often make more noise, butterflies should too!

Generally speaking, it is not easy to place the results of the empirical analysis of this paper because there are hardly any reference studies. The only study on the – implicitly – Anglophone linguistic region and the dialogue between both disciplines shows some parallels with this study (see Brakman et al. 2011). The trend towards English-speaking and WoS-indexed journals is an example of this, as is the extreme rarity of joint articles by EGs and GEs. One important difference between the two disciplines as well as between German-speaking economic geography and economic geography in other non-English speaking countries remains, although it is becoming less important as the proportion of German journals publishing exclusively in English increases: There is a relatively high number of geography journals publishing predominantly in German in the German-speaking world (particularly those not indexed by the WoS), but only a small number of such economic journals.

Of course, our attempt suffers from some limitations. One could question critically whether GEs really are typical "lions" as meant by Amin and Thrift (2000, 8). No, they doubtless are not, but the affinity to EGs is certainly greatest in this (small) population of economists as there are many subject overlaps. Nevertheless, one should be careful and should not automatically apply the findings of this paper, insofar as they concern GEs, to all economists in the German-speaking world. This paper naturally shares the weaknesses of the WoS as a source of data: articles in a journal indexed by the WoS are only recorded once they have been recorded by the WoS (after indexing). Some very old journals in which EGs or GEs have been publishing for a long time have therefore only been taken into consideration for a relatively short period of time.

This paper is intended as a first attempt to shed some empirical, however descriptive, light on a hitherto under-researched topic. At the current point in time there are no bibliometric and comparative studies on the publication and citation behaviour of EGs and GEs in the German-speaking world. Of

course there are many ways to approach this subject in more detail and, potentially, differently. Potential options for further research include multivariate procedures to explain publication and citation patterns of both disciplines. Second, it may be useful to compare the German-speaking countries with other countries outside the Anglo-American hemisphere. France, Spain, or the Scandinavian countries are possible candidates, all with strong national communities of EGs and GEs and with some framework conditions similar to the ones in the German –speaking world. Third, a cross-reference analysis of GEs and EGs in the German-speaking world would be an option in order to compare the results with the (implicitly) Anglophone study of Brakman et al. (2011). Finally, and in the long run, such bibliometric analysis should at least consider testing the Scopus database as an alternative to the WoS database. It has various advantages over the WoS (e.g., the journal coverage of some disciplines of the social sciences is better than with the WoS), even if they are currently still outweighed by the disadvantages. At least then significantly more journals and therefore more articles from these two – relatively small – disciplines would be taken into consideration, including those in the respective national language.

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