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Regional Science in Germany During the Nineties – are German Publication Patterns Different?¹

Regionalforschung in Deutschland in den 1990er Jahren – Hat Deutschland andere Veröffentlichungsmuster?

Abstract

This article compares the German research in regional science in the period 1991-2000 with research that has been carried out internationally and in particular with that developed in continental Europe. We have done this on the basis of the publications in a sample of nine top regional and urban international journals. We found that the publication patterns of German contributions were very similar to international patterns, though there were several interesting peculiarities. Results show that Germany's share in regional and urban research is relatively high, fourth in the world.

Kurzfassung

Der Beitrag vergleicht die Regionalforschung in Deutschland der Jahre 1991 bis 2000 mit der im internationalen Raum, insbesondere in Kontinentaleuropa. Dies geschieht auf Basis einschlägiger Veröffentlichungen in neun führenden internationalen Zeitschriften zur Stadtund Regionalforschung. Dabei zeigt sich, dass die deutschen Veröffentlichungsmuster den international üblichen insgesamt ähneln, wenn auch mit einigen interessanten Besonderheiten. Im Ergebnis belegt die deutsche Stadt- und Regionalforschung den vierten Rang, hat also einen relativ hohen Anteil an der weltweiten Forschung in diesem Bereich.

1 Introduction and objectives

The objective of this paper is to increase our knowledge of the status of regional and urban research in Germany by taking publications in a wide sample of nine top international journals. Bibliometrical techniques are used to extend the previous research by Suriñach et al. (2003, 2005) at the international level. Here we use bibliometrics to analyse the publication patterns of academic institutions and authors in various journals and to measure the relevance of several subject fields or topics in published research. These methods have been widely used in a range of scientific fields, and economics and regional science are no exception. Although regional science is a very young branch of general knowledge, several trends in its life cycle have led sections of the academic community to question the practical dimension and breadth of perspective of much of the research in the field. Several attempts have been made to evaluate the state of the art in the discipline and to identify future directions (Funck 1991; Bailly 1992; Bailly/Coffey 1994; Anselin 1995; Isserman 1993, 1995; Florax 1999; Isard 1999; Axhausen 2000).

As Bailly and Coffey (1994) point out, it is clear that interdisciplinarity is one of the most important princi-

ples in regional science, with consideration of the spatial dimension as its main characteristic. In reaction to the trend towards focusing regional science on the notion of the "space-economy", Hägerstrand (1970, 1989) reminded us that regional science is about people, and not just about economic locations. Anselin (1995) showed that the articles published in five different volumes of the "Papers in Regional Science" covered a wide range of disciplines and broad geographical areas. Suriñach et al. (2003) showed that the number of articles published in regional and urban journals had risen considerably, that they used more complex techniques, that they continue to have a high degree of multidisciplinarity, and that in 2003 they were more about people than ten years before. Thus, the inspection of the publication patterns of regional science arises at a key moment for tackling the question of just what point the discipline has reached in its life cycle.

And what about regional science in Germany? According to ISI Essential Science Indicators, Germany ranged third in all fields of research during the period 1994-2004 with 666,104 papers and 6,102,642 citations received², and in the last five years had an overall share of 8.8 %.³ However, the share of German research in Economics and Business was significantly lower (3.9 %). In regional and urban research, Florax and Plane (2004) examined the articles published during the last 50 years in the journal "Papers in Regional Science" and found that the contribution of German authors⁴ was 3.3 % in terms of pages. This share clearly increased until the 1975-84 period, when it reached 7.3 %, but then it fell to 2.3 % between 1985 and 1994, though it rose again to 3.1 % between 1995 and 2003.⁵

We have to mention that one of the most important applications of bibliometrics to economics is the establishment of rankings, since the work published by Fusteld in 1956. Since then a number of studies have been conducted, mainly for job searchers to evaluate the quality of the research environment at each institution, and for students to gain an idea of the skills and specializations of faculty members. Recent works are Dusansky and Vernon (1998) for the USA, Kalaitzidis et al (2001) and Tombazos (2005) for Europe, among others, and Pommerehne (1986), Meier (1994), Bommer and Ursprung (1998), Brinkmann (2001), Mein (2002), Ursprung (2003), Steininger and Süssmuth (2004) and Sternberg and Litzenberg (2005) for Germany or German-speaking countries.

This kind of analysis has only rarely been applied to regional science. The studies that have been performed focused on particular journals: for example, O'Kelly (1999) on Geographical Analysis, Allen and Kau (1991) on the Journal of Urban Economics and Taylor and Johnes (1992) on Regional Studies. Apart from the above-mentioned study by Florax and Plane (2004), only four studies adopted a more general approach. First, Kau and Johnson (1983) calculated the output of academic institutions and authors from 1965 to 1980 in selected regional journals and found wide-spread interest in regional science; and second, Rey and Anselin (2000) (following the classification by Anselin et al., 2000) examined the publication patterns in five regional science journals during the nineties, establishing rankings for authors using article counts, page counts and citation indices. Third, Suriñach et al. (2003) analysed the publication patterns in regional and urban science during the nineties from publications in nine top international journals. Fourth, Isserman (2004) analysed the citations received by articles published in 13 regional journals from 1958 to the present, in order to identify the main researchers in the field in different periods of time. Finally, other studies have focused in particular European countries (for Spain: Suriñach et al. 2002, for Nordic countries: Ramos et al. 2005; for Italy: Royuela et al. 2005, for France: Lacour/Puissant 2003, Duque et al. 2006).

In Germany, few studies have looked at regional science (Jochimsem 1997) and, to our knowledge, none has focused on analysing regional science from our perspective. Thus, our purpose in this paper is to analyse the publication patterns of German researchers in regional and urban science during the nineties, looking at the most common objectives, topics and techniques and the kinds of data used, and comparing them with international patterns, and in particular with other continental European countries. Moreover, we also analysed the relevance of regional and urban research by German researchers on the basis of their contributions to the international literature during the period 1991-2000. Two sub-periods (from 1991 to 1995 and from 1996 to 2000) were taken in order to provide a dynamic analysis.

The rest of the paper is organised as follows: first, the methodological approach in the paper is clearly described; next, in sections three and four, the empirical results are given; finally, we conclude with some remarks on the results.

2 Methodology

Conroy and Dusansky (1995) argue that there are several fundamental conceptual problems in designing a study of this sort:

- The selection of the set of journals on which the analysis will be based
- Ensuring that the publications of each author are correctly identified
- The assignation of authors and their articles to institutions and countries
- The unit of analysis in the study: should productivity be measured on the basis of the number of articles published, or of the number of pages in each article?
- And, last, a certain kind of analysis may require specific information about articles that is not recorded in standard bibliographic databases.

2.1 Selection of journals

In reference to the first problem, we initially considered all journals included in the finally chosen database, published between the years 1991 and 2000 and belonging to the field of urban and regional science. One alternative could be the use of the descriptor on R-topics. Nevertheless in many cases an article may not have this label as it is assumed that it is a regional article if is published in a regional journal. Thus, following research in other areas, and assuming that our research is a partial but feasible approach, we decided to limit our analysis to a selected sample of top journals focused on regional and urban topics. We selected journals that could not be considered as national, that is, the majority of authors does not belong to the country in which the journal is published. In this sense, we have considered the Jahrbuch für Regionalwissenschaft, Raumforschung und Raumordnung, and Seminarberichte der Gesellschaft für Regionalforschung as national journals and consequently they are not included in our study. The clear disadvantage of our approach is that we lose an important source of information about what regional and urban scientists in Germany do. On the other hand, we think that the final results will be comparable internationally. Next, we initially chose journals included in the Econlit database, as it is the wider database in economics⁶. We then reduced this sample of journals further to those included at least one year in the more restricted Social Science Citation Index database in one or more of the following categories: demography, economics, environmental studies, geography, planning and development, transporta-

Table 1 Top international regional and urban journals included in the analysis

Annals of Regional Science	ARS
International Journal of Urban and Regional Research	IJURR
International Regional Science Review	IRSR
Journal of Regional Science	JRS
Journal of Urban Economics	JUE
Papers in Regional Science	PRS
Regional Science and Urban Economics	RSUE
Regional Studies	RS
Urban Studies	US

tion and urban studies. Next, we revised the "aim and scopes" section of all these journals to select only those that deal with urban, local and/or regional problems. The final result of this process was the list of nine journals shown in Table 1.

The next step was to obtain detailed information about all articles published in the journals selected over the ten-year period. The standard source for this kind of information is the Econlit database. As not every journal in our list was recorded in Econlit over the entire period, we compiled these data directly from the journal contents pages and we only accepted refereed articles. The total articles, pages and standardized pages⁷ included in the analysis are shown in Table 2.

2.2 Unit of analysis

Another issue in need of definition was the unit of measurement to evaluate the output of the research activity of the different authors and institutions. There are three aspects that should be considered when defining the unit of analysis in this kind of work: the first one is related to the measurement of an author's output; the second one is related to co-authorship; and the third one is related to quality differences among the considered publication.

For the first point, the measurement of an author's output, we could choose either the number of articles or the number of pages per article. Using the number of articles as a criterion gives equal weight to long and short papers. However, during the evaluation process journal editors are likely to allocate more pages to papers of higher quality and to shorten lower-quality papers. As a result, the number of published pages may be a better indicator of quality research. In this context, another possible source of distortion is the disparity of character and page size in the different journals. To avoid this effect we expressed all journal pages in terms of American Economic Review equivalents, which is used extensively in the literature⁸ and remained unchanged throughout the time period covered. In the standardization process we took great care to include any changes in journal formats. This is why the weightings differ over time for four of the journals analysed.⁹

The second problem mentioned, that of the unit of analysis, concerns the question how to deal with multiauthored papers. The standard procedure is to assign to each author the number of pages of the articles multiplied by 1/n where n is the total number of authors in each paper. Coupé (2000) chose this criterion following Sauer's (1988) economic justification based on the monetary value of papers. However, Cribari-Neto et al. (1999) calculated the page count in a different way. They saw professional collaboration and co-authorship as a major pillar of academic research and argued that dividing an article's page count by the number of authors imposed an excessive penalty. For this reason, they divided by the square root of the number of joint authors. The problem with this weighting is that the sum of pages assigned to each individual author in a paper will not be the total number of pages of the article. For this reason, we used the first criterion to assign not only the number of pages but also the number of articles and standardized pages.

The same approach was taken to assigning pages when an author belonged to more than one institution according to the information published in the article. Kalaitzidakis et al. (2001) used the same procedure to solve both cases: n co-authors (1/n) and m affiliations (1/m).

The third aspect, related with the consideration of quality differences in order to ensure a right measure of authors contributions was proposed by van Damme (1996). His proposal consisted in weighing up the relationship between the length of the publication and the number of authors by a measure of the quality of the publication. This weight is useful when the size and heterogeneity of the journals sample are high. In this sense, different approaches have been considered in the literature to take into account the unequal quality of articles and journals.

A first option consists in analysing the number of citations received by every article. The idea is that authors whose articles have received a lot of citations should be in a higher position than when it is assumed that every article has the same quality. Rey and Anselin (2000) use this kind of approach. However, most recent articles would receive less citations that those published at the beginning of the considered period.

A second option consists in ranking journals according to their quality. These differences in journal quality would be later applied to establish author or institution rankings. The idea is that the characteristics of the process of revision and selection of articles in every journal determine the quality of the published articles. So authors who have published in high quality journals should be in higher positions than authors who have published in low quality journals. To approximate quality differences among journals we chose identifying quality differences among journals using the total number of citations received by the articles published in every journal. Taking this idea as a starting point, different indexes have been proposed. Among the bestknown indexes, the one elaborated by the Institute for Scientific Information (ISI) for the different research fields should be highlighted. We will focus our interest in two of the different indexes: the total number of citations given in a particular year by all the articles published in a journal and the impact factor index, calculated from the citations received by an article during the first two years after its publication. The first index can be understood as a measure of "historical" differences in quality. The total number of citations received in one year can be a good measure of the prestige of the journal, but it could be a result of the quality of articles published a long time ago10. The second index considers the number of citations in relation to the total number of articles published in one journal, but the delimitation of the analysis to only two years after publication can be inappropriate for some research fields¹¹. Combes and Linnemer (1999, 2000) analysed the publication patterns of economic research in France using all these approaches without taking into account the possible differences in the quality of published articles. The correlations among the obtained results using the different criteria were very high.

In Suriñach et al. (2005) we presented the rankings by using five criteria:

- (1) the number of published articles (in terms of the one-author equivalent),
- (2) the number of published pages,
- (3) the number of journal standardized pages,
- (4) the number of "journal citations adjusted" standardized pages and
- (5) the number of "journal impact adjusted" standardized pages"¹².

	Articles				Pages			Standardized pages			
Journal	1991-2000	1991-1995	1996-2000	1991-2000	1991-1995	1996-2000	1991-2000	1991-1995	1996-2000		
ARS	248	108	140	4307	1734	2573	3184.4	1278.2	1906.2		
IJURR	310	147	163	5483	2534	2949	5318.5	2457.9	2860.5		
IRSR	162	94	68	2659	1354	1305	1745.7	853.0	892.7		
JRS	288	138	150	5463	2350	3113	4131.6	1786.0	2345.6		
JUE	438	217	221	8574	3868	4706	5487.3	2475.5	3011.8		
PRS	228	121	107	4196	2076	2120	3161.4	1557.0	1604.4		
RSUE	348	187	161	7085	3564	3521	4676.1	2352.2	2323.8		
RS	420	184	236	5456	2453	3003	6965.6	3139.8	3825.8		
US	914	387	527	16202	6467	9735	14905.8	5949.6	8956.2		
Total	3356	1583	1773	59425	26400	33025	49576.8	21849.5	27727.3		

Table 2	
Description of the sample of regional and/or urban	articles considered

Table 3 shows the values of the weights that are applied to the number of standardized pages to obtain the number of "journal citations adjusted" standardized pages and the number of "journal impact adjusted" standardized pages. To interpret them more easily, both groups of weights have been normalized, taking as a base the value for "Regional Science and Urban Economics".

As can be seen from table 3, the results for both groups of weights have similarities but also differences. According to both groups of weights, the journals with lower indices are "Annals of Regional Science" (ARS) and "Papers in Regional Science" (PRS). There is also a coincidence that "International Regional Science Review" (IRSR) and "Regional Science and Urban Economics" (RSUE) have medium-valued indices while the

Table 3 Weights approximating quality differences among journals

Journals	Citations received during 2000	Average "impact index" 1991-2000
ARS	0.43	0.69
IJURR	1.01	2.09
IRSR	0.73	1.00
JRS	1.19	0.92
JUE	1.59	1.43
PRS	0.73	0.49
RSUE	1.00	1.00
RS	0.91	1.82
US	0.85	1.62

Source: Own elaboration from SSCI data

"Journal of Urban Economics" (JUE) has high indices. However, the results for the rest of journals are quite unequal: "Regional Studies" (RS), "Urban Studies" (US) and "International Journal of Urban and Regional Research" (IJURR) have high values in the average impact indices and lower citation indices.

2.3 Purpose, topics, techniques, data and co-authorships

One way to identify the purpose, topics, techniques and the rest of the information desired on articles published is to analyse the information contained in the Econlit database. However, the information included is not as thorough as we would have desired, and for this reason we followed the approach of Anselin et al. (2000) and classified each published article, after a careful check, according to the purpose, topics, techniques and data used. The variables considered for each paper were the purpose of the analysis, the topic considered, the technique applied and the types of data used (see Table 4).

For the purpose of the analysis, four categories were considered: the three classic objectives of econometric analysis, "policy analysis", "structural analysis" and "prediction", and a fourth category named "others", which included other possibilities such as methodological analysis. As regards topics, fourteen categories involving regional and urban themes of analysis were considered. They are shown in the second column in Table 4. Although one paper may have focused on more than one topic in the list, we only considered one possibility and tried to identify the emphasis of the author (for example, by looking at the keywords or the Econlit subject classification codes in the paper).

Purpose	Topics	Techniques	Type of Data 1
Policy analysis	Methodological articles	Non-quantitative	Time Series
Structural analysis	Natural resources management & environment	Descriptive analysis	Cross-Section
Prediction	Human resources: Demography	Multivariate analysis	Panel Data
Other	Human resources: Labour market	Univariate econometric analysis	Simulated data
	Economic growth and development	Uniequational regression models: quantitative variable	
	Housing analysis	Uniequational regression models: qualitative variable	
	Land use patterns and planning	Multiequational Regression models	
			Type of Data 2
	Transportation	Spatial econometrics	
	Sectoral analysis	Optimisation methods	Micro data
	Firm location	Geographical information systems	Macro data

Table 4
List of categories for each of the considered variables
List of categories for each of the considered variables

The classification of papers according to the techniques applied was rather more complex, since most papers used more than one of the techniques considered. We therefore classified each paper on the basis of the most complex of the techniques applied, the one most frequently used, or the one that had most bearing on the conclusions of the research.

For the types of data used, two different criteria were applied: first, the time dimension of the data (i.e. "time series", "cross-section" and "panel data") and second, the nature of the data (i.e. "macro data" or "micro data"). For both criteria, there is another possibility: the use of "simulated data". As different kinds of data may be used in one paper, we assigned here the data used with the most complex of the techniques applied, the one most frequently used, or the one that had most bearing on the conclusions of the research (in accordance with the classification of techniques).

A last aspect to be considered was the role of co-authorships in regional and urban research in Germany. It is widely held that researchers who collaborate produce higher-quality research than sole authors. In this sense, we analysed whether changes over time of the research output of researchers belonging to German institutions are related to more co-authorships.

3 Germany's contributions to regional and urban research in the international context

To analyse the relative position of Germany in regional and urban research in the international context, we elaborated countries' rankings for the period 19912000 and two sub-periods 1991-1995 and 1996-2000. The results in terms of articles, pages and standardized pages are shown in Table 5.

As this table shows, authors belonging to American institutions came first in the ranking with about 40 % of total publications. The United Kingdom came second with 20 % and the rest of the European countries were third with a similar percentage. Germany is always in second place among the continental European countries in all considered sub-periods, and in terms of articles, pages and standardized pages.

Table 6 describes the regional and/or urban articles published by authors belonging to German institutions. As the table shows, authors belonging to German institutions published 92.2 articles, 1,595 pages and 1,322 standardized pages (although, in fact, German authors were involved in 103 articles¹³) between 1991 and 2000. If we compare these figures with the total figures in Table 2, the share of German contributions to these top nine international journals is about 3 %. Looking at sub-periods, we can see how in absolute terms the number of articles increased slightly from 40.8 to 51.3, but in terms of pages and standardized pages the contribution of Germany increased more: from 653 standardized pages in the first period to 942 in the second period. As, additionally, the world amount of articles and pages increased, we can see how the share of German research increased during the second sub-period, in any of the three units of analysis, from 2.5-2.6 % in the 1991-1995 sub-period to 2.8-2.9 % in the 1996-2000 sub-period.

Table 5

Articles		1991-2000		1991-1995		1996-2000		
United States			1378.7	41.5%	744.6	47.3%	634.1	36.2%
United Kingd	om		749.8	22.5%	307.1	19.5%	442.7	25.3%
Continental E	Europe		638.3	19.2%	265.3	16.8%	373.1	21.3%
1991-2000	1991-1995	1996-2000						
Netherlands	Netherlands	Netherlands	131.2	3.90%	57.3	3.70%	73.9	4.30%
Germany	Germany	Germany	92.2	2.8%	40.8	2.6%	51.3	2.9%
France	Sweden	France	64.5	1.9%	29.7	1.8%	43.4	2.5%
Sweden	Israel	Spain	54.5	1.6%	21.3	1.3%	35.2	2.0%
Israel	France	Israel	49.3	1.4%	21.2	1.3%	28.1	1.6%
Other (25)		246.2	7.4%	95	6.0%	140.9	8.0%	
Other (36)			553.7	16.6%	255.7	16.2%	298	17.0%
Total		3320.5	100.0%	1572.7	100.0%	1747.8	100.0%	
Et al.		35.5		10.3		25.2		
Total			3356		1583		1773	

Pages		1991-2000		1991-1995		1996-2000		
United States		25189.9	42.8%	12684	48.3%	12506	38.4%	
United Kingd	om		12684	21.5%	5038	19.2%	7646	23.5%
Continental E	urope		11064.5	18.8%	4277.3	16.3%	6787.3	20.8%
1991-2000	1991-1995	1996-2000						
Netherlands	Netherlands	Netherlands	2088.7	3.6%	819.7	3.1%	1269.0	3.9%
Germany	Germany	Germany	1595.7	2.7%	653.2	2.5%	942.5	2.9%
France	Sweden	France	1236.4	2.1%	455.8	1.7%	901.9	2.7%
Sweden	France	Spain	921.5	1.5%	334.5	1.2%	607	1.8%
Israel	Italy	Israel	824.3	1.4%	317	1.2%	515.8	1.5%
Other (25)			4121.3	7.0%	1513.1	5.7%	2458.4	7.5%
Other (36)			9800.8	16.6%	4216.1	16.0%	5584.6	17.1%
Total		58739.2	100.0%	26215	100.0%	32524	100.0%	
Et al.		685.8		184.8		501		
Total		59425		26400		33025		

Standardized pages		1991-2000		1991-1995		1996-2000		
United States		18991.1	38.7%	9520.8	43.8%	9470.3	34.6%	
United Kingd	om		12422.8	25.3%	4997.3	23.0%	7425.5	27.1%
Continental E	urope		9359.6	19.1%	3646.8	16.8%	5712.8	20.9%
1991-2000	1991-1995	1996-2000						
Netherlands	Netherlands	Netherlands	1771.2	3.6%	716.4	3.3%	1054.9	3.9%
Germany	Germany	Germany	1322.2	2.7%	556.1	2.6%	766.1	2.8%
France	Sweden	France	1061.3	2.1%	389.3	1.7%	762	2.7%
Sweden	France	Spain	774	1.5%	299.3	1.3%	514	1.8%
Israel	Italy	Israel	701.8	1.4%	290.2	1.3%	441.6	1.6%
Other (25)			3527.2	7.2%	1269.7	5.8%	2098.3	7.6%
Other (36)			8237.1	16.8%	3527.1	16.2%	4709.9	17.2%
Total		49010.6	100.0%	21692	100.0%	27319	100.0%	
Et al.		566.3		157.5		408.8		
Total		49576.9		21850		27727		

	Articles			Pages			Standardized pages		
Journal	1991-2000	1991-1995	1996-2000	1991-2000	1991-1995	1996-2000	1991-2000	1991-1995	1996-2000
ARS	18.67	6.50	12.17	369.00	127.00	242.00	270.72	91.44	179.28
IJURR	8.50	5.50	3.00	133.00	80.00	53.00	129.01	77.60	51.41
IRSR	3.75		3.75	88.75		88.75	60.29		60.29
JRS	3.50	1.00	2.50	71.50	25.00	46.50	54.00	19.00	35.00
JUE	5.50	2.50	3.00	96.50	48.00	48.50	61.76	30.72	31.04
PRS	6.50	3.00	3.50	120.00	47.00	73.00	90.64	35.25	55.39
RSUE	14.50	7.00	7.50	263.50	120.50	143.00	173.91	79.53	94.38
RS	15.25	8.33	6.92	179.92	92.67	87.25	230.29	118.61	111.68
US	16.00	7.00	9.00	273.50	113.00	160.50	251.62	103.96	147.66
Total	92.17	40.83	51.33	1595.67	653.17	942.50	1322.24	556.11	766.13

Table 6
Description of the sample of regional and/or urban articles published by authors belonging to German institution

4 Publication patterns of German contributions

In this section, the results of the four characteristics mentioned above for published regional and urban research are shown, and help to illustrate the most relevant features of German research. In particular, we analysed the publication patterns of German contributions in regional and urban science, and also, whether there were differences from and similarities to international patterns in terms of the purpose of this research, the most important topics, techniques and the kinds of data used in the analysis. Lastly, the relevance of co-authorship was also examined. We measured these patterns by the proportion of standardized pages devoted to each category.

We hoped that the results would enable us to identify any major international differences in regional and urban research. We compared German patterns with the whole international sample and also with the "continental" first-positioned countries: France, Israel, Italy, the Netherlands, Spain and Sweden. And second, to study whether there were changes over time. To avoid distortions caused by irregular yearly observations we split the time period into two sub-periods: from 1991 to 1995 and from 1996 to 2000.

4.1 Purpose of the analysis

As Hägerstrand (1970 and 1989) remarks, regional science is about people and tries to solve problems that involve policies, to gain a basic understanding of reality or simply to predict the future. To find whether the recent evolution of this science has followed this path, we established four categories for our classification of the analytic purposes of regional and urban research: "policy analysis", "structural analysis", "prediction" and "others" (the last category including mainly methodological articles).

Tables 7 a and 7 b show that there are some differences between international and German contributions in terms of the purpose of analysis. In the two sets of articles, the main purpose of the analysis was "structural analysis", but in the German case "policy analysis" weighed more than in the international case (36 % against 32 %) and more than in any of the other considered countries. There are no acute differences between sub-periods.

4.2 Topics considered

As Bailly and Coffey (1994) point out, interdisciplinarity is one of the most important principles in regional science. Nevertheless, there are some topics that receive more attention from scientists than others. This is what we try to analyse in this section: has regional and urban science focused on the analysis of just a few topics? Are regional and urban scientists interested in fewer topics now than at the beginning of the decade? Tables 8 a and 8 b show the topics most discussed in regional and urban science by international and German contributions during the two sub-periods: 1991-1995 and 1996-2000.

For international articles, the most frequent topics were "social and political issues", "economic growth and development" and "housing analysis", while for German articles the most commonly analysed topics

Table 7 aPercentage of standardized pages for each category of "purpose" (in %)

	Inte	rnational contribu	tions	German contributions				
Purpose	1991-1995	1996-2000	1991-2000	1991-1995	1996-2000	1991-2000		
Policy analysis	29.09	33.99	31.83	42.52	31.31	36.02		
Structural analysis	60.95	59.32	60.04	51.64	62.00	57.64		
Prediction	1.81	1.29	1.52	0.00	2.80	1.62		
Other	8.16	5.41	6.62	5.84	3.89	4.71		
Total	100.00	100.00	100.00	100.00	100.00	100.00		

Table 7 b

Percentage of standardized pages for each category of "purpose" - international comparisons (in %)

1991-2000	Whole Sample	Germany	France	Israel	Italy	The Netherlands	Spain	Sweden
Policy analysis	31.8	36.0	27.4	26.3	23.5	29.9	18.7	28.4
Structural analysis	60.0	57.6	62.4	70.2	73.8	60.3	68.4	62.6
Prediction	1.5	1.6	1.0	0.0	0.0	1.3	10.0	0.9
Other	6.6	4.7	9.2	3.6	2.8	8.5	2.8	8.2
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 8 a

Most frequent topics in the sample of articles – summarized international/German contributions (proportion of standardized pages where the topic is analysed) (in %)

	Intern	ational contrib	utions	Ger	rman contribut	ions
Topics	1991-1995	1996-2000	1991-2000	1991-1995	1996-2000	1991-2000
Methodological articles	6.04	4.17	5.00	4.18	1.97	2.90
Natural resources management and environment	2.65	2.03	2.30	4.99	0.00	2.10
Human resources: demography	7.97	5.94	6.84	2.09	10.53	6.98
Human resources: labour market	7.60	7.99	7.82	4.21	2.49	3.21
Economic growth and development	12.56	14.99	13.92	29.22	21.23	24.59
Housing analysis	11.47	13.21	12.45	6.97	2.94	4.64
Land use patterns and planning	7.25	5.14	6.07	0.00	0.00	0.00
Transportation	3.36	4.81	4.17	0.00	7.48	4.33
Sectoral analysis	8.90	7.26	7.99	7.93	8.69	8.37
Firm location	9.27	9.20	9.23	14.46	14.42	14.44
Social and political issues	16.34	19.06	17.86	13.87	19.38	17.06
Monetary and financial issues	1.04	0.19	0.56	1.48	0.00	0.62
Trade	2.83	2.58	2.69	6.96	4.89	5.76
Other topics	2.71	3.42	3.11	3.63	5.98	4.99
Total	100.00	100.00	100.00	100.00	100.00	100.00

1991-2000	Whole Sample	Germany	France	Israel	Italy	The Netherlands	Spain	Sweden
Methodological articles	5.0	2.9	6.4	5.3	3.8	9.1	0.0	1.8
Natural resources management and environment	2.3	2.1	0.0	5.4	0.0	2.6	0.0	0.0
Human resources: demography	6.8	7.0	7.0	10.3	4.7	3.9	4.4	6.2
Human resources: labour market	7.8	3.2	6.2	7.0	0.0	14.3	11.9	8.9
Economic growth and development	13.9	24.6	6.3	23.6	26.3	12.6	38.5	13.8
Housing analysis	12.4	4.6	7.0	10.4	4.3	10.1	5.8	10.0
Land use patterns and planning	6.1	0.0	3.2	8.6	0.0	7.4	0.8	8.5
Transportation	4.2	4.3	6.0	2.7	3.1	11.2	1.1	6.1
Sectoral analysis	8.0	8.4	6.0	5.1	11.0	13.8	5.0	2.3
Firm location	9.2	14.4	16.2	3.8	21.3	5.3	14.9	13.9
Social and political issues	17.9	17.1	25.6	17.3	20.5	6.9	6.9	13.9
Monetary and financial issues	0.6	0.6	0.0	0.0	0.0	0.0	1.5	0.0
Trade	2.7	5.8	3.9	0.4	0.9	1.6	7.1	5.8
Other topics	3.1	5.0	6.2	0.0	4.2	1.4	2.2	8.8
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Tuble 00		
Most frequent topics in the sample of articles	- by countries (proportion of standard	ized pages where the topic is analysed) (in %)

were "economic growth", "social and political issues" and "firm location". It is worth mentioning that in the German case less attention was paid to "housing analysis" and that in the second sub-period special attention was paid to "demography". We can also appreciate how Germany has a publication pattern closer to Italy and more distant to the Netherlands.

4.3 Techniques applied

Tabla 9 b

Some studies have asked whether scientists in general economics or other specialist economic fields are using more complex quantitative techniques than in the past. For example, using a sample of ten top generalinterest journals, Figlio (1994) reported that between 1960 and 1992 the proportion of articles containing empirical research increased substantially, due probably to improvements in information technology.

Tables 9a and 9b show the proportion of publications that did not apply any quantitative technique in their analysis in the sets of articles considered. This ratio is around 20 % for international articles and around 18 % for German articles, although this proportion is clearly lower for the second sub-period (15 %).

As regards the kind of quantitative technique applied, "computable general equilibrium and social accounting matrix" techniques are much more common in German contributions than in the international sample, and that in the countries considered.

4.4 Kinds of data used

Regarding the relationship of data to time, we inspected the use of "cross-section" data, "time series" data and "panel" data. Considering the full set of articles, Table 10a shows an interesting increasing trend in the use of "panel" data, and a relative decrease in the use of "time series" data in the international data set. However, for the German case a general increase in the use of "cross-section" data is observed, against time series and, additionally, panel data. It is worth mentioning that the "Other/Non-quantitative" option is higher in the German case than in the international one, although the difference is becoming less. Additionally,

Table 9 a

Percentage of standardized pages according to technique - summarized international/German contributions (in %)

	Intern	ational contrib	utions	German contributions			
Topics	1991-1995	1996-2000	1991-2000	1991-1995	1996-2000	1991-2000	
Non-quantitative	22.08	19.83	20.82	22.1	15.0	18.0	
Descriptive analysis	25.63	25.83	25.74	25.2	27.8	26.7	
Uniequational regression models: quantitative variable	17.00	17.46	17.26	14.3	8.6	11.0	
Computable general equilibrium and social accounting matrix	12.45	12.09	12.25	27.33	31.66	29.84	
Uniequational regression models: qualitative variable	3.59	6.22	5.06	3.10	4.98	4.19	
Optimization methods	4.48	4.96	4.75	4.67	6.18	5.55	
Multivariate analysis	2.73	3.33	3.07	0.00	2.07	1.20	
Multiequational regression models	1.79	2.21	2.03	0.00	2.43	1.41	
Spatial econometrics	1.40	1.31	1.35	0.00	0.00	0.00	
Cost-benefit analysis. valuation. project evaluation	0.77	0.81	0.79	0.00	0.00	0.00	
Geographic information systems	0.61	0.48	0.53	0.00	0.00	0.00	
Input-output analysis	2.19	0.94	1.49	0.00	1.27	0.74	
Univariate econometric analysis	0.87	0.56	0.70	0.00	0.00	0.00	
Demographic analysis	0.15	0.18	0.16	0.00	0.00	0.00	
Other methods	4.27	3.81	4.01	3.22	0.00	1.36	
Total	100.00	100.00	100.00	100.00	100.00	100.00	

Table 9 b

Percentage of standardized pages according to technique - by countries (in %)

1991-2000	Whole Sample	Germany	France	Israel	Italy	The Nether- lands	Spain	Sweden
Non quantitative	20.8	18.0	24.8	13.7	30.7	14.1	4.0	11.1
Descriptive analysis	25.7	26.7	33.0	27.6	23.1	30.4	20.2	29.7
Uniequiational regression models: quantitative variable	17.3	11.0	9.3	20.5	17.3	13.2	32.4	15.0
Computable general equilibrium and social accounting matrix	12.2	29.8	13.9	10.2	1.6	14.3	14.9	17.4
Uniequiational regressions models: qualitative variable	5.1	4.2	5.3	4.5	1.7	8.7	2.8	4.8
Optimization methods	4.7	5.5	1.3	3.4	4.0	6.0	4.4	1.3
Multivariate analysis	3.1	1.2	2.0	6.0	17.3	0.7	6.0	1.5
Multiequational Regression models	2.0	1.4	0.5	2.1	0.0	3.2	1.1	4.7
Spatial econometrics	1.3	0.0	0.0	0.0	0.0	2.0	4.4	0.0
Cost-benefit analysis. valuation. project evaluation	0.8	0.0	1.2	0.0	0.0	0.8	1.5	1.9
Geographic information systems	0.5	0.0	0.0	0.0	0.0	0.3	0.0	1.5
Input output analysis	1.5	0.7	1.9	1.7	4.3	2.2	0.0	0.8
Univariate econometric analysis	0.7	0.0	0.0	1.1	0.0	0.0	4.7	1.8
Demographic analysis	0.2	0.0	0.0	1.2	0.0	0.0	0.0	0.0
Other methods	4.0	1.4	6.9	7.9	0.0	4.1	3.8	8.6
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 10 a Percentage of standardized pages where different kinds of data are used - summarized international/German contributions (1) (in %)

	Inte	rnational contribu	tions	German contributions				
Data	1991-1995	1996-2000	1991-2000	1991-1995	1996-2000	1991-2000		
Time series	10.50	8.18	9.20	8.71	4.46	6.25		
Cross-section	31.60	32.03	31.84	14.48	27.87	22.24		
Panel data	16.63	21.57	19.40	21.77	16.57	18.76		
Simulated data	6.74	7.80	7.34	11.09	12.38	11.84		
Other / Non-quantitative	34.52	30.41	32.22	43.95	38.71	40.92		
Total	100.00	100.00	100.00	100.00	100.00	100.00		

Table 10b

Percentage of standardized pages where different kinds of data are used - by countries (1) (in %)

1991-2000	Whole Sample	Germany	France	Israel	Italy	The Netherlands	Spain	Sweden
Time series	9.2	6.2	8.4	11.4	7.9	8.9	14.1	12.6
Cross section	31.8	22.2	29.3	40.3	40.6	29.3	28.9	25.0
Panel data	19.4	18.8	17.9	12.9	15.2	24.0	31.6	28.7
Simulated data	7.3	11.8	2.3	8.9	0.0	12.3	5.4	5.1
Other /								
Non quantitative	32.2	40.9	42.2	26.4	36.3	25.5	20.1	28.7
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 11a

Percentage of standardized pages where different kinds of data are used (2) (in %)

1991-2000	Whole Sample	Germany	France	Israel	Italy	The Netherlands	Spain	Sweden
Micro data	26.0	16.8	13.4	28.4	16.8	26.8	12.2	25.1
Macro data	34.4	30.4	42.1	36.2	45.4	35.4	62.3	41.2
Simulated data	7.3	11.8	2.3	8.9	0.0	12.3	5.4	5.1
Other / Non quantitative	32.3	40.9	42.2	26.4	37.7	25.5	20.1	28.7
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 11b

Percentage of standardized pages where different kinds of data are used (2) (in %)

	Inte	rnational contribu	tions	German contributions				
Kings of data	1991-1995	1996-2000	1991-2000	1991-1995	1996-2000	1991-2000		
Micro data	23.88	27.74	26.04	14.22	18.71	16.82		
Macro data	34.86	33.99	34.37	30.75	30.20	30.43		
Simulated data	6.74	7.80	7.34	11.09	12.38	11.84		
Other / Non-quantitative	34.52	30.46	32.25	43.95	38.71	40.92		
Total	100.00	100.00	100.00	100.00	100.00	100.00		

Table 12 a

Relevance of co-authorship in German regional and urban publications - summarized international/German publications (measured in terms of standardized pages) (in %)

	Interna	ational regional an science publication	d urban 18	German regional and urban science publications			
Authors	1991-1995	1996-2000	1991-2000	1991-1995	1996-2000	1991-2000	
1	53.84	48.69	50.96	67.07	60.17	63.07	
2	36.65	38.24	37.54	32.09	30.76	31.32	
3	8.03	10.09	9.18	0.84	9.07	5.61	
>3	1.47	2.98	2.31				
Total	100.00	100.00	100.00	100.00	100.00	100.00	

Table 12b

Relevance of co-authorship in German regional and urban publications - by countries (measured in terms of standardized pages) (in %)

1991-2000	Whole Sample	Germany	France	Israel	Italy	The Netherlands	Spain	Sweden
1	51.0	63.1	53.8	63.7	69.1	34.3	29.1	56.1
2	39.8	31.3	39.3	32.9	29.2	48.7	53.3	36.6
3	9.2	5.6	6.8	3.4	1.7	17.0	17.6	7.3
>3	0.04							
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

in Table 10b we see that Germany has a relatively high proportion of simulated data compared with other countries, ranging only behind the Netherlands. In contrast, time series data are used less in Germany.

In both set of articles, "macro" and "micro" data were much more frequently used than "simulated" data (see Tables 11a and 11b), although the latter was much more common in the German case. In this database we see how the use of "micro data" has increased.

4.5 The relevance of co-authorships

One last interesting point is the relevance of co-authorships in German contributions, compared to the international data set. Table 12 a and 12 b show the number of articles by one, two, three or more authors in the international and German data sets. As can be seen in this Table, there are fewer German contributions with more than one author than international ones: 37 % compared to 50 %. This figure is similar to the French, Israeli, Italian and Swedish ones. Nevertheless, this proportion increased in both datasets: in the period 1996-2000 the international proportion of publications with more than one author was up to 51 %, and the German figure to 40 %.

5 Final remarks

In this paper we report the publication patterns of authors belonging to German institutions compared with international patterns in regional and urban science from 1991 to 2000, using information on articles published (and pages) from a sample of widely recognized journals in this field (see Table 1 in the beginning of this contribution).

The results showed that Germany's share in regional and urban research is lower than in other disciplines, but that it is very well-positioned in Europe: Germany was the second most productive continental European country throughout the 1991-2000 period. Additionally, Germany increased its weight in the sub-period 1996-2000, with up to 3 % of all articles, pages and standardized pages.

In our view, we have seen a differentiated pattern of the German publication in urban and regional science. First, Germany is the most policy-oriented country among the considered "continental" countries. Nevertheless, this feature is converging to more normal figures in the second sub-period. Second, with regard to topics, Germany does not have a relatively leading position in any topic. This means that the interest of German researchers is quite balanced compared to the European standards. Third, the last argument is in contrast with the extensive use of computable general equilibrium and social accounting matrix techniques. It is quite probable that on many occasions these kinds of techniques are related to simulated data. And finally we have observed that far fewer German articles than international articles are multi-authored, although the number increased in the 1996-2000 period.

Footnotes

(1)

We would like to thank Raúl Ramos for his helpful comments and suggestions. The usual disclaimer applies.

(2)

www.in-cites.com/countries/2004allfields.html

(3)

www.in-cites.com/research/2004/july_26_2004-1.html

(4)

We would like to remark that in the rest of the paper we use the term 'German authors' to mean 'authors belonging to German institutions'.

(5)

It is important to assume that German authors have higher possibilities to publish in German-speaking journals than other non-English-speaking authors in their respective countries. That "bias" may lower these percentages, as they are more focused in English-speaking journals.

(6)

Tom Coupé (2000) points out "one can claim with slight exaggeration first, that if one is not in Econlit, one did not do academic research in economic and second, that these journals together form the "economics literature".

(7)

The definition of standardized pages is developed in section 2.4.

(8)

See for example Conroy/Dusansky (1995), Scott/Mitias (1996), Lubrano et al. (2003) or Tombazos (2005)

(9)

The final weights are available from the authors upon request.

(10)

A recently created journal would have less citations than a journal that has been published for a long time.

(11)

It is also important to highlight that the use of citations as a measure of quality has also been criticised: self-citations, policymotivated citations (to colleagues or friends), strategic-motivated citations (to the editor of the journal where the article is sent to be published), among others. (12)

To calculate the average value for the whole decade, we have taken into account the differences in the number of published articles in the two-year period used in the elaboration of the impact indexes.

(13)

This difference lies in the fact that several articles signed by German authors were also signed by foreign authors.

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