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Does Space Finally Matter?
The Position of New Economic Geography in Economic Journals

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Abstract

This paper presents an empirical analysis about the position new economic geography plays in economics. In a theoretical review we discuss recent developments in economics, like new trade theory, endogenous growth theory, and new economic geography and analyze their implications for spatial structure. The paper presents the basic components of these theories and points out their commonalities. This shows that all these theories are based on assumptions that lead to spatial structure, i.e. differences in the spatial allocation of economic activities.

In the empirical investigation we use the Social Science Citation Index to analyze citations of seminal contributions in various types of journals and the rate with which geographical content appears in economic journals. As we show, spatial topics still play only a marginal role in economics. Economists it seems are still reluctant to accept the spatial implications of their own theoretical models.

Keywords : New Economic Geography, Publishing, Economic Journals

JEL-classification: A12, R10

1. Introduction

The work of Krugman, Romer and other economists doing similar work has received major attention in regional science (see, e.g., Isserman, 1996; Cukrowski, Fischer, 2000; Maurer, Walz, 2000; Johansson, Karlsson, Stough, 2001). In recent ERSA congresses, numerous

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papers have been presented that build on their arguments of economies of scale and agglomeration, regionally concentrated growth, and regional specialization. Some examples of such contributions – and by no means an exhaustive list – are Villaverde (1999), Traxler (1999), Barreiro-Pereira (1999), Boddy (1999), Pekkala (2000), Stiller (2000), Krieger-Boden (2000), Frías et.al. (2000), Huovari et.al. (2000), and Breschi and Lissoni (2000).

This is not very surprising given the long history of such argumentation in regional science. Already in the 1950s Gunnar Myrdal (1957) and Alfred Hirschman (1958) have argued that in modern economies markets are monopolistic and oligopolistic rather than perfectly competitive, and that externalities and scale economies generate cumulative processes that make some locations grow faster in the long run than others. The center-periphery-model (Friedmann, 1972) argued convincingly that development differentials between center and periphery are stabilized by economic, social, and political mechanisms and that the weakness of the periphery is caused by the strength of the center and vice versa.

The main difference between the line of arguments of the polarization theory of the 1950s-70s and the recent discussion in economics is that in the polarization theory externalities, selectivity of resource flows, oligopolistic market structures were arbitrary assumptions that led – based on verbal reasoning – to the above mentioned conclusions. As we will discuss more explicitly in section 2 of the paper, in the recent discussion in economics, these deviations from the typical neoclassical assumptions turned out to be necessary in order to be able to explain key economic processes like the use of resources for the production of innovation. The consequences of this new set of assumptions, however, turned out to be very similar to what Myrdal, Hirschman and others have argued them to be: regional differences in economic performance, investment opportunities, factor intensities, etc. Moreover, these implications have been demonstrated by use of stringent methods of economic modeling. So, by applying these modern concepts, economists have (re-)introduced geography into economics. Assuming – be it explicitly or implicitly – homogeneity between locations or regions is logically inconsistent with externalities, increasing economies of scale, and monopolistic competition. So, also in economics, space finally matters.

But, does it really? In his contribution to the 38th European congress in Vienna, Tichy has argued that despite this fact, economists have not yet accepted geography in their day-to-day work: “Economics has found a methodology apt to find geography and it has produced a

considerable number of seminal articles; but it has not yet found geography in actual work” (Tichy, 1998, p.16). He showed, that only a very small percentage of the papers published in key economic journals were dealing with geographical issues (3.1% in average over four years¹ and four journals²). In this paper, we will take his argument as a starting point and try to look at this issue anew and in a more comprehensive way. In the next section we will review the theoretical developments in economics, discuss the different lines of thinking and identify key contributions. In Section 3 we will present an attempt to find an empirical answer to the question raised above. By use of the Social Science Citation Index we will investigate how the different theoretical areas are perceived in the most recent literature, analyze changes over time and differences by type and orientation of journal. The paper closes with a concluding section.

2. Theoretical Review

The new theories on Trade, Growth, and Economic Geography emphasize externalities and increasing returns to scale requiring an imperfect market setup to deal with in an equilibrium model. The importance of externalities and increasing returns to scale for the concentration of economic activity have long been recognized in the economic profession (Marshall, 1920). However, the advances in economic modeling which got manifested in the competitive general equilibrium theory of Arrow and Debreu (1954) slowly displaced the non-formalized fields of economics out of the mainstream. As a consequence theories stressing the importance of externalities and increasing returns to scale for the regional development got neglected by mainstream economics because of their inability to deal with increasing returns in an equilibrium model. Furthermore, regional economics even mirrored the advances in neoclassical growth theory (Borts and Stein, 1962) building on perfect markets leaving no place for increasing returns and inherent regional divergence.

However, advances in economic modeling made in the branch of industrial organization with the main contributions made by Spence (1976), Dixit and Stiglitz (1977), and Ethier (1982) allowed for increasing returns to scale in a general equilibrium setting. For handling increasing returns in a tractable competition model perfect competition had to be given up and

¹ 1994-1997

² American Economic Review, Economic Journal, European Economic Review, Zeitschrift für Wirtschafts- und Sozialwissenschaft.

a particular implementation of the Chamberlinian monopolistic competition concept had to be introduced. This methodological development occurred at a time when economists became more and more frustrated with the limitations of the traditional model. In a growth context, for example, the neoclassical model cannot explain the production of technical progress since “there is no incentive for economically rational agents to invest resources into the production of technical progress” (Maier, 2001, p.115). As a consequence, the neoclassical growth model treated technical progress as exogenously given – thus “explaining” long term growth by something unexplained.

The Dixit and Stiglitz (1977) model of monopolistic competition offered an escape route out of this dilemma. Consequently, it has changed economic thinking in trade theory, a few years later in growth theory and recently in economic geography leading to a vast literature in the different branches termed with the supplement new. Initiating key contributions and monographs trying to synthesize each field are given in Figure 1 (monographs in *italic*) with tentative lines of exerting influences.

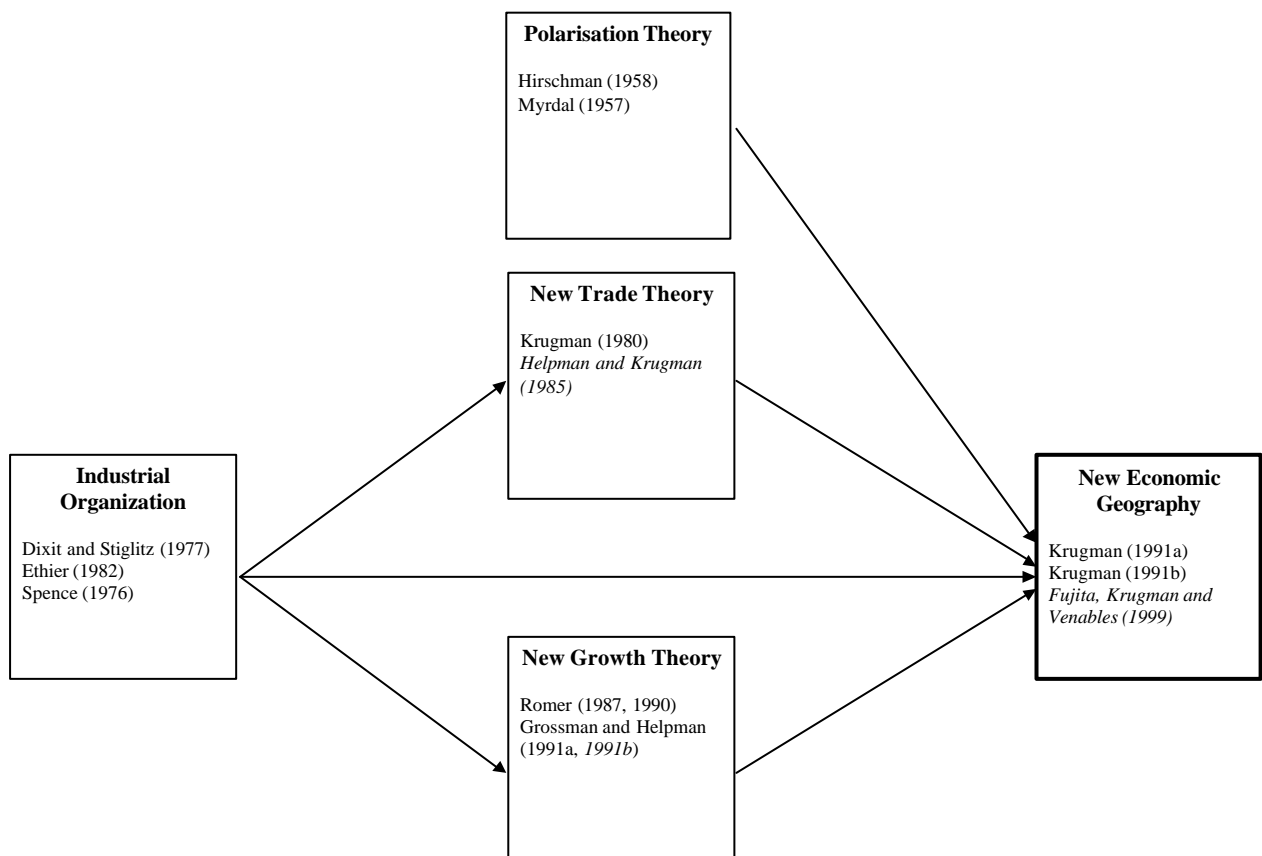


Figure 1: The family tree of New Economic Geography

Although the new theories move on the same methodological ground (i.e. imperfect competition) and apply the same analytical tools (i.e. the Dixit-Stiglitz Model) the underlying concepts and their implementation differ in certain regards.

In a key contribution to new trade theory Krugman (1980) introduced the interaction of increasing returns and transaction costs to international trade. This new trade model can be sketched in the following way: Labor as the only production factor is immobile, constant shares of expenditure are distributed between a constant returns sector (sector A) and a Dixit-Stiglitz-type monopolistically competitive sector (sector M) consisting of a variety of goods with a constant elasticity of substitution among them, the transportation costs for A-goods are zero, whereas shipping M-goods include “iceberg” costs, meaning that only a fraction of the good arrives at the designated location. This setup of the model leads to a home market effect, with the larger economy being a net-exporter of the goods produced by the monopolistically-competitive sector. The intuition behind it is that with increasing returns to scale in the monopolistic sector the production of each good is undertaken in only one location but sold in both. As the production functions are the same in both countries the good will be produced in the country with the larger market to economize on transportation costs. Thus increasing returns and imperfect competition lead to divergent production structures without relying on comparative advantages. Thereby, the degree of concentration in one country depends negatively on the transaction costs and positively on the difference in size between the countries. For the following discussion on new economic geography it is important to mention that in the above model the home market effect leading to concentration applies even in the absence of any cumulative process of agglomeration.

The Endogenous Growth Theory has seen quite a different implementation of increasing returns and monopolistic competition. In a key contribution to New Growth Theory Romer (1990) models the economy existing of three sectors: i) A perfectly competitive final goods production requiring human capital and intermediate goods with the production function exhibiting constant returns to scale in human capital and in capital and increasing returns to scale in all inputs (designs). ii) A monopolistically competitive intermediate goods sector producing the capital good for the final sector by purchasing a design for a specific capital good from the research sector and thereafter translating it into the capital good. iii) And a research sector discovering new designs with productivity proportional to the existing stock of

designs (technological externalities) and thereafter selling them to the intermediate goods sector. Here it is worth to mention that the increasing returns in the final goods production requires imperfect competition in the intermediate goods sector. Monopoly rents in the intermediate goods sector are however extracted by the research sector to compensate for the time spent on searching for new designs. In the search for new designs technological externalities are involved. In the Romer (1990) model the specific setup of the spillovers – the proportionality of research productivity to the existing stock of designs – generates a scale. It is obvious that a cumulative process is at work, as a larger stock of designs makes researches more productive. That means that the productivity of researchers and thus the economy grows over time although the number of researchers stays constant. Or to put it in other words the larger economy should grow faster. Thus, an increase in the size of the economy leads on the one hand to the concentration of production and allows on the other hand the economy to grow faster. However, it is important to keep in mind that although the one seems to condition the other and vice versa both processes – agglomeration and growth – have been dealt with separately.

Building on the earlier developments in new trade theory new economic geography formalizes the cumulative process of agglomeration central to the work of Myrdal and Hirschman. The cumulative process has been introduced through mainly three different channels: i); through allowing for labor migration in a new trade model (Krugman, 1991a, 1991b), ii), through vertical linkages between monopolistically competitive up- and downstream industries (Venables, 1996), and iii), through linking new economic geography with new growth theory (Walz, 1996, Martin and Ottaviano, 1999). The core-periphery model of Krugman extends on a new trade model by allowing for labor mobility. Again there are two sectors, the perfectly competitive agricultural sector and the monopolistically competitive manufacturing sector. Labor is the only factor of production with farmers being immobile and workers mobile. Both regions are the same in the beginning. Now the story goes, as one firm for whatever reason moves to the other region it will increase the competition in the labor and goods market driving wages up and prices down (competition effect). Due to higher wages and an increased number of local varieties more workers get attracted increasing local expenditures (demand linkage, home market effect). This tends to increase local profits attracting again new firms. Two things are worth to mention: first, under perfect competition the home market effect is negligible, and second the overall effect of both effects under imperfect competition depends crucially on the transaction costs. Krugman (1991a) shows

that as transactions costs decrease the symmetric equilibrium becomes unstable and a core-periphery pattern with an industrialized core and an agricultural periphery forms. Venables new economic geography model (1996) can be interpreted as one of international trade as labor is regarded as immobile. The model exists of three sectors: a perfectly competitive one and two - an upstream and a downstream - monopolistically competitive ones. Intersectoral mobility of the factor of production (labor) is allowed. The mechanics of agglomeration work through the input-output linkages amongst firms and the intersectoral mobility of labor. As the output of one firm represents the input of another a move of a firm to the other location (country) increases on the one hand competition in the market and on the other hand reduces the costs for the other firms. The cost reduction comes through allowing the upstream firms to produce at a more efficient scale due to the increased market size and the downstream firm to produce more efficiently due the decrease in their fixed cost as intermediates become cheaper. Although building on different channels to introduce agglomeration the implications of the core-periphery and the international trade model are similar. In both models decreasing transaction costs destabilize the symmetric equilibrium leading to an industrialized and a deindustrialized location. In both models the process of agglomeration can be regarded as one taking place as the economy grows at a constant rate. Thus there exists no link between agglomeration and growth in these models. In contrast Walz (1996) allows for aggregate returns to scale and migration to show how trade liberalization leads to more agglomeration and higher growth. Martin and Ottaviano (1999) consider increasing returns at the firm level and analyze the relation between location and growth in two different contexts: local and global technological externalities (R&D spillovers). In the former case the R&D spillovers intensify the process of agglomeration due to pecuniary externalities. In a crude way the story goes as following: starting from a symmetric distribution one more firm in one location gives research laboratories access to a higher number of inputs resulting in a cost reduction in local innovation. This leads on the one hand to a faster innovation rate and on the other hand to the relocation of research laboratories increasing the demand for intermediates and thus attracting new firms. The result of this circular process is that one location receives all innovation and industry whereas the other specializes in the traditional production. The additional implication here, however, is that through its impact on the agglomeration process decreasing transaction costs lead also to an increase in the growth rate.

Summarizing, beside the distinct mechanisms through which agglomeration economies enter the different new economic geography models are characterized by certain features

worthwhile to mention: whereas, the core-periphery model (i) and the international trade model (ii) describe the location of economic activity as the economy is on a constant growth path the third group of models formalizes the interaction between growth and location. Further, in contrast to the new growth theory that builds purely on technological externalities (spillovers) the new economic geography models of the first two groups emphasize pecuniary externalities³. However, the synthesized models of the last group are more in the tradition of new growth theory relying on spillovers and pecuniary externalities. Thus, on the one side the agglomeration process is enabled through different linkages between economic actors (pecuniary externalities) leaving aside questions of innovation and growth, and on the other side growth is affected by the agglomeration process, however, only in the presence of local spillovers in the innovation process.

3. Empirical Analysis

As our brief review in the last section has shown, the recognition of externalities and monopolistic competition stimulated by the Dixit and Stiglitz (1977) model has led to numerous contributions in economics that imply spatial differences, e.g. by predicting different levels of growth, the emergence of core periphery structures, concentration of innovative activities, etc. This appears to be quite obvious for regional economists. But, is it also for the economic profession in general? Are economists following Paul Krugman in realizing that in employing the Dixit and Stiglitz model they are “thinking and writing about economic geography” (Krugman, 1991b, p.1)?

In this section we want to investigate, to what extent the new economic geography and its related fields are integrated into economics. For this task we use the information available in the Social Science Citation Index (SSCI). This database is published by the Philadelphia based Institute for Scientific Information and “provide(s) access to current and retrospective bibliographic information, author abstracts, and cited references found in 1,700 of the world’s leading scholarly social sciences journals covering more than 50 disciplines. (It) also cover(s) individually selected, relevant items from over 5,700 of the world’s leading science and technology journals.” (Institute for Scientific Information, 2001). We use the CD-ROM version of the database.

³ Following Scitovsky (1954) in distinguishing between different externalities.

More specifically, we intend to answer the following questions:

1. In what journals have the in the last section identified key publications been cited in recent years?
2. Is there a significant difference between the theoretical fields in the extent to which they are cited in various types of journals?
3. How frequently does geographical content appear in leading economic journals?
4. Did the frequency with which geographical content appeared in leading economics journals increase over the recent years?
5. Is there a significant difference between various economics journals in the frequency with which they publish geographical content?

The first two questions refer to citations in journals monitored by the SSCI. Fortunately, in the SSCI citations are not stored in the style of the respective journal, but with a unique identifier. So, in order to find all the references of Krugman's "Geography and Trade" in a given year, for example, we only needed to find one reference to it, extract the unique identifier and then search the CD-ROM of this year for this identifier. This generated the base material for the analysis that we report in section 3.1. below.

In order to answer questions 3-5 we had to turn to the tables of content. We identified 9 important economic journals, downloaded titles and abstracts of these journals for our years of analysis, and identified articles with geographical content. The results of this step of analysis are reported in section 3.2. below.

3.1. Descriptive Statistics: Citation Analysis

For the citation analysis we use the 14 key publications listed in figure 1. We base this step of the empirical analysis on articles⁴ that appeared between 1995 and April 2001⁵. With the exception of Fujita, Krugman and Venables (1999) all our key publications were published 1991 or earlier. So, we could be confident that with this one exception the work we were searching for could be recognized even in journals with an exceptionally long publication

⁴ Only articles are included. We excluded all other publication categories (e.g. book review, editorial material).

⁵ The Social Science Citation Index registers publications in the year when they actually appear. This may differ from the publication year given in the journal. We refer to the year when the publication appears in the SSCI.

delay. Only Fujita et. al. (1999) could introduce a truncation bias into our analysis. Consequently, this publication was excluded from later steps of the investigation.

We found 1224 references to our key publications in a total number of 251 journals. The list of these journals and their classification into “Economic – E”, “Geography – G”, and “Other – O” (we will use this classification later) is given in appendix 1.

Table 1 gives the numbers of citations for each key publication and year of publication of the citing paper. As we can see, Dixit, Stiglitz (1977) is the most widely cited publication from our list in these years, followed by Krugman (1991b), and – surprisingly – Hirschman (1958). Spence (1976), on the other hand, is not cited at all.

Key Publication \ Year	1995	1996	1997	1998	1999	2000	2001	Sum
Dixit, Stiglitz, 1977	24	45	37	40	47	48	17	258
Ethier, 1982	9	10	3	7	8	7	3	47
Fujita et.al., 1999	0	0	0	0	2	1	1	4
Grossman, Helpman, 1991a	6	6	7	8	10	8	6	51
Grossman, Helpman, 1991b	9	22	24	14	33	20	9	131
Helpman, Krugman, 1985	31	21	25	25	27	27	8	164
Hirschman, 1958	27	32	20	33	26	26	12	176
Krugman, 1980	2	0	1	2	3	3	0	11
Krugman, 1991a	1	4	1	4	3	5	1	19
Krugman, 1991b	23	35	32	30	55	0	11	186
Myrdal, 1957	4	8	6	15	7	13	9	62
Romer, 1987	3	3	3	5	5	4	2	25
Romer, 1990	4	10	5	22	0	41	8	90
Spence, 1976	0	0	0	0	0	0	0	0
Sum	143	196	164	205	226	203	87	1224
Sum without Fujita et. al.	143	196	164	205	224	202	86	1220

Table 1: Number of citations by cited publication and year

The largest number of citations is found in 1999. In the first four months of 2001 a total number of 87 citations (86 excluding Fujita et. al.) have appeared. When we extrapolate this number to a full year, we can expect a score larger than that for 1999.

We can cross tabulate the 12 key publications (excluding Fujita et. al., 1999 and Spence, 1976) by the 251 different journals where they have been cited. This table, however, is fairly large and contains many empty cells. Therefore, we do not report it here. We only use it to get a first impression about whether the citations of the key publications vary systematically

between journals. A chi-square test based on the null-hypothesis that the cited publications and the journals where they are cited are independent gives a test statistic of 3,213.21 with 2750 degrees of freedom. With a probability of 1.47E-09 this test statistic is extremely unlikely under the null hypothesis. So, we have to reject the null hypothesis and conclude that these articles are cited in a systematically different way between the journals.

However, we are not so much interested in comparing different journals than types of journals. So, for the next step we group the journals where our key publications have been cited into three groups (see appendix 1):

1. Economics journals (E),
2. Geography journals (G), and
3. Other journals (O).

The cross tabulation of the type of journal by key publication is given in table 2. The number in parentheses in each cell shows the expected number of citations based on the null hypothesis of independence between the two dimensions. Observations larger than expected are printed in bold. The chi-square statistic for this table is 251.81. The probability that this chi-square statistic is generated under the null hypothesis is 6.25E-41 at 22 degrees of freedom. Again, the null hypothesis is rejected.

Key publication \ journal category	E	G	O
Dixit, Stiglitz, 1977	188 (153.03)	31 (45.95)	39 (59.02)
Ethier, 1982	41 (27.88)	3 (8.37)	3 (10.75)
Grossman, Helpman, 1991a	43 (30.25)	0 (9.08)	8 (11.67)
Grossman, Helpman, 1991b	93 (77.70)	8 (23.33)	30 (29.97)
Helpman, Krugman, 1985	116 (97.27)	9 (29.21)	39 (37.52)
Hirschman, 1958	52 (104.39)	67 (31.35)	57 (40.26)
Krugman, 1980	4 (6.52)	5 (1.96)	2 (2.52)
Krugman, 1991a	13 (11.27)	2 (3.38)	4 (4.35)
Krugman, 1991b	65 (110.32)	60 (33.13)	61 (42.55)
Myrdal, 1957	23 (36.77)	26 (11.04)	13 (14.18)
Romer, 1987	22 (14.83)	1 (4.45)	2 (5.72)
Romer, 1990	63 (53.38)	6 (16.03)	21 (20.59)

Table 2: Number of citations by cited publication and journal category

This result shows that the various key publications are recognized in a significantly different way in the three categories of journals. Is this just the fate of certain publications or does it represent a difference in the reception of theoretical categories they represent? When we

compare the observed with the expected frequencies, a pattern seems to emerge. The industrial organization and the new growth theory references are cited more often than expected in economic journals, whereas polarization theory and new economic geography references are cited less often than expected.

To get a more definitive answer to this question, we group the key publications according to the results of section 2 (see figure 1) into 5 theoretical categories:

1. Polarization theory (POL),
2. Industrial organization (IO),
3. New trade theory (NTT),
4. New growth Theory (NGT), and
5. New economic geography (NEG).

Publication category \ journal category	E	G	O	Sum
Polarization Theory	75 (141.04)	93 (42.53)	70 (54.43)	238
Industrial Organization	229 (180.75)	34 (54.50)	42 (69.75)	305
New Trade Theory	129 (108.45)	11 (32.70)	43 (41.85)	183
New Growth Theory	221 (176.01)	15 (53.07)	61 (67.92)	297
New Economic Geography	69 (116.75)	65 (35.20)	63 (45.05)	197
Sum	723	218	279	1220

Table 3: number of citations by publication category and journal category

Table 3 shows the cross tabulation of the number of citations by type of journal and theoretical category. The number in parentheses in the cells again shows the expected number of citations. The chi-square test statistic (236.66, 8 degrees of freedom) shows again that the null hypothesis that the two dimensions are independent must be rejected ($P = 1.16E-46$).

This test statistic and a comparison of observed and expected frequencies in table 3 confirm our above mentioned suspicion that citations of polarization theory and new economic geography are underrepresented in economic journals, whereas citations of the other categories are overrepresented.

3.2. Descriptive Statistics: Content Analysis

The analysis in section 3.1 shows clearly that key publications of geographical areas are not cited with the same frequency in economics journals as the key publications of the other

related theoretical fields. This could be the result of inadequate perception of new economic geography in particular and the geographical implications of the new economic theories in general in economics, or it could be the result of differences in citation habits. In the latter case, we should find a considerable number of papers with geographical content in economics journals.

The second step of our empirical analysis is concentrating on this aspect. Here, we will answer questions 3-5 in the above mentioned list. As has been mentioned above, for this step we downloaded the tables of content (including abstracts) of the following 7 important economics journals:

1. American Economic Review (AER)
2. Economic Journal (Econ J)
3. European Economic Review (EER)
4. Journal of Economic Literature (JEL)
5. Journal of Political Economy (JPE)
6. Quarterly Journal of Economics (QJE), and
7. Review of Economic Studies (Rev Econ Stud).

The choice of these journals has been guided by the literature on the identification of core economic journals (Burton and Phimister, 1995, Diamond, 1989, Hodgson 1999). We considered general economic journals⁶ that have been identified as core journal by all of the three above mentioned papers yielding six highly visible papers (1, 2, 4-7). The European Economic Review as been added as it constitutes the official journal of the European Economic Association. The Journal of Economic Perspectives which has been another candidate had to be excluded because of the absence of abstracts.

Since the Social Science Citation Index publishes abstracts only since 1996, we used the period 1996 – April 2001 for this step of our analysis. In this period, 2472 articles have been

⁶ Anselin and Rey (2000) examined publication patterns in five core regional science journals during the 1990s. After revealing interesting characteristics of recent publications in the core regional science journals Anselin and Rey (2000, p.12) argue that “while the analysis of the citation and impact factors did not touch on the impact of these journals outside the field, these external relationships are very important in terms of understanding the position of regional science within the wider social sciences”.

published in the above mentioned journals. However to compare the publication pattern of this period of time with the pattern prior to the publication of the key contributions in new economic geography we added two additional years (1987 and 1990)⁷ resulting in a total of 3492 articles. Table 4 gives the total number of articles by journal and year.

Journal \ Year	1987	1990	1996	1997	1998	1999	2000	2001	Sum
AER	155	186	167	147	157	143	165	42	1162
ECON J	65	87	97	77	86	65	79	21	577
EER	108	86	108	116	91	87	103	27	726
JEL	9	10	10	13	8	5	5	2	62
JPE	68	65	46	51	42	55	41	23	391
QJE	39	54	41	38	42	30	48	11	303
REV ECON STUD	46	42	28	30	37	42	27	19	271
Sum	490	530	497	472	463	427	468	145	3492

Table 4: Number of articles by journal and year

These have been way too many articles for us to investigate one by one. Therefore, we applied the following strategy in order to find those articles that covered geographical content:

1. We searched the titles and abstracts of all articles for the following strings of characters: "geography", "space", "spatial", "geographi", "region", and "location". This step also found articles containing words like "regional", "geographically", "allocation", etc.
2. We read the title and abstract of all papers identified in step 1 and eliminated those that did not cover any geographical content although they contained one of the search strings. Here, for example, we eliminated publications that mentioned "parameter space" or "resource allocation" (in a non-geographical sense) in the abstract.
3. We added those articles from our list of journals that we had found in the previous step to reference one of the key publications in new economic geography.

This strategy yielded a list of 142 articles that were distributed over the journals and years as can be seen in table 5.

⁷ For these years the hard copies of the different journals have been used.

Journal \ Year	1987	1990	1996	1997	1998	1999	2000	2001	Sum
AER	2	3	11	5	1	3	4	1	30
ECON J	0	1	3	5	6	1	2	2	20
EER	2	1	15	7	6	15	6	2	54
JEL	0	0	0	0	0	0	1	0	1
JPE	1	0	1	1	2	3	5	1	14
QJE	1	0	2	3	1	2	5	0	14
REV ECON STUD	3	0	0	1	3	1	0	1	9
Sum	9	5	32	22	19	25	23	7	142

Table 5: Number of articles with geographical content by journal and year

When we relate table 4 and table 5, we see that the share of articles with geographical content varies considerably both over time and over journals. Table 6 gives the ratio of geographical papers.

Journal \ Year	1987	1990	1996	1997	1998	1999	2000	2001	Sum
AER	1,29%	1,61%	6,59%	3,40%	0,64%	2,10%	2,42%	2,38%	2,58%
ECON J	0,00%	1,15%	3,09%	6,49%	6,98%	1,54%	2,53%	9,52%	3,47%
EER	1,85%	1,16%	13,89%	6,03%	6,59%	17,24%	5,83%	7,41%	7,44%
JEL	0,00%	0,00%	0,00%	0,00%	0,00%	0,00%	20,00%	0,00%	1,61%
JPE	1,47%	0,00%	2,17%	1,96%	4,76%	5,45%	12,20%	4,35%	3,58%
QJE	2,56%	0,00%	4,88%	7,89%	2,38%	6,67%	10,42%	0,00%	4,62%
REV ECON STUD	6,52%	0,00%	0,00%	3,33%	8,11%	2,38%	0,00%	5,26%	3,32%
Sum	1,84%	0,94%	6,44%	4,66%	4,10%	5,85%	4,91%	4,83%	4,07%

Table 6: Share of articles with geographical content by journal and year

The largest share (20%) of papers with geographical content can be found 2000 in the Journal of Economic Literature (JEL). This, however, is the result of the small number of articles appearing in this journal per year. Over the whole observation period the JEL has with 1.61% the smallest number of geographical papers of all journals. The European Economic Review seems to be the journal most willing to accept papers with geographical content. They reach

an overall percentage of over 7.44%. JEL and AER on the other hand have a score of under 3% and so seem to be most reluctant to devote journal pages to geographical content.

In table 6 there is no obvious time trend in the share of geographical articles in these journals. Although it seems that there has been a shift following the publication of the key contributions. However, we need to take a more careful look before we can come up with a definite answer.

3.3 The Model and Estimation Results

We can view the appearance of a paper with geographical content as a Poisson distributed random variable Y_g with parameter I_g . The distribution of this random variable is

$$P(Y_g = y) = \frac{I_g^y}{y!} e^{-I_g}.$$

The appearance of a paper with non-geographical content can be viewed as another Poisson distributed random variable Y_n with parameter I_n . When the two random variables are independent, the probability for a certain number of geographical and a certain number of non-geographical papers appearing in a journal in a certain year is equal to the product of the probabilities. Their sum is again a Poisson distributed random variable with parameter $I = I_g + I_n$. However, it makes more sense to view the total number of articles published in a particular journal in a year as exogenously given. In this case we have to form the conditional probability with the condition of \tilde{Y} total articles:

$$P(Y_g = y_g, Y_n = y_n | Y_g + Y_n = \tilde{Y}) = \frac{\tilde{Y}!}{y_g! y_n!} \left(\frac{I_g}{I_g + I_n} \right)^{y_g} \left(\frac{I_n}{I_g + I_n} \right)^{y_n}.$$

Since the parameter of the Poisson distribution has to be non-negative, it makes sense to specify them as

$$I_g = \exp(X_g \mathbf{b}), I_n = \exp(X_n \mathbf{b})$$

with X being a vector of explanatory variables that characterize the journal and the year of publication, for example, and \mathbf{b} being a vector of unknown parameters. With this specification, however, we get the choice probabilities of a logit model and the conditional probability for observing a combination of numbers of articles leads to the likelihood of a logit model with grouped individuals (Maier, Weiss, 1990). Therefore, we can use a standard logit estimation procedure to estimate this model.

The results of the estimation of this model are given in table 7. In order to allow for a non-linear time trend we use YEAR-SQUARED in addition to YEAR, the year of publication of the articles. Both variables are measured in years since 1995. For every journal we use a dummy variable that is one when the publication is in this journal and zero otherwise. The American Economic Review is the reference journal. So, a significant positive parameter for a certain journal means that an article with geographical content is more likely to appear in this journal than in the American Economic Review. Variables that are significant at the 1% level are printed in **bold**, those significant at the 5% level in *italics*. The statistics for the overall quality of the model (likelihood ratio test, rho-square, corrected rho-square) are relative to a model with only a constant, i.e. a model that assigns the same probability to all journals and all years.

Variable	beta	t-value
CONSTANT	-3.3854	-14.6277
YEAR	-0.0839	-0.6010
YEAR-SQUARED	0.0120	0.4405
APPLIED ECONOMICS	1.1125	4.9365
CAMBRIDGE JOURNAL OF ECONOMICS	0.3212	0.8184
<i>ECONOMIC JOURNAL</i>	<i>0.5178</i>	<i>1.7873</i>
EUROPEAN ECONOMIC REVIEW	1.2125	5.0238
JOURNAL OF ECONOMIC LITERATURE	-0.3586	-0.3483
JOURNAL OF POLITICAL ECONOMY	0.5267	1.5993
<i>QUARTERLY JOURNAL OF ECONOMICS</i>	<i>0.6586</i>	<i>1.9036</i>
REVIEW OF ECONOMIC STUDIES	0.2077	0.5064
LOG-LIKELIHOOD		
start	-145.844	
end	-122.650	
lr-test	46.389	11 DF Prob=0.00000
rho-square	0.159	
rho-sq.corr.	0.084	

Table 7: Estimation results

The model explains the underlying process significantly better than the reference model with just a constant. The two time variables are both insignificant. This shows that even when we take into account the differences between the journals, there is no increase or decrease in the chance that an article with geographical content will appear. This confirms our suspicion that was based on visual inspection of table 6. Obviously, despite the theoretical arguments that can be made in support of geographical implications of the new economic theories, economic

journals have not become more willing to publish papers with geographical content during our observation period⁸.

But, there is a marked difference between the various journals. Applied Economics and European Economic Review are significantly (at the 1% level) more likely to publish a paper with geographical content than the American Economic Review. The higher chance for the Economic Journal and for the Quarterly Journal of Economics is significant at the 5% level. The Journal of Political Economy misses this threshold only by a slight margin.

Of course, we cannot say whether this difference results from the policy of the journals, the preferences of their reviewers or from the author's self-selection in submitting articles to these journals. We can only observe the final outcome of this process. However, it is interesting to observe, that although, the key contributions influencing the new debate on economic geography have been published either in the American Economic Review or the Journal of Political Economy a following wave of articles with geographic content in these journals could not have been realized. Furthermore, by comparing the official journals of the three prominent Economic Associations – the American Economic Association (AER, JEL), the European Economic Association (EER), and the Royal Economic Society (Econ. J.) – it is clear that economic geography has been taken up much more by the European Associations. Whether this can be explained through different traditions in research and/or by the Economic Associations granting different significance to the field remains indecisive.

4. Conclusions

In this paper we have raised the question whether space finally matters in economics. In a theoretical discussion we have shown that following some innovations in modeling technique various fields of economics have incorporated externalities and monopolistic competition into their lines of argument. These, however, generate agglomerative forces that yield spatial clusters of economic activities, centers and periphery. This is made most explicit in new economic geography. New trade theory and new growth theory are other important areas that

⁸ Although Tichy (1998) uses an earlier, partly overlapping time period, we cannot compare our ratios with his, because he does not specify how he identified geographical content. Moreover, one of the four journals he analyzed is not in the SSCI.

apply this line of reasoning. We compare their arguments and show how closely related these are.

This theoretical discussion suggests that questions of regions, location, and spatial structure should become of increasing importance for economists. In the empirical analysis of our paper we investigate this hypothesis. Based on the information in the Social Science Citation Index we first analyze where key publications in the various theoretical fields have been cited in recent years. It turns out, that references to new economic geography publications appear significantly less in economic journals than in non-economic ones. New economic geography shares this fate with polarization theory of the 1950s-70s.

In a second step of our empirical analysis we identify articles with geographical content in a set of 9 important economic journals. We find significant differences between journals in the chance that an article with geographical content is published, but no increase or decrease over time. So, we don't see economists rushing toward geographical topics over time, but can observe diversity between journals. Despite the fact that the initial contributions to new economic geography have been published in US journals, nowadays European based journals in economics appear more willing to publish articles with geographical content.

Despite strong theoretical arguments in our favor, our discipline – regional economics – is still marginalized in economics. Although there are marked differences between journals, the conclusion that Tichy (1998) has drawn three years ago still holds: Economics has developed the means for dealing with geography, but it “has not yet found geography in actual work” (Tichy, 1998, p.16).

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Appendix

Journal	Cat.		
ACADEMY OF MANAGEMENT REVIEW	O	ECONOMIC GEOGRAPHY	G
ADMINISTRATIVE SCIENCE QUARTERLY	O	ECONOMIC HISTORY REVIEW	O
ADVANCES IN STRATEGIC MANAGEMENT	O	ECONOMIC INQUIRY	E
ADVANCES IN STRATEGIC MANAGEMENT : A RESEARCH ANNUAL	O	ECONOMIC JOURNAL	E
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AMERICAN ECONOMIC REVIEW	E	ECONOMIC POLICY	E
AMERICAN JOURNAL OF AGRICULTURAL ECONOMICS	E	ECONOMIC RECORD	E
AMERICAN JOURNAL OF ECONOMICS AND SOCIOLOGY	E	ECONOMIC THEORY	E
AMERICAN JOURNAL OF POLITICAL SCIENCE	O	ECONOMICA	E
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AMERICAN SOCIOLOGICAL REVIEW	O	ECONOMICS OF PLANNING	E
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