

## ***Mind the gap?* Quantifying interlinkages between two traditions in migration literature**

### **Abstract**

*Gap, split, divide* are just a few among many words used in publicizing the divergence of literature on internal and international migration. In this paper we empirically test what has so far been just a conjecture. Using Web of Science data and bibliometric techniques we, first, provide quantitative measures of the size of the proclaimed gap. Second, we inquire into the existing conceptual overlap between the two strands of academic literature. Third, we search for channels through which research on internal and international migration can potentially blend into becoming a single, more holistic area of study. We find that there are significant commonalities between the two literatures when it comes to the journals where they are published, the academic disciplines they relate to, or the keywords by which they are defined. At the same time, however, it becomes visible that authors tend to remain in the realm of one domain and rarely cite papers from the other strand of literature. The latter is especially true for scientists publishing on international migration, who refer to internal migration publications only 4% of the time. In contrast, internal migration scholars have 25% of international migration papers among their citations.

### **Keywords**

citation analysis, internal migration, international migration, BibExcel, Pajek,

## 1. Introduction

Isaac Newton once wrote that he owed the ability to see further than other scholars of his times to standing on the shoulders of giants. Indeed, relying on existing scientific works generally enables us to broaden our knowledge. In our paper we argue, however, that in some cases relying on the works of predecessors may restrain the advancement of an academic discipline. Standing on the shoulders of giants may prevent you from making a step forward.

More than a century ago a British geographer Ernest George Ravenstein formulated his ‘laws of migration’ which are perceived as the theoretical foundation of contemporary migration studies (1885; 1889). His paper was published at the time of great population movements during the first wave of globalization after the Industrial Revolution. A variety of people were on the move and it became clear that the phenomenon is much more complex than geographers could describe. Migration began to attract economists, demographers, sociologists, political scientists, and psychologists.

Despite the integrating and inter-disciplinary character of migration studies, since the very beginning they developed within two almost separate traditions. In their recent paper King and Skeldon complain that ‘[t]he interdisciplinary field of migration studies is split into internal and international migration, characterized by different literatures, concepts, methods and policy agendas’ (2010: 1619). Surprisingly, this fact has been for a long time rarely noticed (Speare 1974; Pryor 1981). The general term ‘migration’ has been used to mean either ‘internal migration’ or ‘international migration’, depending on the author’s provenance (e.g. Ravenstein 1885; Sjaastad 1962; Castles, Miller 1993; Brettel, Hollifield 2000). According to Korcelli the lack of communication among scholars resulted in almost non-overlapping vocabularies developed to describe these two types of population flows (Korcelli 1994). This status quo persists despite that nowadays internal and international migration become more and more similar in many respects (Blanchard, Katz 1992). Though the substitutability of both kinds of population flows is not perfect (Thomas 1954; Baines 1985), in general they share determinants and some of demographic, economic and social consequences. King and Skeldon claim that, nonetheless, there are only few studies in which they have been put into one conceptual framework (Thomas 1954; Wolpert 1965; Zelinsky 1971; DeJong, Abad, Arnold, Carino, Fawcett, Gardner 1983; Baines 1985).

Having the above facts as a point of departure, in this paper we attempt to solve three emerging research problems. First, we aim to describe and measure the gap between two migration literatures by applying statistical methods and tools of network analysis. By doing so we test King’s and Skeldon’s impression that ‘too often one [migration literature] is studied without reference to the other’ (2010: 1619). As one of the results of this analysis we indicate papers which play a role of ‘bridges’ between the two literatures but have not been considered by King and Skeldon in their state of the art (2010). Second, we examine the observation that internal and international migration scholars apply entirely different theoretical concepts, raise different research problems and use different terminologies. We do so by tracing specific keywords that describe papers belonging to the two migration literatures and try to assess to what extent the research fields in internal and international migration studies overlap. Finally, we consider the possibility of knowledge transfers between internal

and international migration studies by indicating authors who conduct research in both fields and journals which publish papers from both domains.

## 2. Data and methods

Two major databases, the Web of Science (WoS) and Scopus, have been considered for the purpose of this study. Each of them has its upsides and downsides (Neuhaus, Daniel 2008; Vieira, Gomes 2009; Bartol, Budimir, Dekleva-Smrekar, Pusnik, Juznic 2014). An initial search revealed that Scopus does cover more publications of interest, but that at the same time it provides complete references only for post-1996 works. A project the aim of which is to add cited references for pre-1996 content is in progress, but even these are to go back only to 1970 (Elsevier 2014). At the moment it remains unclear to what extent database entries have been already enhanced. Moreover, given the nature of our inquiry, we anticipated that pre-1970 references might comprise important common ground for contemporary publications in internal and international migration scholarship. Hence, we opted for WoS as the source of our data due to the availability of references for all records.

To recognize publications in the fields of internal and international migration in WoS, we have used the *topic* criterion. A *topic* term is searched for in the titles, abstracts, author keywords and keywords plus (WoS expert keywords) of all publications. For publications in international migration the topic was defined as “‘international migration’ and not ‘internal migration’”. The opposite defined publications in internal migration. We have also created a separate category of publications concerning both fields, the topic of which was defined as “‘international migration’ and ‘internal migration’”. A publication was classified as representing a given category if the topic term appeared in the title, the abstract, or the keywords. All three searches were further refined by the following criteria: database (WoS Core Collection), research domains (Social sciences or Arts and Humanities), document types (article or book), and language (English). The timespan covered all available years (1945-2015).

Our analyses comprised various methods and measures of interlinkages between publications which were grouped into three clusters (hereafter also termed as domains, categories or strands of literature) - *internal*, *international*, and *both*. First, we performed a network analysis of citation links among WoS records by means of which we established the degree of connectivity between the clusters. We then moved to co-author and co-word analyses (cf. Cobo et al. 2011) which juxtaposed the authors, keywords and journals in the three domains. Last, we applied bibliographic coupling to look at common references of publications in internal and international migration. In our work we have relayed on the BibExcel (Persson 2014) and Pajek (Mrvar, Batagelj 2015) software packages.

Depending on the research question, our input dataset was transformed to suit the adequate bibliometric technique. Table 1 presents the data used for specific analyses.

**Table 1** Data used for specific analyses

Type of analysis and measures used	Units of analysis (grouped into three clusters: <i>international, internal, both</i> )	Number of observations (unique units)	Researched relation
Network	Publications	2 801	Relation of inter-cluster to intra-cluster citations and/or references
	Publications' linkages	12 252	Relation of inter-cluster to intra-cluster linkages (undirected and directed)
Co-author	Authors	4 737	Co-occurrence of author in different clusters
Co-word	Keywords	3 570	Co-occurrence of keyword in different clusters
	Journals	761	Co-occurrence of journal in different clusters
Bibliographic coupling	Publications' references	105 032	Common references across clusters

Source: own elaboration using BibExcel and Pajek software, based on taxonomy by Cobo, López-Herrera, Herrera-Viedma, Herrera (2011), Web of Science data.

Regardless of type of analysis, we had to deal with the most common sources of bias in bibliometric studies (Erman, Todorovski 2015). As both too lax and too restrictive identification of unique units of analysis may lead to erroneous results, we have described the observations in our samples by means of the following criteria: name of first author, year of publication, volume number, and first page number to identify publications (including references); last name and first initial for authors; exact full wording for keywords and journals (both categories have been manually cross-checked for homographs and synonyms). Given the scale of our study, we were not able to control for all possible sources of bias. Nevertheless we have no reason to believe that any errors appear non-randomly across the constructed clusters. As long as there are no systematic differences in the scale in which any of error appears in the international or internal migration literature, we remain satisfied with the quality of the data used.

### 3. Results

#### 3.1 Size of the gap

Our first objective was to quantify the postulated gap between internal and international migration literature. Our first indicator was simply the relative size of the cluster comprising publications classified as *both* on internal and international migration. In our study these publications constituted 2% of all considered works. This measure is demanding, though, as it requires that the author explicitly integrated both strands of literature into one paper. In an attempt to relax this requirement we have relayed on several measures concerning solely *internal* or *international* migration publications. All of these were developed by, first, identifying the interlinkages between these publications in our sample using BibExcel and, second, transferring the network data to Pajek for further analyses. Our primary indicator was a measure of degree centrality of each vertex (publication). We have computed the number of intra- and inter-cluster connections - edges (undirected) and arcs (directed) for each paper or book in the sample. After aggregation, this allowed us to compute the degree of connectivity of each cluster.

Out of 2 750 papers in our study which constituted the *internal* and *international* clusters, 766 papers (28%) cited and/or were cited by a paper from the cluster different than

their own. This concerned every fifth publication from the *international* cluster (454 papers, 21%), and every other publication in the *internal* cluster (312 papers, 51%). For an average *international* publication the share of connections to *internal* publications was 25%. For an average *internal* publication the share of connections to *international* publications was 45%. Clearly, internal migration papers were relatively more strongly connected to international migration papers, than the other way around. The share of links (edges) between the *internal* and *international* publications relative to the total number of links between and within these two clusters amounted to 10%. This implies that 90% of links to or from *international* or *internal* publications are between publications in the same cluster.

Inquiring into the direction of these interlinkages, we looked at the relative number of out-connections (cited publications) leading from the *international* (*internal*) cluster to the *internal* (*international*) cluster for each vertex. This measure shows the degree to which one strand of literature is inspired by the works from the other strand of literature. Out of all papers in either internal or international migration, 2220 were cited by another publication in the sample. For every 100 citations, an average international migration publication had 4 internal migration publications (Table 2; row: 1, column: 2). An average internal migration publication had 25% of international migration publications among its cited papers (Table 2; row: 2, column: 1). All the directed dependencies between the publications in our sample are described in Table 2.

**Table 2** Interconnectivity between clusters (directed links)

		citation's cluster		
		<i>international</i>	<i>internal</i>	<i>both</i>
publication's cluster	<i>international</i>	95%	4%	1%
	<i>internal</i>	25%	73%	2%
	<i>both</i>	62%	28%	10%

Source: own elaboration by means of BibExcel and Pajek software. Web of Science data. Share of intra-cluster arcs in italics.

From the analysis of Table 2 we can conclude that the estimated size of the gap between internal and international migration literature is between 73% and 95%, i.e. it amounts to the share of intra-cluster publications. The category referring to *both*, the *international* and *internal*, literatures is evidently highly connected to the former (62% of citations) and the latter (28% of citations). It presents as a special case by definition, though. Looking at the directed connections confirms our initial finding that it is the *internal* publications that have a more extensive outreach towards *international* publications, than the other way round.

Given that the abovementioned data comprises those authors who make attempts to reflect on works outside of their field as well as those who do not cite any papers from the other strand of literature, we have refined our results to account for this selectivity effect. We have computed the shares inter-cluster citations disregarding those papers which did not cite any work from the other cluster. For an average *international* publication which does cite an *internal* migration publication, 31% of the papers it is citing come from the latter strand of

literature. For internal migration publications, the respective number is 52%. This result leads to think that if only we considered reaching beyond our narrow field of research, the size of the *internal-international* gap could be much smaller. Apparently those authors who do stand on the shoulders of *the other* giants find quite a few inspirations for their work, most probably with great benefit for the development of migration studies in general.

### 3.2. Conceptual overlap

Having estimated several measures of the size of the divide between international and internal migration literature, we have moved to computing the size of conceptual overlap between the two. In doing so we have taken advantage of the fact that the research fields of internal and international migration studies may be described by tags that authors use as keywords in their papers. The WoS database also comprises additional keywords assigned to each publication by a group of experts. In our analysis we have used both the ‘Author Keywords’ (DE field in WoS) and ‘Keywords PLUS’ (ID field in WoS) as sources of information on the content of papers and books. In effect we received two lists of tags, one for the field of internal migration and the other for the field of international migration studies. The lists have been cross-checked for possible synonyms which occurred as:

- (1) differences in British and American spelling (e.g. urbanisation vs. urbanization);
- (2) using both singular and plural form (e.g. migrant vs. migrants);
- (3) using dashes where one or two words could be used (e.g. United-States vs. United States).

The corrected list of tags for internal migration studies comprised 2190 items and was almost by half shorter than the list of tags for international migration studies (3884 items). Three out of ten top keywords are the same in both lists, however, apart from the name ‘United States’, these are rather general terms (i.e. ‘migration’ or ‘immigration’). It seems that researchers in the field of international migration find the US as an interesting case for their studies. They also seem to approach the migration phenomenon from a variety of perspectives (‘globalisation’, ‘gender’, ‘policy’, ‘family’, ‘networks’). At the same time researchers investigating internal migration are interested in US, Chinese and British mobility and look at the migration predominantly as if it was a part of a strictly economic process (‘earnings’, ‘growth’, ‘unemployment’; see Table 3). The overlap is visible in the correlation between the frequency of specific keywords, which is positive but rather low (Pearson’s  $r$  equal to 0.31 with  $p$ -value lower than 0.001).

**Table 3** Top-twenty keywords describing papers from two clusters

Keywords describing papers from the 'internal migration' cluster	Number of occurrences	Keywords describing papers from the 'international migration' cluster	Number of occurrences
Internal migration	377	International migration	1007
United States	189	Migration	387
Migration	151	United States	323
Mobility	77	Remittances	258
Immigration	72	Immigration	232
China	61	Migrants	145
Population	50	Mexico	139
Impact	46	Gender	131
Models	46	Immigrants	123
Labour market	45	Networks	117
Earnings	44	Brain drain	113
Migrants	44	Labour migration	102
Growth	41	Earnings	87
Unemployment	39	Policy	87
Urbanisation	38	Globalisation	85
Britain	35	Family	84
Gender	34	Labour	83
Self-selection	34	Labour market	82
Determinants	32	Countries	81
Employment	32	Inequality	76

Source: own elaboration using BibExcel, WoS data.

The table above also reflects the order of the most popular disciplines that papers from these two clusters come from (SC field in WoS). Papers concerning internal migration issues have been most frequently classified as either economic (18%), geographic (16%), demographic (13%) or environmental studies (10%), whereas papers from the *international* cluster are most likely to be labeled as demographic (31%), economic (16%), geographic (8%) or sociological (6%). Despite these slight differences, migration is a subject of interest of scholars from similar disciplines as the correlation between abovementioned frequencies is relatively high and equal to 0.83 ( $p$ -value < 0.001).

We considered not only the co-occurrence of keywords and scientific fields across the *internal* and *international* clusters as measures of conceptual overlap, but also the scale of bibliographic coupling, i.e. the extent to which *internal* and *international* publications have common references. The correlation between the frequencies of particular papers referenced in the internal and international cluster was 0.39 ( $p$ -value < 0.001). This result shows that migration scholars in both domains rely to some extent on similar sources. When inquiring into particular papers, though, the results are not as promising and indicate that *internal* and *international* scholars still tend to diverge in delimiting the frameworks for their studies. Among the top-twenty most cited papers (Table 4) there are only five which can truly be considered as popular in both the *international* and *internal* cluster with the share of citations from one particular cluster lower than 80%; these are: Sjaastad (1962), Lee (1966), Todaro (1969), Harris and Todaro (1970), and Borjas (1994).

**Table 4** Top-twenty most cited papers in internal and international migration studies

Citation's details	Number of occurrences <sup>a</sup>	Share of citations from internal cluster
Massey D., Arango, J., Hugo, G., Kouaouci, A., Pellegrino, A., Taylor J. E. (1993). Theories of International Migration: A Review and Appraisal. <i>Population and Development Review</i> , 19(3), 431-466.	279	95%
Sjaastad, L. (1962). The Cost and Returns of Human Migration. <i>Journal of Political Economy</i> , 70(5), 80-93.	230	55%
Piore, M. (1979). <i>Birds of passage: migrant labor and industrial societies</i> . Cambridge, New York: Cambridge University Press.	152	89%
Harris, J. R., & Todaro M. P (1970). Migration, Unemployment and Development: A Two-Sector Analysis. <i>The American Economic Review</i> , 60(1), 126-142.	148	62%
Boyd M. (1989). Family and Personal Networks in International Migration: Recent Developments and New Agendas. <i>International Migration Review</i> , 23(3), 638-670.	139	97%
Stark, O., & Bloom, D. E. (1985). The New Economics of Labour Migration. <i>The American Economic Review</i> , 75(2), 173-178.	129	87%
Massey, D. (1987). <i>Return to Aztlan: the social process of international migration from western Mexico</i> . Berkeley: University of California Press.	126	90%
Massey, D., & Espinosa K. E. (1997). What's Driving Mexico-U.S. Migration? A Theoretical, Empirical, and Policy Analysis. <i>American Journal of Sociology</i> , 102(4), 939-999.	125	90%
Stark, O. (1991). <i>The Migration fo Labor</i> . Cambridge: Blackwell.	124	87%
Borjas G. J. (1987). Self-Selection and the Earnings of Immigrants. <i>The American Economic Review</i> , 77(4), 531-553.	121	81%
Massey, D. (1990). Social Structure, Household Strategies, and the Cumulative Causation of Migration. <i>Population Index</i> , 56(1), 3-26.	118	83%
Massey D., Arango, J., Hugo, G., Kouaouci, A., Pellegrino, A., Taylor J. E. (1998). <i>Worlds in Motion: Understanding International Migration at the End of the Millennium</i> . Oxford: Clarendon Press.	117	91%
Todaro M. P. (1969). A Model of Labor Migration and Urban Unemployment in Less Developed Countries. <i>The American Economic Review</i> , 59(1), 138-148.	107	66%
Greenwood M. J. (1975). Research on Internal Migration in the United States: A Survey. <i>Journal of Economic Literature</i> , 13(2), 397-433.	102	23%
Borjas, G. J (1994). The Economics of Immigration. <i>Journal of Economic Literature</i> , 32(4), 1667-1717.	92	67%
Lucas, R., & Stark O. (1985). Motivations to Remit: Evidence form Botswana. <i>Journal of Political Economy</i> , 93(5), 901-918.	89	94%
Lee, E. S. (1966). A Theory of Migration. <i>Demography</i> , 3(1), 47-57.	89	69%
Durand, J., Kandel, W., Parrado, E. A., Massey, D. S. (1996). International migration and development in Mexican communities. <i>Demography</i> , 33(2), 249-264.	83	99%
Massey D., Arango, J., Hugo, G., Kouaouci, A., Pellegrino, A., Taylor J. E. (1994). An Evaluation of International Migration Theory: The North American Case. <i>Population and Development Review</i> , 20(4), 699-751.	81	96%
Sassen, S. (1988). <i>The Mobility of Labor and Capital</i> . Cambridge: Cambridge University Press.	78	96%

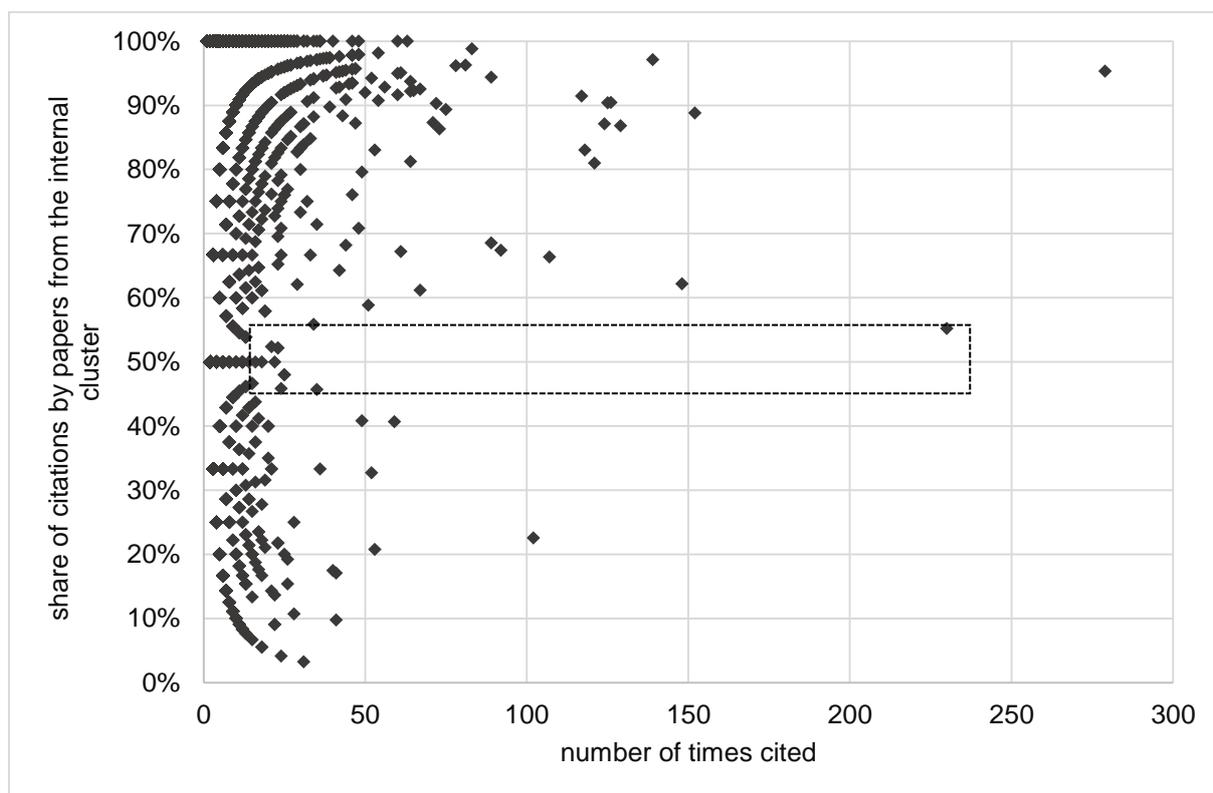
<sup>a</sup> sum of citations from both *internal* and *international* cluster.

Source: own elaboration using BibExcel, WoS data.

Apart from the Lee's general push-pull model of migration, the 'bridging' publications are economic papers related to labour market economics, theory of international trade or the the human capital approach in decision making processes. Notwithstanding these few exceptions, most papers with the highest scientific impact remain almost entirely utilized by authors from either internal or international migration field.

In search for common inspirations for scholars from internal and international migration we have also looked at papers which bridge the two strands of literature, i.e. which have many citations (at least 20) and appear equally often in international and internal migration publications (share of citations from the *internal* cluster was 46%-56%; see the highlighted points inside the black frame in Fig. 1).

**Fig. 1** Relation between the number of times cited and the share of citations by papers from the *internal* cluster<sup>a</sup>



<sup>a</sup> Highlighted are the dots that refer to papers which have been cited at least 20 times and which have been cited equally often by *internal* and *international* publications (share of citations by *internal* publications equal to 46%-55%).  
Source: own elaboration using BiExcel software and WoS data.

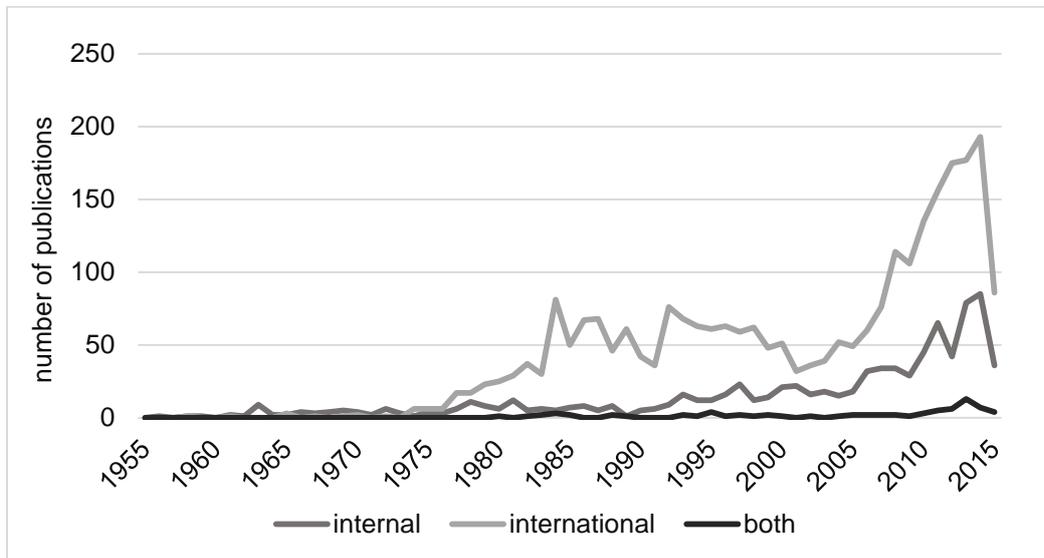
Half of the ‘bridging’ publications concern various aspects of substitutability of native and immigrant workers and investigate possible causation/linkages between international and internal population flows (Lewis 1954; Grossman 1982; Altonji 1991; Friedberg 1995; Borjas 1996), another three investigate a situation of different groups of migrants living in United States from mixed sociological and economic perspective (Bean, Tienda 1987; Massey, Danton 1993; Portes 1995). None of them have been mentioned by King and Skeldon in their state of the art in the area of studies with the potential to integrate both strands of migration literature. Possibly because these are relatively old publications (34 years old on average) and this potential has been exhausted to a large extent. However, as all of them refer to the population of United States, they may be treated as a model or inspiration for empirical research in other parts of the world (e.g. current situation in European Union with common labour market and intensive immigration from Africa and Asia become similar to the situation of USA; Blanchard, Katz 1992).

### 3.3. Potential knowledge transfers

Our last research question concerned the possibility of knowledge transfers between the literatures on internal and international migration. Thus, we have firstly looked at the current state of affairs by examining the evolution number of papers which concern both internal and

international migration in comparison to the number of papers which represent only one or the other field (Fig. 2).

**Fig. 2** Evolution of *international*, *internal*, and *both* clusters over time



Source: Own elaboration derived from BibExcel based on Web of Science data.

From Fig. 2 it stands out that despite a visible rise in the number of publications in the field of international migration starting in the late 1970's, and an increase in publications in internal migration since the early 2000's, the number of publications concerning both international and internal migration does not exhibit such a boom at any point until now. Nonetheless, we remain optimistic about the possibilities of merging the two strands of literature in the future and hence we have considered two possible media: the authors themselves and academic journals.

When it comes to authors as possible engines of knowledge transfers, we have looked at the frequency of appearance of particular scholars in the *international* and *internal* domains. Out of 4 569 authors in our database who published either on internal migration or international migration, 206 published in both fields. When to this number we add the 141 authors who had a publication in the *both* cluster, it turns out that around 8% of all authors in our sample dealt with both internal and international migration in their oeuvre.

The authors who most frequently appear in *international* and *internal* publications are listed in Table 5, followed by the authors who have the most publications and appear equally often in international and internal migration publications.

**Table 5** Top authors in *international* and *internal* literature, and in bridging the two fields

	top <i>international</i> authors		top <i>internal</i> authors		top bridging authors		total number of publications	share of <i>internal</i> publications
	number of publications		number of publications					
	<i>internal</i>	<i>international</i>	<i>internal</i>	<i>international</i>				
Massey, D.	0	41	Newbold, K.	12	1	Liang, Z.	11	55%
Hugo, G.	2	22	Bell, M.	8	1	Greenwood, M.	10	50%
Findlay, A.	2	20	White, M.	7	1	Wright, R.	9	44%
Castles, S.	0	16	Ellis, M.	6	4	Hunter, L.	6	50%
Docquier, F.	0	14	Fan, C.	6	4	Hierro, M.	6	50%
Portes, A.	0	12	Rees, P.	6	3	Skop, E.	4	50%
Rapoport, H.	0	12	Kritz, M.	6	3	Friedlander, D.	4	50%
Davis, B.	0	12	Liang, Z.	5	6	Zhu, Y.	4	50%
Djajic, S.	0	11	Greenwood, M.	5	5	Chang, H.	4	50%
Appleyard, R.	0	11	Wright, R.	5	4	Myers, G.	4	50%

Source: own elaboration based on BibExcel analyses, Web of Science data.

Visibly, the frequency of occurrence of most productive *international* authors in *internal* publications is close to zero. *Internal* authors seem to publish on international migration slightly more often. Pearson's correlation coefficient between the frequency of an authors' occurrence in *international* and *internal* literature is 0.13 (p-value < 0.001) leading us to conclude that, in general, authors tend to remain in the realm of their domain. The names in the last section are of main interest to our study, however, as we consider them not only to be very prolific authors, but also those who in their work manage to merge topics, concepts, and methods others do not combine.

A similar analysis to the one above has been conducted on journals which published articles in internal or international migration. The most popular for academic debate on the former and the latter are listed in Table 6.

**Table 6** Top journals for articles on international and internal migration, and for bridging the two fields

	top <i>international</i> journals		top <i>internal</i> journals		top bridging journals		total number of articles	share of internal articles
	number of articles		number of articles		total number of articles	share of internal articles		
	<i>interna</i> <i>l</i>	<i>internationa</i> <i>l</i>	<i>interna</i> <i>l</i>	<i>internationa</i> <i>l</i>				
INTERNATIONAL MIGRATION REVIEW	29	459	POPULATION SPACE AND PLACE	41	31	ENVIRONMENT AND PLANNING A	51	55%
INTERNATIONAL MIGRATION	10	365	INTERNATIONAL MIGRATION REVIEW	29	459	POPULATION RESEARCH AND POLICY REVIEW	38	50%
JOURNAL OF ETHNIC AND MIGRATION STUDIES	12	60	ENVIRONMENT AND PLANNING A	28	23	SOCIAL SCIENCE & MEDICINE	30	50%
JOURNAL OF DEVELOPMENT ECONOMICS	6	58	DEMOGRAPHY	20	32	POPULATION AND ENVIRONMENT	28	54%
JOURNAL OF POPULATION ECONOMICS	4	37	POPULATION RESEARCH AND POLICY REVIEW	19	19	ANNALS OF THE ASSOCIATION OF AMERICAN GEOGRAPHERS	14	50%
ASIAN AND PACIFIC MIGRATION JOURNAL	2	36	REGIONAL STUDIES	18	12	SOCIAL SCIENCE QUARTERLY	13	46%
DEMOGRAPHY	20	32	SOCIAL SCIENCE & MEDICINE	15	15	ECONOMIC GEOGRAPHY	10	50%
POPULATION SPACE AND PLACE	41	31	POPULATION AND ENVIRONMENT	15	13	AMERICAN ECONOMIC REVIEW	9	44%
WORLD DEVELOPMENT	8	28	JOURNAL OF REGIONAL SCIENCE	15	4	PLOS ONE	9	44%
GEOFORUM	5	26	PAPERS IN REGIONAL SCIENCE	13	3	EURASIAN GEOGRAPHY AND ECONOMICS	6	50%

Source: own elaboration based on BibExcel analyses, Web of Science data.

Pearson's correlation coefficient between the number of *international* and *internal* articles in the 761 journals in our sample is 0.44 ( $p$ -value < 0.001). This leads us to conclude that journals are indeed a medium which is only intermediately partial when it comes to discriminating against *internal* or *international* articles. Assuming that scholars read or at least monitor all publications which appear in certain research outlets, journals allow scientists to come across a variety of topics related to their field of interest, including both internal and international migration issues. The outlets which we classified as bridges between *internal* and *international* publications (table 6; column: 3) interestingly do not concern migration per se. Hence, we conclude that it is not that *internal* and *international* scholars do not meet in international journals, but that they do not meet in the core of the academic debate on migration.

#### 4. Discussion and conclusions

The objective of our study was to quantitatively assess the size of the gap (King, Skeldon 2010) between the literature on internal and international migration. We have approached this

task from three angles which are reflected in our research questions: 1) what is the degree of interconnectedness between publications in internal and international migration?; 2) what is the scale of the conceptual overlap between the two strands of literature?; and 3) what is the scale of the potential of the two to integrate in a common research framework? In search of answers to these question we have classified all publications in our sample to one of three clusters: *international*, *internal*, or *both*. In answering each research question we have provided a number of measures all of which are summarized in Table 7.

**Table 7** Applied measures of the *internal-international* gap, conceptual overlap, and potential for knowledge transfers

Analysis	Degree connectivity measures		
	Measure	Result	Implied size of gap
Network (interconnectivity)	Share of <i>both</i> vertices in all vertices	2%	98%
	Share of <i>international</i> vertices with edge to non- <i>international</i> vertices in all <i>international</i> vertices	21%	79%
	Share of <i>internal</i> vertices with edge to non- <i>internal</i> vertices in all <i>internal</i> vertices	51%	49%
	Share of edges between the <i>international</i> and <i>internal</i> clusters in all edges within and between the <i>international</i> and <i>internal</i> clusters	10%	90%
	Share of arcs (out-connections) from <i>international</i> to <i>internal</i> in out-connections from <i>international</i> to <i>internal</i> and to other <i>international</i>	4%	96%
	Share of arcs (out-connections) from <i>internal</i> to <i>international</i> in out-connections from <i>internal</i> to <i>international</i> and to other <i>internal</i>	25%	75%
Co-occurrence measures			
Conceptual overlap	Correlation between number of occurrences of a given keyword in the <i>internal</i> and <i>international</i> clusters (co-word analysis)	0.31	--
	Correlation between number of occurrences of a given discipline in the <i>internal</i> and <i>international</i> clusters (co-word analysis)	0.83	--
	Correlation between number of occurrences of a given reference in the <i>internal</i> and <i>international</i> clusters (bibliographic coupling)	0.39	--
Potential knowledge transfers	Correlation between number of occurrences of a given author in the <i>internal</i> and <i>international</i> clusters	0.13	--
	Correlation between number of occurrences of a given journal in the <i>internal</i> and <i>international</i> clusters	0.44	--

Source: own elaboration using BibExcel and Pajek software, WoS data.

Looking at the above table we find it safe to estimate the size of *internal-international* gap, as described by King and Skeldon (2010), at 49%-96% depending on the measure applied. The large uncertainty results from the very different findings we obtain when analyzing the gap from the perspective of *internal* and from the perspective of *international* publications. Publications concerning internal migration cite (as defined by the degree of interconnectivity) *international* publications much more often than is true for *international* publications citing *internal* works. In our analyses we have also found that:

- (1) International migration publications concern a wider variety of aspects (as defined by keywords) than *internal* publications;
- (2) Papers in internal and international migration tend to be positioned within the same academic disciplines;
- (3) Most papers with the highest scientific impact (based on analysis of bibliographic coupling) remain almost entirely utilized by authors from either the internal or international migration field;
- (4) In general, authors tend to publish in the realm of their domain;

(5) Certain academic journals do create a forum for a scholarly debate without distinguishing between internal and international migration, yet these are not necessarily the ones which are at the core of the academic debate on migration.

The validity of our results holds as long as we have no reason to believe that potential biases affect internal and international literature differently. Nonetheless, there are certain features of our sample, which should raise caution. Though their effects on our study are difficult to assess, intuition suggests that they could bias our results both upward and downward, and even then to a very small extent. We have identified three problematic issues. All of them are typical for bibliometric studies which analyse large samples of publications.

First, we have focused only on English language publications, while it seems reasonable to suppose, that many works on internal migration are addressed to national audiences and hence are published in national languages. In a citation study limiting the analysis to one language is necessary, though. Otherwise we would not be able to assure that the potential link between any of two publications was possible and its nonexistence was not a result of limited language skills of the authors.

Second, we were unable to control for whether the authors' perspective was that of a sending or receiving country. This issue may cause concern as the mechanisms of internal migration in receiving countries (e.g. US) are probably different than in migrant sending countries (e.g. Ireland or Great Britain until the 1980s). In the former, internal mobility is not an alternative for emigration, while the contrary is true for the latter. However, it is hard to judge whether the links between the *internal* and *international* literature would be stronger in one case or the other.

Third, our method of classifying publications into *internal* and *international* excludes those, which do not explicitly relate to international or internal migration in their title, abstract or keywords at least once. This could have deprived our analyses of certain works e.g., in the domain of political science, where analysing international migration seems to be self-evident. In such a case authors might refer to, simply, migration or other related concepts such as 'citizenship' or 'nationality'. It is possible that this specificity would increase the estimated size of the gap. Nonetheless, such papers constitute just a part of migration scholarship, thus the possible bias remains relatively small.

Having in mind the above considerations, in conclusion, we find that there are significant commonalities between the two strands of literature when it comes to the journals where they are published, the academic disciplines they relate to, or the keywords by which they are defined. At the same time, however, it becomes visible that authors tend to remain in the realm of one domain and rarely cite papers from the other strand of literature. Though standing on the shoulders of a giant allows you to see quite far, you may be able to see even further if you acknowledge that there is more than just one giant.

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