


Article

# Worldwide Scientific Production Indexed by Scopus on Labour Relations

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Received: 28 August 2017; Accepted: 10 October 2017; Published: 13 October 2017

**Abstract:** This article examines the features of the worldwide contributions to the specialized literature in labour relations in the period 1970–2016. The source considered has been the Scopus Elsevier database, together with bibliometric analysis techniques. Different aspects of the publications are analysed, such as publication type, field, language, subcategory and journal type, as well as the keyword occurrence frequency. The results of this work show that the most popular keywords were Trade Union, Employment, Labour Market and Industrial Relations. It is observed how the United States, being the most productive country, leads in almost all the keywords except in two, “Labour market” and “Working Conditions”, which are led by UK. If the keywords are studied only as geographical terms we can find the United States, Eurasia and India. The contributions are geographically and institutionally broken down. The most active categories are Social Sciences, Business, and Management and Accounting. The evolution of the most popular keywords indicates how in the last years “Trade Unions” “Industrial Relations” and “Personnel” have lost importance against “Labor Market” and “Employment”, showing new concerns in the labour relations field.

**Keywords:** labour relations; scientometric; worldwide; Scopus

## 1. Introduction

Labour relations can be defined as the set of processes and activities that unions and employers develop and use to clarify, manage, reduce, and resolve conflicts between employees and their representatives while accommodating the various goals of each [1]. Thus, labour relations are the links established in the field of work [2]. They refer to the relations between labour and capital within the framework of the productive process [2]. Some authors extend this concept as tripartite consultation whereby workers, employers and government contribute to the development of labour standards and the protection of workers’ rights through voluntary interaction and dialogue [3]. Labour relations can be understood in a broad sense as the social transformations of work and employment [4,5], gender relations [6], or even all kinds of social policies [7]. Labour relations have a wide spectrum of study covering issues directly related to work and employment [1], but also from a multidisciplinary point of view that includes: Sociology [8]; Law [9–11]; Anthropology [12]; Philosophy [13]; Economics [14,15]; or Psychology [16], among other subjects.

Research related to labour relations has among its objectives the study of work from an interdisciplinary perspective for the improvement of employment and social inclusion [17]. We can find studies related to a multitude of disciplines, such as: human resources management [18]; health [19], safety [20] and hygiene [21], the sociology [22], the labour economy [23], labour policy [24]; the labour law [25] the history of labour law [26,27] and, nowadays, also; how information technology is changing social relations in workplaces [28].

Additionally, exits-related topics such as comparative and international study can also be included: the individual and collective status of the worker [29]; equality and discrimination at work [30]; the transition to the world of work, public policies in labour matters [31]; changes in labour regulation [25]; vulnerable workers [32]; precarious employment [33]; labour productivity [34]; the effectiveness of international labour regulations [35], and; the labour market [36].

The existence of two major databases, Web of Science (WoS) and Scopus, raises the important question of the comparability and stability of statistics obtained from different data sources [37]. Several studies have measured the overlap between databases and the impact of using different data sources for specific research fields on bibliometric indicators. In this regard, some studies related to citations conclude that Scopus citations are comparable to Web of Science citations when limiting the citation period to 1996 and onwards (the citation coverage of Scopus); each database covered about 90% of the citations located by the other [38]. However, related to the journal coverage of Web of Science and Scopus, a comparative analysis shows that the coverage of active scholarly journals in WoS (13,605 journals) is lower than Scopus (20,346 journals) [39], and the correlations between the measures obtained with both databases for the number of papers and the number of citations received by countries, as well as for their ranks, are extremely high ( $R^2 \approx 0.99$ ) [40]. The advantages of Scopus are shown in several research papers and therefore also used for numerous bibliometric analysis [41–43].

The main objective of this work was to analyse the research state and trends in labour relations topic. More precisely, this study aims to analyse related to this topic: types and languages of publications, evolution of this scientific output, publication distribution by countries and institutions, distribution of output in subject categories and journals, and at answering the following research questions: what are the general trends of research in this field and what are the main interests of the countries that work on it, for that an extensive analysis of author keywords will be made.

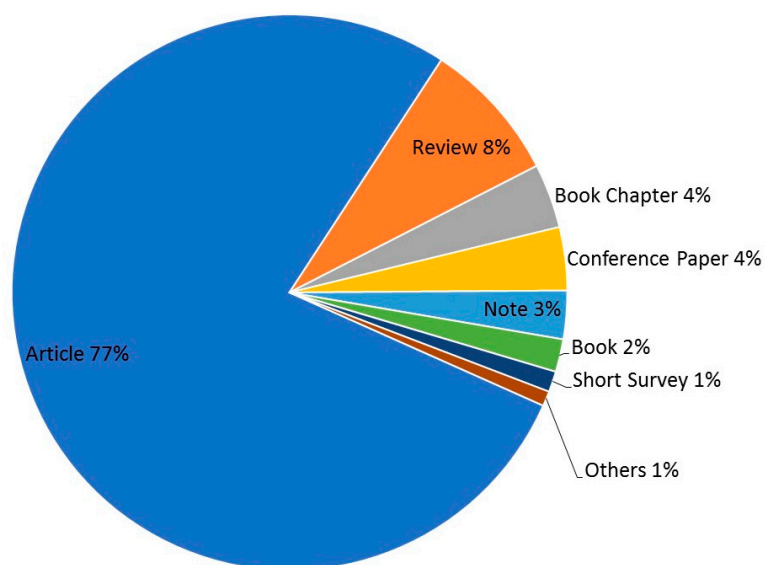
## 2. Materials and Methods

In this study, a complete search of Elsevier's Scopus database was conducted using the subfields key, authkey, title, indexterms and affilcountry to identify publications addressing the subject of labour relations. The following search query was used: (TITLE-ABS-KEY(({Labour relations}OR{Labour relation}OR{Labor relation}OR{Labor relations}OR{Employment relation} OR{Employment relations}))), and limited to the period 1970 to 2016. The records obtained were conveniently processed using spreadsheets and a specific open-source coding tool [44]. This application "is a standalone desktop application initially developed by Google for data clean-up and transformation to other formats" [45]. This methodology allowed the easy analysis of unsorted, conflictive or disorganised text, and very satisfactory results were obtained that would otherwise be nearly impossible to achieve given the large size of the database used. This methodology has been used with success in other bibliometric studies [46,47]. Publications from 1970–2016 that referred to Labour relations were evaluated based on the following aspects: document type and language; characteristics of scientific output; publication distribution by region and institution; distribution subject categories and journals, and; analysis of author keywords and index keywords.

## 3. Results

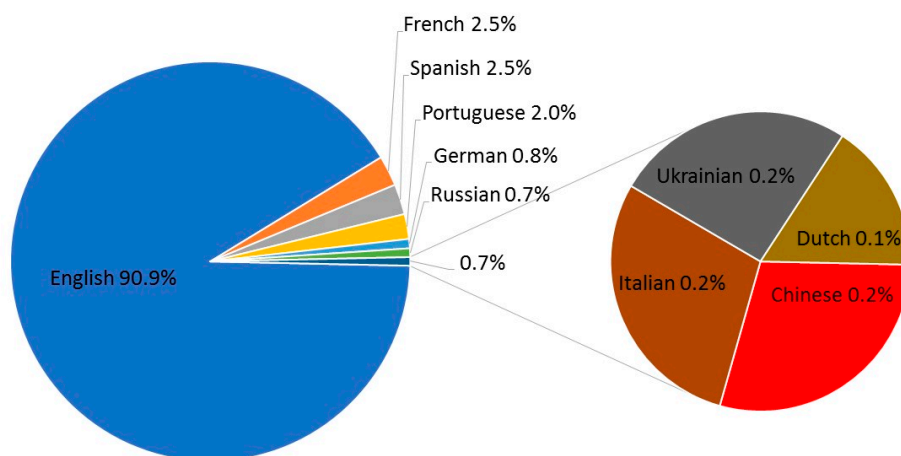
### 3.1. Types and Languages of Publications

The search yielded 4394 documents of diverse origins, primarily articles (3401; 77%), book chapters (165; 4%) and conference papers (147; 4%) (see Figure 1). Review articles were found (at a lower frequency (364; 8%), and other publication types were found at significantly lower frequencies. It is observed from this first analysis that conference papers are not a frequent source of dissemination of these studies, since it has less than 3% of the data.



**Figure 1.** Distribution of worldwide research from 1970–2016 on labour relations by type of document.

As for the language used in scientific dissemination, as expected we find English in 91% of cases, then follow with percentages slightly above 2% as French, Spanish and Portuguese, and below 1% we can find German, Russian, Ukrainian, Italian, Dutch or Chinese; see Figure 2.



**Figure 2.** Language distribution of worldwide of scientific output on labour relations.

### 3.2. Evolution of Scientific Output

Figure 3 shows the temporal evolution of the publications analysed on the subject of labour relations from 1970–2016. A certain stability of scientific production was observed up to 1997 between 40–60 publications per year. From here begins a continuous growth, observing two relative highs, for the years 2004 and 2014. Probably the highest of 2004 is due to the fact that on 1 May 2004 the countries of Eastern Europe joined the EU: Czech Republic; Cyprus; the Czech Republic; Estonia; Hungary; Latvia; Lithuania; Malta, and; Poland. This massive incorporation could motivate numerous studies from the point of view of labour relations. It should be recalled that Point 7 of the Community Charter of the Fundamental Social Rights of Workers provides, inter alia [48] that “the completion of the internal market must lead to an improvement in the living and working conditions of workers in the European Community. This process must result from an approximation of these conditions while the improvement is being maintained, as regards in particular forms of employment other

than open-ended contracts, such as fixed-term contracts, part-time working, temporary work and seasonal work”.

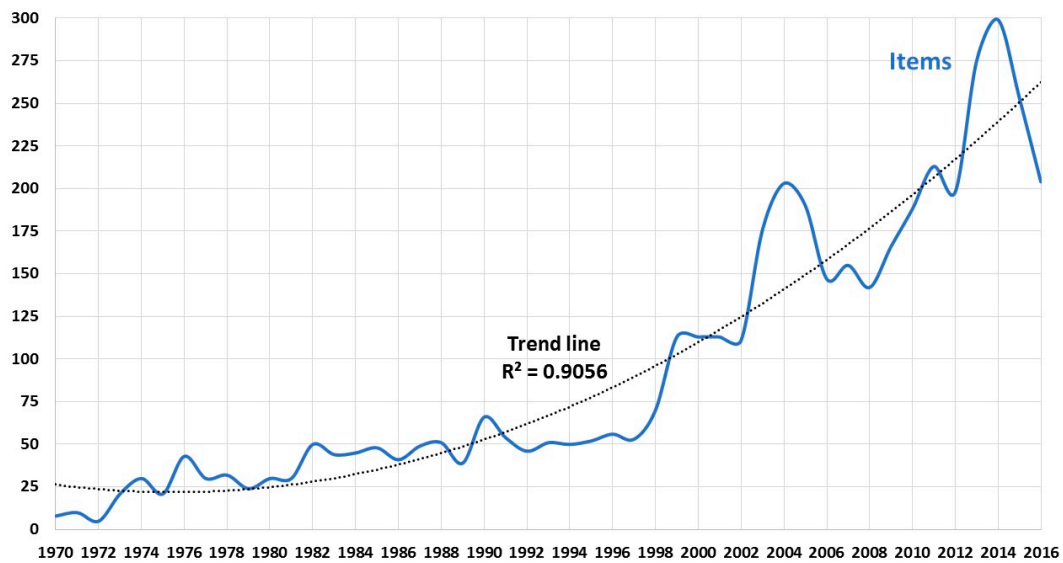


Figure 3. Trends in publications on labour relations from 1970–2016.

The other major increase in publications is the period from 2008 to 2014, and coincides with the global financial crisis from 2008 to 2014 known as the Great Recession.

### 3.3. Publication Distribution by Countries and Institutions

The countries that published the most throughout the years were from the United States, followed in second place by the UK with almost three times fewer publications; and third place is for Canada. It is observed that in general in Africa and much of Asia there is no research on this topic by these countries. Figure 4 shows scientific output by countries.

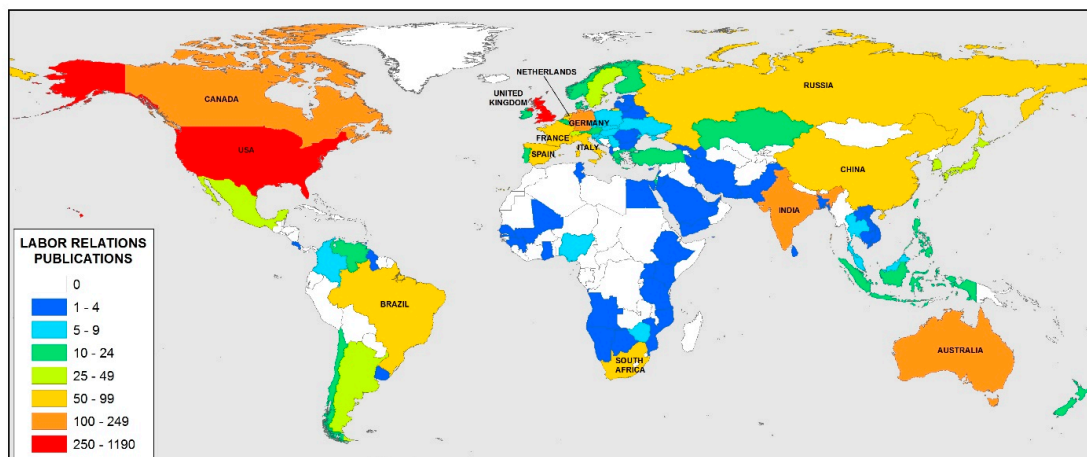


Figure 4. Worldwide research on labour relations for the period 1970–2016.

If the institutions are analysed according to the country to which they belong, it is observed that the United States has the most highly productive institutions and, therefore, is the country that marks the general trend. Nevertheless, it is observed how the UK also follows this trend; see Figure 5,

where the publications trend of only first three countries are drawn. In the case of Canada, this trend can be seen to a certain degree, but not as marked as for the United States or the UK.

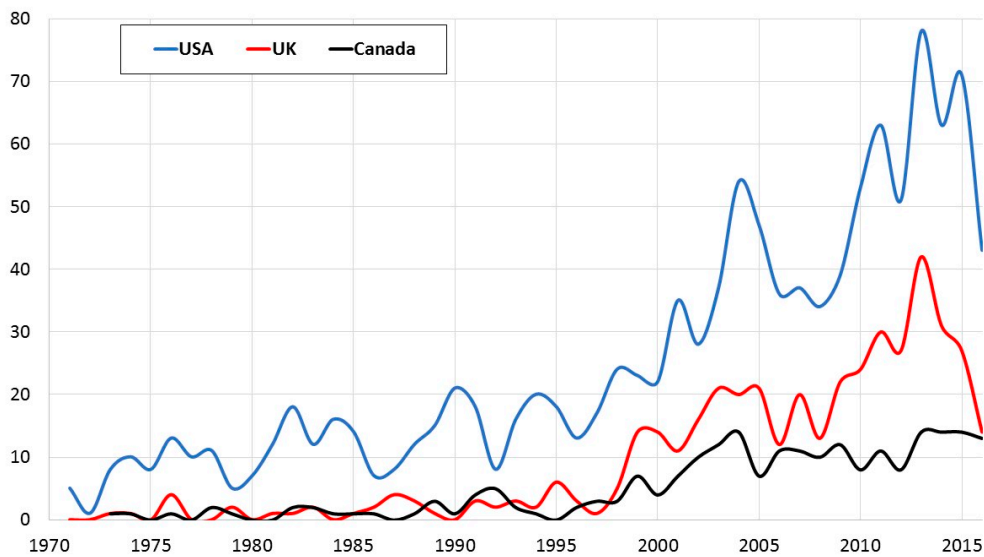


Figure 5. Trends in publications on labour relations from 1970–2016 for the Top 3 countries.

The 10 most productive institutions are listed in Table 1 and classified as follow. First place is occupied by the most relevant institution, Cornell University (USA), followed by UC Berkeley (USA) and the London School of Economics and Political Science (UK) in third place. These institutions mainly belong to the most productive countries in this area as discussed above. If the publications of the main institutions are studied by their main keywords, it is observed that “employment” occupies the first place in four of this 10 institutions, leading this research, followed by “Trade Union” three times. If this analysis is extended to the three main keywords, “employment” appears in eight to 10 institutions, followed by “Labor market” and “Trade Union” in six of these institutions.

Table 1. Rankings of the 10 most productive institutions.

Institution	Country	Items	Main Keywords Used		
			1°	2°	3°
Cornell University	USA	37	Employment	Working Conditions	Labor Market
UC Berkeley	USA	28	Trade Union	Labor Unions	Collective Bargaining
London School of Economics and Political Science	UK	27	Employment	Globalization	Trade Union
University of California, Los Angeles	USA	24	Trade Union	Employment	Labor Market
University of Toronto	Canada	23	Employment	Workplace	Labor Migration
University of Melbourne	Australia	23	Employment	Labor Market	Trade Union
SOAS University of London	UK	23	Agricultural Labor	Capitalism	Class
York University	Canada	22	Trade Union	Employment	Labor Market
University of Manchester	UK	21	Working Conditions	Labor Market	Employment
University of Cambridge	UK	21	Labor Market	Employment	Labor Policy

### 3.4. Distribution of Output in Subject Categories and Journals

Figure 6 shows the distribution of publications by field as classified by Scopus (note that a single study may be indexed in more than one category). The highest number of publications corresponds to Social Sciences (34%), followed in second and third places by Business, Management and Accounting (20%) and Economics, Econometrics and Finance (10%) and, in fourth, fifth and sixth places, by Arts and Humanities (8%), Engineering (5%) and Medicine (5%). Every item that cannot be attributed to any of the above has been added in a single category (as others). Figure 7 shows the journals with the

most publications on labour relations research in the period under study, including only those that have more than 25 publications, resulting in a total of 15 journals, where seven are from UK, six are from USA, one is from India, one is from Canada, and one is from Switzerland.

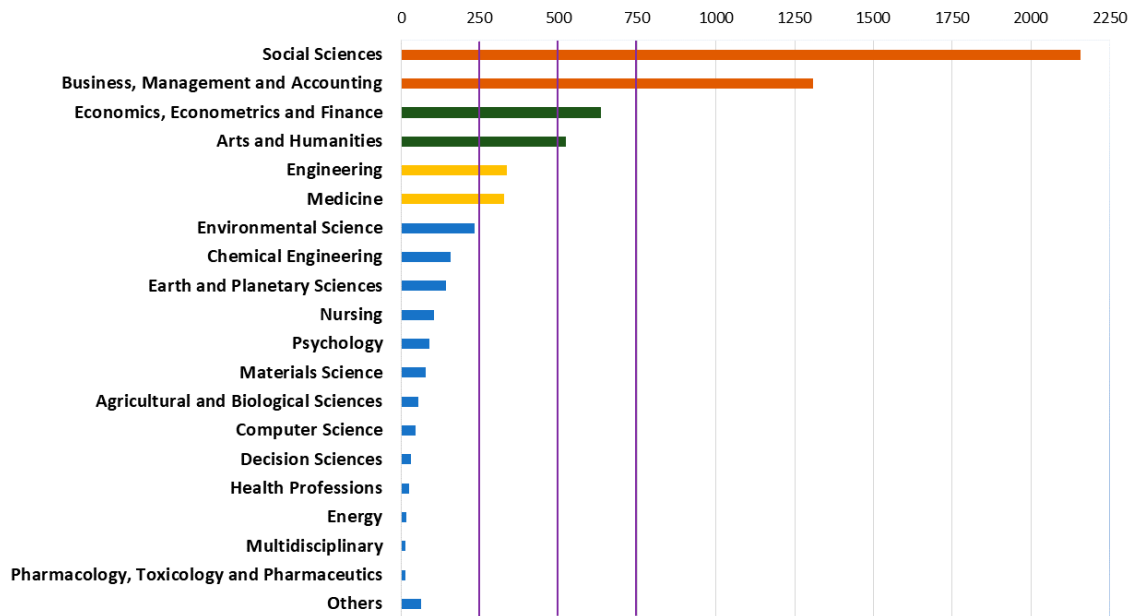


Figure 6. Distribution of publications by field, as classified by Scopus.

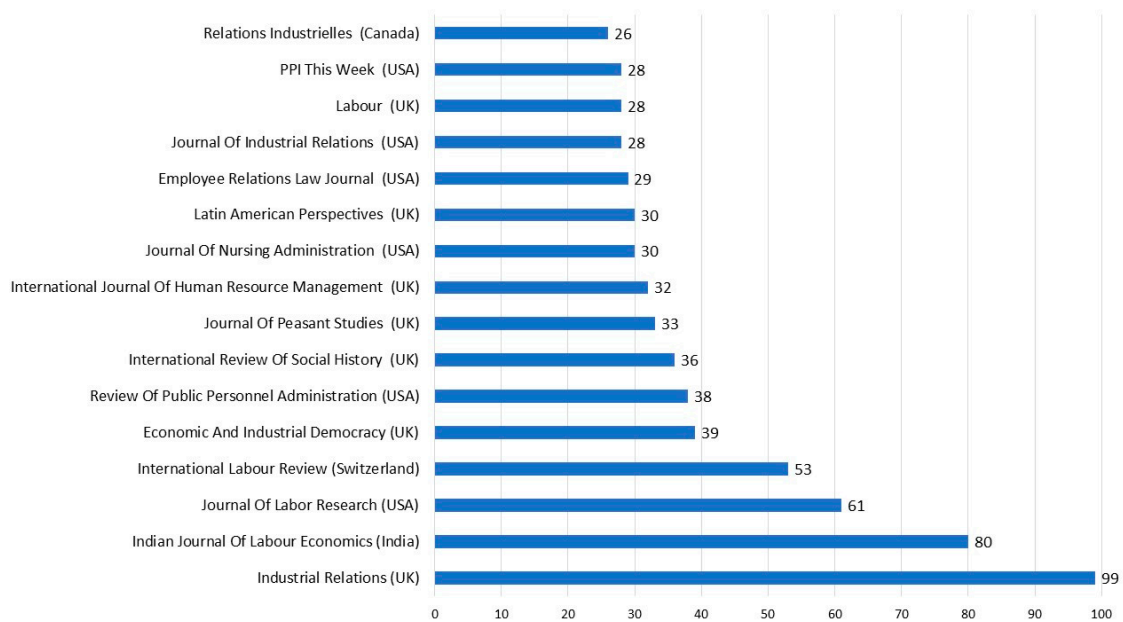


Figure 7. Main sources for labour relations worldwide research.

### 3.5. Analysis of Author Keywords and Index Keywords

Analyses of keywords in scientific articles are of great interest for monitoring and identifying trends in different fields of science [49]. Authors tend to list a set of keywords to frame their publication in the field or subject matter they consider to be most closely related to the topic of their study. It is also common for editors to complete or expand such information with additional keywords (index keywords or index terms) obtained from thesaurus databases based on the subject matter of the

text in the publication. The keyword analysis was divided into three sets: keywords which are related to a geographical area; keywords related to professions, and; topics.

Figure 8 shows the keywords related to a geographical area of the period analysed here. In the figure are marked in blue those keywords that belong to a single country; as we can see, the United States comes first, India is second, and China is third. Also, purple was used for wider geographical areas, where the Eurasia, Asia and Europe are the highlighted positions. World studies are around 39 manuscripts. It should be noted that the geographic areas of Africa, Sub-Saharan Africa or Southern Africa have a notable presence among the geographical keywords taking into account that they are not among the main countries by number of publications, nor by institutions, nor have specific journals of this subject, which denotes a great outside concern for this area.

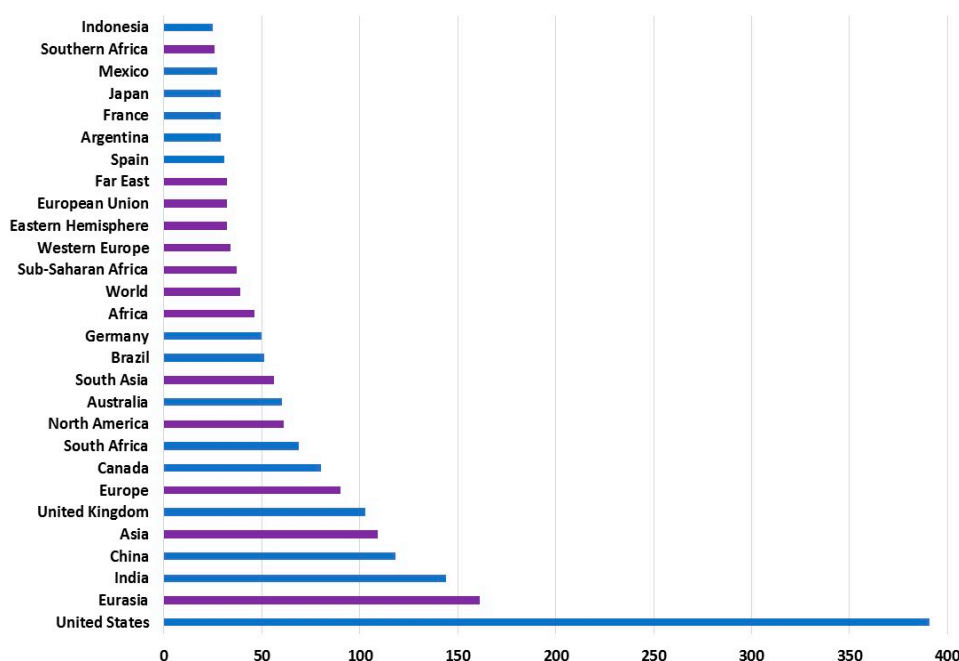


Figure 8. Worldwide keywords related to a geographical area.

Table 2 shows the keywords related to professions, where Paper and Pulp Industry occupies the first position, followed by Nursing and, in third position, by Industrial Management. The overall health and hospital professions are the more studied because we found five keywords in the top 10: “Nursing”; “Personnel Administration Hospital”; “Hospital Personnel”; “Hospital Subdivisions and Components”, and; “Occupational Health”. This data can be related to the fact of the existence of specific journals for the study of these professions in particular. Examples of where these studies are being published are, for Nursing: the *Journal of Nursing Administration*; for Paper and Pulp Industry: *Pulp and Paper*, *Pulp & Paper Week*, or *PPI Pulp and Paper International*; for Hospital Professions: *Hospitals*, *Hospital Progress*, *Hospital & Health Services Administration*.

Table 2. Keywords related to professions.

Keyword	Items
Paper And Pulp Industry	138
Nursing	105
Industrial Management	101
Personnel Administration, Hospital	79
Hospital Personnel	73
Hospital Subdivisions And Components	48

**Table 2.** *Cont.*

Keyword	Items
Education	45
Public Sector	37
Occupational Health	30
Textile Industry	30

Table 3 shows the most common keywords excluding those from geographies and specific professions. It is observed how the Trade Union leads the keywords, related to Labour Unions in sixth position. The researchers' next concern regarding labour relations has been Employment, which is also related to Unemployment and Labour Market; also, very important keywords found in this study. Another important topic is Personnel, in third position, which is related to Working Conditions and Organization and Management. Laws and Legislation occupies only the ninth position. Collective Bargaining, Wage and Economic Aspect are in 11th to 13th positions. Following these, we found another related group of keywords related to groups of disadvantaged workers: Women's Employment, Migrant Worker or Gender Relations, 14th to 16th positions, respectively. Around position 20th we can find a group of keywords related to labour as resource, that is, Manufacturing, Labour Supply, Industry, Productivity or Labour Standard. Finally, a cloud word was made in order to have a visualization of most relevant keywords, see Figure 9.

**Table 3.** Most relevant keywords related to labour relations.

Order	Keyword	Items
1	Trade Union	550
2	Employment	405
3	Personnel	352
4	Labour Market	340
5	Industrial Relations	338
6	Labour Unions	294
7	Working Conditions	288
8	Organization and Management	285
9	Laws and Legislation	243
10	Labour Policies	228
11	Collective Bargaining	227
12	Wage	213
13	Economic Aspect	107
14	Women's Employment	100
15	Migrant Worker	87
16	Gender Relations	79
17	Unemployment	73
18	Industrial Management	54
19	Human Rights	50
20	Manufacturing	50
21	Labour Supply	49
22	Industry	47
23	Productivity	47
24	Labour Standard	46
25	Marketing	46
26	Neoliberalism	46
27	Decision Making	45
28	Capitalism	44
29	Contracts	44
30	Economic Development	43
31	Income Distribution	43
32	Historical Perspective	42
33	Labour Productivity	42



Table 3. Cont.

Order	Keyword	Items
34	Societies And Institutions	42
35	Economic History	40
36	Government	40
37	Professional Aspects	40
38	Social Movement	40
39	Management Practice	39
40	Industrial Economics	38
41	Investment	38
42	Political Economy	38
43	Competition	37
44	Public Sector	37
45	Twentieth Century	36
46	Hospital	35
47	Job Satisfaction	35
48	Personnel Training	35
49	Strategic Planning	35
50	Gender	34
51	Skilled Labour	34
52	Leadership	33
53	Numerical Model	33
54	Customer Satisfaction	32



Figure 9. Cloud word based on the main keywords related to labour relations worldwide research.

Studying the evolution of the main keywords in the analysed period, see Figure 10, it is observed that there are several periods in which certain keywords are emphasized over the rest. In the period 2000 to 2003, “Trade Unions” was the most used keyword, and from here it always maintains a prominent role, being in the top positions. From the period 2002 to 2005, the last year was marked by “Industrial relations” and “Personnel”, but after this period they returned to the general group. In the last period analysed, from 2007 to 2016, “Labor Market” and “Employment” stand out, which began to be more used since 1999, and in general have been increasing since then.

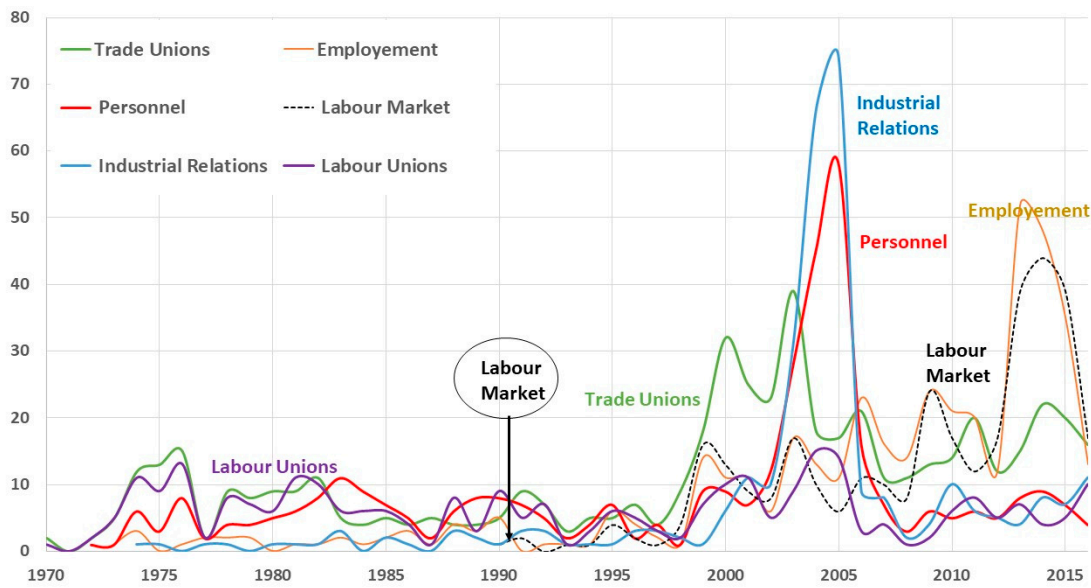


Figure 10. Keywords evolution related to labour relations worldwide research (1970–2016).

Another interesting analysis is to examine these main keywords by country; see Figure 11. It is observed how the United States, being the most productive country, leads in almost all the keywords except in two, “Labour market” and “Working conditions”, which are led by UK. Note, however, the great difference in “Laws and Legislation” and “Labour Unions” that, although they are led by the United States for the other countries, have little implication. On the other hand, a similar interest in absolute mode is shown for “Labour Policies”.

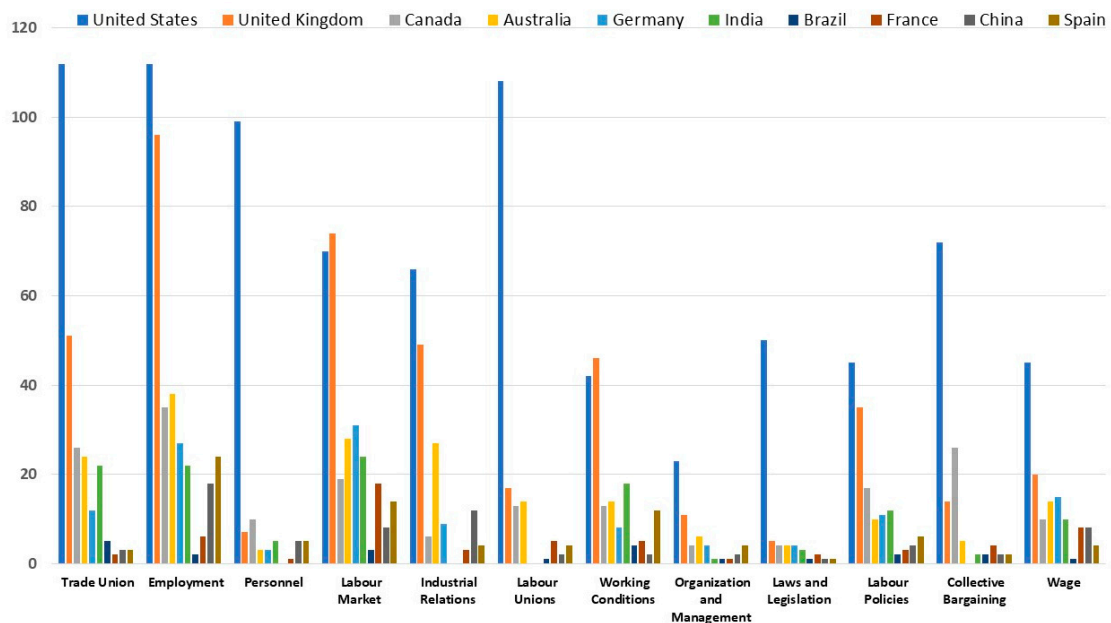


Figure 11. Main keywords by countries related to labour relations.

This study of keywords could not be complete without seeing the relative importance of the main keywords of publications for each country, whose percentages are represented by country in Figure 12. It is shown that in European countries like the UK, Germany, France and Spain, “Employment” and “Labor market” always occupy at least 40%, reflecting the concern or problem which represents in

these areas, compared to other countries like the United States or Brazil where it is close to only 20%. “Trade Unions” plays a particularly important role in Brazil and India, as well as “Working Conditions”, which is also the case in Spain, where legislation is very advanced in this regard. The keyword of “Personnel” has a lot of weight in the United States, as it appears in 10% of its publications. For Australia and China, a very important issue is “Industrial Relations”.

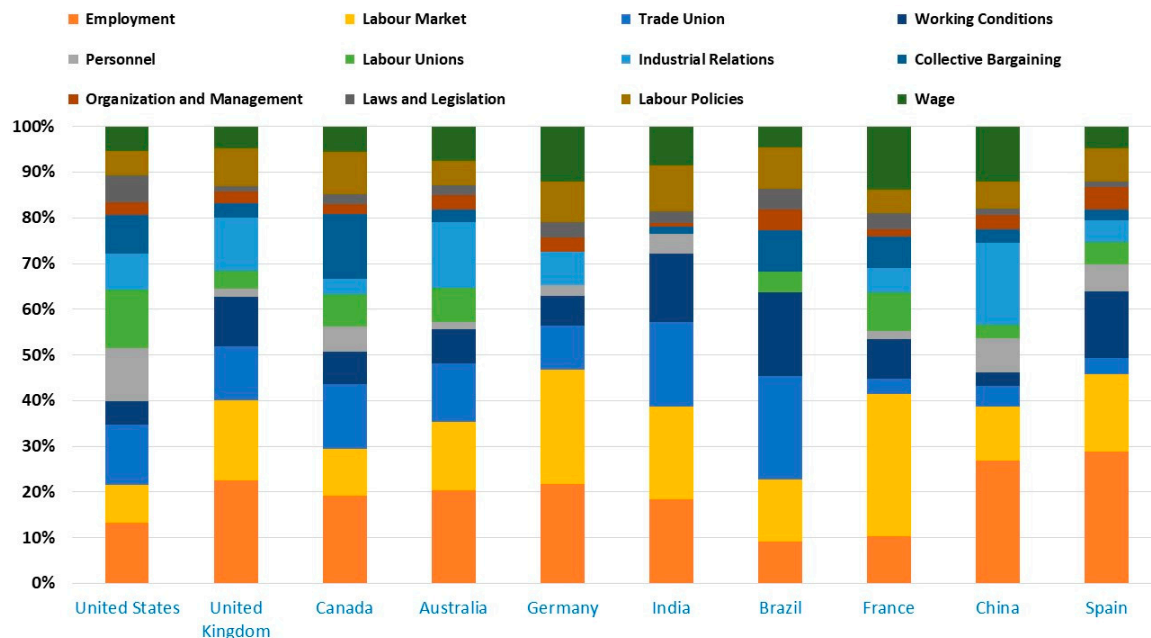


Figure 12. Distribution of main keywords by country as a percentage of their own publications.

#### 4. Discussion and Conclusions

The working world works out labour relations between team members and between the team and the rest of the institution. Labour relations influence not only the work environment but the constant exercise of each activity. They are a fundamental factor in any company, and can be a factor of success or failure of the organization itself.

Research in labour relations should play a fundamental role in this field. Specifically, the identification of opportunities for improvement, the creation of coalitions with all actors in labour relations that facilitate the transformation, the development of specific strategies to achieve concrete goals in terms of flexibility and productivity, management of resistances and barriers, the materialization of results in the short term, the creation of levers that allow to easily integrate new initiatives of change and, finally, the establishment of the metrics that allow to measure the connections of the process of change with the achieved business objectives. Within these metrics, bibliometric study can play a key role revealing the main research trends in this field.

Then, by conducting a worldwide bibliometric analysis of the topic of labour relations during the period 1970 to 2016, it has been observed that articles, including reviews, cover the 85% of communication in the topic of labour relations, as expected. In addition, these works are mainly published in English, but there is also a notable presence of the French and Spanish languages. The scientific interest in this subject has been increasing since the 1970s, reaching two historical maximums in 2004 and 2014, the first probably due by the fact that on 1 May 2004 the countries of Eastern Europe joined the EU, and the other maybe due to global financial crisis from 2008 to 2014 known as the Great Recession. Both events could have important repercussions in the world of labour relations. Regarding the countries that published the most throughout the years, the United States is in first place, followed by the UK in second place, and Canada in third place.

Given that these countries are the most productive institutions in this area, Cornell University can be highlighted as the most productive institution in the world. It has been observed that if the publications of the main institutions are studied by their main keywords, "Employment" appears in eight to 10 institutions, followed by "Labor market" and "Trade Union" in six of these institutions, highlighting the main concern for them. In the main countries involved in this research, there has been a change in the trend, from the concern for trade unions and perhaps the workplace towards employment and the labour market. This may be since in these countries working conditions and wages are acceptable, and the problem lies in the possible unemployment (employment). This question is observed geographically, where it is more accentuated in the European countries like the UK, Germany, France and Spain if they are compared to USA or Brazil. These data therefore act as an indicator, the economic evaluation of the studied countries. On the other hand, it has been seen labour law is an important issue in the field of labour relations, since it regulates the rights and obligations that it acquires from both the employer and the employee, as well as the state. For example, a key aspect is the value of the labour force that must correspond with the academic level, professional and experience in the economic sector to which it belongs; for that reason is of vital importance the collective bargaining.

Regarding the Subject Area, Social Sciences and Business, Management and Accounting collect more than 55% of the scientific output in this field. The analysis of the keywords reveals how certain geographic areas are specially studied by the outside as is the case of Africa, and in particular Sub-Saharan Africa and Southern Africa. If we pay attention to a single country, it is the United States, followed by India and China. The others keyword analysis related to jobs or related to industries specifically shows Paper and Pulp Industry in first position, followed by Nursing. Finally, the most studied topic related to labour relations are Trade Union, Employment, Personnel, and Labour Market, but there has also been concern about Working Conditions and Organization and Management or Laws and Legislation. Finally, there is a set of topics related to groups of disadvantaged workers, which were Women's Employment, Migrant Worker or Gender Relations. The labour market increasingly demands better labour relations between its professionals. Therefore, it is also necessary to consider that part of this development effort must be a result of constant research in this sense of labour relations, which should be directed towards an improvement in the economy and therefore of the workers, and ultimately of the society as a whole.

**Acknowledgments:** The authors would like to thank to the CIAIMBITAL (University of Almeria, Ceia3) for its support.

**Author Contributions:** E.S.-M. and F.M.-A. conceived, designed the search and wrote the paper.

**Conflicts of Interest:** The authors declare no conflict of interest.

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