

The Situation of Management Research in Peru. A Bibliometric Analysis in the Bicentennial

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Abstract

In 2021, Peru celebrated 200 years of independence, marking an important milestone in its history, which leads us to the following question: In these 200 years, how much progress has been made in business studies in Peru? We found bibliometric analysis to be the most appropriate method to answer this question. The software used to analyze the interrelationships between articles was Vosviewer, a software that allows the creation and visualization of bibliometric networks. Using the search terms "Peru" and "Business", we retrieved 908 articles from the Scopus Database.

Keywords: Bibliometric Analysis, Business, Peru, Scopus, Vosviewer

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La Situación de la Investigación Gerencial en el Perú. Un análisis bibliométrico en el Bicentenario

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Abstract

En el 2021, el Perú cumplió 200 años de independencia, marcando un hito importante en su historia, lo que nos lleva a la siguiente pregunta: En estos 200 años, ¿cuánto se ha avanzado en los estudios empresariales en el Perú? Encontramos que el análisis bibliométrico es el método más apropiado para responder a esta pregunta. El software utilizado para analizar las interrelaciones entre artículos fue Vosviewer, un software que permite la creación y visualización de redes bibliométricas. Utilizando los términos de búsqueda "Perú" y "Negocios", se procesaron 908 artículos encontrados en la base de datos Scopus.

Palabras clave: Análisis bibliométrico, Negocios, Peru, Scopus, Vosviewer

Introduction

Business and management studies in South American countries are a topic of wide interest in the academic world. Studying how these countries have evolved in knowledge development, how they compare with first world countries, is a valuable source of information for future research. In 2021, Peru celebrated 200 years of independence, marking an important milestone in its history, which leads us to the following question: In these 200 years, how much progress has been made in business studies in Peru? We believe that answering this question is relevant to explore the current level of research on Peru and business. We found a bibliometric analysis to be the most appropriate method for this purpose.

These studies use a variety of bibliometric data to get a general idea of the current level of research on a specific topic. This type of studies is popular in the scientific world, and can be found applied into different topics such as social sciences, psychology, economics, business, entrepreneurship, among others (Pineda Escobar & Merigó, 2020). One of the most popular bibliometric data for this type of studies is the data on citations and references of scientific articles.

The use of citation analysis allows a quantitative study to be made of bibliometric data related to citations of scientific articles. These data, such as, for example, the number of times scientific research or an author is cited, or the number of documents published by a researcher or scientific journal, allows to have impact or quality measures of various agents in the research field (Moed, 2019). This is why scientific research indexed in the most recognized databases, such as Web of Science or Scopus, are usually the main object of study in this type of research. In addition, these databases allow downloading the metadata of these articles containing the bibliometric information required for the study.

A bibliometric study of articles on business and Peru would show the level of studies on these topics. This will allow us to observe which are the countries with the highest production in these topics, as well as which are the most popular authors or scientific journals. Furthermore, it will be possible to observe if there are co-citation networks between researchers or countries. It is even possible to find the existence of research clusters between authors, topics, countries, scientific journals, etc.

The following sections are: the theoretical framework, which highlights the importance of studies on Peru and business; the methodology, where a description of the sample collection and the software used (Vosviewer) is made; the results, where we describe the results along with the tables and figures generated in Vosviewer; and finally, the conclusions of the study.

Methodology

The data used in this study were obtained from the Scopus database. The search terms used were "Peru" and "Business". A total of 924 articles were found in the database that met the search requirements. Articles that were in press and those from the year 2022 onwards were eliminated, leaving a total of 908 articles. Since Perú was written as "Peru" in some articles and as "Perú" in others, they were all standardized to "Peru". The metadata of these articles were exported to be used with the Vosviewer software.

The software used to analyze the interrelationships between articles was Vosviewer, a tool that allows the creation and visualization of bibliometric networks (van Eck & Waltman, 2010) and that has been used in other studies to perform bibliometric studies on business topics or journals (Dubois & Walsh, 2017; Maia & Di serio, 2017; Ferreira et al., 2017).

Vosviewer allows you to build networks consisting of items that can represent scientific articles, journals, researchers, research institutions, countries, or keywords. These items are connected by relationships representing levels of co-authorship, co-occurrence, citation, bibliographic matching, or co-citation. Vosviewer also allows you to view other data such as the number of documents published by authors, journals or countries, as well as the number of times they have been cited.

The Vosviewer software provides definitions of the 5 possible types of analysis for bibliometric analysis. Co-authorship, where the relationship of items depends on the number of documents co-authored. Co-occurrence, where the relationship of items depends on the number of documents in which they appear together. Citation, where the relationship of items depends on the number of times they cite each other. Bibliographic matching, where the relationship of items depends on the number of references they share. And co-citation, where the relationship of items depends on the number of times they have been cited together.

For purposes of this research, we analyzed co-authorship between countries, co-occurrence between keywords proposed by researchers, citation between countries, bibliographic matching of countries, and co-citation of scientific journals and researchers. All analyses were performed with the default values of Vosviewer except for journal co-citation, where the minimum number of citations was doubled to 40, in order to facilitate interpretation of the data. For co-citation by authors, only the 40 authors with the highest degree of co-citation are shown.

Results

Results of the 6 analyses are presented in tables 1 to 6. These show the items of each analysis, whether they are countries, keywords, scientific journals or researchers. Countries are indicated by the number of documents and citations attributed to them and the ratio of citations per document. Keywords defined by authors are shown with the number of occurrences. Scientific journals are indicated by the number of times they are cited. All items are followed by their total link strength according to the network analysis in Vosviewer. What the total link strength represents depends on the type of analysis performed.

Figures 1 to 6 are the graphical representations of the networks made in Vosviewer. Circles depict the items in the sample; the larger the circle, the greater the total link strength. Lines represent the existence of a relationship between items. The thicker the line, the stronger the relationship between the items. The proximity of the items also represents the strength of their relationship. Colors represent the clustering of the items.

Co-authorship per country

Co-authorship analysis allows us to see the volume of joint papers in each country. The greater the total link strength, the greater the number of co-authored papers per country. Table 1 shows the levels of co-authorship found in the sample. It is evident that the United States is the country with the highest number of citations, while Peru is the country with the highest number of published papers and has the highest linkage strength. This indicates that Peru has the highest degree of collaborative work with other countries, which is to be expected because one of the search terms for the sample is Peru. In

addition, it can be seen that the United States is the country with the second highest level of collaborative work when searching for business and Peru. Costa Rica and Uruguay are the countries with the highest number of citations per paper.

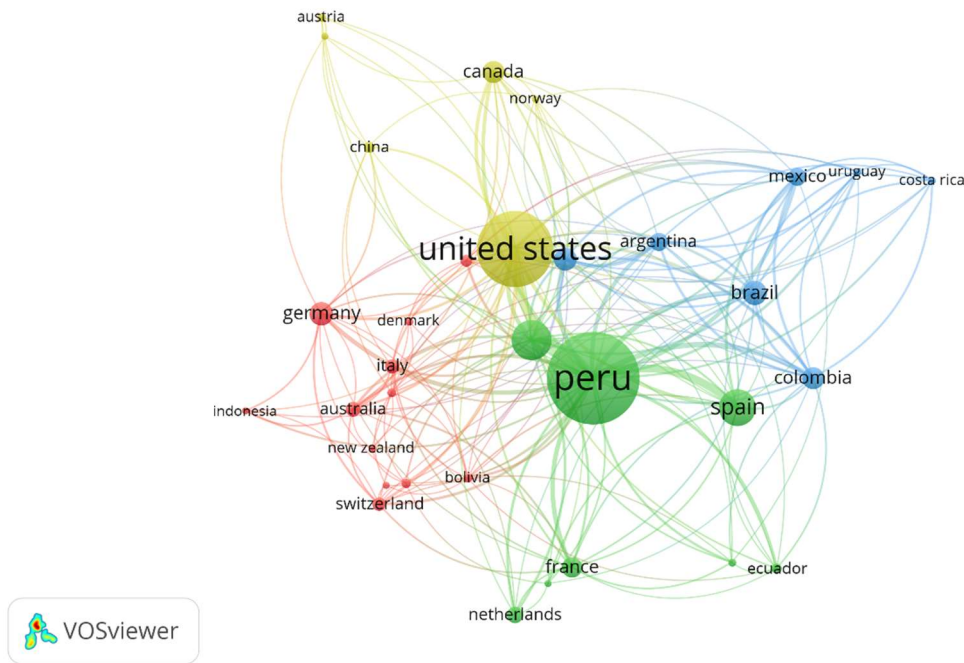
Figure 1 is the graphical representation of the co-authorship network made in Vosviewer. Circles depict the countries in the sample. Here, Peru and the United States show the highest total link strength. An interesting result is that Peru is located in a different cluster than most Latin American countries and the country with the highest number of citations, the United States.

Table 1. Co-authorship per country sorted by number of citations

Rank	Country	Documents	Citations	C/D	Total Link Strength
1	United States	246	5361	21.7926829	164
2	Peru	337	4024	11.9406528	301
3	United Kingdom	90	1614	17.9333333	89
4	Canada	35	875	25	33
5	Spain	79	768	9.72151899	78
6	Brazil	40	742	18.55	60
7	Germany	38	700	18.4210526	37
8	Chile	36	655	18.1944444	53
9	Argentina	26	613	23.5769231	55
10	France	31	524	16.9032258	42
11	Colombia	35	502	14.3428571	67
12	Mexico	26	433	16.6538462	53
13	Switzerland	16	361	22.5625	25
14	Australia	19	290	15.2631579	31
15	Italy	17	272	16	18
16	Ecuador	11	196	17.8181818	18
17	Costa Rica	6	186	31	20
18	Uruguay	6	186	31	25
19	Netherlands	22	176	8	17
20	Norway	6	165	27.5	9
21	China	12	163	13.5833333	11
22	Denmark	7	162	23.1428571	5
23	Finland	10	145	14.5	10
24	Japan	13	129	9.92307692	15
25	Bolivia	8	114	14.25	16
26	Czech Republic	5	113	22.6	4
27	Belgium	7	99	14.1428571	14
28	Austria	8	88	11	6
29	Sweden	8	75	9.375	14
30	India	5	65	13	10
31	Singapore	5	48	9.6	7
32	Indonesia	5	44	8.8	10
33	New Zealand	7	39	5.57142857	5

Minimum number of documents per country: 5
Source: own elaboration

Figure 1. Co-authorship network per country



Source: own elaboration

Co-occurrence of keywords by author

Table 2 shows the result of the keywords co-occurrence analysis per author. This analysis allows us to analyze which are the most popular keywords used by researchers. Given that one of the search criteria was "Peru", it is not surprising that this appears as the most used keyword with the highest level of matching. The most used keyword that does not involve a geographic aspect is "entrepreneurship", and the second most used keyword is "innovation". These results were to be expected since the study of innovation and entrepreneurship in third world countries is a topic of wide interest in the scientific world.

Figure 2 shows the network created in Vosviewer. "Peru" is at the center of the network and is the largest item because it has the largest link strength by a high margin. "Peru" is found in a cluster with terms such as "management", "sustainability", and "sustainable development"; and locations such as "Bolivia", "Brazil", "Ecuador" and "Andes". While "Entrepreneurship" and "Innovation" are clustered with other research topics such as "Competition", "Culture", "Development", "Economic Growth", "Microfinance", "Productivity" and "South America".

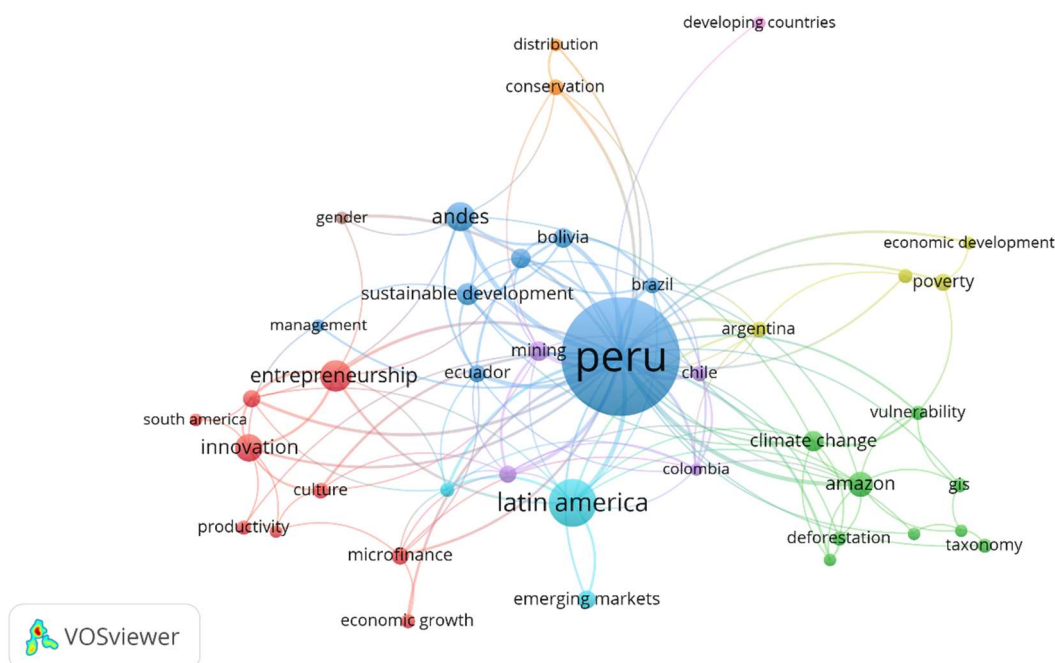
Table 2. Co-occurrence of keywords defined by authors

Rank	Keyword	Occurrences	Total Link Strength
1	Peru	171	142
2	Latin America	41	27
3	Entrepreneurship	21	16
4	Andes	19	21
5	Innovation	17	14
6	Amazon	15	18
7	Sustainable Development	12	15
8	Climate Change	11	12
9	Bolivia	10	23
10	Mining	10	16
11	Sustainability	10	10
12	Emerging Markets	9	5
13	Corporate Social Responsibility	8	16
14	Development	8	13
15	Ecuador	8	19
16	Microfinance	8	9
17	Poverty	8	6
18	Argentina	7	11
19	Brazil	7	20
20	Chile	7	12
21	Conservation	7	9
22	Culture	7	8
23	Deforestation	6	5
24	Economic Growth	6	4
25	Emerging Economies	6	13
26	Gis	6	4
27	Hiv	6	5
28	Productivity	6	3
29	Taxonomy	6	2
30	Vulnerability	6	8
31	Colombia	5	15
32	Competition	5	4
33	Developing Countries	5	1
34	Distribution	5	4
35	Economic Development	5	4
36	Gender	5	6
37	Genetic Diversity	5	4
38	Management	5	4
39	Microsatellites	5	3
40	Redd+	5	7
41	South America	5	2

Minimum number of occurrences per keyword: 5

Source: own elaboration

Figure 2. Co-occurrence network of keywords defined by authors



Source: own elaboration

Citation per country

Table 3 shows the volume of citation links per country. Peru is the country with the most citation links with other countries although the United States is the country with the highest number of citations. This result suggests that Peruvian research tends to cite research works from other countries in greater volume.

Figure 3 shows the graphical representation of the network. Here, Peru, besides being the largest item in the network, is the item with the highest number of links.

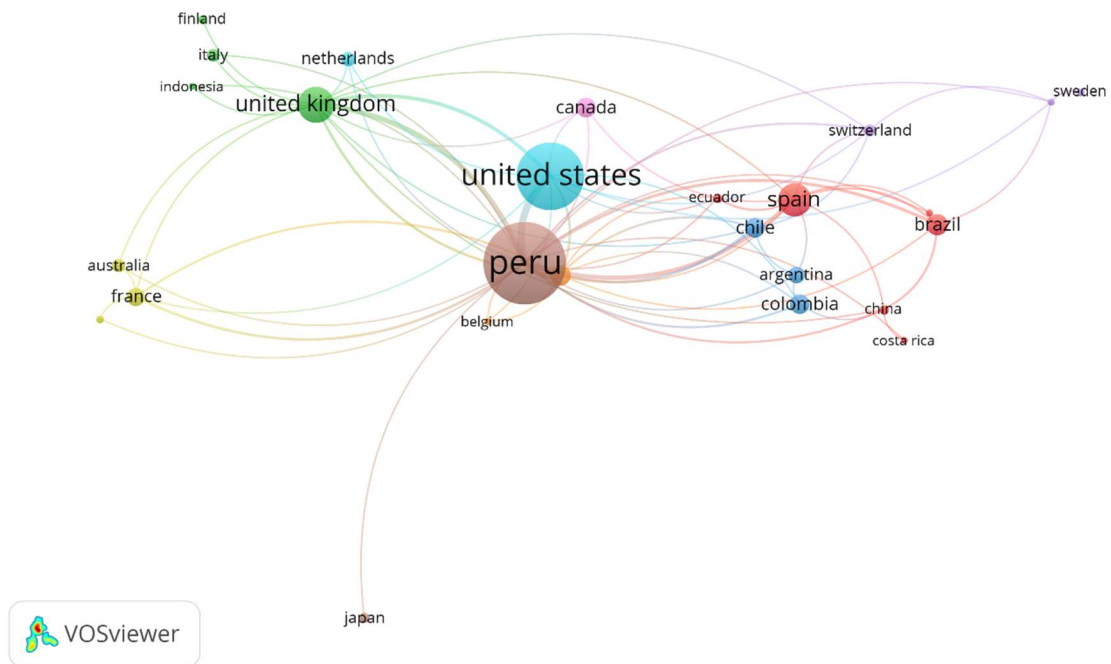
Table 3. Citations per country

Rank	Country	Documents	Citations	C/D	Total Link Strength
1	Peru	337	4024	11.94065282	88
2	United States	246	5361	21.79268293	41
3	United Kingdom	90	1614	17.93333333	32
4	Spain	79	768	9.721518987	19
5	Brazil	40	742	18.55	11
6	Germany	38	700	18.42105263	29
7	Chile	36	655	18.19444444	9
8	Canada	35	875	25	4
9	Colombia	35	502	14.34285714	6
10	France	31	524	16.90322581	9
11	Argentina	26	613	23.57692308	4
12	Mexico	26	433	16.65384615	0

13	Netherlands	22	176	8	3
14	Australia	19	290	15.26315789	3
15	Italy	17	272	16	2
16	Switzerland	16	361	22.5625	7
17	Japan	13	129	9.923076923	1
18	China	12	163	13.58333333	8
19	Ecuador	11	196	17.81818182	5
20	Finland	10	145	14.5	1
21	Bolivia	8	114	14.25	2
22	Austria	8	88	11	0
23	Sweden	8	75	9.375	2
24	Denmark	7	162	23.14285714	0
25	Belgium	7	99	14.14285714	3
26	New Zealand	7	39	5.571428571	0
27	Costa Rica	6	186	31	2
28	Uruguay	6	186	31	0
29	Norway	6	165	27.5	0
30	Czech Republic	5	113	22.6	6
31	India	5	65	13	0
32	Singapore	5	48	9.6	3
33	Indonesia	5	44	8.8	2

Minimum number of documents per country: 5
 Source: own elaboration

Figure 3. Citation Network per country



Source: own elaboration

Bibliographic matching per country

Table 4 shows the number of references that one country has in common with another. Peru and the United States are the countries with the highest number of references shared with other countries, which is to be expected since both have the largest number of published documents. It is worth noting that out of all the analyses carried out in this research, the bibliographic matching analysis has the highest linkage strength values. This result may be due to the relatively low number of scientific productions meeting the search criteria. It is possible that the low number of researches led to the fact that they share several references.

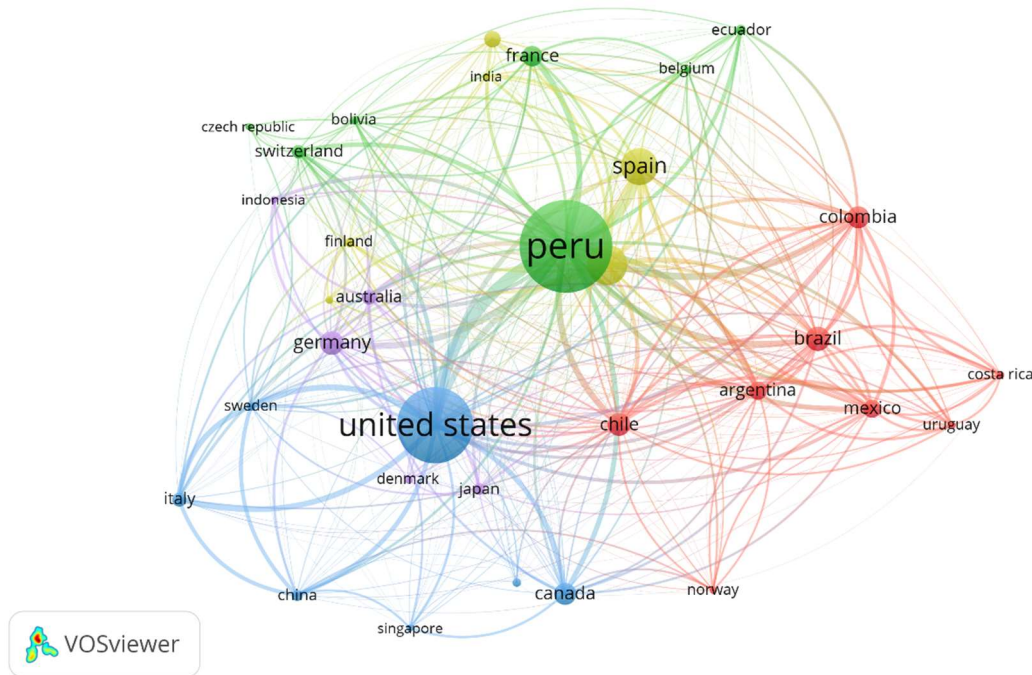
Table 4. Bibliographic matching per country

Rank	Country	Documents	Citations	C/D	Total Link Strength
1	Peru	337	4024	11.9406528	18672
2	United States	246	5361	21.7926829	11344
3	United Kingdom	90	1614	17.9333333	6697
4	Spain	79	768	9.72151899	5163
5	Brazil	40	742	18.55	3922
6	Germany	38	700	18.4210526	2772
7	Chile	36	655	18.1944444	3783
8	Canada	35	875	25	2521
9	Colombia	35	502	14.3428571	4158
10	France	31	524	16.9032258	2098
11	Argentina	26	613	23.5769231	3322
12	Mexico	26	433	16.6538462	3147
13	Netherlands	22	176	8	808
14	Australia	19	290	15.2631579	2128
15	Italy	17	272	16	2586
16	Switzerland	16	361	22.5625	1768
17	Japan	13	129	9.92307692	820
18	China	12	163	13.5833333	1876
19	Ecuador	11	196	17.8181818	1178
20	Finland	10	145	14.5	876
21	Austria	8	88	11	144
22	Bolivia	8	114	14.25	867
23	Sweden	8	75	9.375	2800
24	Belgium	7	99	14.1428571	965
25	Denmark	7	162	23.1428571	417
26	New Zealand	7	39	5.57142857	542
27	Costa Rica	6	186	31	1273
28	Norway	6	165	27.5	752
29	Uruguay	6	186	31	1340
30	Czech Republic	5	113	22.6	239
31	India	5	65	13	786
32	Indonesia	5	44	8.8	1013
33	Singapore	5	48	9.6	581

Minimum number of documents per country: 5

Figure 4 is the graphical representation of the network. As it can be seen, the relationship between the items (the curved lines) are much more pronounced in this graph compared to the other ones.

Figure 4. Bibliographic matching per country



Source: own elaboration

Co-citation per source

Table 5 shows the level at which a scientific journal is cited together with another. Due to the large number of scientific sources, the minimum number of citations was increased to 40, in order to avoid considering scientific journals from disciplines other than management and business topics. The most cited journal with the highest link strength is "Strategic Management Journal". It is evident that the journals with the highest linkage strength are those covering management and/or business topics.

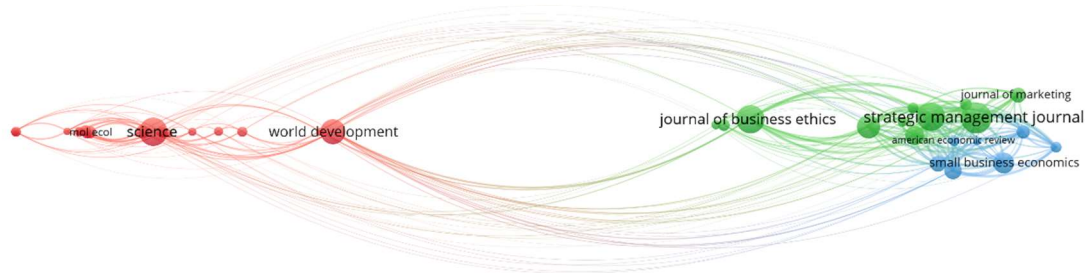
Figure 5 shows the graphical representation of the co-citation network per source. It can be seen that the network is made up of two large groups. The group on the left, formed by a cluster of journals on topics such as ecology, science, nature, biodiversity, global development, etc. The group on the right contains two clusters that include several scientific journals on management, business and economics.

Table 5. Co-citation per journals

Rank	Source	Citations	Total Link Strength
1	Strategic Management Journal	167	5949
2	Journal Of Business Ethics	153	2884
3	Science	153	1858
4	Journal Of International Business Studies	152	4101
5	World Development	133	1208
6	Academy Of Management Review	126	3584
7	Small Business Economics	111	2994
8	Academy Of Management Journal	106	3639
9	Journal Of Business Venturing	95	3084
10	Entrepreneurship Theory And Practice	87	2868
11	Journal Of Marketing	80	2239
12	Journal Of Management	71	2482
13	Nature	71	920
14	Mol Ecol	67	769
15	Energy Policy	66	231
16	Journal Of Business Research	66	1821
17	Ecology	62	912
18	Journal Of Small Business Management	62	2252
19	Plos One	60	522
20	Harvard Business Review	59	1239
21	Human Ecology	56	506
22	Theor Appl Genet	55	552
23	American Economic Review	54	729
24	American Journal Of Primatology	54	679
25	Sustainability	53	396
26	American Anthropologist	52	665
27	Journal Of Management Studies	50	1729
28	Aids	49	144
29	Conservation Biology	48	485
30	International Journal Of Primatology	48	685
31	Conserv Biol	47	608
32	Ecological Economics	47	555
33	Lancet	47	221
34	Biodivers Conserv	45	495
35	Biotropica	40	643
36	Journal Of Financial Economics	40	599

Minimum number of citations per source: 40
Source: own elaboration

Figure 5. Co-citation network per journals



Source: own elaboration

Co-citation per author

Table 6 shows the frequency in which authors are cited together. Mendo, J; Hofstede, G; and Young, K. R. are the most cited authors in the group, all exceeding 50 citations. Mendo, J. and Wolff, M. are the authors with the highest link strength by a significant amount. Although Hofstede, G. is one of the authors with the highest number of citations, he is one of the authors with the lowest level of link strength of the entire group. This may suggest that the author is usually cited on specific topics, which is why he is not usually cited with the other authors on the topics covered in this study.

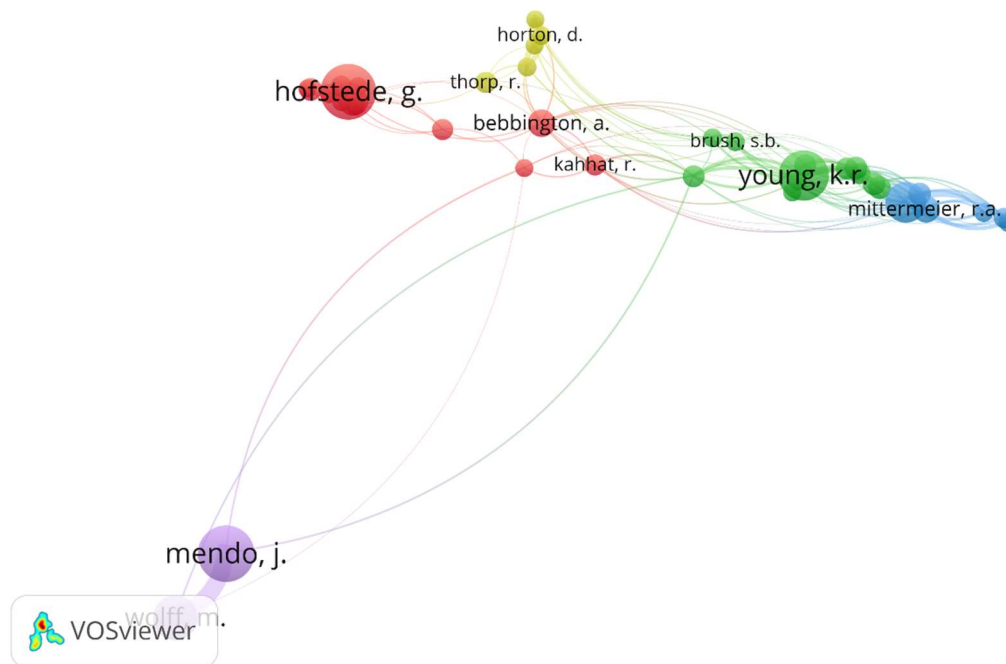
Figure 6 shows the co-citation network per author. This suggests that researchers tend to be cited more frequently with authors researching similar topics. Noteworthy is the link between Mendo, J. and Wolff, M. which is, by a large margin, the strongest link in the entire network. This indicates that these two authors are often cited together when studying these topics. Also, it is important to highlight that the two authors have the same number of links, one to each other, one to Lambin, E.F. and one to Majluf, P.

Table 6. Co-citation per author

Rank	Author	Citations	Total Link Strength
1	Mendo, J.	61	738
2	Hofstede, G.	60	48
3	Young, K.R.	54	277
4	Wolff, M.	48	729
5	Peres, C.A.	44	309
6	Porter, M.E.	32	133
7	Bebbington, A.	30	63
8	Mittermeier, R.A.	29	206
9	Sanchez, J.	28	59
10	Weber, J.C.	25	32
11	Thurik, R.	25	61
12	Malhi, Y.	25	78
13	Gentry, A.H.	25	168
14	Terborgh, J.	25	174
15	Coomes, O.T.	24	104
16	Padoch, C.	24	117
17	Lambin, E.F.	24	169
18	Porter, M.	23	21
19	Thorp, R.	23	27
20	Kahhat, R.	23	43
21	Cuervo-Cazurra, A.	23	49
22	Kalliola, R.	23	150
23	Di Fiore, A.	22	212
24	Aquino, R.	22	235
25	Mayer, E.	21	58
26	Khanna, T.	21	59
27	Shane, S.	21	62
28	Brush, S.B.	21	67
29	Barney, J.B.	21	104
30	Heymann, E.W.	21	109
31	Ortiz, O.	21	117
32	Horton, D.	21	300
33	Majluf, P.	20	25
34	Audretsch, D.B.	20	41
35	Caceres, C.F.	20	51
36	Peterson, A.T.	20	86
37	Parnell, J.A.	20	110
38	Laurance, W.F.	20	136
39	Thiele, G.	20	240
40	Devaux, A.	20	268

Only the 40 authors with the highest level of citations are shown.
Source: own elaboration

Figure 6. Co-citation network per author



Source: own elaboration

Conclusions

This study allows us to observe the level of research existing on business in Peru. More than 900 studies on the subject were found in Scopus. The bibliometric analysis shows that Peru and the United States are the countries with the most documents and citations. Peru is also the most popular country for papers on these topics as it has the highest degree of co-authorship, citation, co-citation and bibliographic matching of all countries.

The journal with the highest citation and co-citation level is Strategic Management Journal. The most popular journals for business topics in Peru are those focused on management and/or business topics. The most cited authors are Mendo, J; Hofstede, G; and Young, K. R. In addition, Mendo, J. and Wolff, M. are the authors with the most joint papers. For future work, it is recommended to work with other databases following the same search criteria to analyze the effect of the database used.

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