

Bibliometric analysis of scientific production on sharing economy

Scientific
production on
sharing
economy

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Received 25 January 2019
Revised 6 May 2019
Accepted 7 May 2019

Abstract

Purpose – In recent years, much has been discussed about new consumer practices based on the sharing economy. In this context, the purpose of this paper is to map out the international scientific production on sharing economy.

Design/methodology/approach – The research adopted a descriptive qualitative approach. Based on a sample of 95 documents collected in the Scopus database, analyses of bibliometric and sociometric indicators were carried out, as well as content analyses were conducted to identify the main thematic categories in the field.

Findings – The results show that sharing economy is an emerging topic, and of late, the research in this field has grown rapidly. The study provides a mapping of top journals and authors, works of greatest impact and of co-authorship, co-citation and bibliographic coupling networks, which evidence the low intensity of researcher's interactions and scientific production dispersion in the field. The main subjects found in the sharing economy literature are determinants, motivations and barriers, sharing economy impacts, regulation, models and frameworks, critical approach and entrepreneurship and sharing-based new businesses.

Research limitations/implications – The analyses did not take into account the timing perspective. Further research could undertake a timeline-based approach in order to present direct citation networks and to relate works according to the year when they were published.

Originality/value – The study innovates by identifying the main subjects in the sharing economy literature, as well as by presenting network analysis for some bibliometric indicators, complementing previous research in the field.

Keywords Bibliometrics, VOSviewer, Sharing economy, Co-authorship networks, Sociometrics

Paper type Research paper

1. Introduction

The sharing economy began in the 1990s in the USA, mainly as an outcome of the technological progress that led to cost cuttings in online transactions (Shirky, 2012). There are alternative versions for the term: according to Dubois, Schor, and Carfagna (2014), it was termed as online consumption; Botsman and Rogers (2009) adopted collaborative consumption; one can also find peer-to-peer markets (Einav, Farronato, & Levin, 2016) and peer-to-peer economy (Weber, 2016), among others.

Variations of this term also identified in the literature are “collaborative consumption” and “collaborative economy.” According to Botsman and Rogers (2009), a shared economy is typified by non-ownership, temporary access and redistribution of less tangible material goods or assets, such as money, space or time. In addition, these systems rely mainly on new information technologies, making this form of consumption highly accessible, flexible and easy to share. According to Gansky (2010), it is a socioeconomic system developed around the sharing of resources, human or physical, and it comprises



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Revista de Gestão
Vol. 26 No. 3, 2019
pp. 237-255
Emerald Publishing Limited
2177-8736
DOI 10.1108/REGE-01-2019-0018

the creation, production, distribution, marketing and shared consumption of goods and services by people or organizations.

Despite the variety of terms, which indicates an emerging unconsolidated theme, they all share the nature of the phenomenon in question: people selling, buying, renting or lending products and services among themselves, usually – but not necessarily – with support of IT platforms, a trend that is inserted in the environment of new organizations and new business models, which are focused on sharing (Gansky, 2010).

The growing interest in the subject has not yet materialized in broader studies aimed at mapping research in this field. Few studies on the subject have a bibliometric characteristic; hence, it is understood that this research can fill the gap in scientific literature and promote the development of this subject. Taking into account the potential impact on researching sharing economy in a broad spectrum of knowledge fields and practical contexts, this research aimed to map the international scientific production on sharing economy.

Publications in journals are commonly used as object of analysis to evaluate scientific production in a given field of knowledge, investigating parameters such as authors, research centers, keywords, citations, journals and research networks.

Bibliometric studies deal with such an approach and are understood by Lacerda, Santos, Freitas, and Alvarenga (2015) as studies from the field of information sciences aimed at quantifying what has already been published and evaluating the evolution of related areas and fields. Zupic and Cater (2015) highlighted that the basic items of bibliometric analysis are authors, publications, citations, co-citations, partnerships, co-authorships, research centers' identification, such as universities, countries and journals, as well as the interrelationship among these attributes. Thus, bibliometric studies serve as support in research guiding on emerging themes, since they are not yet consolidated in the academic–scientific environment. In this sense, this research investigates the subject “sharing economy,” still embryonic in the academic research field, mainly in Brazil.

Goulart and Carvalho (2008) argued that international scientific production has a greater impact due to the fact that it covers studies published in English; hence, international publications prepared in this language and published in the Scopus knowledge base, a comprehensive database of scientific journals, were chosen as the object of this study.

2. Literature review

2.1 *Sharing economy*

Consumption practices in the context of sharing economy are based on the exchange, sharing, rental or borrowing of goods, resources or services, usually among unknown people who seek to meet latent needs (Botsman & Rogers, 2009). Such practices do not include sharing activities without compensation involved, such as donations, since this modality implies permanent transfer of ownership (Belk, 2014a).

Study topics on sharing economy are diverse. Teubner and Flath (2015) and Weber (2016) discuss information technology. Legal and regulatory aspects are also a subject of study, such as those of Morgan and Kuch (2015), Miller (2016) and Nerinckx (2016). Other studies address the impact of sharing economy in specific sectors of the economy, such as McArthur (2015) and Wekerle and Classens (2015) for agriculture, Germann Molz (2013) and Cheng (2016) for tourism and hospitality and Ballús-Armet, Shaheen, Clonts, and Weinzimmer (2014) and Shaheen, Chan, and Gayno (2016) for the transport and urban mobility sector, among others.

Other research trends in the field of sharing economy have discussed its link with sustainable consumption and the impacts on sustainability and the environment (Cohen & Muñoz, 2016; Light & Miskelly, 2015), or used behavioral approaches seeking to understand the determining factors of people's engagement in collaborative consumption (Böcker & Meelen, 2017; Hamari, Sjöklint, & Ukkonen, 2016; Santana & Parigi, 2015).

From a marketing perspective, the sharing economy has spread owing to the internet (Belk, 2014b) and the advancement of other communication and information technologies (Kathan, Matzler, & Veider, 2016), driving the emergence of several companies and categories of new business models (Cohen & Kietzmann, 2014).

Given this diversity in both the thematic approaches and business models emerging within the sharing economy, some studies have tried to provide proper classifications and taxonomies for the phenomenon (Belk, 2014a; Lamberton, 2016; Muñoz & Cohen, 2017). However, none of these studies presented a bibliometric work aiming at mapping a given phenomenon or field of knowledge, which is the scope of this research.

2.2 Brief history on bibliometric analysis and its indicators

Araújo (2006) stated that bibliometrics appeared in the beginning of the twentieth century as a symptom of the need to study and to evaluate production activities and scientific communication. A definition that would help to understand its concept was given by Guedes and Borschiver (2005); according to them, bibliometrics is a set of laws and empirical principles that contribute to establishing the theoretical foundations of information science.

Bufrem and Prates (2005) argued that bibliometrics is a part of the measuring mechanism of the production, disclosure and use of information obtained through books or any other production type. Table I presents some important works for the consolidation of bibliometrics in the field of information sciences and the treatment given to the measurement of bibliographic productions.

Pritchard (1969) defined bibliometrics as the application of mathematical and statistical methods for the quantitative evaluation of book content and other means of communication. The original claim of the expression “bibliometrics” is credited to this author (Machado Junior, Souza, Parisotto, & Palmisano, 2016).

As the bibliometrics field evolved, empirical laws were also devised on the behavior of literature, also called bibliometric theories; Araújo (2006) listed them as researchers’ productivity law or Lotka’s law; scientific knowledge dispersion law or Bradford’s law; and word distribution and frequency law in a text or Zipf’s law, elaborated in 1926, 1934 and 1949, respectively.

Alvarado (2008) clarified that Lotka’s law defines the foundations of the inverse square law, arguing that the number of authors who make “ n ” contributions in a given scientific field is approximately $1/n^2$ of those who make a single contribution, and that the proportion of those who make a single contribution is about 60 percent or so.

Bradford’s law, on the contrary, enables, by measuring the productivity of journals, the establishment of the nucleus and the areas of dispersion on a given subject in the same set of journals (Vanti, 2002), that is, by dividing the production of a given field into zones with equal amounts of published documents, the first zones will have a smaller number of journals; as the following zones are analyzed, there will be more journals in each one of them, denoting the mentioned dispersion.

Year	Term	Author	Work landmark
1924	Statistical Bibliography	Hulme	Used the term for the use of statistics in book counting
1934	Bibliometrics	Otlet	Used the term for measurement of book content
1948	Biblioteconometrics	Ranganathan	Used the term to define statistical applications to books and other media
1969	Bibliometrics	Pritchard	Other papers (not just books) could be the subject of such studies

Source: Adapted from Bufrem and Prates (2005)

Table I.
Important works to
consolidation of
bibliometrics

Zipf's law is, in fact, subdivided into two laws (Costa Santos, 2009): Zipf's first law is related to high-frequency words in a text, and the second law is related to low-frequency words. They were based on empirical observation and analysis of word occurrence frequency in a satisfactorily long text. The premise is that higher frequency words are a sign of the central theme of a textual document.

As Machado Junior *et al.* (2016) argued, studies that statistically analyze the characteristics of publications (authors, keywords, among others) seek to quantify, describe and predict the written communication process. Communication frequency studies, written over time, identified behavior models that were established in data analysis standards. These standards were instituted in behavior principles, namely, Lotka's Law, Bradford's Law, Zipf's Law and others.

Bufrem and Prates (2005) asserted that these laws have been giving way to more complex analyses, which complement them with the purpose of mapping a certain scientific field by means of sociometric analyses, which will be applied and examined below. Among the main analyses, one may mention the networks of co-authoring, co-citation and bibliographic coupling.

Co-authoring network analysis enables the identification of how researchers, research institutions or countries are connected on the basis of the number of publications they have co-produced (Van Eck & Waltman, 2014). In a co-citation network, two publications are said to be co-cited when there is a third one that refers to them simultaneously (Small, 1973). In other words, the greater the number of papers in which two publications are jointly referred to, the stronger will be the co-citation relationship between them, and therefore the closer they will be graphically represented in the network.

According to Kessler (1963), two publications are considered bibliographically coupled if there is a third one that is cited concurrently by both. As observed by Van Eck and Waltman (2014), this analysis points out that the greater the number of citations that two publications have in common, the greater will be the bibliographic coupling between them. Graphically speaking, the nodes of a bibliographic coupling network will be closer as more citations they share, tending to address close or similar themes.

Although it does not deal with authors or publications, the keywords co-occurrence analysis, also performed in the study, enables the evaluation of their occurrence on a given basis, as well as the intensity that two keywords are simultaneously used in the same work, which suggests specific themes.

In face of the discussion above, it is argued that the efforts to quantify and analyze the production of journals, authors and their citations, and also to elaborate and analyze sociometric networks exceed the scope of studies traditionally held in this field, addressing directly or indirectly, the three most traditional bibliometric laws and their evolution.

2.3 Bibliometric studies on sharing economy

While evaluating scientific production on sharing economy, one may notice that very few bibliometric studies were carried out. In Brazil, research by Silveira, Petrini, and SANTOS (2016) addressed the sharing economy and collaborative consumption topics, identifying 44 articles written by 77 authors and published in 35 journals. The main results show that the production is relatively dispersed, as the journal with most articles published was the *Information Communication & Society*, with three papers. The *Journal of Consumer Research* was presented as the journal with the greatest impact regarding the number of citations, however, due to a specific work by Russell W. Belk, in 2010. The authors performed a systematic analysis of the literature and mapped four categories: ontology, technology, alternative of consumption and its drivers and management of collaborative businesses.

At the international level, the study by Cheng (2016) should be highlighted, which aimed to detect the theoretical foundations and the key issues underlying the sharing economy,

using both co-citation and content analysis for this purpose. A total of 66 publications were analyzed, of which, ten (higher frequency) were dedicated to tourism and hospitality. The author mapped five clusters derived from the co-citation analysis, grouping them by social lifestyle changes, consumption practice, sharing economy paradigm, trust and innovation. In turn, the content analysis showed three major lines of research: business models, nature of the sharing economy and sustainable development.

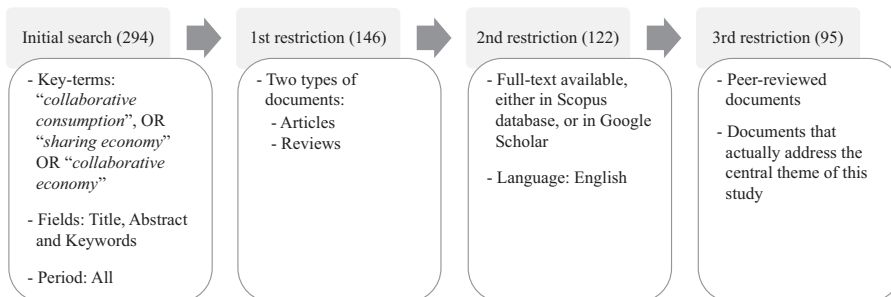
Another international study was performed by Durán-Sánchez, Álvarez-García, del Río-Rama, and Maldonado-Erao (2016). Starting from an objective similar to the one proposed in our study, the authors used descriptive analyses of authors' quantification, citations, journals and keywords, however, on a smaller base of documents. As expected, in the part in which their paper resembles the present study, the authors found results similar to those that will be discussed herein. However, the present work advances knowledge in the field in comparison to other bibliometric studies while undertaking, on a broader base of documents, a complete and detailed content analysis of the sample documents aiming at categorizing the thematic areas prevailing in the field research, and sociometric analysis, investigating networks of co-authorship, co-citation, among others, that will be discussed further.

3. Method

In order to map the international scientific production on the sharing economy, criteria were established for the systematic search of this theme in the journals of the Scopus database, as shown in Figure 1.

The database was accessed in January 2017. The most frequent terms in scientific literature on the phenomenon were taken as search keywords: "collaborative consumption," "sharing economy" and "collaborative economy" were the search key terms queried in the database from the topic fields (title, abstract and keywords). The inclusion of other related terms, such as peer-to-peer economy and peer-to-peer markets, did not increase the sample size, so the terms used were considered to be exhaustive. Other restriction criteria adopted were the type of document, language and thematic linkage, the latter being verified through transversal reading of the text, which led to a final sample of 95 documents[1].

Consolidating the sample, the study was performed on three work fronts, which rules the way the results are presented and discussed. The first aimed to map the bibliographic features of the sample: the quantitative evolution of research in the field, the authors, works and journals of greater prominence were analyzed, among others. The second front, undertaken with the support of the software VOSviewer[®], version 1.6.5, focused on the analysis of bibliometric and sociometric information of the sample, enabling the mapping of the networks of co-authoring, co-citation, bibliographic coupling and co-occurrence of keywords. Van Eck and Waltman (2014)



Source: Prepared by the authors

Figure 1.
Systematic search
process

argued that the visualization of bibliometric and sociometric networks is often performed using one of three basic approaches: distance-based, graph-based and timeline-based approaches. The VOSviewer[©] tool uses the distance-based approach, in which the relationship among the nodes of a bibliometric network is roughly determined by the distance between them: in general, the smaller the distance between two nodes, the greater is their relationship, that is, their similarity. In order to place the nodes in the network, the tool uses the VOS (visualization of similarities) mapping technique, whose calculation takes into account the strength of the association – or proximity index or even probabilistic affinity index – measured in terms of the ratio between the observed number of co-occurrences of two items (nodes) and the expected number of their co-occurrences, under the assumption that their co-occurrences are statistically independent (Van Eck, Waltman, Dekker, & Van Den Berg, 2010)[2].

Finally, in the third qualitative effort, a systematic analysis of the sample documents was performed according to some criteria set by the authors, in light of the research purposes (Tranfield, Denyer, & Smart, 2003; Bardin, 2011). Through the detailed and judicious reading of all articles by the two authors of this study, the most frequently studied thematic categories were mapped, in addition to the main methodological approaches used. In some cases – approximately 15 percent of the articles analyzed – there was divergence between the classifications assigned by the authors, either regarding the thematic category investigated or regarding the methodological approach employed by the studies. For these cases, the authors sought to reach a consensual categorization by reading and reclassifying the documents.

The three work fronts presented were sufficient to fully map the international scientific production regarding sharing economy, which is the study’s core objective, so that the results meet the precepts of the main laws of bibliometrics previously discussed.

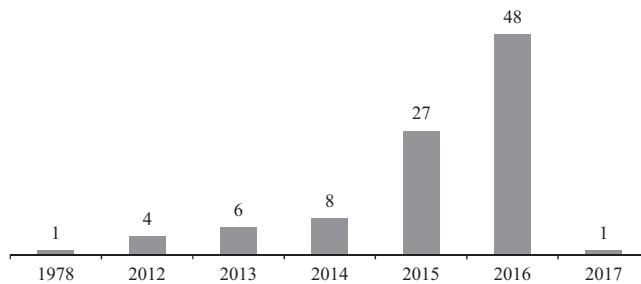
4. Results and discussions

This section initially discusses the general results obtained after a detailed analysis of all the documents in the sample. The study advanced in comparison with other bibliometric works on the subject by also discussing the networks of co-authorship, co-citations and bibliographic coupling, in addition to presenting an analysis of the main research approaches employed and a synthesis of the most frequent thematic categories in the sample.

4.1 Evolution of production in the field

The final sample of the study, with 95 articles, comprised 74 journals and 181 different authors and co-authors. Figure 2 shows how the number of articles published at Scopus database evolved depending on the search criteria defined in the research.

Pioneer in the use of the term “collaborative consumption,” the oldest document in the sample, entitled “Community structure and collaborative consumption: a routine activity



Source: Prepared by the authors (research data)

Figure 2.
Evolution of
scientific production
in the theme

approach,” was published in 1978 by Marcus Felson and Joe L. Spaeth in *American Behavioral Scientist* (Vol. 21, No. 4, pp. 614-624). In this paper, the authors define collaborative consumption as the practice of consuming together with other people (making meals with relatives, sharing a washing machine, etc.), an aspect that only tangents the concept currently linked to sharing economy. Although it cannot be taken as a seminal article – it got only three citations in Scopus – the work draws attention for inaugurating the expression in the field.

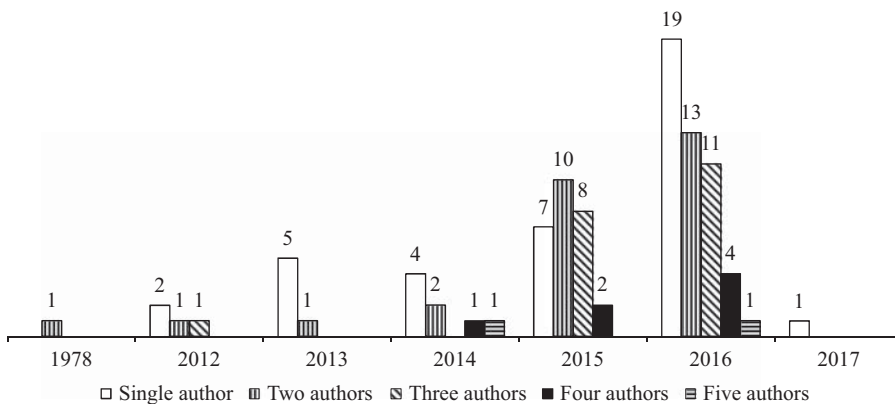
Due to the date on which the data collection in the Scopus database was carried out (January 2017), there is only one article in the sample published in 2017: This is the work “Does Craigslist reduce waste? Evidence from California and Florida” by Anders Fremstad, in *Ecological Economics* (Vol. 132, pp. 135-143), in which the author analyzes the environmental impact of asset sharing platforms, looking specifically at Craigslist, a platform created in 1995 in the USA, which enables users to advertise job opportunities, real estate, services and other items for sale. Its results suggest that Craigslist has enabled a daily reduction in solid waste generation per capita of about one-third of a pound (or ~0.150 kg), starting from the premise that the exchange and acquisition of second-hand goods through the platform avoid the acquisition – and therefore the production – of new goods, thereby mitigating the environmental impact.

There is a discrete growth between 2012 and 2014, and a jump in the production in the field in 2015 – and this was repeated in 2016. This surge in the academic–scientific production that addresses the sharing economy, especially in 2015, shows that this is an emerging theme, a field that still has much to be explored.

4.2 Composition of authorship

The growth discussed above is mirrored in the authorship composition analysis. Figure 3 shows the field production evolution according to the number of authors.

Articles produced by more than five authors were not found in the sample. There is also a strong growth in solo production from 2015 onwards, as well as in the collaborative production of two – from 2014 onwards – and three authors – from 2015 onwards. Based on the total production of the period (95 documents), 60.0 percent were performed on a co-authorship basis (more than one author), with a predominance of articles with two authors (29.5 percent) and with three authors (21.1 percent). Individual authorship was presented by 40 percent of the sample. In addition to a growing interest in the issue by the academic community, such results may suggest a trend toward the formation of research



Source: Prepared by the authors (research data)

Figure 3.
Co-authoring feature

groups focused on sharing economy and collaborative consumption, helping to improve the scientific knowledge in the field.

Additionally to the general production analysis in the field, it is important to discuss results related to particular highlights, such as journals and authors who have published more works.

4.3 Main journals in the analyzed period

Table II presents the main journals regarding the amount of documents available in the Scopus database, and therefore in the study sample.

During the analysis period, two or more articles were published by 11 journals, which accounts for 32 articles or one-third of the study sample, and 6 of these journals published three or more articles, including the *Journal of Cleaner Production* and the *Annals of Tourism Research*. However, the most notable finding herein is the dispersion of the research on sharing economy, as there is still no prominent publication in this field. One may also observe that 63 articles (two-thirds of the sample) were the only representatives of their respective journals in the period investigated. On the one hand, this may be due to the still recent research in this area, denoting a maturation process that seems to be still far from consolidation; on the other hand, this result corroborates the argument that the sharing economy can affect a wide range of sectors.

The dispersion noticed in Table II reflects Bradford's law assumptions, since there was a higher concentration of articles per journal in the first third, the so-called first zone (11 journals), and an increase in the dispersion of production in the following zones.

4.4 Most frequent authors

The dispersion of the scientific production on sharing economy can also be evidenced by the productivity analysis of the 181 authors present in the sample wherein 95 percent of them published only one document; only nine (therefore, 5 percent) published more than one article in the analyzed period, which are shown in Table III.

Only two authors had three articles in the sample: Susan A. Shaheen of University of California, Berkeley, USA, whose research on sharing economy is focused on investigating its impacts on urban mobility, specifically through car sharing systems, and Chris J. Martin of University of Manchester, England, who investigates innovative business models based on sharing economy and collaborative consumption, and the behavioral aspects that lead people to engage in sharing practices. It is also worth mentioning that the only Latin

Journals	Amount of articles
<i>Journal of Cleaner Production</i>	6
<i>Annals of Tourism Research</i>	4
<i>Interaction Design and Architecture(s)</i>	3
<i>Journal of Business Research</i>	3
<i>Ecological Economics</i>	3
<i>Information Communication and Society</i>	3
<i>Journal of Fashion Marketing and Management</i>	2
<i>Journal of Consumer Behaviour</i>	2
<i>Journal of Management Information Systems</i>	2
<i>Geoforum</i>	2
<i>International Journal of Hospitality Management</i>	2
Other	63
Total	95

Table II.
Main journals

Source: Prepared by the authors (research data)

Table III.
Main authors,
affiliations and
countries

Authors	Amount of articles	Affiliation	Country
Shaheen S.A.	3	University of California, Berkeley	USA
Martin C.J.	3	University of Manchester, Manchester	England
Cheng M.	2	University of Technology Sydney, Sydney	Australia
Belk R.	2	York University, Toronto	Canada
Cohen B.	2	Universidad del Desarrollo, Santiago	Chile
Fremstad A.	2	Colorado State University, Fort Collins	USA
Tussyadiah I.P.	2	Washington State University Vancouver, Vancouver	USA
Upham P.	2	University of Leeds, Leeds	England
Weber T.A.	2	Swiss Federal Institute of Technology, Lausanne	Switzerland

Source: Prepared by the authors (research data)

American representative was Boyd Cohen, an American researcher based in Chile, linked to the Universidad del Desarrollo of Santiago, whose works are focused on sustainability, entrepreneurship and smart cities, and their relationship with collaborative consumption practices and sharing economy.

The results discussed herein seem to confirm, even if generically, the assumptions of Lotka's law, since only a small "elite" of nine authors published more than one article in the field. Because of the small sample size, it should not be argued that they "publish a lot." Nevertheless, the immediate comparison with the other group – the other 172 authors who have published only one article – indicates the ratification of this law. It is noteworthy that the sample of documents analyzed herein was restricted to the English language as one of the survey criteria, and there may be other researchers publishing internationally in other languages not covered by this study.

4.5 Works with greater impact

Table IV shows the most often cited works among those in the study sample. Although this analysis enables to determine which works and authors are more influential on the research carried out herein, as discussed previously, it is still an emerging theme.

The table details 13 studies that had more than five citations in the analysis. These studies represent 13.5 percent of the total sample of 95 documents, and the references to them – with emphasis on the studies of Belk (2014a) and Albinsson P.A. and Yasanthi Perera B. (2012) – represent 72.5 percent of all 335 citations found in the database, which indicates that they are the works with the greatest impact on the subject. These results show the dispersion of the citations, showing a small group of authors whose works have the greatest impact in this emerging field.

4.6 Methodological approaches employed

An important contribution of bibliometric studies concerns the mapping of the methodological approaches employed in the field. Table V summarizes the main approaches of the sample studies, from an evolutionary perspective, identified according to the content analysis procedures described in the section devoted to the study methods.

Most of the studies analyzed were theoretical essays, followed by studies that used exclusively qualitative approaches. These categories account for almost 70 percent of the analyzed sample. It can also be noticed that the relative growth of publications in the form of theoretical essays is disproportionately higher than that of other approaches, with a tripled volume between 2015 and 2016. This may also be a sign of the inclusion of the sharing economy theme in new fields of knowledge.

Although it is the second most frequent group in the sample, exclusively qualitative research showed a drop in 2016 in comparison to the previous year. In turn,

Author(s) (Year)	Work	Journal	Qty. of citations	% Accumulated
Belk R. (2014b)	You are what you can access: Sharing and collaborative consumption online	<i>Journal of Business Research</i>	66	19.7
Albinsson P.A., Yasanthi Perera B. (2012)	Alternative marketplaces in the 21st century: Building community through sharing events	<i>Journal of Consumer Behaviour</i>	33	29.6
Shaheen S.A., Mallery M.A., Kingsley K.J. (2012)	Personal vehicle sharing services in North America	<i>Research in Transportation Business and Management</i>	27	37.6
John N.A. (2013)	The social logics of sharing	<i>Communication Review</i>	24	44.8
Belk R. (2014a)	Sharing versus pseudo-sharing in Web 2.0	<i>Anthropologist</i>	14	49.0
Cohen B. and Kietzmann J. (2014)	Ride on! Mobility business models for the sharing economy	<i>Organization and Environment</i>	14	53.1
Szekely F., Strebler H. (2013)	Incremental, radical and game-changing: Strategic innovation for sustainability	<i>Corporate Governance</i>	11	56.4
Germann Molz J. (2013)	Social networking technologies and the moral economy of alternative tourism: The case of couchsurfing.org	<i>Annals of Tourism Research</i>	10	59.4
Riles A. (2013)	Market collaboration: Finance, culture, and ethnography after neoliberalism	<i>American Anthropologist</i>	10	62.4
Heinrichs H. (2013)	Sharing economy: A potential new pathway to sustainability	<i>GAI</i>	9	65.1
Möhlmann M. (2015)	Collaborative consumption: Determinants of satisfaction and the likelihood of using a sharing economy option again	<i>Journal of Consumer Behaviour</i>	9	67.8
Piscicelli L., Cooper T., Fisher T. (2015)	The role of values in collaborative consumption: Insights from a product-service system for lending and borrowing in the UK	<i>Journal of Cleaner Production</i>	8	70.1
Weber T.A. (2014)	Intermediation in a sharing economy: Insurance, moral hazard, and rent extraction	<i>Journal of Management Information Systems</i>	8	72.5
	Other (45) – from one to five citations		92	100.0
	Other (37) – not cited		0	
	Total		335	

Table IV. Major impact works **Source:** Prepared by the authors (research data)

Methodological approach	1978	2012	2013	2014	2015	2016	2017	Total	% Accumulated
Theoretical essay		1	4	5	7	21		38	40.0
Qualitative only		2	2	2	13	9		28	69.5
Quantitative only	1	1		1	7	12	1	23	93.7
Quali-quantitative						6		6	100.0
Total	1	4	6	8	27	48	1	95	–

Table V. Research approaches **Source:** Prepared by the authors (research data)

quali-quantitative surveys on sharing economy had their first occurrences precisely in 2016, with six studies.

The stratification and discussions presented above seem to be in line with what occurs with themes still in the emerging phase of scientific research, since the smallest part of the studies in the sample resorted to purely quantitative approaches, which traditionally happens with research fields already widely explored.

4.7 Co-authoring networks

Figure 4 shows the main co-authoring networks of the 95 papers of the sample analyzed in this study. The association strength normalization was used by VOSviewer to normalize for differences between items in the number of linkages they have to one another. The association strength gets higher proportionally to the frequency of documents produced by a group of authors, so that their corresponding nodes are displayed more closely.

It was observed that 114 of the 181 authors in the sample had at least one citation (63 percent), a cut-off criterion applied to generate the co-authoring networks represented above. A total of 53 author clusters were identified, totaling 89 inter-author connections. The circle size represented the amount of documents each author had in the sample, highlighting the authors, Shaheen S.A. and Martin C.J., with three articles. The most linked cluster was formed by eight authors, with Shaheen S.A. being the one who had most links with the others, namely, Ballús-Armet I., Chan N.D., Clonts K., Gaynor T., Kingsley K.J., Mallery M.A., Weinzimmer D. There were also 4 four-author clusters and 12 three-author clusters. This result confirms the dispersion characteristic of the scientific production in the field.

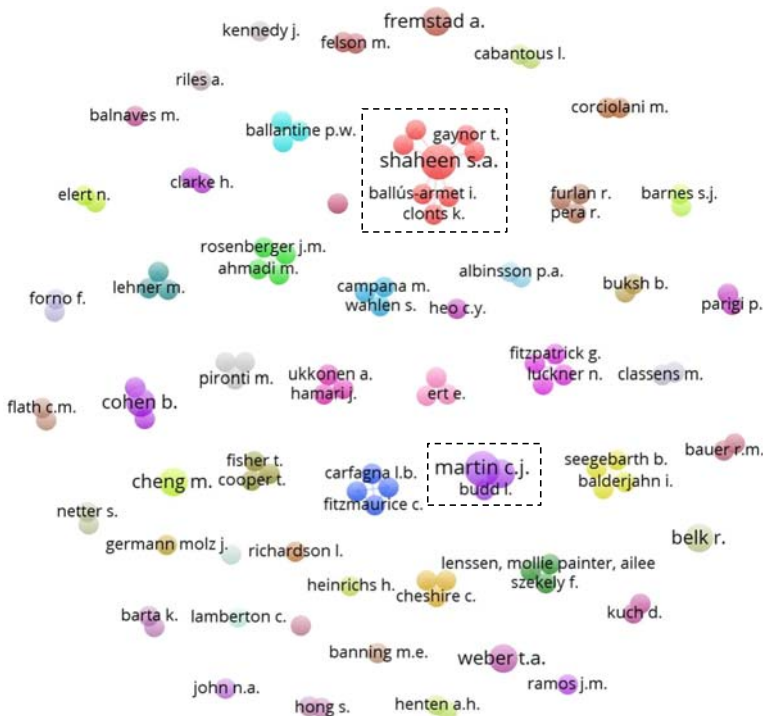


Figure 4.
Co-authoring
networks

Source: Prepared by the authors (research data)

4.8 Co-citation network

Figure 5 shows the co-citation of references relationship network. The cut-off criterion was the minimal amount of three citations, which led to a co-citation network of 20 works (nodes).

The size of each network node (circle) represents the amount of citations obtained by the respective work from other references in the network. The publications in the same cluster, therefore, have a stronger co-citation relationship.

The co-citation network was then composed of four clusters. The first is made up of six works, of which the most cited are those by Bardhi F. and Eckhardt G.M. (2012) "Access-based consumption: the case of car sharing", published in the *Journal of Consumer Research* (Vol. 39 No. 4, p. 881-898), by Lamberton C.P. and Rose R.L. (2012) "When ours is better than mine? A framework for understanding and altering participation in commercial sharing systems", published in the *Journal of Marketing* (Vol. 76 No. 4, p. 109-125), and finally, the work of Belk (2014) "You are what you can access: Sharing and collaborative consumption online", of the *Journal of Business Research* (Vol. 67 No. 8, p. 1595-1600). Apparently, this cluster concentrates works focused on behavioral traits that lead to the engagement in collaborative consumption practices, using specific cases of sharing platforms.

The second cluster, in turn, groups six research studies that address the subject of specific goods and services collaborative consumption communities. The most cited of these are the studies by Albinsson P.A. and Yasanthi Perera B. (2012) "Alternative marketplaces in the 21st century: Building community through sharing events," published in the *Journal of Consumer Behaviour* (Vol. 11, No. 4, pp. 303-315), and of Black I.R. and Cherrier H. (2010) "Anti-consumption as part of living a sustainable lifestyle: daily practices, contextual motivations and subjective values," published in the *Journal of Consumer Behaviour* (Vol. 9, No. 6, pp. 437-453).

Clusters three and four unduly present a work in common, because it was cited differently by distinct authors, resulting in a noise in the two group analyses. It is the work of Belk (2010) "Sharing," published in the *Journal of Consumer Research* (Vol. 36, No. 5, pp. 715-734), that is found in Cluster 3 with six citations and with seven citations in Cluster 4. Both group studies that address the sociocultural dimensions of the sharing economy indicate that they would actually form only one cluster. Despite the mentioned inconsistency, it is worth noticing herein the importance of this author for the scientific production in the field, since his research studies appear both in this study's sample and in the references cited by the works of this sample.

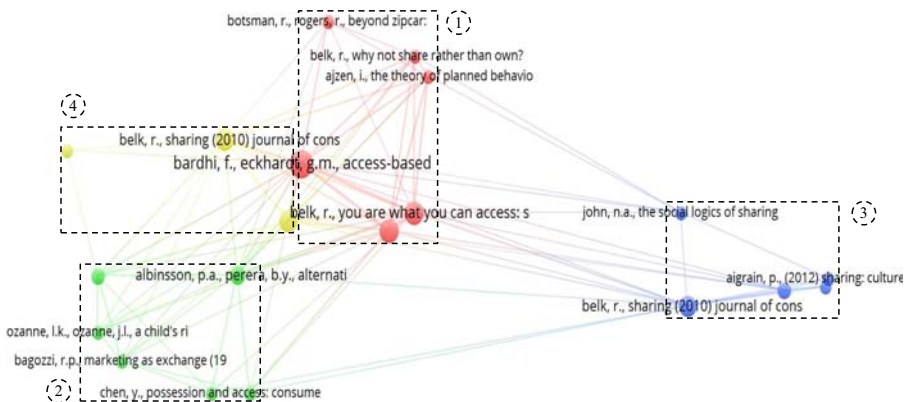


Figure 5. Publications co-citation networks

Source: Prepared by the authors (research data)

4.9 Bibliographic coupling network

Figure 6 shows the bibliographic coupling network of the works. As in other network analyses, the size of each node indicates the total number of citations made to the respective publication; the smaller the distance between two nodes, the greater will the number of bibliographic references they share, which is the criterion used by the clustering algorithm.

Adopting the cut-off criterion of the minimal of five citations, a 16 node coupling network was obtained, allocated in four clusters. The first one gathered the largest number of articles (six), highlighting the articles whose first authors are Shaheen, Mallery and Kingsley (2012) and Cohen and Kietzmann (2014) who, together with the works led by Heinrichs (2013) and Teubner and Flath (2015), address collaborative consumption and its repercussions on urban mobility systems.

In Cluster 2, consisting of four articles, discussions on social and cultural issues and processes that support collaborative consumption practices predominate, with emphasis on the work headed by John (2013).

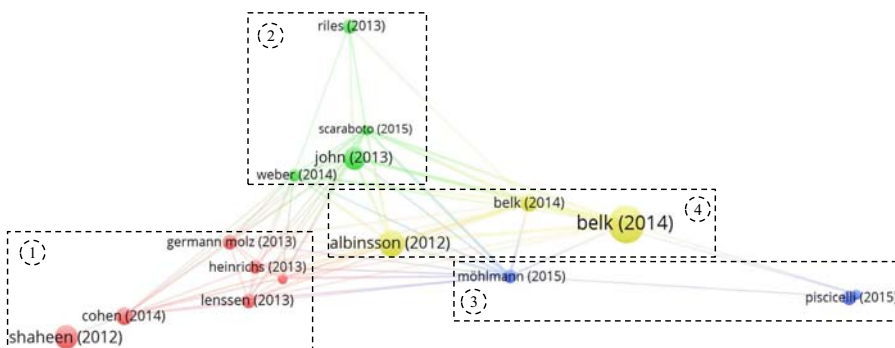
Cluster 3 grouped three publications; two of them related to values and motivations for engaging in collaborative consumption practices: Möhlmann (2015) and Piscicelli *et al.* (2015). This work is strongly coupled with the research headed by Martin, Upham and Budd (2015), despite both addressing quite different objects and themes, which is an atypical outcome.

Also featuring only three works, Cluster 4 has two studies published individually by Belk (both in 2014), in addition to the study headed by Albinsson P.A. and Yasanthi Perera B. (2012). The common feature of these works is that they discuss the characteristics of business models based on the sharing economy. Albinsson and Yasanthi Perera's work (2012) also addresses aspects inherent to social events of non-monetary exchanges, which approximates it to Cluster 2, and determinants of the propensity to engage in collaborative consumption, bringing it closer to Cluster 3, specifically to Möhlmann (2015), so that it occupies a central position in the network of bibliographic coupling.

4.10 Keyword co-occurrence network

In this type of network, the size of the nodes reflects how often they occur; in turn, their relatedness (more distant or closer) indicates the co-occurrence in a given quantity of publications. Ultimately, this analysis may also enable the detection of possible themes being investigated about sharing economy and collaborative consumption. Figure 7 presents the keywords co-occurrence network for 95 sample documents.

In order to create the network, the keywords were limited to at least two occurrences in 95 articles of the study database, leading to 33 nodes, organized in three clusters. Although Zipf's law was originally proposed for word counting throughout the body of a text,



Source: Prepared by the authors (research data)

Figure 6.
Bibliographic coupling

bibliometric studies traditionally apply keyword counting. Thus, the nodes presented in Figure 7 are, at first, those from which it is possible to infer the themes addressed by the articles in the sample.

In Cluster 1, it is possible to observe that the most frequently used keywords are “sharing,” “community,” “collaboration,” “trust” and “access-based consumption.” There are also occurrences, though minor, of “internet,” “exchange,” “commons,” “risk,” among others, suggesting that such searches may be related to aspects such as risk and trust in the exchanges enabled by sharing platforms.

Cluster 2 comprises keywords such as, in this order, “collaborative consumption,” “sustainability,” “collaborative economy,” “circular economy,” “sustainable development” and “business models.” In addition, “social innovation,” “grassroots innovation,” “carsharing,” “ridesharing,” among others, are also to be found. Such occurrences suggest that this group has concentrated research related to innovative collaborative consumption business models and their relationship with sustainability.

In relation to Cluster 3, it is possible to observe that there is only one keyword that stands out, “sharing economy,” but that is associated with expressions such as “alternative tourism,” “peer-to-peer accommodation” and “airbnb,” among others, indicating that this group has gathered research that addresses the sharing economy in the tourism industry, with alternatives for sharing accommodation, such as the Airbnb platform.

For a more in-depth and assertive approach of the main research themes in the sample, it was necessary to undertake a categorical content analysis (Bardin, 2011), also known as thematic analysis.

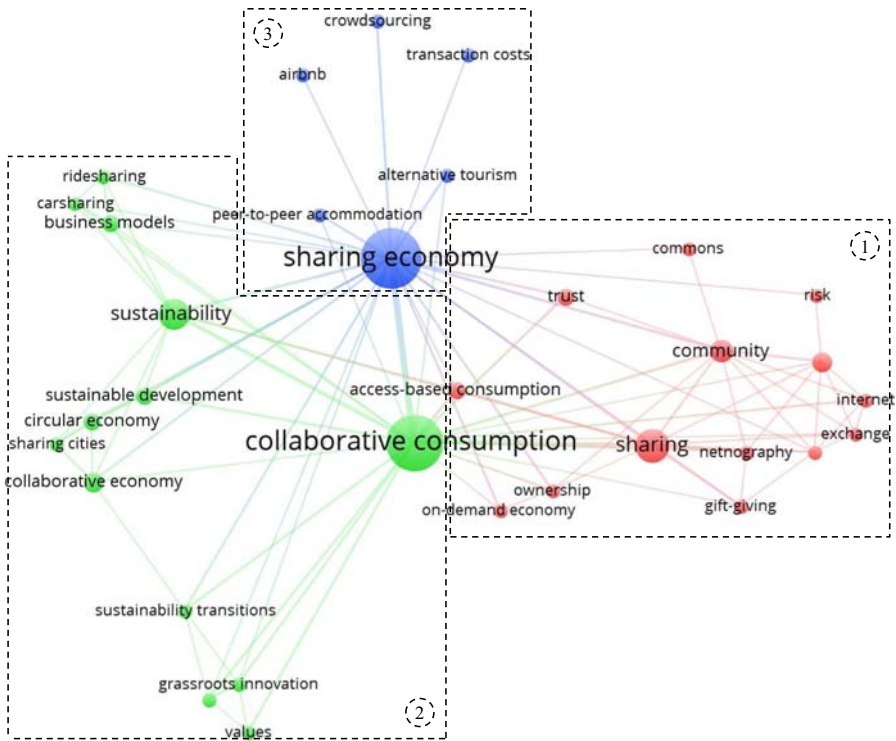


Figure 7.
Co-occurrence of
keywords

Source: Prepared by the authors (research data)

4.11 Analysis of the thematic categories

Through the reading of the abstracts of the 95 articles in the sample by the two authors separately, an initial set of thematic categories was mapped. Then, in order to confirm such categorization – in many cases, the abstract section had not clearly evinced the study object – the authors read, also separately, all the full papers, which enabled a more accurate analysis of their study objects, providing a finer adjustment in the current categorization, a task through which seven main thematic categories were identified in the field. Figure 8 summarizes the result of this content analysis, with the most frequent thematic categories in the sample.

The most frequent thematic category was determinants, motivations and barriers of sharing economy or collaborative consumption, with 29 articles, which accounts for 30.5 percent of the sample. The vast majority of these studies (27) employed empirical approaches (quantitative, qualitative or quali-quantitative) to map factors that led people – and also companies – to engage in collaborative consumption practices.

There are 18 studies (18.9 percent) that address the impacts of sharing economy, typically from an economic – referring to some economic sector – or a sustainability perspective; eight of these works were theoretical essays, and the remaining ones followed some empirical approach, with six of them resorting to quantitative methodology.

The categories regulation and models and frameworks appear, with nine articles, accounting for 9.5 percent of the sample each. Articles on regulation were mostly theoretical essays that discussed issues related to the inadequacy of the current juridical–legal apparatus to cover the consumption relations that occur based on the sharing economy, as the case of conflicts involving vehicle sharing services – such as Uber and Zipcar – and accommodation – such as Airbnb. The articles in the category models and frameworks, mostly theoretical essays, sought to propose typologies, classifications and models to explain collaborative consumption, based on the argument that this is a phenomenon still little explored.

The categories critical approach and entrepreneurship and new business brought together six articles (6.3 percent) each. The first case refers mainly to critical-dialectical empirical studies that proposed a critique of the “win-win” approach to the sharing economy, arguing, for example, that this was only a manifestation of neoliberal capitalism that aimed to make labor relations more flexible and precarious. In the second case, there are

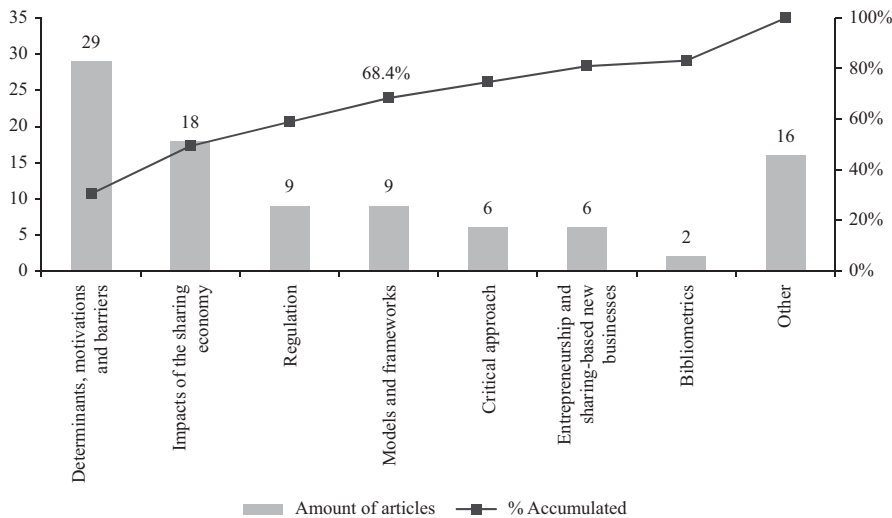


Figure 8.
Main thematic
areas studied

Source: Prepared by the authors (research data)

theoretical essays and qualitative studies that investigate entrepreneurial action and the emergence of innovative businesses based on sharing economy.

These first six thematic categories account for 81 percent of the scientific production featured in the sample. The other studies (18 articles or 19 percent) cover two bibliometric studies of themes tangent to sharing economy or works that did not fit in any of the basic categories previously mapped.

5. Conclusions

This study aimed to map international scientific production on sharing economy through the analysis of bibliometric and sociometric indicators, as well as content analysis, which enabled the identification of the main methodological approaches employed by researchers in the field, as well as international aspects of research in the sharing economy field.

Through this more comprehensive approach, not limited to descriptive analyses of authors, works, journals or keywords, the study was able to complement recent research, such as those undertaken by Cheng (2016), Durán-Sánchez *et al.* (2016) and Silveira *et al.* (2016).

The historical evolution of sharing economy has shown that such subject indicates an emerging behavior, which was corroborated by the prevalence of qualitative research approaches and theoretical essays. This suggests an opportunity to intensify studies in this field, including quantitative studies, as knowledge on the phenomenon is consolidating in the academia.

Thus, due to the still initial stage of research, countries, universities or research centers, authors or even publications that could assume the status of reference in the area could not be highlighted. In addition, the co-authoring analyses performed with the support of VOSviewer[©] showed a large number of clusters, each containing few authors. From these discussions, it was possible to observe that the dispersions of authors and journals identified in the database corroborated, respectively, the precepts of the bibliometric laws of Lotke and Bradford.

The analysis of co-citation networks enabled the identification of clusters, addressing issues such as behavioral traits that lead to collaborative consumption practices, collaborative consumption communities, and sociocultural aspects of sharing economy. Similarly, the keyword co-occurrence analysis identified three clusters, related to inherent risk and trust issues of exchanges via sharing platforms, to innovative collaborative consumption business models and their relationship with sustainability and, finally, to sharing economy in the tourism industry through accommodation sharing. To a significant extent, the topics addressed in this paper validate the categories that emerged from the complete and detailed reading of the articles, namely, determinants, motivations and/or barriers, sharing economy impacts, regulation, models and frameworks, critical approach and entrepreneurship and new sharing-based businesses. The relevance of this finding is that these tracks can offer valuable opportunities for more researchers, research groups and institutions to engage and collaborate in a field whose research is still in its early stages.

This study faced some limitations. By its nature, bibliometric studies focus on the accumulated scientific production of a given theme or field within a given period. As the results showed, in the sharing economy field, this period is very recent. Thus, it is supposed to be an emerging theme whose foundations may not have been fully established. Other major limitation may lead to new research efforts in order to overcome it: the analyses performed in this study did not take into account the timing perspective (timeline-based approach), which made it impossible to view the direct citation networks connecting articles in the database at the time of their publication. The process of mapping the sample's main themes intended to exhaust any possibility of categorical intersection, seeking, ultimately, their mutual exclusion. Despite recognizing the difficulty of this effort – divergences in about 15 percent of the categorizations evidence the nature of this limitation – the authors realize that future research can assume such categories as a starting point, which may serve as the basis for proposing a comprehensive framework on sharing economy and collaborative consumption.

Notes

1. The database containing the 95 articles of the final sample can be accessed in “comma separated values” format (.csv) by a direct request to the corresponding author or by clicking the link www.dropbox.com/s/6u8pa5u814nxz8e/scopus95.csv?dl=0
2. For a more in-depth understanding of the clustering and visualization method employed by the VOSviewer[®] tool, the authors recommend reading the works of Van Eck *et al.* (2010) and Van Eck and Waltman (2014), both cited in the References section.

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