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Research Article

A Scientometric Analysis of Supplier Selection Research

Athena Forghani [a], Seyed Jafar Sadjadi [b]*, Babak Farhang Moghadam [c]

[a] *Department of Industrial Engineering, Science and Research Branch, Islamic Azad University, Tehran, Iran*
[b] *Department of Industrial Engineering, Iran University of Science and Technology, Tehran, Iran*
[c] *Institute for Management and Planning Studies, Tehran, Iran*

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Abstract

Supplier selection (SS) is a decision-making process by which potential suppliers can be identified, evaluated, and ranked. Thus, multiple types of financial resources are used that can significantly contribute to the success of a firm. This study offers a broad view of SS publications from 1973 to 2019 through scientometric analysis recruiting Scopus, the Elsevier's abstract and citation database, as a primary search engine. The documents are also statistically classified in terms of different criteria. The research results indicate that publications have considerably grown over the past few years. Moreover, the most influential countries, institutions, journals, papers, authors, and collaborations in the field of SS literature are identified. Besides, the most-cited papers are thoroughly discussed. Finally, keywords are analyzed and hot research topics are presented. This study hopes to bring awareness to researchers, journal editors, and industries in future efforts.

Keywords: Supplier Selection; Bibliometrics; Scientometrics; Scopus; Research Evaluation

1. Introduction

Scientometrics was firstly defined by Mulchenko (1969) as "the quantitative study of research on development of science". In view of that, scientometrics refers to a research method aimed at simplifying knowledge visualization and mapping (Börner et al., 2003). The given practice correspondingly makes use of several bibliometric techniques for literature in print and is frequently applied to map the formation and the evolution of numerous subjects with reference to datasets worldwide (Chen, 2006).

In the field of supply chain management (SCM), different systematic reviews have been recently published. For example, Yalcin et al. (2020) provided a scientometric review of SCM studies published from 1998 to 2017. Focusing on research methodologies, Bhatia and Gangwani (2020) examined empirical studies on green SCM between 2001 and 2019. As well, Lizot et al. (2020) and Lis et al. (2020) analyzed papers in the field of sustainable SCM. In this line, Pournader et al. (2020), Fagundes et al. (2020), and Senna et al. (2020) reflected on supply chain risk management literature. Holgado de Frutos et al. (2020) similarly assessed 92 papers in case of operational decisions utilized in collaborative supply chains.

The present study is a scientometric review of papers related to supplier selection (SS) (Alinezhad and Seif, 2020; Sobhanallahi et al., 2019; Makui et al., 2016), which can have a substantial impact on the efficiency of the entire supply chain. Selecting appropriate suppliers can thus result in improved product quality and reduced purchasing costs, to name some outcomes (Forghani et al., 2018). Even if SS has been studied for years, there is little scientometric analysis in the related literature. This study sheds light on SS publications from 1973 to 2019 using Scopus, the Elsevier's abstract and citation database, to accomplish the these objectives through SS research analysis:

- Detecting main trends in SS literature as the first research of its kind
- Classifying leading actors under authors, papers, journals, affiliations, and countries of origin
- Illustrating co-authorship relations and collaboration status
- Presenting SS research hot topics via keyword analysis

2. Data Collection and Methodology

The data collection process in this study was performed via the Scopus repositories, as one of the widely used databases for bibliometric analysis. Since the Bibliometrix R-package is often exploited as a data mining package to conduct a systematic science mapping analysis of the literature in quantitative research (Aria and Cuccurullo, 2017), this package was programmed in R to accelerate integration with graphical and statistical packages. The bibliometrix workflow is shown in Fig 1.

To complete the scientometric analysis in this study, biblioshiny as an application for Bibliometrix providing various routines for conducting bibliometric analysis, was employed. This application helps recognize emerging trends along with key points in distinctive domains. Moreover, it is endowed with some benefits for

* Corresponding Author Email: sjsadjadi@iust.ac.ir

visualizing and analyzing scientific literature to simplify understanding of prior research by generating various graphs in a systematic manner. Visualizing can be thus of assistance in discovering implications in a substantial amount of information.

The search process was accordingly commenced by looking for the terms, "Supplier Selection", "Supplier Evaluation", "Vendor Selection", and "Vendor Evaluation" in the titles, abstracts, or keywords of the papers. The document language was basically limited to English. Book reviews, editorials, and conference papers were excluded since journal papers typically provide more comprehensive and high-quality information than other types of publications. The filtered search implemented to papers, the ones in press, and reviews published from January 1973 to October 2019 resulted in a total number of 2,582 papers in 636 journals. The search results included all essential information such as paper titles, authors' names, affiliations, abstracts, keywords, and references.

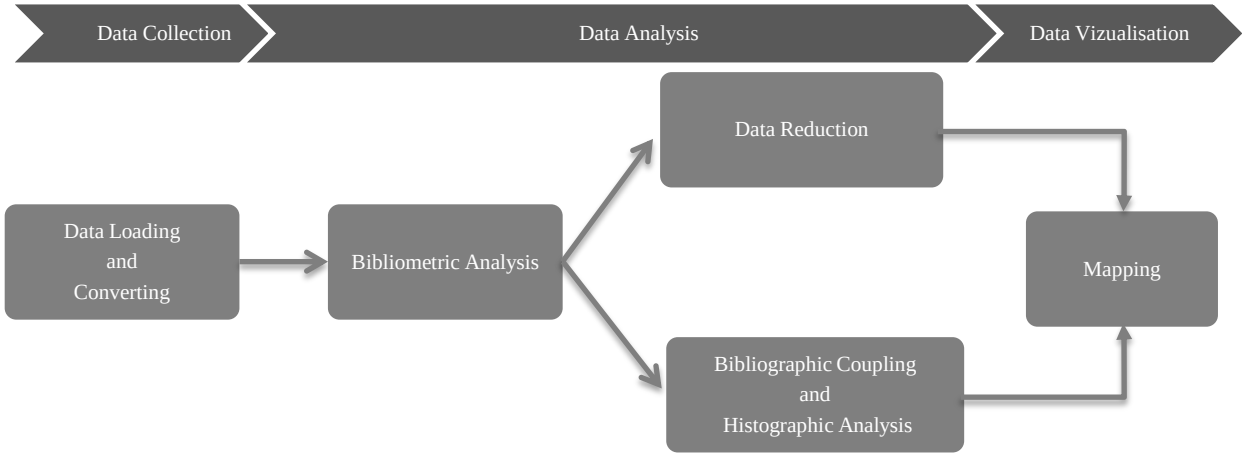

Fig 1. Bibliometrix main stages

3. Results

The initial search results are outlined in Table 1. The publications were comprised of 2,523 (97.71%) papers and 59 (2.29%) reviews. The average number of the documents published each year was about 55. The papers were also mainly from the following subject areas: "Engineering", "Computer Science", "Business, Management, and Accounting", "Decision Sciences", "Mathematics", "Economics, Econometrics, and Finance", "Social Sciences", "Environmental Science", "Energy", and "Material Science". All the documents had received 85,748 citations, and the average citation per item was roughly 33, denoting that SS has a high impact factor.

Besides, there were 4,566 authors, 259 of whom as single author, and the remaining papers had been completed through contributions of other authors. The cooperation index in this field was 1.92, which meant that each paper had been approximately written by two authors. Therefore, it was concluded that SS researchers were willing to do collaborative research.

Table 1.
Initial search results

Description	Results
Documents	2582
Article (document type)	2523
Review (document type)	59
Journals	636
Keywords plus	6251
Author keywords	4955

Description	Results
Period	1973 - 2019
Average citations per paper	33.21
Authors	4566
Author appearances	7149
Authors of single-authored papers	259
Authors of multi-authored papers	4307
Single-authored papers	334
Authors per paper	1.77
Papers per author	0.565
Co-authors per papers	2.77
Collaboration Index	1.92

3.1 Annual scientific productions

The data on the historical development of a research field can give essential clues to the underlying support structures and incentives. Therefore, the trend in publication dates is analyzed to gain information about the evolution SS research over time. Fig 2 illustrates the annual distribution of all documents. Rising scholarly interest in SS is also reflected by more than 90% of the papers published after 2006. These results are hardly surprising since there have been firm policies and financial incentives for SCM over the last two decades. In addition, it was around this period that the rigor of the research started to increase.

In this resepct, Kapriely (1973) published the first document in Scopus. In this paper, the author analyzed purchasing processes of fluid power components from various aspects, such as decision-makers' roles in selecting components and suppliers. In 2018, the number

of papers per year reached the highest of 283 (11%), but no studies were published in 1974, 1976, 1977, 1978, 1981, and 1982. Until October 2019, a total number of 244 papers are already published, and the trend indicates that a new milestone can be reached this year.

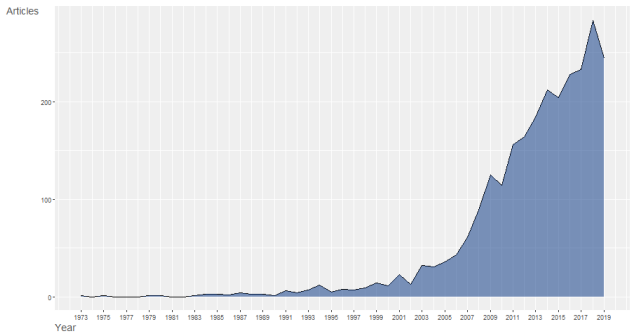

Fig 2. Annual scientific productions

3.2 Most relevant countries

Using a statistical analysis with regard to countries, the study results demonstrate that SS research has been dispersed and global. As depicted in Figs. 3 and 4, authors from China (781), the United States (the US, 695), and Iran (643), among 71 countries, have thus far made substantial contributions to the papers in this field.

It is notable that the list of the top 10 countries contains developing countries, namely, China, Iran, India, Turkey, and Malaysia, with 781, 643, 460, 195 and 100 papers, respectively.

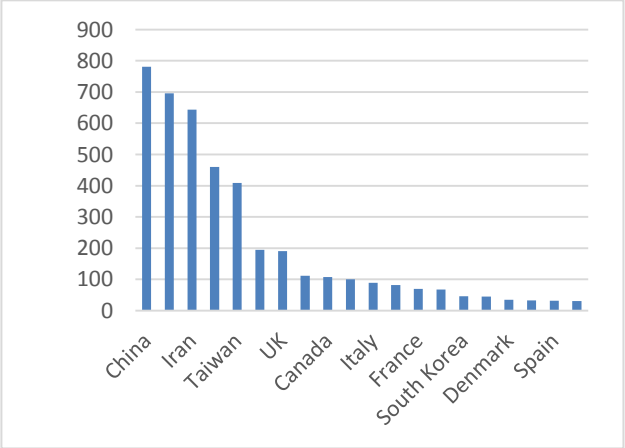

Fig 3. Top 20 countries in terms of publications

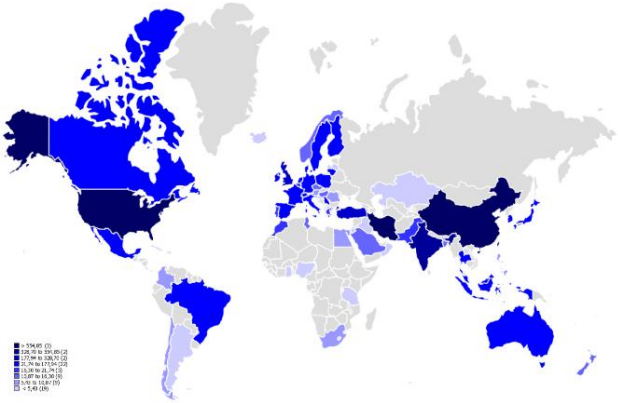

Fig 4. Scientific publication density of countries

For each country with documents in SS literature, the productivity score is correspondingly calculated using the formula, viz. *total production number/population×1,000,000* (Şenel et al., 2017). As well, Taiwan is marked the most productive country (17.20), and then there are Lithuania and Iceland (9.10 and 8.83, respectively) (Figs. 5 and 6). China is also ranked 45 even though it has been in the first place in the SS literature in terms of the total number of publications.

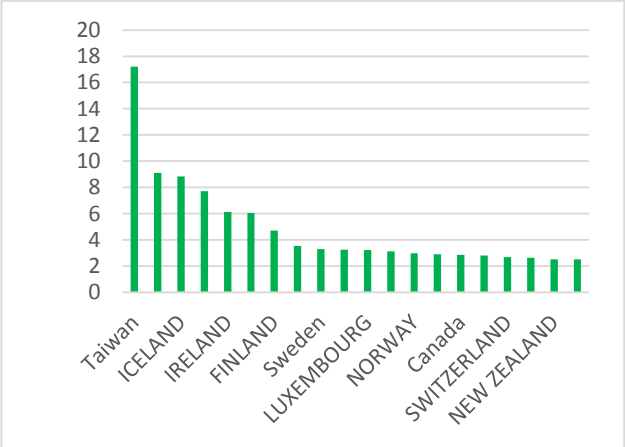

Fig 5. Top 20 countries in terms of productivity

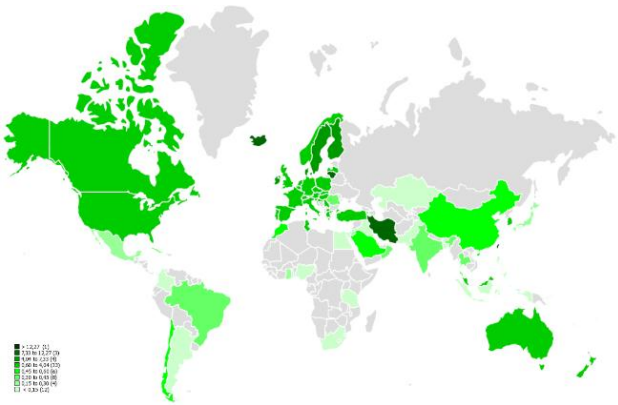

Fig 6. Scientific productivity density of countries

This study also aims to explore the network of authors collaborating in SS literature, because identification of relationships between researchers can help value research

status quo and learn about leading authors. Of note, numerous factors can shape intercontinental collaboration, e.g. settings, languages, as well as scientific research exchange rates. Nevertheless, settings also called geographical locations might not be deemed as the crucial factor for the reason that academic exchange is becoming progressively convenient with the accelerating pace of globalization and information technology.

The global collaboration map among researchers in different countries is shown in Fig 7. Each node represents a country and the node size stands for the number of publications in that country. The links between the nodes refer to the collaboration established through countries in publications and the link thickness denotes the level of cooperation between the countries.

Fig 7. Country collaboration network

The highest cooperation level is between Hong Kong and China, with a frequency of 41. After that, the China-US and the US-Iran relationships are ranked second and third, respectively, with 34 and 24 papers. Fig 7 also confirms that the US (153), China (107), and Iran (69) are the frontrunners in collaborative research. The results reveal an effective collaboration between different research communities in SS.

3.3 Most relevant affiliations

The leading institutions, their geographic locations, and the total number of publications (TP) for SS are listed in Table 2. Accordingly, "the Islamic Azad University (IAU)" (Iran) is by far the most frequent publishing institution (7.20%), followed by "the University of Tehran" (Iran) (3.49%), and "the National Institute of Technology" (India) (1.98%). It is worth mentioning that other than "the IAU" and "the University of Tehran", "Iran University of Science and Technology" (4th) and "Amirkabir University of Technology" (7th) from Iran are in the top 20 list.

Table 2.
Top 20 productive institutions

Institutions	Country	TP
Islamic Azad University	Iran	186
University of Tehran	Iran	90
National Institute of Technology	India	51
Iran University of Science and Technology	Iran	43
National Taipei University of Technology	Taiwan	40
Hong Kong Polytechnic University	Hong Kong	39
Amirkabir University of Technology	Iran	27
Indian Institute of Technology Delhi	India	26
Sichuan Normal University	China	26
National Chiao Tung University	Taiwan	25
Michigan State University	USA	24
Arizona State University	USA	23
Jiangxi University of Finance and Economics	China	21
National Taiwan University of Science and Technology	Taiwan	21
Sichuan University	China	20
University of Hong Kong	Hong Kong	20
Vilnius Gediminas Technical University	Lithuania	19
City University of Hong Kong	Hong Kong	18
Pennsylvania State University	USA	18
National Institute of Industrial Engineering (NITIE)	India	17

The network of institutional relationships also reveals that "the IAU" (Iran) has centered in the scientometric network as the most affiliated institution (Fig 8). As observed in the institutional network, "the IAU" (Iran), "Vilnius Gediminas Technical University" (Lithuania), and "the University of Tehran" (Iran) are the most collaborative institutions.

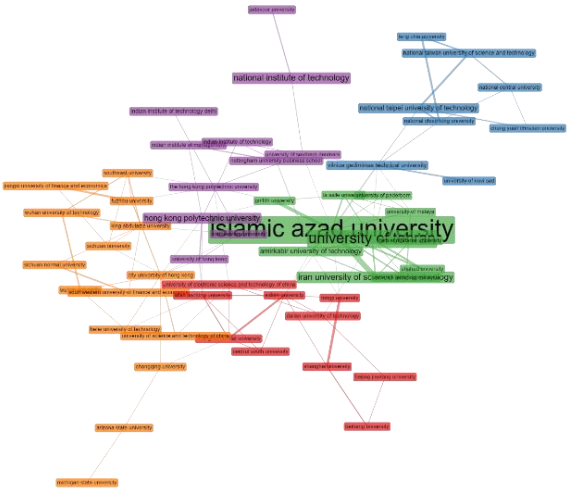

Fig 8. Institutional collaboration network

3.4 Most relevant sources

The relevant journals were analyzed according to Bradford's law (Bradford, 1934) and the total citations (TC). In this respect, Bradford found that the top third (core) of papers in a given subject area could be published in particular journals of the same subject. The middle third could be thus accepted for publication in journals related to the subject, and the remainder could be

published in a large number of journals in which the papers were not usually expected to be published.
If total papers of journals in a specific area are sorted in descending order, they can be split into groups of core journals in the first category and consequently into other categories. Table 3 shows 17 core journals in the field of SS under Bradford's law and Fig 9 is provided for further understanding of the subject.

Table 3.
Core journals under Bradford's law

Journal	Rank	TP	CumTP
International Journal of Production Research	1	129	129
Expert Systems with Applications	2	112	241
International Journal of Production Economics	3	99	340
Computers and Industrial Engineering	4	73	413
Journal of Cleaner Production	5	65	478
International Journal of Advanced Manufacturing Technology	6	45	523
International Journal of Logistics Systems and Management	7	41	564
European Journal of Operational Research	8	39	603
Sustainability (Switzerland)	9	37	640
Benchmarking	10	35	675
Mathematical Problems in Engineering	11	32	707
Applied Mathematical Modelling	12	30	737
International Journal of Services and Operations Management	13	30	767
Journal of Purchasing and Supply Management	14	30	797
Applied Soft Computing Journal	15	25	822
International Journal of Supply Chain Management	16	24	846
International Journal of Computer Integrated Manufacturing	17	22	868

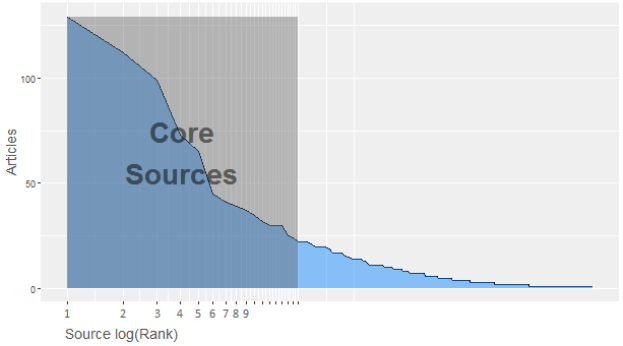

Fig 9. Core sources under Bradford's law

Fig 10 illustrates the growing trend of 17 core journals. As shown, "the Journal of Cleaner Production" and "Computers and Industrial Engineering" witnessed the fastest growth.

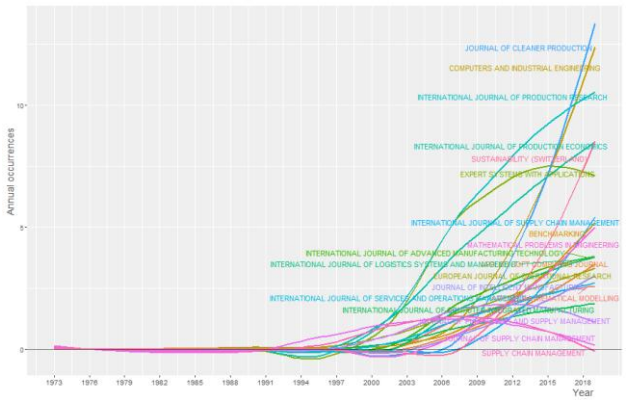

Fig 10. Growth trend of core journals from 1973 to 2019

The top 20 sources in the field of SS, according to TC, are listed in Table 4. Further information, including citations per paper (CPP), h-index (Hirsch, 2005), g-index (Egghe, 2006), and m-index (Hirsch, 2005) are also disclosed. There are 15 journals receiving more than 1,000 citations. The top citing journals based on Scopus are "Expert Systems with Applications", "the International Journal of Production Economics", and "the International Journal of Production Research", respectively.

Table 4.
Top 20 journals based on TC

Source	TC	CPP	h-index	g-index	m-index
Expert Systems with Applications	10973	97.97	61	104	3.39
International Journal of Production Economics	9175	92.68	48	95	2.18
International Journal of Production Research	5281	40.94	41	68	1.86
European Journal of Operational Research	4611	118.23	26	39	0.90
Supply Chain Management	4487	213.67	32	66	1.45
Journal of Cleaner Production	3765	57.92	25	61	2.27
Journal of Supply Chain Management	2347	106.68	20	46	0.95
Computers and Industrial Engineering	1878	25.73	26	42	0.93
Journal of Purchasing and Supply Management	1700	56.67	22	36	0.85
Applied Mathematical Modelling	1598	53.27	22	30	1.69
European Journal of Purchasing and Supply Management	1533	255.5	6	6	0.23
Applied Soft Computing Journal	1531	61.24	18	25	1.5
Computers and Operations Research	1458	85.76	15	17	1
International Journal of Operations and Production Management	1249	89.21	12	14	0.5

Source	TC	CPP	h-index	g-index	m-index
International Journal of Advanced Manufacturing Technology	1195	26.56	22	33	1.47
Benchmarking	741	21.17	13	27	0.76
Industrial Management and Data Systems	719	42.29	12	17	0.71
Industrial Marketing Management	663	39	11	17	0.27
International Journal of Physical Distribution and Logistics Management	645	107.5	6	6	0.22
Journal of Manufacturing Technology Management	557	29.32	13	19	0.81

It is notable that 11 out of these top 20 journals are among the core ones in Table 3. Thus, the journals contributing more to this research area have received relatively more citations. Other interesting findings from this list are that the subject areas of the journals are mostly relevant to industry, production, operations research, and SCM.

3.5 Most relevant papers

The study results also presented the top 20 most-cited papers on SS. Table 5 reports the most relevant papers by listing TC and average citations per year (CPY). The ranking is according to TC. The diversity of the authors of these top 20 cited papers is thus an interesting observation.

Table 5.
Most-cited papers

Paper	TC	CPY
Doney and Cannon (1997)	3314	150.64
Weber et al. (1991)	1345	48.04
Ho et al. (2010)	1073	119.22
Chen et al. (2006)	964	74.15
De Boer et al. (2001)	924	51.33
Ghodsypour and O'Brien (1998)	804	38.29
Chan and Kumar (2007)	739	61.58
Boran et al. (2009)	697	69.70
Carr and Pearson (1999)	616	30.80
Choi and Hartley (1996)	569	24.73
Krause et al. (2007)	540	45.00
Ghodsypour and O'Brien (2001)	457	25.39
Büyüközkan and Çifçi (2012)	447	63.86
Spekman (1988)	432	13.94
Chai et al. (2013)	429	71.50
Aissaoui et al. (2007)	425	35.42
Lee et al. (2009)	420	42.00
Bai and Sarkis (2010)	416	46.22
Min and Galle (2001)	393	21.83
Verma and Pullman (1998)	391	18.62

As can be seen, there is no paper published after 2012 among the top 20 ones. The reason is that the recently published works have not had a chance to gain as much tracking and typically require a longer time to build citations. In addition, an in-depth examination of these papers indicates that the focus has been merely on decision-making methods and mathematical modeling.

Review papers have similarly received high citation rates. Commonly, reviews are expected to have considerable impacts as they shed light on development, status, and future research trends in a field or a method. Accordingly, reviews can be cited by many researchers.

In terms of receiving citation reports, the paper by Doney and Cannon (1997), examining the impact of trust on relationships between buyer and seller, is the first paper among others with 3314 TC and 150.64 CPY. The second highly-cited paper has been written by Weber et al. (1991), reviewing criteria as well as analytical techniques recruited in SS process. In the third highly-cited paper, multi-criteria decision-making (MCDM) approaches have been reviewed by Ho et al. (2010).

It is noteworthy that the papers by Ghodsypour and O'Brien, published in "the International Journal of Production Economics", provide the coverage of the authors twice in this list.

3.6 Most relevant authors

It is important to know about various scholars influential in SS research since they may set the stage for further studies. Therefore, monitoring their works can provide some guidelines for future. The top 20 leading authors, publishing between 11 and 40 papers on SS are ranked in Table 6, based on the total number of papers. Further information, including TC, h-index, g-index, and m-index are also disclosed. According to the study findings, Reza Farzipour Saen, Guiwu Wei, and Jie Wang are the three top authors in terms of total papers. Based on TC, Felix Tong San Chan is the forerunner. The highest CPP is also achieved by Joseph Sarkis (161.62) with TP of 13 and TC of 2101, followed by Kannan Govindan (120.92) and Felix Tong San Chan (120.17) in terms of CPP. Reza Farzipour Saen has twice as many papers as Felix Tong San Chan, whereas both authors have the h-index of 14, which means they have 14 papers with at least 14 citations.

Table 6.
Top 20 leading authors

Authors	TP	TC	CPP	h-index	g-index	m-index
Reza Farzipoor Saen	40	839	20.98	14	24	1.08
Guiwu Wei	23	483	21	10	21	1.25
Jie Wang	21	413	19.67	8	27	0.68
Felix Tong San Chan	18	2163	120.17	14	18	0.82
Wen Lea Pearn	18	212	11.78	9	14	0.56
Satish Kumar	17	362	21.29	8	19	0.75
Xiaona Liu	16	379	23.69	8	16	0.53
Majid Azadi	16	364	22.75	8	16	1
Vipul Jain	14	577	41.21	10	14	0.63
Joseph Sarkis	13	2101	161.62	11	13	0.61

Authors	TP	TC	CPP	h-index	g-index	m-index
Kannan Govindan	13	1572	120.92	12	13	1.2
King Lun Choy	13	1048	80.62	12	13	0.67
Jafar Razmi	13	658	50.62	9	13	0.82
Tadeusz Sawik	13	594	45.69	12	13	1.09
Zhenhua Che	13	361	27.77	9	13	0.69
José A. Ventura	13	244	18.77	8	13	0.67
Siba Sankar Mahapatra	13	152	11.69	8	12	0.89
Ravi Shankar	12	612	51	9	12	0.75
Saurav Datta	12	133	11.08	7	11	0.88
Madjid Tavana	11	463	42.09	10	11	1

Comparing this list with the top 20 contributing institutions in Table 2, it can be observed that the listed institutions are represented by the more prolific authors. Thus, it may only take the work of one or two researchers for an organization to be ranked as a top performer.

3.7 Most common keywords

As the core of the literature (Tang et al., 2018), keywords are normally analyzed to identify rise and fall in various fields and to perceive hotspots by reporting keyword frequency. Through keyword analysis, research themes and interests can be further organized (Xie et al., 2008). Moreover, a high-quality summary can be obtained through keywords even though only 3-5 of them are typically inserted by authors. In this regard, word cloud, as a popular information visualization tool to express text data and keywords in a context, is practiced to evaluate SS hot topics. Fig 11 demonstrates keyword frequency in a word cloud in which keyword size corresponds to its frequency. Accordingly, SCM, supplier evaluation, and supply chain are the most popular keywords frequently used in the studies (1, 132, 284, and 205, respectively).

Fig 11. Frequency of keywords

Moreover, it is concluded that decision-making, programming, uncertainty, sustainability, genetic algorithm, logistics, and green SS are the most popular topics. Additionally, the subjects of the analytic hierarchy process (AHP), data envelopment analysis (DEA), and the technique for order of preference by similarity to ideal solution (TOPSIS) have been used as preferred methods since the inception of SS. The annual trends of these methods are shown in Fig 12. The AHP and DEA respectively reach their peaks in 2010 and 2012, and the TOPSIS has been increasingly practiced since 2008.

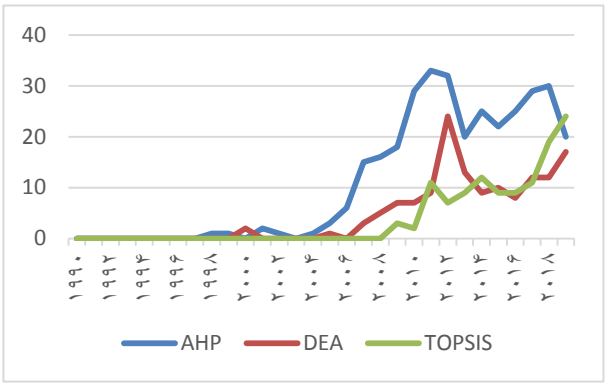

Fig 12. AHP, DEA, and TOPSIS trends

The paper by Ghodsypour and O'Brien (1998) is the most-cited SS research in which the AHP has been applied. Considering tangible and intangible factors, this paper presents the integration of AHP and linear programming to maximize purchasing total value in selecting the best suppliers.

The most-cited SS paper in DEA has been written by Liu et al. (2000). In this study, a simplified DEA model has been proposed to assess potential suppliers with the orientation to reduce the number of suppliers. The paper by Chen et al. (2006) is also the most-cited paper related to both SS and the TOPSIS. In this study, an extended version of the TOPSIS is presented to select the best suppliers in a fuzzy environment.

3. Conclusion

This study provides a clear insight into SS papers spanning 47 years of research. The bibliometric methodology is accordingly applied to analyze the trend of documents in this area, using Scopus for data collection. After searching among the titles, abstracts, and keywords in SS literature, 2582 papers were found (Access date: October 1, 2019). The set of scientometric data presented in this study can thus allow researchers and other interested parties to reach journals, papers, and authors easily. It also provides the views and tendencies of the leading researchers working on SS. Furthermore, this research is useful for journal decision-makers to obtain a comprehensive understanding of the trends to set or to develop decision-making policies.

The results show that SS publications have exponentially grown over the last two decades, and research activities have been supported globally by policy-makers. Since its inception in 1973 until 2005, the number of papers on SS has been nearly 9%, which is justifiable; since, over these

years, the concept of SS has been still in its early stage. The number of papers has been also on the rise since 2006 and has reached 209 papers in 2018.

The study results also provide valuable information on citations made to the papers on SS, including TC and the average CPY. There are 85,748 citations to 2,582 papers. This outcome offers further incentives for researchers to carry out more studies in this field.

The results correspondingly demonstrate that Asian countries, namely, China (1st), Iran (3rd), India (4th), Taiwan (5th), and Malaysia (10th), are in the list of the top 10. Based on the average citation per paper, studies published by authors in Jordan, Iceland, and Denmark have further received the highest citations. The considerable number of papers on SS suggests growing industries in the above-mentioned countries.

How researchers are connected to each other within a social network can also determine its influence. Communication activities in academic contexts can accordingly ease SS development. As a consequence of globalization and profound international exchanges scientifically over the last years, collaboration has been continuously reinforced particularly in the top three countries of the US, China, and Iran. The highest cooperation index has been also between China and Hong Kong, followed by China and the US as well as Iran and the US.

The most relevant sources are "the International Journal of Production Research", "Expert Systems with Applications", and "the International Journal of Production Economics". In this sense, "Expert Systems with Applications" has been the most-cited journal, and "the Journal of Cleaner Production" has had the fastest growth among the core ones.

Based on the number of documents, "the IAU" (Iran) tops the list, followed by "the University of Tehran" (Iran) and "the National Institute of Technology" (India). Reza Farzipour Saen is also the most active researcher based on the number of publications, followed by Guiwu Wei and Jie Wang ranked second and third, respectively. It is worthwhile noting that 16 out of 20 top institutions are based in Asia. Overall, the geographical dispersion of these institutions indicates that SS research has attracted institutions from around the world.

The limitations of this body of knowledge become apparent once the content is analyzed. As presented, keywords can speak for the core content of the publications in the field. Decision-making, programming, uncertainty, sustainability, genetic algorithm, logistics, and green SS are thus considered as the main patterns. Besides, the AHP, DEA, and the TOPSIS are respectively the most frequently used methods by scholars.

The results of this study can help scholars find methods, the hottest topics, and the most influential authors/countries/institutions to extend their research interests and to seek collaboration or academic exchange in the future. Nevertheless, there are still questions to answer, for instance, "why" and "how" research conducted so far can be further addressed. Additionally, it seems interesting to fulfill a similar analysis over the same period using different indices, such as paper influence score and p-index, as an option available for future research.

References

Aissaoui, N., Haouari, M., & Hassini, E. (2007). Supplier Selection and Order Lot Sizing Modeling: A Review. *Computers & operations research*, 34(12), 3516-3540.

Alinezhad, A., & Seif, A. (2020). Application of Fuzzy Analytical Hierarchy Process and Quality Function Deployment Techniques for Supplier's Assessment. *Journal of Optimization in Industrial Engineering*, 13(2), 279-289.

Aria, M., & Cuccurullo, C. (2017). Bibliometrix: An R-Tool for Comprehensive Science Mapping Analysis. *Journal of Informetrics*, 11(4), 959-975.

Bai, C., & Sarkis, J. (2010). Integrating Sustainability into Supplier Selection with Grey System and Rough Set Methodologies. *International Journal of Production Economics*, 124(1), 252-264.

Bhatia, M.S., & Gangwani, K. K. (2020). Green supply chain management: Scientometric review and analysis of empirical research. *Journal of Cleaner Production*, 124722.

Boran, F.E., Genç, S., Kurt, M., & Akay, D. (2009). A Multi-Criteria Intuitionistic Fuzzy Group Decision Making for Supplier Selection with Topsis Method. *Expert Systems with Applications*, 36(8), 11363-11368.

Börner, K., Chen, C., & Boyack, K.W. (2003). Visualizing Knowledge Domains. *Annual review of information science and technology*, 37(1), 179-255.

Bradford, S.C. (1934). Sources of Information on Specific Subjects. *Engineering*, 137, 85-86.

Büyüközkan, G. & Çifçi, G. (2012). A Novel Hybrid Mcdm Approach Based on Fuzzy Dematel, Fuzzy Anp and Fuzzy Topsis to Evaluate Green Suppliers. *Expert Systems with Applications*, 39(3), 3000-3011.

Carr, A.S., & Pearson, J.N. (1999). Strategically Managed Buyer-Supplier Relationships and Performance Outcomes. *Journal of operations management*, 17(5), 497-519.

Chai, J., Liu, J.N.K., & Ngai, E.W.T. (2013). Application of Decision-Making Techniques in Supplier Selection: A Systematic Review of Literature. *Expert systems with applications*, 40(10), 3872-3885.

Chan, F.T.S., & Kumar, N. (2007). Global Supplier Development Considering Risk Factors Using Fuzzy Extended Ahp-Based Approach. *Omega*, 35(4), 417-431.

Chen, C. (2006). Citespace Ii: Detecting and Visualizing Emerging Trends and Transient Patterns in Scientific Literature. *Journal of the American Society for information Science and Technology*, 57(3), 359-377.

Chen, C.T., Lin, C.T., & Huang, S.F. (2006). A Fuzzy Approach for Supplier Evaluation and Selection in Supply Chain Management. *International journal of production economics*, 102(2), 289-301.

Choi, T.Y., & Hartley, J.L. (1996). An Exploration of Supplier Selection Practices across the Supply Chain. *Journal of operations management*, 14(4), 333-343.

De Boer, L., Labro, E., & Morlacchi, P. (2001). A Review of Methods Supporting Supplier Selection. *European journal of purchasing & supply management*, 7(2), 75-89.

Doney, P.M., & Cannon, J.P. (1997). An Examination of the Nature of Trust in Buyer-Seller Relationships. *Journal of marketing*, 61(2), 35-51.

Egghe, L. (2006). Theory and practise of the g-index. *Scientometrics*, 69(1), 131-152.

Fagundes, M. V. C., Teles, E. O., de Melo, S. A. V., & Freires, F. G. M. (2020). Decision-making models and support systems for supply chain risk: literature mapping and future research agenda. *European Research on Management and Business Economics*, 26(2), 63-70.

Forghani, A., Sadjadi, S.J., & Farhang Moghadam, B. (2018). A Supplier Selection Model in Pharmaceutical Supply Chain Using Pca, Z-Topsis and Milp: A Case Study. *PloS one*, 13(8), 1-17.

Ghodsypour, S.H., & O'Brien, C. (1998). A Decision Support System for Supplier Selection Using an Integrated Analytic Hierarchy Process and Linear Programming. *International journal of production economics*, 56, 199-212.

Ghodsypour, S.H., & O'Brien, C. (2001). The Total Cost of Logistics in Supplier Selection, under Conditions of Multiple Sourcing, Multiple Criteria and Capacity Constraint. *International journal of production economics*, 73(1), 15-27.

Hirsch, J. E. (2005). An index to quantify an individual's scientific research output. *Proceedings of the National academy of Sciences*, 102(46), 16569-16572.

Ho, W., Xu, X., & Dey, P.K. (2010). Multi-Criteria Decision Making Approaches for Supplier Evaluation and Selection: A Literature Review. *European Journal of operational research*, 202(1), 16-24.

Holgado de Frutos, E., Trapero, J. R., & Ramos, F. (2020). A literature review on operational decisions applied to collaborative supply chains. *PloS one*, 15(3), e0230152.

Kapriely, S.P. (1973). Factors Governing Fluid-Power Purchases. *Instrumentation and control systems*, 46(10), 21-22.

Krause, D.R., Handfield R.B., & Tyler, B.B. (2007). The Relationships between Supplier Development, Commitment, Social Capital Accumulation and Performance Improvement. *Journal of operations management*, 25(2), 528-245.

Lee, A.H.I., Kang, H.Y., Hsu, C.F., & Hung, H.C. (2009). A Green Supplier Selection Model for High-Tech Industry. *Expert systems with applications*, 36(4), 7917-7927.

Lis, A., Sudolska, A., & Tomanek, M. (2020). Mapping Research on Sustainable Supply-Chain Management. *Sustainability*, 12(10), 3987.

Liu, J., Ding, F.Y., & Lall, V. (2000). Using data envelopment analysis to compare suppliers for supplier selection and performance improvement. *Supply Chain Management: An International Journal*.

Lizot, M., Júnior, P. P. A., Trojan, F., Magacho, C. S., Thesari, S. S., & Goffi, A. S. (2020). Analysis of Evaluation Methods of Sustainable Supply Chain Management in Production Engineering Journals with High Impact. *Sustainability*, 12(1), 270.

Makui, A., Gholamian, M.R., & Mohammadi, E. (2016). A hybrid intuitionistic fuzzy multi-criteria group decision making approach for supplier selection. *Journal of Optimization in Industrial Engineering*, 9(20), 61-73.

Min, H., & Galle, W.P. (2001). Green Purchasing Practices of Us Firms. *International Journal of Operations & Production Management*, 21(9), 1222-1238.

Mulchenko, Z.M. (1969). Measurement of Science. Study of the Development of Science as an Information Process. *USAF Foreign Tcchnology Division Translation AD735634.*

Pournader, M., Kach, A., & Talluri, S. (2020). A Review of the Existing and Emerging Topics in the Supply Chain Risk Management Literature. *Decision Sciences*, 51(4), 867-919.

Şenel, E., Demir, E., & Alkan, R.M. (2017). Bibliometric Analysis on Global Behçet Disease Publications During 1980-2014: Is There a Silk Road in the Literature?. *Journal of the European Academy of Dermatology and Venereology*, 31(3), 518-522.

Senna, P., da Cunha Reis, A., & Sant'anna, D. (2020). Supply chain risk management: a bibliometric analysis considering healthcare supply chains. *Refas-Revista Fatec Zona Sul*, 6(4), 1-15.

Sobhanallahi, M.A., Zendehdel Nobari, N., & Pasandideh, S.H.R. (2019). An aggregated supplier selection method based on QFD and TOPSIS (case study: A financial institution). *Journal of optimization in industrial engineering*, 12(1), 31-40.

Spekman, R.E. (1988). Strategic Supplier Selection: Understanding Long-Term Buyer Relationships. *Business Horizons*, 31(4), 75-81.

Tang, M., Liao, H., & Su, S.F. (2018). A Bibliometric Overview and Visualization of the International Journal of Fuzzy Systems between 2007 and 2017. *International Journal of Fuzzy Systems*, 20(5), 1403-1422.

Verma, R., & Pullman, M.E. (1998). An Analysis of the Supplier Selection Process. *Omega*, 26(6), 739-750.

Weber, C.A., Current, J.R., & Benton, W.C. (1991). Vendor Selection Criteria and Methods. *European journal of operational research*, 50(1), 2-18.

Xie, S., Zhang, J., & Ho, Y.S. (2008). Assessment of World Aerosol Research Trends by Bibliometric Analysis. *Scientometrics*, 77(1), 113-130.

Yalcin, H., Shi, W., & Rahman, Z. (2020). A review and scientometric analysis of supply chain management (SCM). *Operations and Supply Chain Management: An International Journal*, 13(2), 123-133.

Forghani, A., Sadjadi, S. & Farhang Moghadam, B. (2021). A Scientometric Analysis of Supplier Selection Research. *Journal of Optimization in Industrial Engineering*. 14(1), 149-158.

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