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Mapping of Literature on Financing of Start-ups in the Last Thirty Years, a Bibliometric Analysis

Aniket Pundir[1*], Rasna Pathak[2]

[1] *Ph.D. Scholar, USB, Chandigarh University, Mohali, Punjab, India*
Assistant Professor, Government Degree College (GDC), Kaffota, Sirmaur District, Himachal Pradesh, India

[2] *Associate Professor, University School of Business (USB), Chandigarh University, Mohali, Punjab, India*

Abstract:- Research on Start-up financing has observed a significant development in the past few years, and shown boost in the interest & number of publication. This research reviewed the literature which are published on the Start-up financing with the help of bibliometric tools. This research studied the recent development in this field and highlight the important gaps in the present published literature on Start-up financing. Found 1344 research papers in the Scopus data house by searching keywords. Methods of performance analysis used which supported in exploring of significant sources i.e. journals, significant authors, major contributor countries and affiliations to add on the literature on Start-up financing. This systematic process of different tools has presuming significant understanding on the theoretical & cognitive frame of the area. Ultimately, the finding suggested in the research paper will give a significant direction for further research on the subject.

Keywords: *Capital financing decision, entrepreneurship and finance, funding start-ups, Start-up financing.*

1. Introduction

Finance is considered lifeblood of the organization. As per **Pecking order theory**, authored by Donaldson in the year 1961 and amended by Myers and Majluf in the year 1984. Financing can be arranged from 3 major sources, own funds (retained earnings), debt financing & issue of fresh equity capital. Organizations preference for their sources of financing are, first preference to own funding (Internal source), then debt financing & lastly arranging through issue of equity capital as a "last resort". Over the past few years, startups have been seen as a taste of the season for India (*Chaudhury S.K., Panigrahi A., Gaur M., 2019*). Arrangement of seed capital for the start-up is the one of the challenging task for the entrepreneur. Conventional wisdom says that 3 Fs, these are Family, Friends and Fool provides the startup financing (*Frid C.J., 2014*). Majorly of startups arrange startup funding through, Equity Financing (both Self and external in terms of Venture Capital, Funding through angel investors), and Debt Financing (in terms of term loan and working capital finance from Banks and NBFCs). The starting procurement & structure of capital play an important part for the structure of the capital of new venture & its performance both (*Cooper, Gimeno-Gascon, & Woo,1994; Haber & Reichel, 2007*)

Firms usually depends on their own funds like equity capital & retained earnings, especially at start-up stage. And for their 2nd preference for source of finance remains short-term debt. As the startup grows, then share of short-term debt in the capital structure reduces and then share of equity & long-term debt will increase simultaneously (*Yazdanfar D., 2012*). Some start-ups prefer debt capital to equity financing with the intention to get more profits in the future, by taking more risks (*Minola T., Minshall T., Giorgino M., 2008*). This study would insights on the funding pattern of startup, majorly for debt financing. Hence It would help the potential entrepreneurs who are willing to seek start-up funding through debt financing. This would also help out the financial institution to have idea about the existing pattern of startup funding and will also help out the state and central government to make and review the policies to boost start up in the nation.

It is observed that out of 988 related article published on SCOPUS database on the financial of startup through funding from financial institution, maximum was published by US (250) and followed by UK (135), India is at 16th position with 38 articles only, in terms of authors foreign authors Grill L (10) and Colombo (9) are at the top and Indian author Mr. Singh is at 16th position with only 4 articles. Most occurred Key word is Venture Capital (159) followed by Entrepreneurship (131). "Start-up Financing" are not even in the top 20 list and It is found that there is further scope for the study on "Start-up financing through financial institutions". The current research will address the following research questions to map the structure of the research in this field:

1. What are the trends of the publication in the field of Financing Start-ups?
2. Who are the major contributing authors, sources, organizations and nations, which are contributing in the area of Financing Start-ups?
3. Which are the mature & emerging subject areas in the field of Financing Start-ups?
4. What are the further directions for research in the future on the topic?

2. Research Methodology

Objective of the present study is to review the published literature in the area of financing of start-ups. To achieve this objective, this research has done bibliometric analysis & content analysis. Bibliometric analysis technique which includes science mapping & performance analysis furnish significant understating about the development of a particular field. To review the literature for this study, the research depends upon Systematically Literature Review tools. Systematically Literature Review has done with specific set of rules and process of finding different data houses with a defined search process which increases the standard of study done with more comprehensive, transparent & scientific. This systematic literature review done entirely so that it enhances the validity of the study done. This process which is followed for review of literature in this study is explained below

2.1. Keywords with Inclusion & Exclusion Criteria:

Exclusions	Criteria	Eliminated	Accepted
Database	SCOPUS		
Initial Search	(TITLE-ABS-KEY ("start-up" AND "finance") OR TITLE-ABS-KEY ("startup" AND "finance") OR TITLE-ABS-KEY ("start-up" AND "financing") OR TITLE-ABS-KEY ("startup" AND "financing")		2,840
1 - Document Type	"Article"	1098	1,742
2 - Language	"English"	100	1,642
3 -Subject Area	"Business Management and Accounting", "Economics, Econometrics and Accounts", "Social Sciences"	298	1,344

Figure 1. Data retrieval process

Systematic search has been done in SCOPUS data bases with multiple keywords in the Title, Abstract and Key words, with different combination, shown in above table and found total 2840 results, then put exclusion criteria number 1 in which is consideration of articles only ignoring book chapter and conference proceeding because sometime they may not properly peer reviewed, then found total 1742 articles. Then applied exclusion criteria number 2 i.e. language of the document and considered documents which are published in English language only and found 1642 articles which are written in English language. Then applied exclusion criteria number 3 i.e. Subject Area and included total Three subject areas i.e. "Business Management and Accounting", "Economics, Econometrics and Accounts", and "Social Sciences" and found total 1344 relevant articles. These are the top 3 subject areas where maximum number of articles were published. So finally got 1344 relevant articles from these search criteria and further analysed these articles which are published on SCOPUS in last three decades.

2.2. Chronological Publication Trend

Figure 2. Publishing trend

Trends of publication on "Financing of Start-ups" from 1989 to 2023 are shown in the figure 2 and it shows that it is in increasing order. There is robust hike observed from there year 2018. Maximum numbers of articles were published in the year 2023 which are 141 followed by the year 2022 & 2021 with 134 & 120 articles respectively. Then followed by the year 2019 where numbers are 105, little dip observed in the year 2020 to 97 articles, maybe due to COVID.

2.3. Authors' Statistic

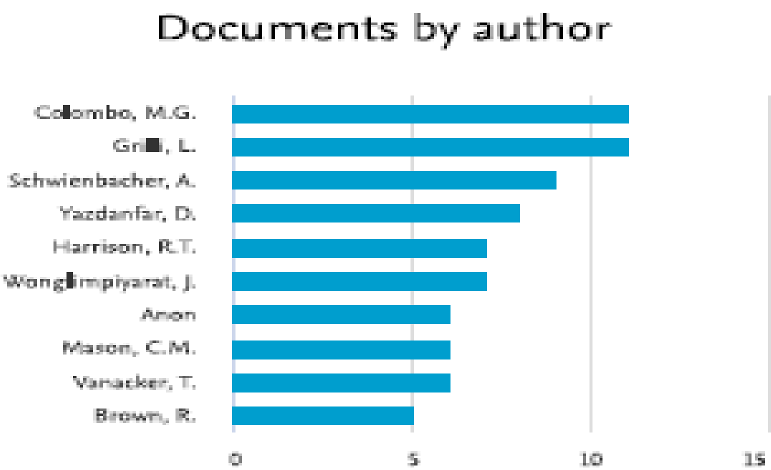


Figure 3. Top 10 contributing authors

Colombo M.G. & Grilli. L are the authors who have contributed the maximum articles which are 11 in these keywords, followed by Schwiebacher A. who has published 8 articles. Brown R. is at the 10th Position who has published the 5 articles in the study.

2.4. Citation by Author

Sr. No.	Author	Document	Citation
1	Colombo M.G.	11	1388
2	Grilli L.	11	1347
3	Hornuf l.	5	681
4	Schwienbacher a.	9	624
5	mason c.m.	5	536
6	Brown Ross	5	494
7	Vanacker t.	6	229
8	wonglimpiyarat j.	7	109
9	Momtaz, Paul p.	5	66
10	yazdanfar d.	8	40

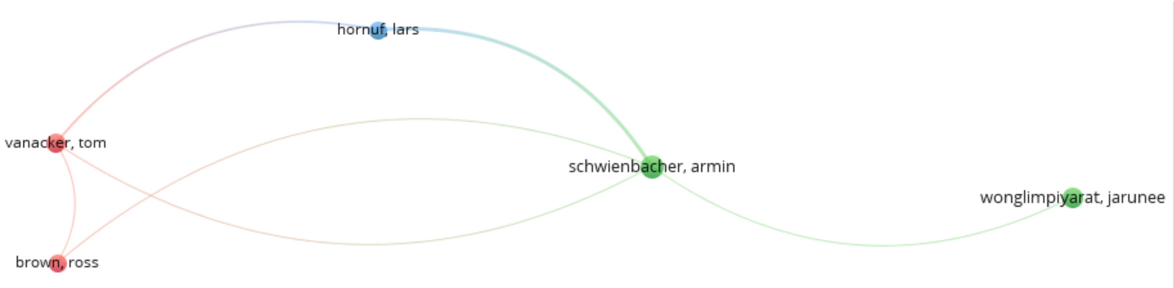


Figure 4. Top 10 cited authors

Colombo M.G. is the top of the list with the 11 articles and cited in 1388 article followed by Grilli L who have contributed 11 articles and cited in 1347 articles and 3rd in the top cited list is Hornuf l. who have contributed 5 articles and cited in 581 documents.

2.5. Co-Author and Citation by Countries

Sr. No.	Author	Document	Citation
1	US	328	18918
2	UK	181	7040
3	Germany	136	4666
4	Canada	54	3521
5	Italy	91	3157
6	France	61	1657
7	China	86	1260
8	Sweden	34	1238
9	Belgium	30	1042
10	Netherland	1623	962

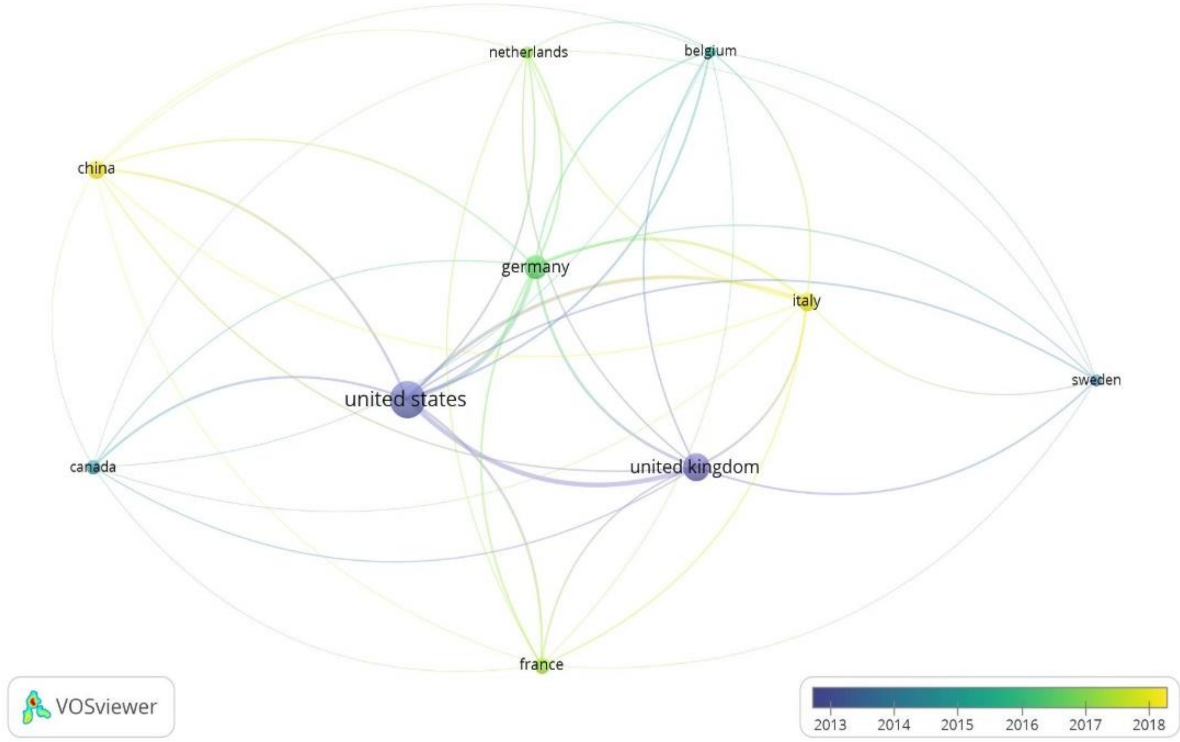
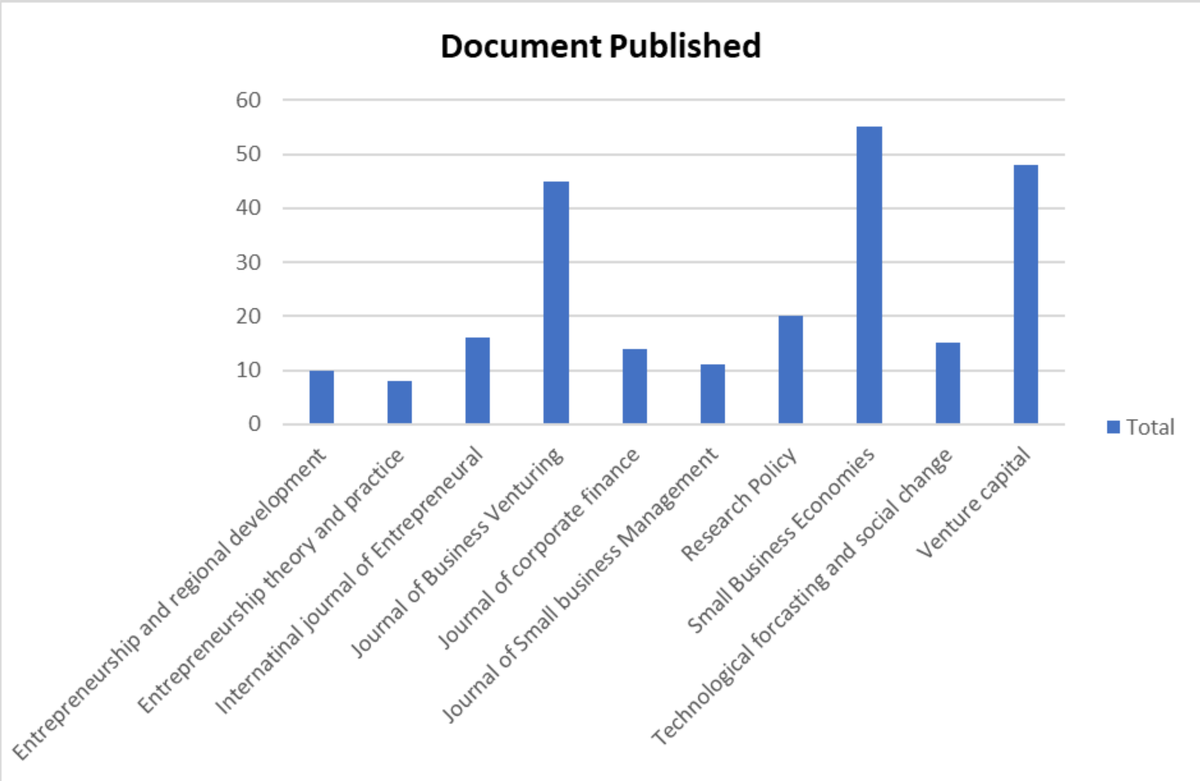


Figure 5. Top 10 most contribution and citation by countries

US is at the top of the most cited country with 18918 citation, followed by UK with 7040 citation and Germany is at the 3rd of the top citation list with citation of 4666. India is at 13th position from the top with citation of 283.

2.6. Documents & Citation by Source

Sr. No.	Source	Document	Citation
1	Journal of Business Venturing	45	10741
2	Small Business Economies	55	3827
3	Research Policy	20	1499
4	Venture capital	48	1456
5	Journal of corporate finance	14	614
6	Entrepreneurship and regional development	10	597
7	Technological forecasting and social change	15	482
8	Entrepreneurship theory and practice	8	405
9	International journal of Entrepreneurial	16	379
10	Journal of Small business Management	11	288



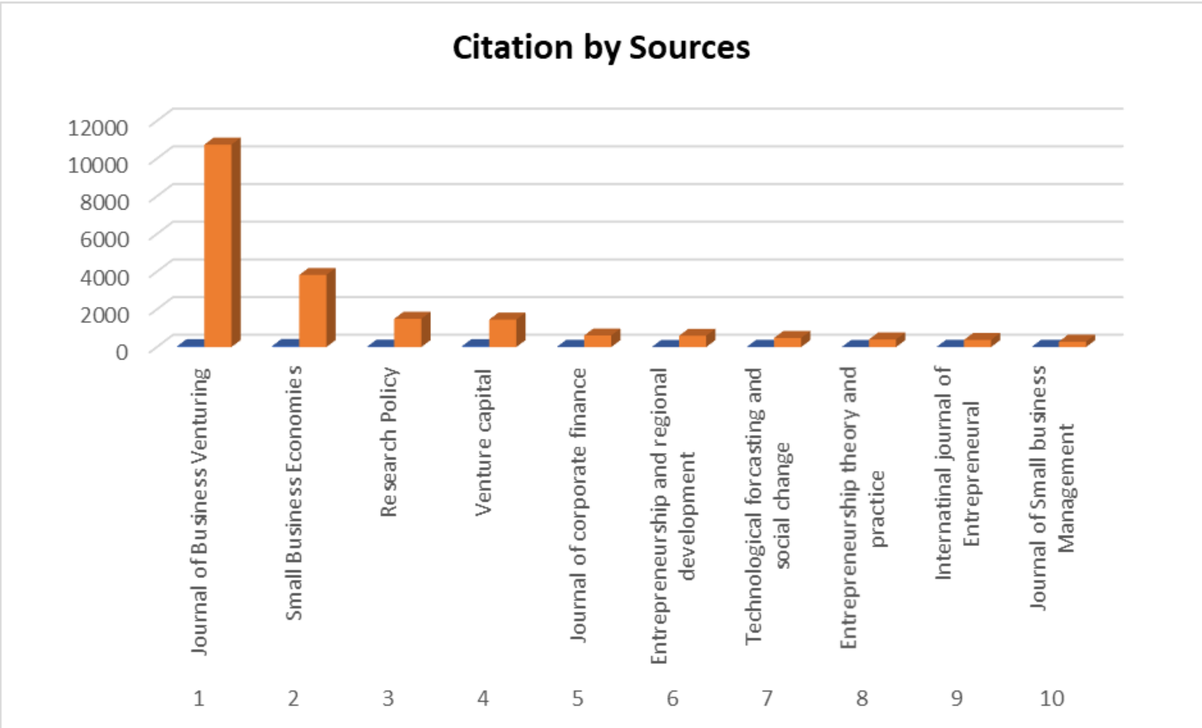


Figure 6. Top 10 sources by citation & documents

Top cited journal is Journal of Business Venturing which has total citation of 10741 and it has contributed 45 articles, second cited journal is Small Business Economies with 3827 citation and it has contributed 55 articles, however it is highest contributor in terms of articles but it could not get maximum citation, it is at 2nd position in terms of citation. 3rd highest cited journal is Research Policy with 1499 citation & contributed 20 articles.

2.7. Bibliographic Coupling by Countries from VOS Viewer

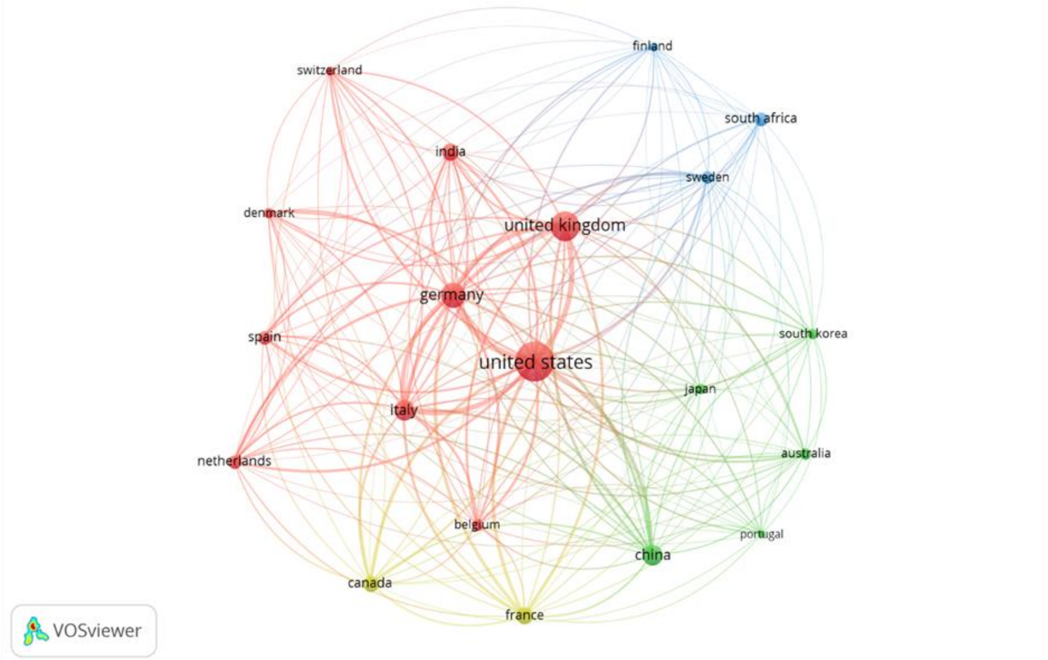


Figure 7. Bibliographic coupling by countries

There are total 5 clusters and the top cluster which have contributed maximum documents have 8 countries US, Germany, India, Denmark, Italy, Netherland, Spain and Switzerland. Maximum coupling is observed in US and UK, US and Germany, UK and Germany., It is observed that in latest coupling countries are India, Italy, Spain, China and South Africa. Maximum contribution by the US which is at the top with the 328 documents, followed UK 181 and then Germany at the 3 position with the 137 documents. Italy is at the 4th position with the 91 documents and followed by China with the contribution of 86 documents.

2.8. Bibliographic Coupling by Authors from VOS Viewer

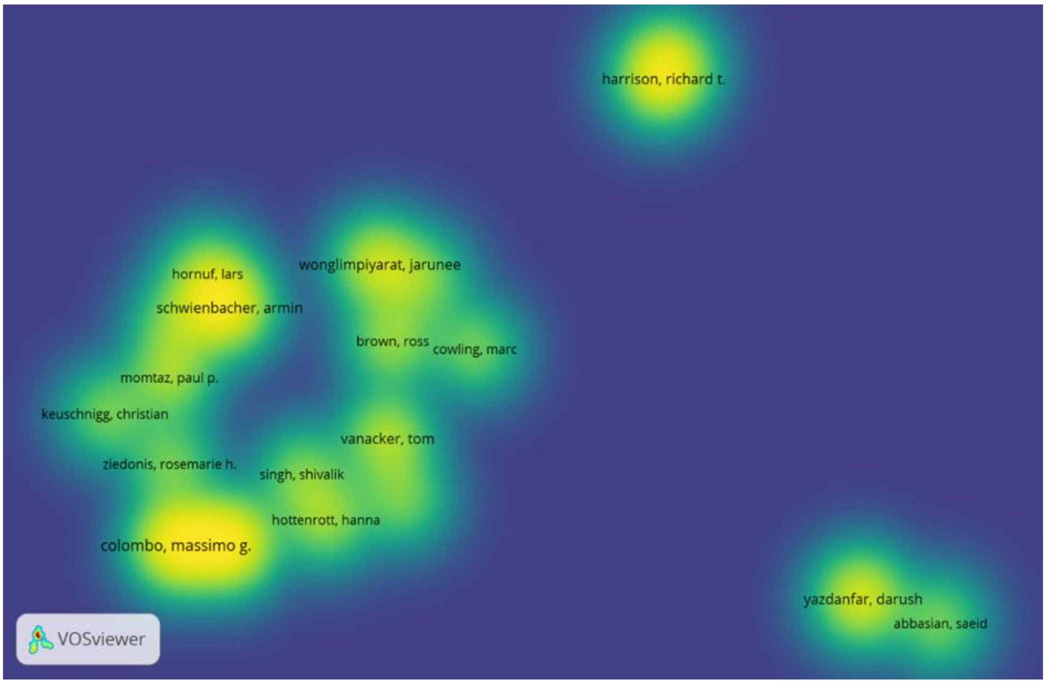


Figure 8. Bibliographic coupling by authors

There are total 6 clusters and the top cluster which have contributed maximum documents have 2 authors Grilli L. and Colombo m.g. Other clusters have 2 authors Harrison r.t. and mason c.m. Latest papers are published by the cluster which 6 authors Brown.r. Cowling m. Frid c.j. Honjo Y. Singh s. Vanacker t.

2.9. Documents by Publish Area

Subject area	Documents
Business management	38.30%
Economics	26.00%
Social Science	15.00%
Engineering	3.90%
Others	3.80%
Decision Science	4.10%
Environment Science	2.50%
Computer Science	2.70%
Energy	1.60%

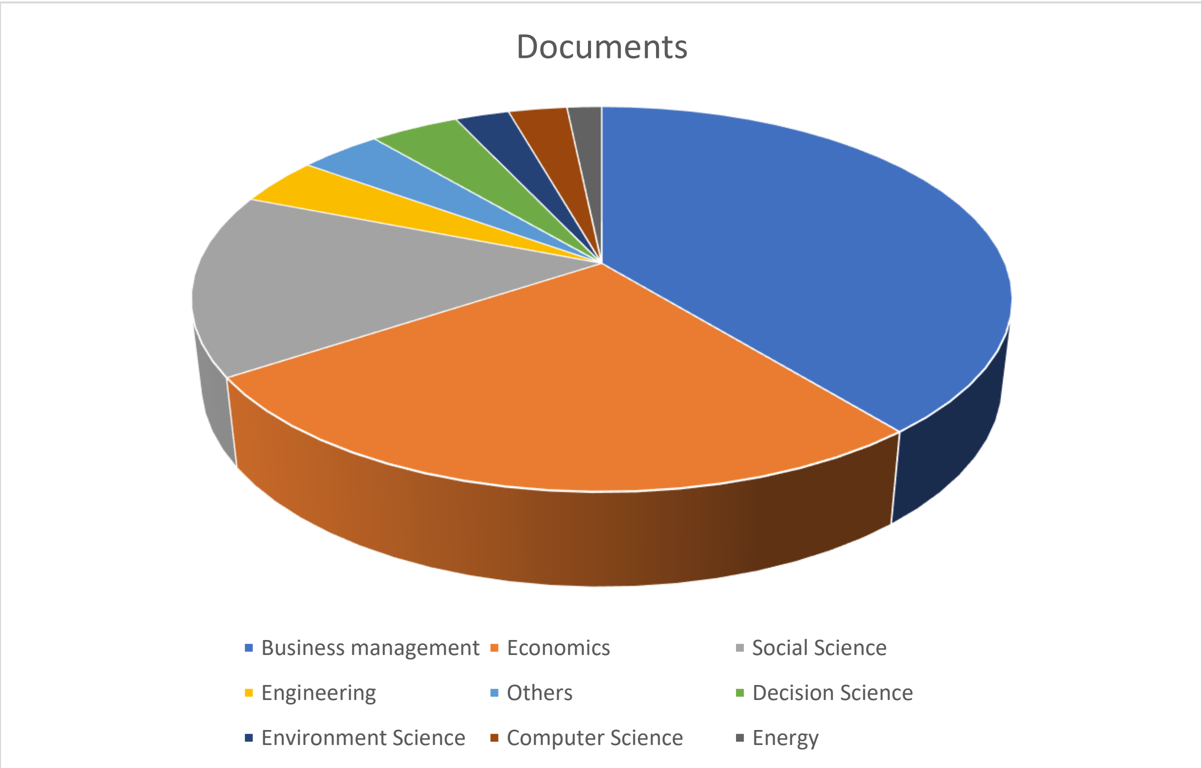


Figure 9. Top most subject area

Business management is the top most area where maximum articles are published it is 38.3%, followed by Economics where 26% articles are published and social science is also major contributor and 3rd in the top list with the 15% share in the total paper published. These 3 top area i.e. Business Management, Economics and Social Science contributed 79% of total document published.

2.10. High Frequency Keywords

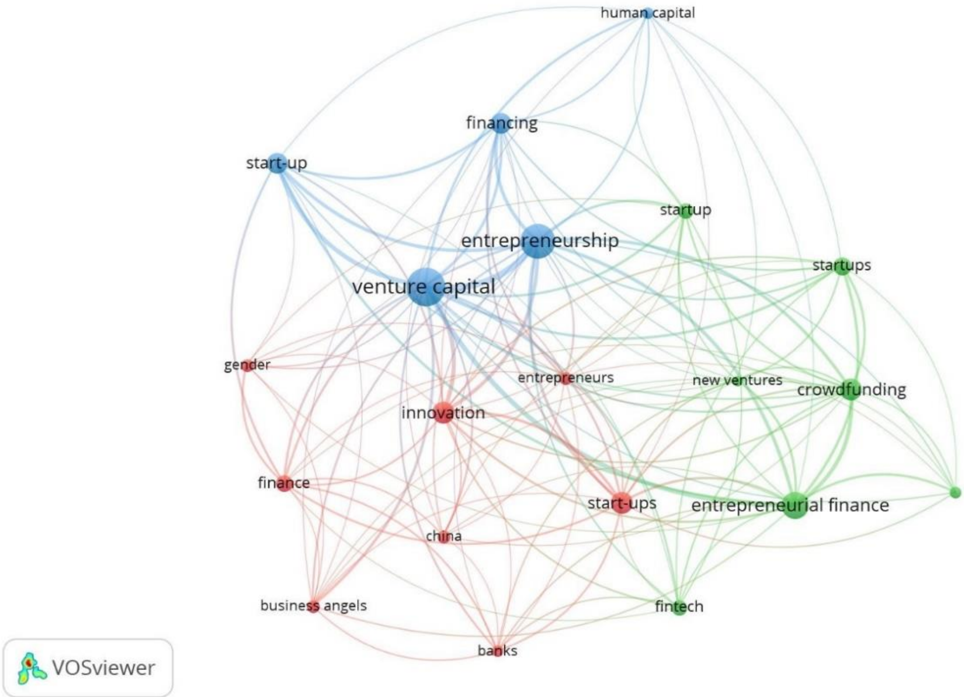


Figure 10. Most occurred Keywords

"Venture Capital" is the most occurred key word with occurrence of (159) followed by Entrepreneurship (131). Third major keyword in the top list is "Entrepreneurial finance" with 71 occurrence and then "Crowd funding" at 4th with the 52 occurrences and "Innovation is at the 5th position with occurrence of 49. "Start-up Financing" are not even in the top 20 list and it is found that there is further scope for the study on "Start-up financing through financial institutions"

3. Limitation with Mitigation

All SCOPUS database has considered analysis ignoring other databases. While searching for keywords in SCOPUS data base exclusion criteria was followed and only published article is considered, article written in any other language than English are also excluded. Also considered the specific area in which papers are published that is "Business Management and Accounting", "Economics, Econometrics and Accounts", "Social Sciences" and considered the research work which published in the latest three decades only, work published before 1989 are excluded because there are few papers only which are written prior to that, however data available on the SCOPUS was from 1977.

Mitigation: SCOPUS database is analyzed in this study but SCOPUS has ample collection as despite of a single database total 1344 research articles are studied in the study and English language is most common language in the world and maximum papers in this study are written in English and only 100 papers were excluded due to exclusion of the papers written other than English out of 1742 papers. Included 9 subject areas which are the major contributor on our keywords and have excluded only 298 papers out of 1642 papers due to subject area, hence maximum of the existing literature has considered for study. There were few papers which were excluded as published prior to 1989, finally considered 1344 papers in the study.

4. Discussions and Scope for Future Research

In this study considered SCOPUS database to analyse so further researcher may considered 2 or more databases and may compare SCOPUS with Web of Sciences or any other database and may also considered papers other than English like people of the other nation who may also considered French, Chinese etc. Future researcher may also use the Tool like R Studio for analysis purpose.

It is observed that most occurred keywords in existing literature is “Venture Capital” with 159 occurrences which is followed by Entrepreneurship with 131 occurrence and at the 3rd position from the top is “Entrepreneurial Finance” with 79 occurrences and it is found that “Start-up Financing” are not even in the top 20 list and It is found that there is further scope for the study on “Start-up financing through financial institutions”.

5. Conclusions

Finance is playing a crucial part for the person and corporates in their decision-making approach. Finance is not the only important for Start-ups organization but it is required in all other organization to run the business and that is why it is also called life blood of the enterprise. Finance or Money is amongst the one of the factor of production. The present study focused to review or analyze the existing literature on financing startups and explore the further scope of study in this field. This paper presents a review the literature on “financing start-ups” by using the tools of bibliometric analysis and content analysis. Through this analysis contributing organizations, contribution of countries based on their location, citation analysis, author influence, and keyword analysis are studied. It is found in the study that the prominent publishers are US followed by UK and Germany in this area in terms of number of publications. Small Business Economies followed by Venture capital and Journal of Business Venturing are found to be most productive journals in terms of their contributions. It is also found that top occurred keywords in existing literature are “Venture Capital” followed by Entrepreneurship and Entrepreneurial Finance is at 3rd position from the top. This study offers future research directions. It is observed that there is robust hike in the publication of papers from the year 2018. Maximum numbers of articles were published in the year 2023 i.e. 141 followed by 2022 & 2021 with 134 & 120 article respectively and then followed by 2019 where numbers were 105, little dip observed in 2020 to 97 articles, maybe due to COVID. However it is a very comprehensive study, there are few constraints like this systematic search have been done on only one data house i.e. Scopus. Analysis of more data houses may lead to further understanding in the area. This study also excluded the proceeding of books and conferences & it may explore some additional understanding if that may be included in the study.

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