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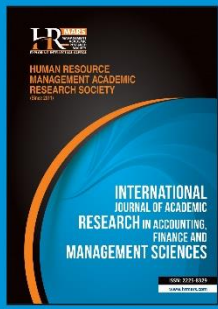
The Capital Structure of Small and Medium Enterprises: A Bibliometric Analysis

Hafizah Mat Nawi[1], Wan Nur Shawatul Aswal Zulkefle[2], Krishna Tanaraj[3], Nur Shaliza Sapiai[4], Fadhilah Mohd Ishak[5], Wan Masnieza Wan Mustapha[6], Noorfadzilah Arifin[7]

[1] National Defence University of Malaysia, Malaysia, [2,3]Quest International University, Malaysia, [4,5,6,7]Universiti Teknologi Mara, Malaysia
Email: hafizah.matnawi@upnm.edu.my (Corresponding author); wnshawatul.aswal@qiu.edu.my

Abstract
It is theoretically acknowledged that decisions on capital structure remain an important goal to maximise returns. By exploring scientific data on the capital structure of small and medium-sized enterprises, this study aims to provide accounting and finance scholars with a useful single-source resource. This study aimed to: (i) assess the development of research on 'SMEs capital structure', (ii) highlight key areas in SMEs capital structure research, and (iii) identify the major players in the research. 406 works pertaining to the capital structure of SMEs were described and the data was analysed using a bibliometric approach in the study. In October 2022, the data was extracted from the Scopus database. Software from VOSviewer and Harzing Publish or Perish were utilised in the study to visualise and integrate the data, respectively. The study also used Microsoft Excel in analysing the data. Findings indicated that studies on capital structure began as early as 1984. Early progress was extremely slow, attracting only the attention of Western academics, particularly those from the U.S. and the U.K. In 2008, the number of publications began to increase. Data show that "Small Business Economics" published the most articles about SMEs' capital structure. However, the top 10 papers that have been cited the most show that there are currently few investigations in this area. Since the study is limited to publications that are indexed in the Scopus database, thus the study is regarded as moderately representative. This bibliometric study can serve as a first step in doing systematic literature reviews and meta-analyses.
Keywords: Bibliometric Analysis, SCOPUS, Capital Structure, Small and Medium Enterprises (SMEs), VOSviewer, Harzing's Publish or Perish Software.

Introduction

Small and medium-sized enterprises (SMEs) are highly valued for their ability to grow into larger, more successful companies, their capacity to invest in and adopt new technologies, and their adaptability to changing economic conditions (Nawi, 2015). One of the challenges that people in many countries most regularly cite having trouble with is access to financing (Nawi, 2017).

Individual savings, internal money, debt, and equity are typically used by businesses to finance their operations, both individually and collectively (Kumar et al., 2020). Financial limitations can undermine a successful business idea, cause a company to fail, or impede growth and progress. Besides, making complicated judgments that could maximise economic returns is typically associated with capital structure considerations (Nawi, 2015).

Regardless of the importance of the SMEs, large public companies were typically the focus of the theories and empirical research that highlighted capital structure. The theories derived from earlier capital structure studies might also be applied to SMEs, regardless of the types of businesses, their environments, or their unique business strategies.

In light of the significance of this issue for SMEs and the flexibility of theory applications, this study prepared a bibliometric analysis of published documents on a topic linked to 'SMEs capital structure'. This paper primarily addresses three research issues:

1. "how has the research on SMEs capital structure evolved?",
2. "what are the key areas in SMEs capital structure research?", and
3. "who are the major players in SMEs capital structure research?".

The bibliometric analysis in this study would consider the following aspects in answering the above-stated research questions. This study examined sources and document types, the number of published studies per year, and the language of documents to address the first question. In response to the second question, this study examined the subject area, title analysis, and frequency of keywords. Further, this paper looked into countries with the most contributions, citation analysis, and authorship analysis, in answering the third question.

The study methodologies are described in the next part, which is followed by the bibliometric analysis's findings, their interpretations, and a discussion. The findings are summarised in the concluding part, along with limitations and suggestions for further research in capital structure.

Methodology

This study used a bibliometric analysis approach to find possible areas of 'SMEs capital structure' that may be understudied. As the largest searchable resource for the social sciences, the study gathered data from the Scopus scientific database (Nasir et al., 2021). This study conducted the following query:

TITLE-ABS-KEY ("capital   structure" AND "SME" OR "small   and medium" OR "small firm" OR "small business").

The database retrieved 406 documents. This data was extracted on October 10, 2022, without imposing any restrictions on the year of publication, document type, topic matter, or language. After the data cleaning process, no duplicate documents were found, hence a total of 406 documents were considered for the Bibliometric Analysis.

The Scopus retrieved data were used to plot a graph of publication growth, and total citations of scientific articles published related to 'SMEs capital structure' from the year 1984 until 2022. Through the 'analyse search results' feature on the Scopus website, several analyses were immediately downloaded from Scopus.

To further visualise the data as network visualisation maps, this study employed VOSviewer software (version 1.6.15). The examination of the visualisation maps was divided into two parts: Keyword analysis and Title analysis. Bibliometric networks were constructed

and visualised using VOSviewer. This software visualises the authors' keywords and demonstrates the relationship between them by using different font sizes, square sizes, colours, and thickness of connecting lines. In addition, the study used Harzing's Publish or Perish software to incorporate data and look for the data's citation metrics. The data were also analysed manually or using Microsoft Excel. The results' descriptions and interpretation came as the last phase. Figure 1 shows the diagram of the search strategy.
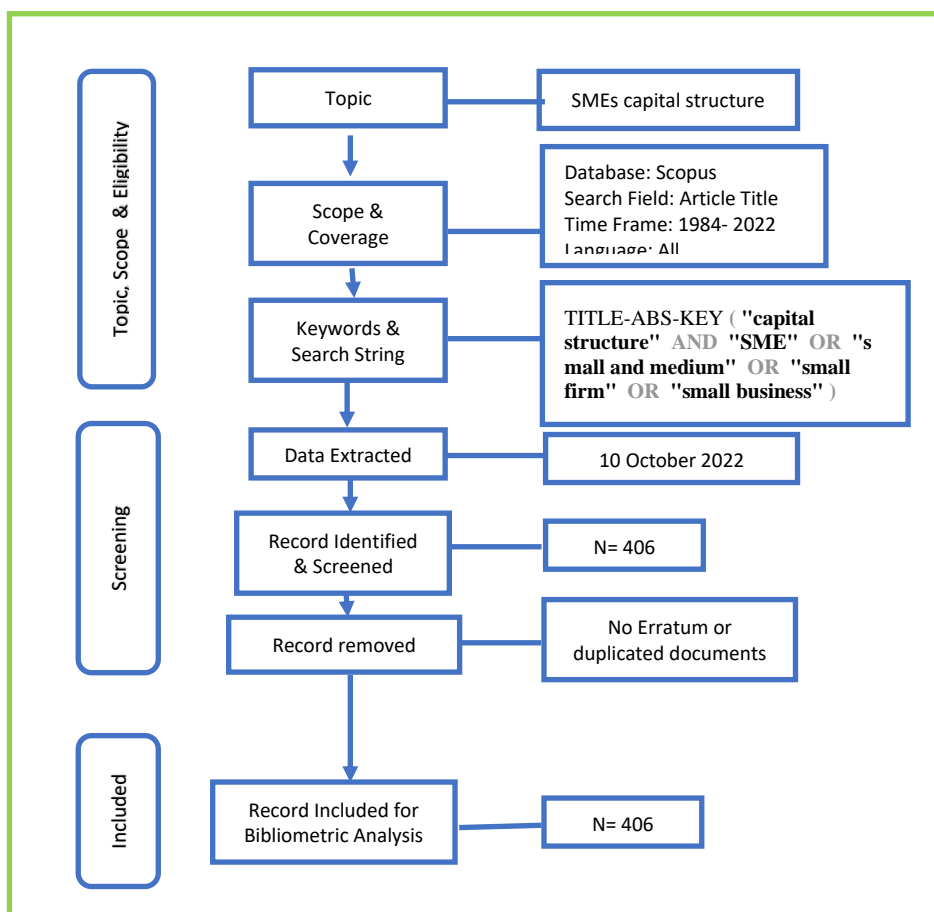
Figure 1: Flow diagram of the search strategy

Results

This section presents the results of the bibliometric analysis. The results are presented in three subsections in accordance with the aforementioned research questions:

1. The evolution and transmission of 'SMEs capital structure' research;
2. Important areas for 'SMEs capital structure' research; and
3. Major players in 'SMEs capital structure' research.

1.   Evolution and Transmission of 'SMEs Capital Structure' Research

In addressing this research question, this study was looking into (i) document and source types, (ii) number of published studies per year, and (iii) languages of documents.

(i)   Document and Source Types

Figure 2 illustrates the eight different types of documents that have been used to classify the publications on 'SMEs capital structure'. The data shows that article is the most

prevalent document type, accounting for more than 83% of all documents (338 documents), followed by conference paper at 8.4% of the total documents (34 documents). Less than 9% of the total number of publications were other kinds of papers such as book chapters, reviews, books, conference reviews, editorial, and retracted.

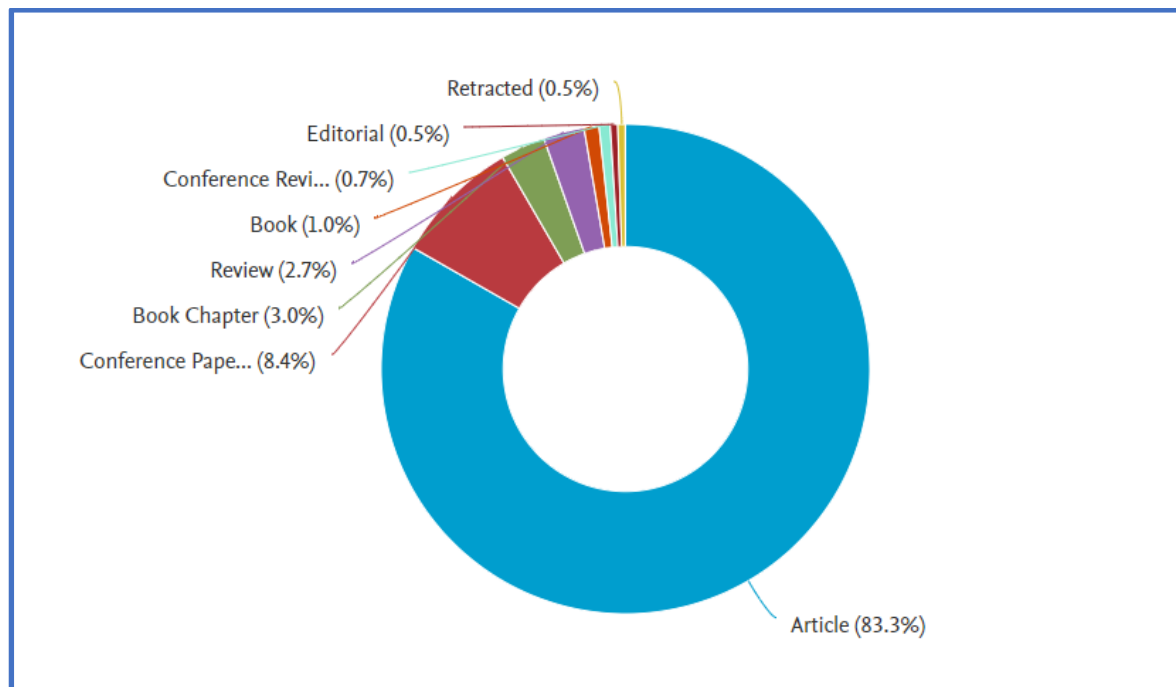*Figure 2: Document type*

It is worth noting that the conference paper in the document type might not be the same as the source paper (Sweileh et al., 2017). When a paper is presented at a conference, for example, it is designated as a conference paper under document type. Depending on its publishing status, the same material could be categorised as a complete journal article, book chapter, or conference proceeding under the source type (Mansour et al., 2021). Table 1 shows the four different types of sources. Journals accounted for 86.5 per cent of all sources, followed by conference proceedings (7.6%). The remaining publications were published in book and book series, with a total document of 13 and 11, respectively.

Table 1
Source type

Source type	Frequency	Percentage (%)
Journal	351	86.5
Conference Proceeding	31	7.6
Book	13	3.2
Book Series	11	2.7
Total	**406**	**100**

Additionally, the data were examined in light of the Source Title. The top ten journal lists for research on 'SMEs capital structure' which made up nearly one-fifth of all documents are shown in Table 2. The results showed that the journal "*Small Business Economics*" had the greatest influence and published the most papers on 'SMEs capital structure'. This journal has been covered by Scopus under Springer Nature as the publisher since 1989. "*Journal of Small*

Business and Enterprise Development", which has been published under the Emerald imprint since 1994, came in at number two with 10 documents. It is interesting to note that *"Sustainability Switzerland"* published the most over the previous five years despite being ranked ninth among the Top 10 journals.

Table 2
Top 10 journals in the area related to 'capital structure in SMEs'

Rank	Source Title	No of documents
1	*"Small Business Economics"*	23
2	*"Journal Of Small Business And Enterprise Development"*	10
3	*"Managerial Finance"*	8
4	*"Research In International Business And Finance"*	7
5	*"Journal Of Banking And Finance"*	6
6	*"Journal Of Financial Economics"*	6
7	*"Applied Financial Economics"*	5
8	*"Journal Of Corporate Finance"*	5
9	*"Sustainability Switzerland"*	5
10	*"Academy Of Accounting And Financial Studies"*	4

(ii) Year of Publications

The "Actualite Economique" published the first study on capital structure in SMEs in 1984 by Suret, with a paper titled, "Financial structure of small and medium-sized enterprises in the Province of Quebec". The research on capital structure in SMEs has increased since the first publications were published. The trend (i.e., the number of publications relating to capital structure) was first relatively slow, but it began to rise steadily in 2008. According to Figure 3, it was anticipated that 2021 would see the highest number of publications since 1984. For the year 2022, the Scopus database has already listed or is planning to include a sizable number of papers on capital structure in SMEs. This analysis showed a keen interest in the subject, underscoring the significance of studies on 'SMEs capital structure'.
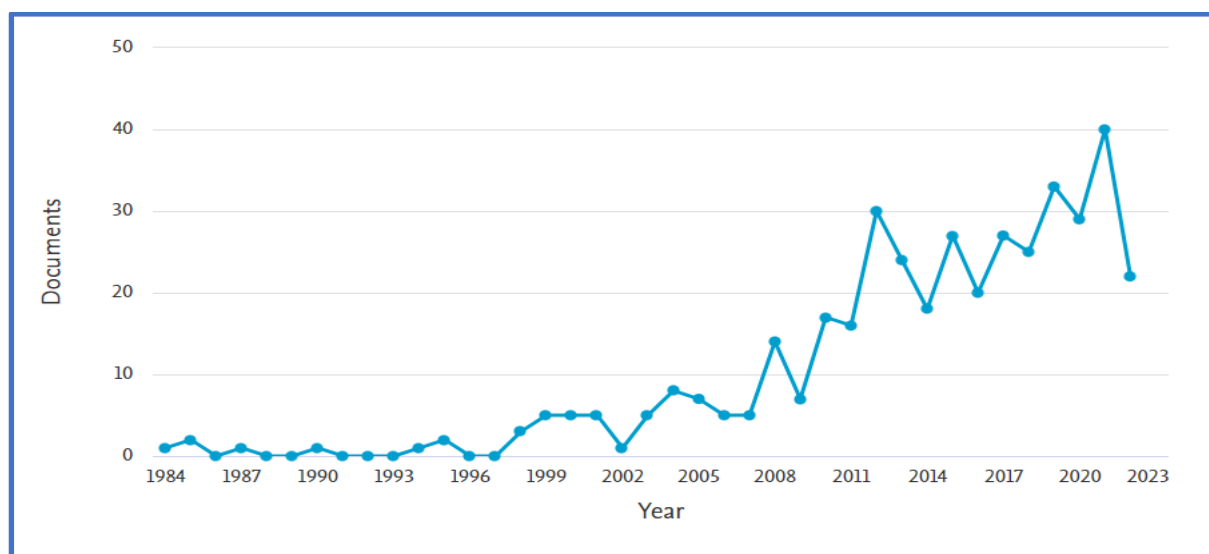

Figure 3: Documents by the year

(iii)   Languages of Documents

The majority of the research documents for 'SMEs capital structure' were written in English, which made up 96% of them (389 documents). Table 3 displays the remaining document languages. It is important to note that, despite the fact that the majority of the documents were written in English, the first language used to write about the 'SMEs capital structure' was French. All published documents, even those authored in languages other than English, have English-language abstracts.

Table 3
Languages of documents

Languages	Frequency	Percentage (%)
English	389	96
Spanish	10	2.5
Chinese	2	0.5
Croatian	1	0.2
Czech	1	0.2
Polish	1	0.2
Slovak	1	0.2
French	1	0.2
Total	**406**	**100**

2.   Important areas for 'SMEs capital structure' research

In addressing this research question, the study examined the (i) subject area and, (ii) keyword analysis.

(i)   Subject Area

Figure 4 depicts the subject areas covered in capital structure research. The proportion of all documents falling under the categories of "Business, Management and Accounting" and "Economics, Econometrics and Finance" is roughly the same. They comprised 254 and 248 documents, respectively. The following three domains were "Social Sciences", "Decision Sciences", and "Engineering". "Agricultural and Biological Sciences", "Computer Science", Energy", "Environmental Science", "Mathematics" and "Other" fields made up less than 13% of the documents.
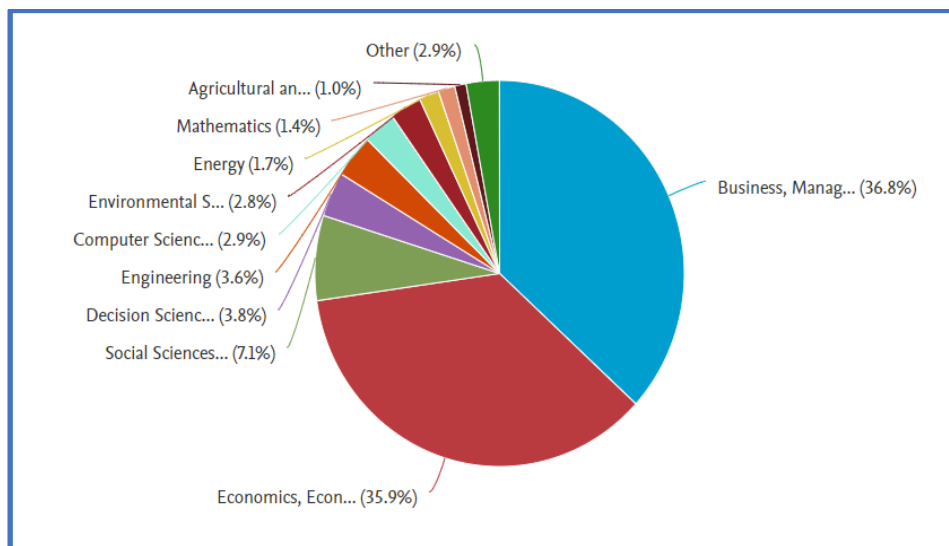
Figure 4: Documents by subject area

(ii) Keywords Analysis

Figures 5, 6 and 7 portray the maps visualisation of the keyword created using VOSviewer, demonstrating the strength of the relationship between keywords. Keywords that are related, are usually grouped in the same colour (Sweileh et al., 2017). Figure 5 shows a visualisation of the keyword map based on the co-occurrence of all keywords. This study used a default setting of 5 as the minimum number of occurrences of a keyword. The authors utilised 1339 keywords in 406 publications according to VOSviewer data. Following the cleaning process, 66 of the 1339 keywords met the threshold.
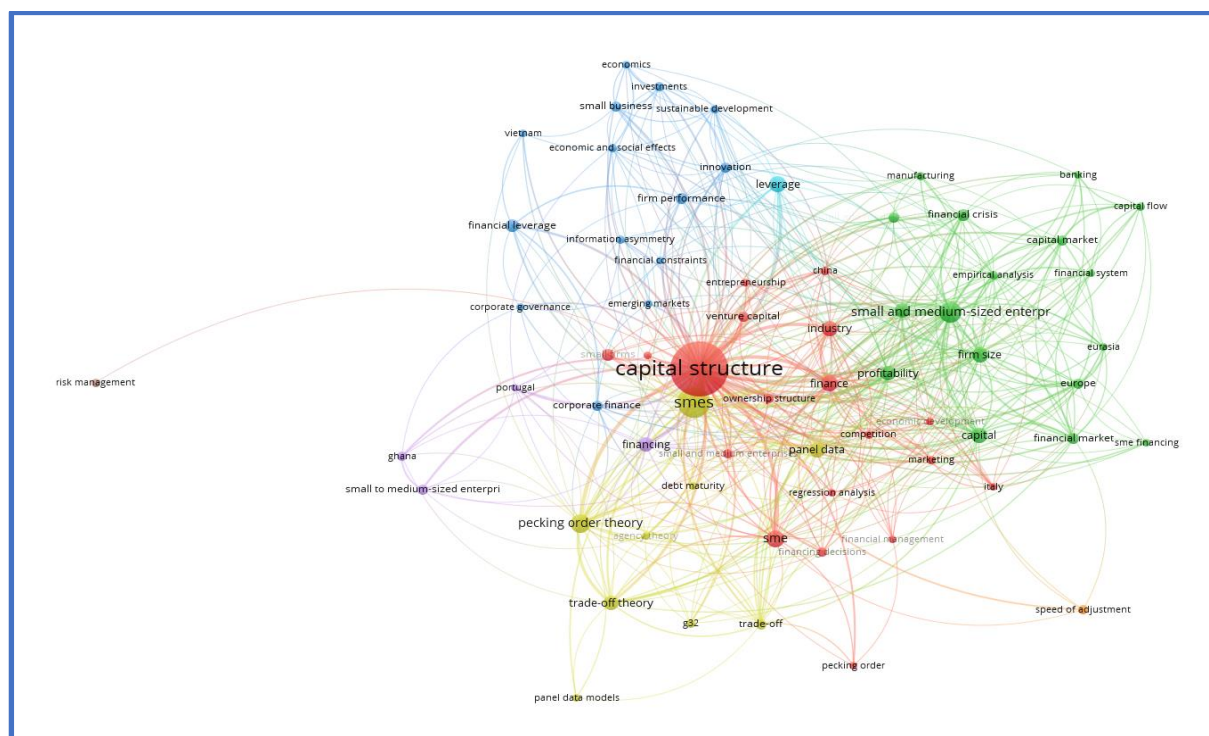
Figure 5: Keyword map for the study on 'SMEs Capital Structure' (based on co-occurrence of all keywords)

In addition, this study visualises the keyword based on the co-occurrence of the author's keyword considering the fundamental principle of keyword analysis. According to Comerio and Strozzi (2019), the authors' keywords are adequate to represent the contents of the article. In terms of the number of occurrences for the author's keyword, this study set a minimum number of 3 occurrences of a keyword. The authors utilised 930 keywords in 406 publications. Following the cleaning process, 92 of the 930 keywords met the threshold.

Figure 6: Keyword map for the study on 'SMEs Capital Structure' (based on co-occurrence author's keyword)

In this field of study, the keyword "*capital structure*" was the most frequently utilised. The top ten keywords used in the research on 'SMEs capital structure' are listed in Table 4.

Table 4

Top Ten (10) Keywords in 'SMEs Capital Structure' Research

No	Keywords	No. of Documents
1	Capital structure	223
2	SMEs	75
3	Pecking order theory	25
4	Leverage	20
5	Trade-off theory	16
6	Financing	16
7	Financial leverage	13
8	Panel data	12
9	Small firms	12
10	Firm performance	10

This study used index keywords as the unit of analysis and expanded it into the overlay visualisation to highlight the evolution of 'SMEs capital structure' research through time. This was done to make the visualisation more appealing (refer to Figure 7). According to VOSviewer data, 406 publications contain the use of 554 keywords. This study set a threshold for the minimum number of occurrences of a keyword at 3. The analysis resulted in 56 out of 554 keywords meeting the threshold. The most often used index terms in this field of study were "capital structure" and "small and medium-sized firms". The keywords in this map with a blue colour range indicate research activities with a more recent average publication year, whereas the keywords with red, orange, or yellow colour ranges indicate phrases used in a more recent average publication year.
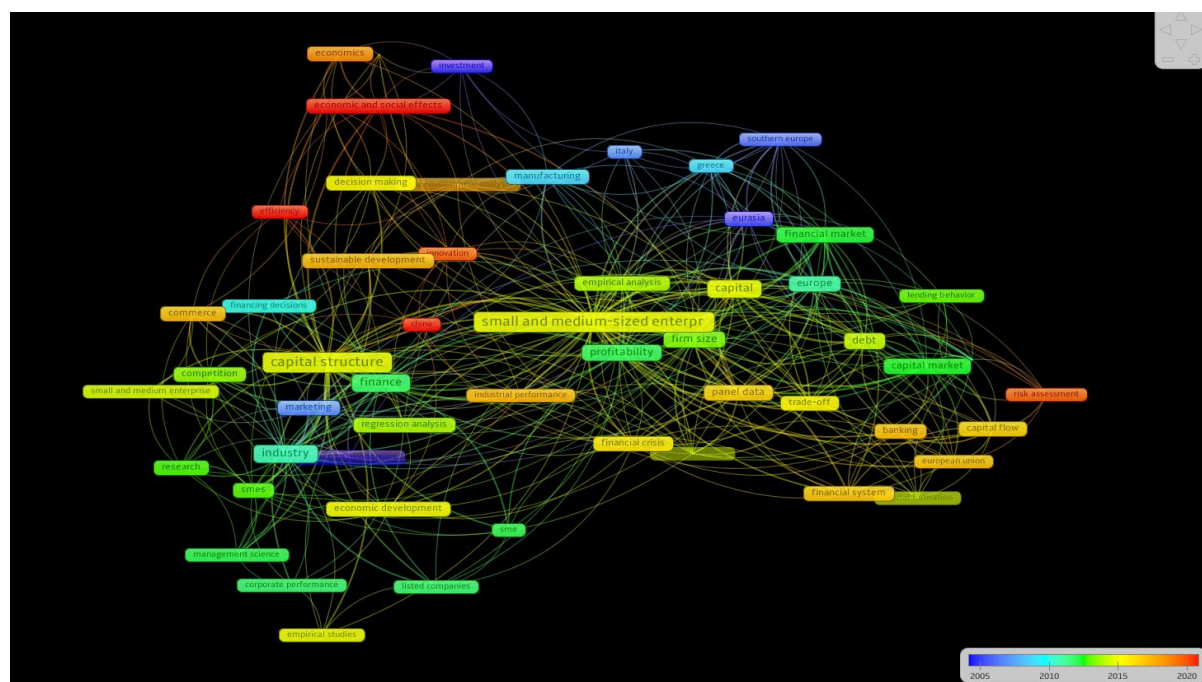

Figure 7: Evolution of 'SMEs Capital Structure' research (based on co-occurrence index keyword)

Major Players in 'SMEs capital structure' Research

This study examined the following in addressing the research question related to the major players.

    (i)   geographical distribution,
    (ii)   main institutions involved,
    (iii)   authorship analysis, and
    (iv)   citation analysis.

    (i)   Geographical Distribution

34 countries are identified in Scopus as having contributed to the articles related to 'SMEs capital structure' based on geographic distributions. The top 10 countries in relation to the study on 'SMEs capital structure' are displayed in Table 5 after analysis using the VOSviewer software. With a total of 53 publications (13%), the United States was reported to be in first place, followed by the United Kingdom (9.8%) and China (9%). Interestingly, the United States topped the list of countries with the most citations (6111 citations), followed by the United Kingdom (1878 citations). The data revealed that while Australia was placed seventh in terms of publications, she was third in terms of citations. Furthermore, it is crucial to note that even though the Netherlands only provided six publications and was not in the top ten, the number of citations is still rather significant (i.e. 960). A world map of the top ten countries by the total number of publications is shown in Figure 8.

Table 5

Top 10 countries that contributed to the publication

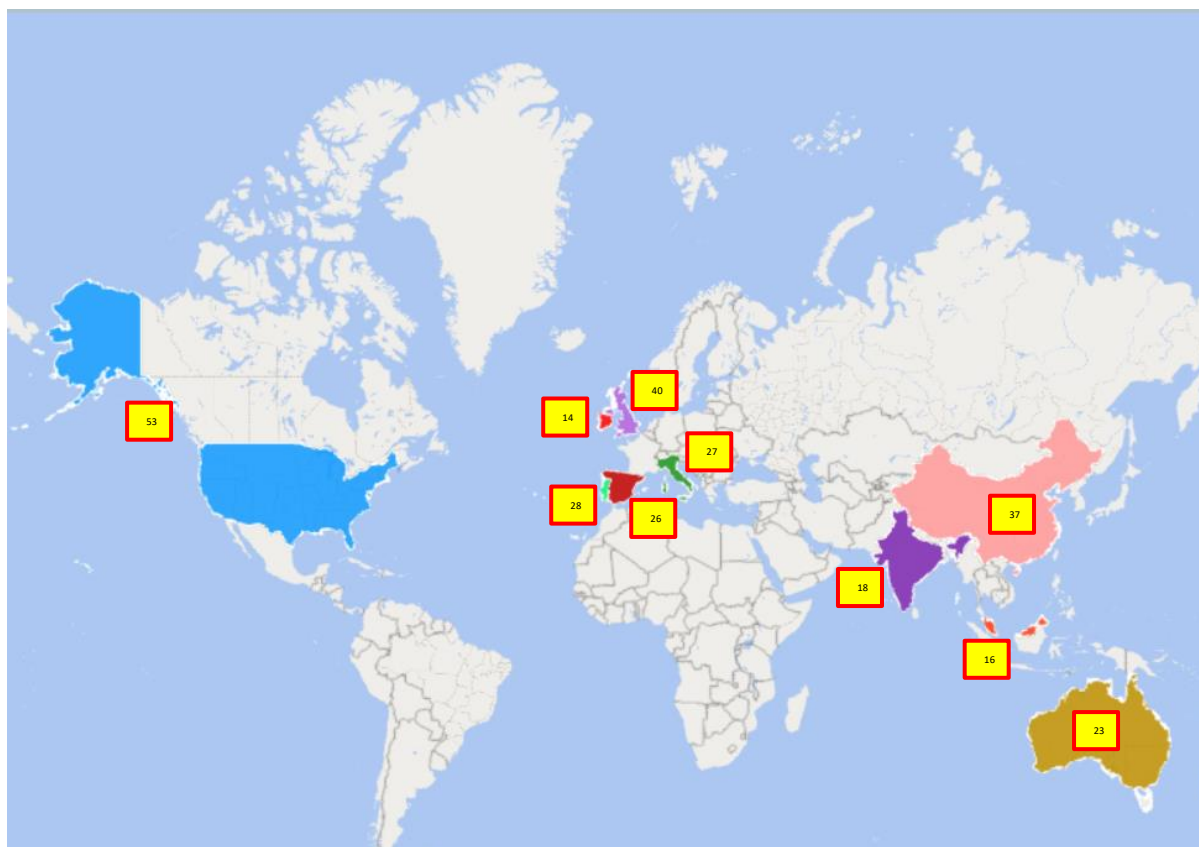| Rank	Country	No. of documents	Citations
1	United States	53	6111
2	United Kingdom	40	1878
3	China	37	237
4	Portugal	28	482
5	Italy	27	686
6	Spain	26	658
7	Australia	23	1188
8	India	18	137
9	Malaysia	16	158
10	Ireland	14	373
**	**Netherland**	**6**	**960**

Figure 8: World Map - Top 10 countries with the highest publications

(ii)   Main Institutions

Furthermore, Table 6 lists the most productive institutions in the field of capital structure in SMEs. 'Fiontar- Dublin City University' comes in first with six articles, followed by the 'Department of Business, Economics and Law, Centre for Research on Economic Relations- Mid Sweden University', 'Center for Financial Studies- National and Kapodistrian University of Athens', and 'Department of Social Sciences- Mid Sweden University' with three articles each. There was no correlation between the number of papers and the overall number of citations for any school, according to the data. Even though Fiontar published the most, the number of citations is still moderate. In contrast, a Duke University article from the 'Fuqua School of Business', which is not one of the top 10 institutions, received the most citations (2358 citations). It is interesting to note that 'Fuqua' only contributed one document.

Table 6

Top 10 Main institutions contributed to the publications

Rank	Institution	No. of documents	Citations
1	Fiontar, Dublin City University	6	159
2	Department of Business, Economics and Law, Centre for Research on Economic Relations, Mid Sweden University	3	86
3	Center for Financial Studies, National and Kapodistrian University of Athens	3	43
4	Department of Social Sciences, Mid Sweden University	3	3
5	Business Development Centre, Manchester Business School	2	423
6	School of Business, Trinity College Dublin	2	158
7	Department of Management Studies, Malaviya National Institute of Technology	2	71
8	Department of Management and Economics, University of Beira Interior	2	15
9	University of Ghana Business School	2	158
10	Robert H. Smith School of Business, University of Maryland	2	935
**	**Fuqua School of Business, Duke University**	**1**	**2358**

(iii) Authorship analysis

The top ten most prolific authors on capital structure in SMEs are shown in Table 7. *Serrasqueiro, Z* has the most articles on the list (n=16), followed by *Yazdanfar, D.* (n=8). All the remaining authors published less than 8 articles. Interestingly, while being the top author in the capital structure research, *Serrasqueiro, Z.'s* overall number of citations (n=244) is quite low. In contrast, *Graham & Harvey*, who released a paper in 2001, were discovered to be the most frequently referred (n=2358).

Table 7

Top 10 most productive authors in 'SMEs Capital Structure' research

Authors	No of Documents	Citations
Serrasqueiro, Z.	16	244
Yazdanfar, D.	8	116
Daskalakis, N.	6	388
Nunes, P.M.	6	131
Michaelas, N.	5	825
Poutziouris, P.	5	539
Kumar, S.	5	129
Abor, J.	5	219
Ohman, P.	**5**	113
**Graham J.R. & Harvey C.R.	**1**	**2358**

(iv)   Citation Analysis

Since citations are a major indicator of the quality of a scientific publication (Mukherjee et al., 2021), this study conducted a citation analysis of high-quality and influential publications. To some degree, the articles with high citations constitute the research trends in the scientific field (Gao et al., 2022). The citation metric for the data was determined using Harzing's Publish or Perish software. As of 10 October 2022, Table 8 shows the citation metric for all documents gathered. The citation metrics' table reveals that 13246 citations were referenced for 406 published papers over 38 years (1984-2022), with an average of 348.58 citations each year.

Table 8
Citation metrics

Reference date	10 October 2022
Publication years	1984-2022
Citation years	38 (1984-2022)
Total number of papers	406
Total citations	13246
Cites/year	348.58
Cites/paper	32.63
Authors/paper	2.36
Papers/author	0.42
Hirsch h-index	48
Egghe g-index	109
PoP hI,norm	35
PoP hI,annual	0.92

Further, Table 9 presents the top 10 most cited publications. The table summarises the number of times each document was cited in both the Scopus and Google Scholar databases, together with the 'cites per year'. According to the findings, Graham and Harvey (2001) hold the top position for the most cited article. Specifically, this study offers evidence on the field for the theory and practice of corporate finance. Findings showed that small businesses are more likely to employ the payback criterion than large businesses, which mainly rely on present value approaches and the capital asset pricing model. It also found some support for the pecking order and trade-off capital structure hypotheses. According to the Scopus database, the article has been cited 2358 times, with an average of 112 citations per year. Alternatively, based on the computation of Google Scholar as of 10 October 2022, the articles also received the highest number of citations (8131 times; 387 citations per year).

Following this is Berger and Udell (1998), which has been cited 1646 times. In this study, the authors examined the economics of financing small businesses in private equity and debt markets. Firms are viewed through a financial growth cycle paradigm in which different capital structures are optimal at different points in the cycle.

Looking into the year of publication of the most cited documents, the table shows that all articles were published on and before the year 2005. One-third of them were published in the "*Journal of Financial Economics*".

Table 9

Top 10 cited articles on 'SMEs Capital Structure'

No	Authors (year)		Document Title	Source	Cited by	Cites per year	GS cites	GS cites per year
1	Graham & Harvey	2001	"The theory and practice of corporate finance: Evidence from the field"	*"Journal of Financial Economics"*	2358	112.29	8131	387.19
2	Berger & Udell	1998	"The economics of small business finance: The roles of private equity and debt markets in the financial growth cycle"	*"Journal of Banking and Finance"*	1646	68.58	5664	236
3	Beck et al	2008	"Financing patterns around the world: Are small firms different?"	*"Journal of Financial Economics"*	498	35.57	1546	110.43
4	Demirguc-Kunt & Maksimovic	1999	"Institutions, financial markets, and firm debt maturity"	*"Journal of Financial Economics"*	437	19	1479	64.30
5	Michaelas et al	1999	"Financial Policy and Capital Structure Choice in U.K. SMEs: Empirical Evidence from Company Panel Data"	*"Small Business Economics"*	418	18.17	1474	64.09
6	Romano et al	2001	"Capital structure decision making: A	*"Journal of Business Venturing"*	357	17	1081	51.47

			model for family business"					
7	Cassar & Holmes	2003	"Capital structure and financing of SMEs: Australian evidence"	"Accounting and Finance"	220	11.58	1017	53.53
8	Hall et al	2004	"Determinants of the capital structures of European SMEs"	"Journal of Business Finance and Accounting"	216	12	926	51.44
9	Sogorb-Mira	2005	"How SME uniqueness affects capital structure: Evidence from a 1994-1998 Spanish data panel"	"Small Business Economics"	205	12.06	681	40.06
10	Scherr & Hulburt	2001	"The debt maturity structure of small firms"	"Financial Management"	185	8.81	540	25.71

Discussion, Recommendation and Conclusion

This study conducted a bibliometric analysis to gain an overview of the literature on capital structure in SMEs. The first research question provided a clear understanding of the development and distribution of research on the topic. A total of 406 documents are found in the Scopus database relating to this topic. The first document was written by Suret, titled "*Financial structure of small and medium size firms in the Province of Quebec*", and was published in the year 1984. Findings indicate that research on 'SMEs Capital Structure' was initially carried out by western scholars. It began to attract scholars from the East or Asia starting from the year 1994 by Harris, Schiantarelli, and Siregar, who studied "*The effect of financial liberalization on the capital structure and investment decisions of Indonesian manufacturing establishments*". In the early decades, the number of studies on capital structure remained stable at a modest level. It began to change beginning in the year 2008. It is interesting to note that, according to Scopus statistics, 96% of the documents were written in English, and more than 45% of the articles were 'journal' source types.

Furthermore, a subject areas and keywords analysis might be used to view the key area of research (i.e., the second research question). The majority of the research on 'SMEs capital structure' was conducted in the fields of "Business, Management, and Accounting" and "Economics, Econometrics, and Finance". It makes sense since the terms 'capital structure' and 'finance' are mostly associated with one another. Specifically, this study examined all keywords, author keywords, and index keywords in addressing the second research question.

The last query concerns the investigation of significant players and their collaboration. The citation metrics could be used to explain the importance of publications in "capital structure" research (refer to Table 8). The Scopus database shows that, on average, 348.58 times each year, or 32.63 citations per paper, were cited in papers related to 'SMEs capital structure'. Several authors collaborated on articles regarding 'SMEs capital structure', with an average of 2.36 authors per article.

There were several limitations found in the study. First, sole reliance on the Scopus database can result in publications on the 'SMEs capital structure' studies that are not definitive. Furthermore, the article's title, abstract, and keywords led researchers to concentrate solely on the subject of 'SMEs capital structure' for this study. As a result, all other information that was somewhat related to 'SMEs capital structure' but did not use it within those subject areas was excluded. Second, there is a possibility that authors registered numerous names or submitted different spellings in Scopus, which led to inaccurate information about their works. Thirdly, the analyses of this study were limited to the leading journals in 'SMEs capital structure'. Therefore, any publications appearing in specialised journals with lower rankings were not taken into account. Thus, when considering whether the findings of this study can be applied generally, keep in mind these restrictions.

Nevertheless, this study adds to knowledge by providing current research trends in 'SMEs capital structure' and expanding the literature on 'SMEs capital structure' through the application of the bibliometric method. Since interest in studies on 'SMEs capital structure' is on the rise year after year, this topic should be thoroughly studied. Future studies in this area might focus on a thorough content analysis of papers related to the research topic. As a stepping stone, this bibliometric study can be used alongside meta-analysis and structured literature reviews. Reviews will offer further details regarding the domain's origins and outcomes. Finally, this research can act as a foundation for other studies that are anticipated to add to the growing body of information on 'SMEs capital structure'.

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