

THE LATEST STREAMS IN FINANCE RESEARCH: AN UPDATED BIBLIOMETRIC MAPPING BASED ON CO-OCCURRENCE DATA

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ABSTRACT

The aim of this study is to analyse the latest streams in finance research using bibliographic mapping in order to identify the most relevant topics, journals, universities and countries, and to visualise the interrelations among them. For this purpose, a bibliometric mapping of the publications indexed in WoS and Scopus was conducted using WOSviewer software. During the search process, a set of 7455 references for the recent period 2017-2018 were obtained, of which a total of 3000 of the most frequently cited were analysed. Based on the co-occurrence frequencies of key terms, our term map provides a visual representation of the latest research in finance and, more specifically, of the organisation around seven main clusters, namely Core Finance, Financing and Environmental Finance, Finance Networks, Financial Crisis and Financing Issues, Financial Development, Public and Social Finances, and Financial Literacy. In our opinion, this study contributes to the literature on bibliometric research. Findings may be useful for scholars, researchers and journal editors in the field of finance.

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KEY WORDS

Bibliometric mapping, clustering, finance research, Scopus, WoS, WOSviewer.

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Introduction

According to Linnenluecke et al. (2016: 66), the field of finance has a prominent and growing role in business research. Financial decisions influence corporate performance, industrial growth and economic stability. Finance research has a long history with many exceptional and Nobel Prize-winning ideas published since its inception, including those by Black and Scholes (1973); Fama (1970); Markowitz (1952); Merton (1971, 1973, 1974); Miller

and Modigliani (1961); Modigliani and Miller (1958), and Sharpe (1964). Finance researchers worldwide strive to publish in the top journals in the field, including the Journal of Finance, Journal of Financial and Quantitative Analysis, Journal of Financial Economics, Review of Financial Studies (often referred to as A* or Tier 1 journals). The Tier 1 journals have placed a strong emphasis on US-based research, with a lesser focus on regional studies

as well as non-traditional data sets and research directions. Publications in local journals are often seen as peripheral, not because of a lack of significance and (often excellent) quality, but because of a lack of visibility within the global research conversation due to factors such as the dissemination of research findings among a more limited network of scholars (Tijsen et al., 2006).

Following Durán Sánchez et al. (2017:8), when carrying out the bibliometric analysis of a research field, the first step is to evaluate the available databases, their suitability and the consequences of using an alternative. Databases are defined as sets of data organised in a logical sequence, allowing simple access in order to make the information contained in the database easy to update, usable at any time by means of any computer program to which it is connected, and operated at all times according to different criteria (Luque, 1995: 44). According to Granda-Orive et al. (2013: 2), they play a key role in bibliometric research, as they enable users to analyse the scientific activity carried out by researchers, institutions, regions and countries, and identify trends in research. The validity of a paper will depend on the proper selection of the database, as it should sufficiently cover the study area.

For over 40 years, the Thomson Reuters' Web of Science (WoS) database was the only one that allowed this type of bibliometric study. Its multidisciplinary character and the availability of references, among other features, kept it at the forefront for decades. However, in November 2004 Elsevier Science launched Scopus, which quickly became its great rival for control of the international market of scientific databases (Durán Sánchez et al., 2017: 23). Recently, there have been studies comparing WoS and Scopus, concluding that both databases are consistently

improving thanks to this competition and there is no clear winner (Bakkalbasi et al., 2006: 7). However, as Durán Sánchez et al. (2017:10) state, comparative analysis was not only carried out between WoS and Scopus; authors such as Jacso (2005) and Bar-Ilan (2010) also include Google Scholar in their analysis.

To achieve our objectives, an advanced search of the terms related to the topic of finance in both databases was carried out, with the aim of locating articles published in journals and other documents indexed in these databases. In this way, a set of 2812 references in the case of WoS and 4643 for Scopus during 2017-2018 were selected, which are the basis for an empirical study and were dealt with using bibliographic mapping WOSviewer software.

This paper is divided into five main sections. Firstly, and after this introduction, a review of the prior studies and bibliometrics in the field of research in finance is presented in Section 1. Section 2 describes the data set and the research methodology, where we explain how we undertook our bibliometric mapping analysis. We present our results in Section 3. Finally, the last section summarises our main findings, some general conclusions and limitations associated with the research presented.

1. Theoretical background and prior research

Science is cumulative, as each new research builds on previous work and extends knowledge in a particular field. The literature review consists of "identifying, obtaining and consulting the literature and other materials, which are useful for the purposes of our study" (Hernández et al. 2007: 23-24).

The growth of scientific production in recent decades, and its collection in bibliographic databases, has led to the use of "bibliometrics" as a useful tool to measure

scientific activity based on the statistical analysis of quantitative data provided by scientific literature (Sancho 1990: 842–843). However, although this technique is applicable to all areas of knowledge and bibliometric studies have been carried out in many disciplines for a long time, its application to the field of research in finance has been rather scarce.

Bibliometric mapping is an important research topic in the field of bibliometrics (for an overview, see Börner et al. 2003). Bibliometric mapping¹ is a powerful tool for studying the structure and the dynamics of scientific fields. Researchers can utilise bibliometric maps to obtain a better understanding of the field in which they are working. In addition, bibliometric maps can provide valuable insights for science policy purposes (Van Eck et al. 2010: 581). Two aspects of bibliometric mapping that can be distinguished are the construction of bibliometric maps and the graphical representation of such maps. In the bibliometric literature, most attention is paid to the construction of bibliometric maps, whereas graphical representation receives considerably less attention (Van Eck and Waltman 2010: 524). Before their construction, it is needed to build bibliometric networks. A bibliometric network consists of nodes and edges. The nodes can be, for instance, publications, journals, researchers, or keywords. The edges indicate relationships between pairs of nodes. The most commonly studied types of relationships are citation relationships, keyword co-occurrence relationships, and co-authorship relationships. In the case of citation relationships, a further distinction can be made between direct citation relationships, co-citation relationships, and bibliographic coupling relationships. Bib-

liometric networks are usually weighted networks. Hence, edges indicate not only whether there is a relationship between two nodes or not, but also the strength of the relationship. For more information about bibliometric networks and bibliometric mapping, see Kopcsa and Schiebel (1998), Leydesdorff (2004), Waltman et al. (2010) and Van Eck and Waltman (2007b, 2010 and 2014).

With regard to the field of research in finance, Linnenluecke et al. (2016: 66) carried out a systematic review of 73 influential publications among 667 journal articles published in the literature on Asia-Pacific finance from 2011 to 2015. They used the bibliographic visualisation software HistCite™ for their analysis, which allowed them to produce citation maps of publications in a research field (Garfield 2004, 2009). Using the HistCite™-generated results as guidance, they identified 73 influential finance publications among four Asia-Pacific finance journals (Accounting and Finance, Australian Journal of Management, International Review of Finance, and Pacific-Basin Finance Journal) in the last five years. Their findings also showed how these publications are related in terms of their citation relationships. Among these top 73 papers, they identified eight different research fields, or lines of enquiry: (1) corporate finance, (2) asset pricing, (3) conditional asset pricing, (4) research on anomalies, (5) market microstructure research, (6) factor models, as well as two novel research streams, (7) research process and (8) research on frontiers in finance. When focusing on research frontiers in finance, their study identified emerging research trends and pathways for future research in the following areas: (1) environmental finance, (2) modern markets, (3) behavioural finance, (4) qualitative methods, (5) equity and diversity.

¹ Bibliographic mapping offers an objective assessment of the major contributions to a field of research over time. See Janssen (2007) and Janssen et al. (2006).

In 2017, these same authors also used bibliographic mapping to identify the fifty most influential articles in the Tier 1 finance journals since their inception, and to visualise the conceptual interrelations among them (Linnenluecke et al. 2017: 188). Their analysis showed that, over the last 50 years, research in the Tier 1 finance journals has developed from a few publications on asset pricing into a field with influential articles across six distinct genealogies, namely asset pricing, corporate finance, conditional asset pricing, market microstructure, factor models and anomalies and empirical regularities. Research in the Asia-Pacific finance journals largely parallels these developments, with a greater focus on regional studies but also innovative approaches such as qualitative and interdisciplinary research as well as research on alternative financial systems, particularly Islamic finance. As Linnenluecke et al. state (2017: 189), within the Tier 1 journals, quantitative modelling has been the dominant focus of finance research so far, and future challenges are related to empirical testing. Asset pricing studies have greatly contributed to theoretically determining appropriate asset returns, based on the capital asset pricing model (CAPM). This model continues to dominate the literature and is widely used in practice, but struggles with empirical verification. The conditional asset pricing stream, which examines the predictability of financial asset returns, is yet to overcome overfitting or data snooping biases (Foster et al. 1997). Factor models fall into the trap of Roll's (1977) critique that the expected return space can be spanned by any two frontier portfolios. This means that, if a researcher does not have an ex-ante model defining what constitutes a factor, they will fall into a mathematical identity trap by examining ex-post returns, and will instead find ex-post frontier portfolios.

Anomaly studies, which rely on average returns to study trading strategies, can be misleading if the proposed trading strategy does not have sufficient asset liquidity. Overcoming these limitations will be a key challenge for future research. In this context, a promising avenue will be establishing connections between the research streams; for instance, bringing together market microstructure (behaviour at the transaction level), asset pricing and conditional asset pricing (behaviour over long holding periods). Novel research directions are also emerging which hold great promise for expanding upon existing models and insights. They identify seven new streams of research in the Tier 1 finance journals by focusing on publications since 2010 (2011-2017). These are: environmental finance, financial crises, emerging markets, electronic markets, equity and diversity, research process and behavioural finance. These research directions have also found uptake in the Asia-Pacific research journals, yet more innovation is visible in the Asia-Pacific journals in terms of research studies targeting non-US countries, and focusing on non-traditional data sets and research directions. They believe that these emerging fields show real promise for the future but they encourage researchers to be even more open to new methodologies. Finance researchers have great opportunities to benefit from alternative research methodologies such as qualitative research and neuro finance. Neuro finance and qualitative methods are just some of the alternative techniques that can be used to tackle fundamental questions that cannot be answered by traditional empirical research using archival data sources. They encourage researchers to tackle the big, important questions that we face in the 21st century and to follow the lead of the pioneers of finance research by closely linking their research to

practice (Linnenluecke et al. 2017: 197).

The paucity of studies on bibliometric mapping in emerging trends in finance research in American and European countries contrasts with this type of systematic review in other parts of the world, as Linnenluecke et al. (2016 and 2017) have done in the Asia-Pacific area, for instance.

In the field of management and business research, Bigné (2016: 90) concludes by saying that a new paradigm shift is knocking on the door of research, with features such as multidisciplinary-based groups, blurred and mixed frontiers of disciplines, knowledge dissemination which takes place not only in managerial journals, and mixed research methods (see Molina-Azorín 2016). Interesting, new and fresh research will drive our research in the coming years.

2. Methodology

2.1. Data set

The first step in this study is the construction of a representative data set of finance literature in the last two years. To construct this data set, we needed to select the sources in which the most important financial studies can be found – thus, we compiled them from the Web of Science and Scopus databases. The Web of Science (WoS) is a Web technology-based platform created in 1960 that includes the references of the main scientific publications of any discipline of knowledge (scientific and technological, humanistic and sociological) since 1945, essential for supporting research and for recognising the efforts and advances made by the scientific and technological community. SCOPUS is a database owned by Elsevier, which contains 18,000 journals published by over 5000 international publishers. It has been active since 1996 and includes integrated websites and patents, as well as two research impact factor metrics:

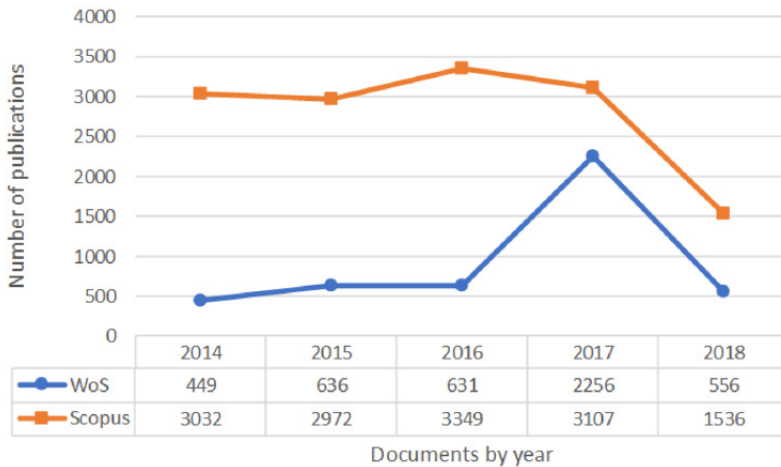
Scimago Journal Rank (SCR) and SNIP (Source-normalised impact Paper) of Leiden University. The Spanish Foundation for Science and Technology FECYT manages the licenses of the two main global databases of bibliographic references and citations of periodicals, Web of Science, owned by Clarivate Analytics, and Scopus, owned by Elsevier. We accessed them via the University Library of the University of Huelva (Spain). We only considered articles and other documents that were published in the 2017–2018 period. Therefore, the period pertaining to our data set was from January 2017 until May 2018. This most recent period is representative for the last developments in the field of finance. During this time span, the field has grown substantially and has become more interdisciplinary. As mentioned above, we used both WoS and SCOPUS data to collect research results and to build the research data set, as explained in Table 1. Data was retrieved in May 2018. In Fig. 1 we can see the evolution of the number or publications collected in WoS and SCOPUS.

Table 1. Detailed conditions of data collection and results

Descriptions	Conditions/results	
	Web of Science	SCOPUS
Search target DB	Web of Science	SCOPUS
Search expression	"Finance*" or "Financial*" or "Banking"	"Finance*" or "Financial*" or "Banking"
Search field	Topic, Title, Key words, Abstract, and year published	Topic, Title, Key words, Abstract, and year published
Search period	2017-2018. May	2017-2018. May.
Last search date	30-05-2018	31-05-2018
Search results	2.812	4.643

Source: Own research.

Figure 1. Evolution of the number of publications collected in WoS and Scopus. Publications were retrieved by querying "TITLE-ABS-KEY ("Finance*" OR "Financial*" OR "Banking*") AND SRCITITLE ("Finance*" OR "Financial*" OR "Banking*")



Source: Own research.

Results have been released in articles, book chapters, proceedings papers, books, reviews, conferences and other documents as explained in Fig. 2. For each paper, the following information was downloaded: name(s) of the author(s), title, name of the journal, citation details (vol-

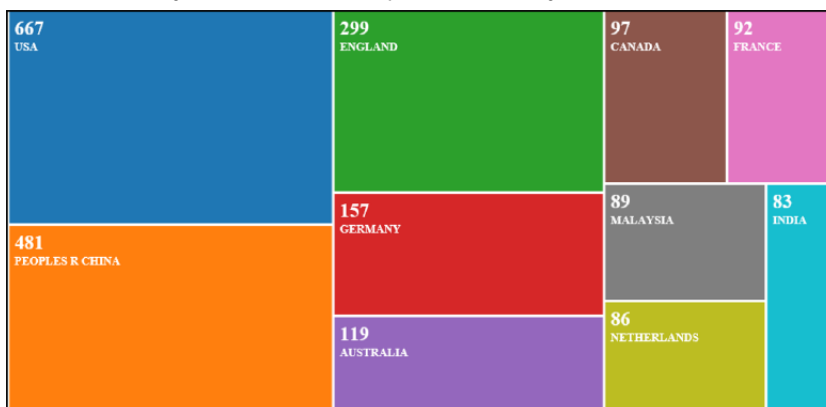
ume, issue and page numbers), as well as abstract and keywords. In addition, we downloaded a full record of cited references (i.e., references cited by each paper in the data collection). The downloaded data was used to produce the maps and figures described in the next sections.

Figure 2. Types of documents collected from WoS



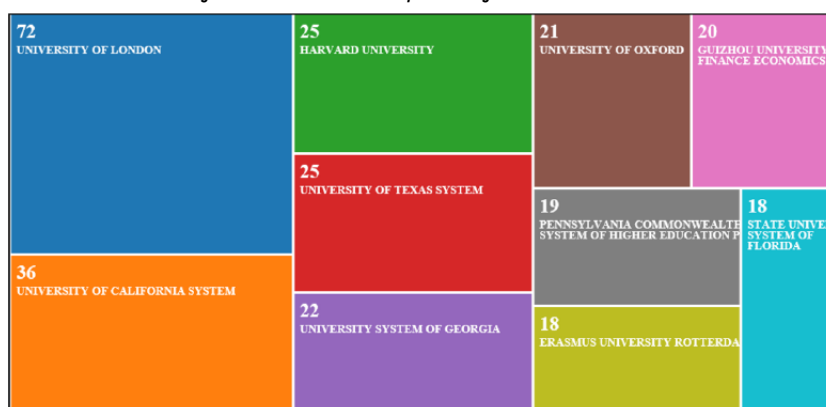
Source: Own research.

Figures 3. WOS documents by main countries/regions – enhanced



Source: Own research.

Figure 4. WoS documents by main organisations-enhanced



Source: Own research.

Table 2 shows the journals that have been most productive in terms of data collected from SCOPUS in the last 18 months. For each journal, we indicate the number of issues from which articles were taken.

Table 2. SCOPUS – highly productive journals collected in the most recent period

Rank	Source title	Number of issues
1	Research in International Business and Finance	226
2	Journal of Banking and Finance	158
3	Emerging Markets Finance and Trade	110
4	Journal of Financial Stability	106
5	Quantitative Finance	106
6	Review of Financial Studies	104
7	Journal of Corporate Finance	100
8	Finance Research Letters	97
9	Journal of International Money and Finance	94

10	International Review of Economics and Finance	93
11	Journal of Finance	93
12	Quarterly Review of Economics and Finance Journal of International Financial	92
13	Markets Institutions and Money	85
14	Review of Quantitative Finance and Accounting	85
15	Journal of Behavioural Finance	80
16	Managerial Finance	79
17	International Review of Financial Analysis	75
18	International Review of Finance	73
19	Accounting and Finance	70
20	Investment Management and Financial Innovations	70
21	European Journal of Finance	68
22	Journal of Financial Economics	67
23	Financial Management	64
24	North American Journal of Economics and Finance	63
25	Academy of Accounting and Financial Studies Journal	58

Source: Own research.

2.2. Research methodology

In this paper, we use a bibliometric mapping approach to analyse our data set and identify the most recent topics, streams and trends in finance, and to visualise their interrelations. Bibliometrics is the scientific field that is concerned with the quantitative analysis of books, articles, and other types of written communication. In the field of bibliometrics, a significant amount of attention is paid to bibliometric mapping. Bibliometric mapping aims to produce visual representations of the relations between certain units of interest. The units of interest can be, for example, documents, authors, or keywords, and the relations between the units can be based on, for example, citations, co-citations, co-authorships, or co-occurrences of keywords. In our analysis, we focus on relations between key terms in finance based on co-occurrences in titles and abstracts of articles. We refer to the map that we produce as a "term map". In the literature, the maps are often referred to as co-word maps (Heersmink et al. 2011: 243).

We use VOSviewer, a freely available computer program, for constructing and viewing bibliometric maps. VOS is an acronym for visualisation of similarities. Unlike programs such as SPSS and Pajek, which

are commonly used for bibliometric mapping, VOSviewer pays special attention to the graphical representation of bibliometric maps. We refer to Van Eck et al. (2010) for a discussion of the advantages of the VOS mapping technique over traditional multi-dimensional-scaling-based approaches to bibliometric mapping. The functionality of VOSviewer is especially useful for displaying large bibliometric maps in an easy-to-interpret way. VOSviewer has been used successfully in various projects carried out by the Centre for Science and Technology Studies at Leiden University. The program is accessible to the bibliometric research community (see www.vosviewer.com). VOSviewer can be used, for example, to construct maps of authors or journals based on co-citation data or to construct maps of keywords based on co-occurrence data. The program offers a viewer that allows bibliometric maps to be examined in full detail. VOSviewer can display a map in various different ways, each emphasising a different aspect of the map. The viewing capabilities of VOSviewer are especially useful for maps containing at least a moderately large number of items (e.g., at least 100 items). To construct a map, VOSviewer uses the VOS

mapping technique (Van Eck and Waltman 2007a and Van Eck et al., 2010). For earlier studies in which the VOS mapping technique was used, we refer to Van Eck and Waltman (2007b) and Van Eck et al. (2010).

Using a computer algorithm (Van Eck et al. 2010: 584-585), we identified terms in the titles and abstracts of the 3000 most cited articles in our data set. Only terms occurring at least 12 times in the titles, key words and abstracts were taken into consideration. Of the 6195 words or phrases, 48 meet the threshold. Some terms, such as Author, Abstract, or Preparation, are not particularly informative about finance. General terms such as 'finance' or 'finances' were also excluded from our analysis. The selection of the 46 terms was done using an automatic term identification technique (Van Eck et al. 2010).

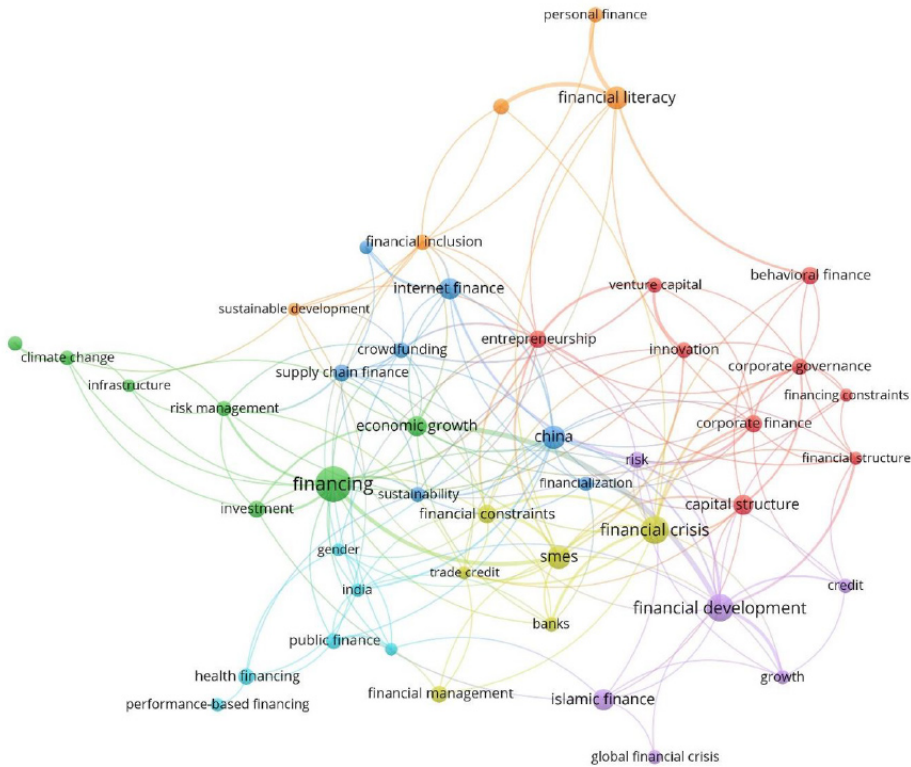
For each pair of terms, we counted the number of times the terms occur together in the same article (or more precisely, in the title, key words or abstract of the same article). Co-occurrence frequencies of terms are a commonly used measure of the relatedness of terms. We used the co-occurrence frequencies of our terms as input for the VOSviewer computer program. Based on the co-occurrence frequencies, the VOSviewer software constructed a term map. This is a 2-D map in which the 46 terms are located in such a way that the distance between any two terms reflects the relatedness of the terms as closely as possible. In general, the stronger the relationship between two terms, the smaller the distance between the terms in the map. Each term in the term map also has a colour assigned to it. Colours are used to indicate the grouping or clustering of the terms. Terms with the same colour belong to the same cluster and tend to be more closely related than terms with different colours. In other words, terms with the

same colour tend to co-occur with each other more frequently than terms with different colours. The clustering consists of seven clusters. We also tried out larger and smaller numbers of clusters, but a term map with seven clusters seemed to yield the most satisfactory interpretation.

3. Results

The term map constructed using the methodology discussed in the previous section is shown in Figures 5, 6, 7 and 8. These figures display the so-called network visualisation and density visualisation of the map. In the network visualisation, items are represented by their label and, by default, by a circle (Figure 5) or a frame (Figure 6) as well. The size of the label and the circle/frame of an item are determined by their weight. The higher the weight of an item, the larger the label and the circle of the item. For some items, the label may not be displayed. This is done in order to avoid overlapping labels. The colour of an item is determined by the cluster to which the item belongs. The lines between items represent links. By default, 500 lines are displayed at most, representing the 500 strongest links between items (Van Eck and Waltman 2018: 8).

Figure 5. Map of 46 key terms in finance (network visualisation with labels in circles)



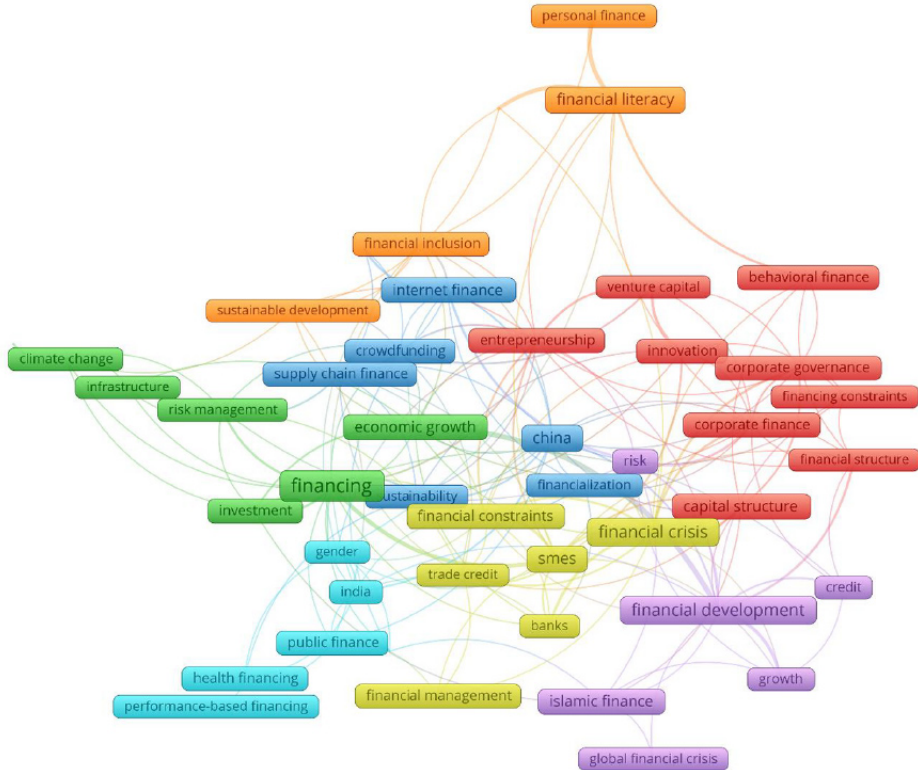
Legend: The font size used to display a term and the size of a term’s circle indicate the number of articles in which the term occurs. The colour of a term’s circle indicates the cluster to which the term belongs. To avoid overlapping labels, only a subset of all labels is visible.

Source: Own research.

The network visualisation focuses on the details of the map, while the density visualisation provides a general overview of the map by indicating the relative importance of the various areas in the map. In the density visualisation, the colour of an

area reflects the number of times the terms located in the area occur in the titles, key words and abstracts of the articles in our data set. The terms located in these areas occur together many times in the titles, key words and abstracts of our articles.

Figure 6. Map of 46 key terms in finance (network visualisation with labels in frames)



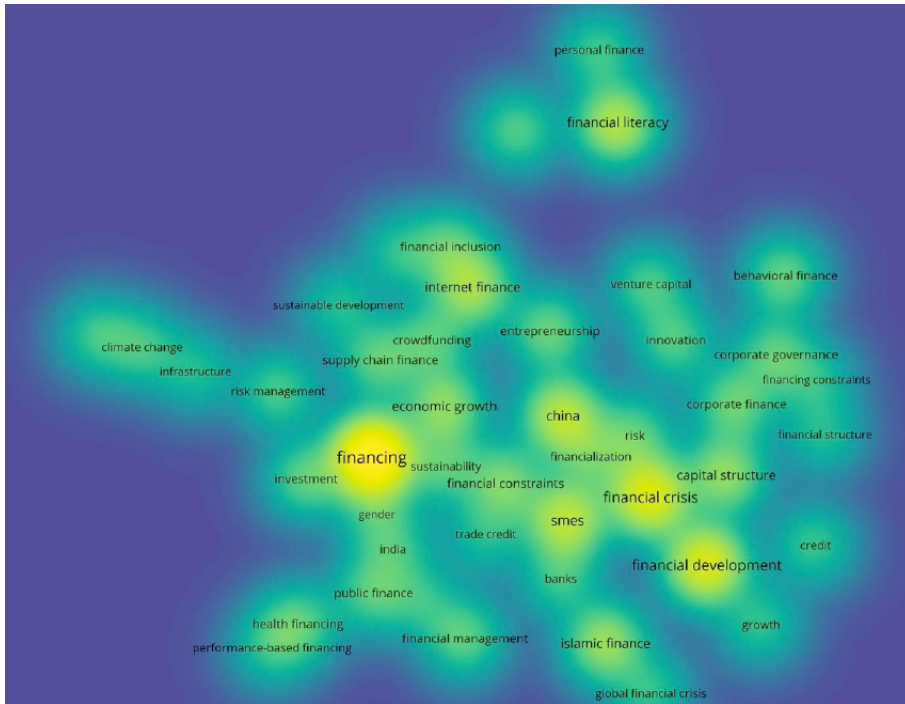
Legend: The font size used to display a term and the size of a term's frame indicate the number of articles in which the term occurs. The colour of a term's frame indicates the cluster to which the term belongs. To avoid overlapping labels, only a subset of all labels is visible.

Source: Own research.

There are two variants of the density visualisation. In the item density visualisation, items are represented by their label in a similar way as in the network visualisation and the overlay visualisation. Each point in the item density visualisation has a colour that indicates the density of items at that point. By default, colours range from blue to green to yellow. The larger the number of items in the vicinity of a point and the higher the weights of the neighbouring

items, the closer the colour of the point will be to yellow. Thus, the yellow areas in the density visualisation can be regarded as the most important ones. Conversely, the smaller the number of items in the neighbourhood of a point and the lower the weights of the neighbouring items, the closer the colour of the point is to blue (Van Eck and Waltman 2018: 10). An example of the item density visualisation is shown in Figure 7.

Figure 7. Map of 46 key terms in finance – item density visualisation

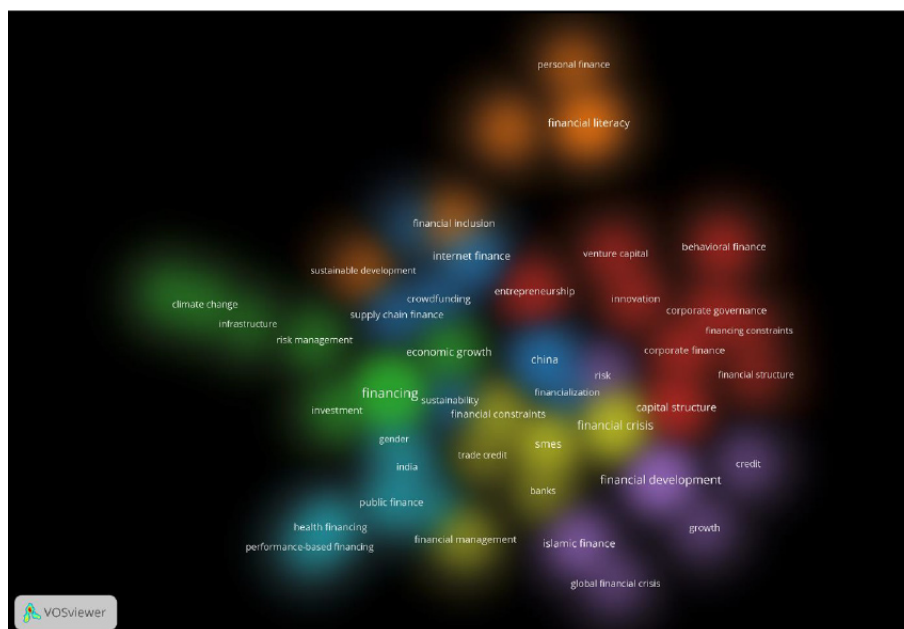


Source: Own research.

The cluster density visualisation is available only if items have been assigned to clusters. The cluster density visualisation is similar to the item density visualisation, except that the density of items is displayed separately for each cluster of items. In the cluster density visualisation, the colour of a point in the visualisation is obtained by mixing the colours of differ-

ent clusters. The weight given to the colour of a certain cluster is determined by the number of items belonging to that cluster in the neighbourhood of the point. As with the item density visualisation, the weight of an item is taken into account as well (Van Eck and Waltman 2018: 11). An example of the cluster density visualisation is shown in Figure 8.

Figure 8. Map of 46 key terms in finance - cluster density visualisation



Source: Own research.

Figures 6 and 8 show that none of the seven clusters has a prominent central term around which the other terms are positioned, but we can find some remarkable terms to describe them. The seven central terms are capital structure, financing, China, financial crisis, financial development, public and social finances, and financial literacy. The font size used to display a term and the size of a term's circle indicate the number of articles in which the term occurs. Hence, in finance research, financing, financial crisis, financial development, and financial literacy are the most prominent and

the most frequently discussed topics in the last year-and-a-half. We have named the seven clusters Core Finance, Financing and Environmental Finance, Finance Networks, Financial Crisis and Financing Issues, Financial Development, Public and Social Finances, and Financial Literacy. For each cluster, the 46 most frequently occurring terms are listed in Table 3. Most of these terms coincide with the results provided by Linnenluecke et al. (2017: 195-197) as directions for future research, but related in a different way.

Table 3. The most frequently occurring terms in each cluster in the most recent period

Number of terms	Clusters	Number of occurrences	Total link strength
Cluster 1: "Core finance"			
1	Behavioural finance	21	7
2	Capital structure	29	11
3	Corporate finance	22	16
4	Corporate governance	19	14
5	Entrepreneurship	22	23
6	Financial structure	12	10
7	Finance constraints	12	5
8	Innovation	18	13
9	Venture capital	17	13
Cluster 2: "Financing and environmental finance"			
10	Climate change	15	11
11	Climate finance	15	13
12	Economic growth	28	25
13	Financing	88	28
14	Infrastructure	12	15
15	Investment	20	14
16	Risk management	17	13
Cluster 3: "Finance networks"			
17	Big data	13	8
18	China	39	24
19	Crowdfunding	18	15
20	Financialisation	16	9
21	Internet finance	32	14
22	Supply chain finance	20	11
23	Sustainability	17	11
Cluster 4: "Financial crisis and financing issues"			
24	Banks	15	13
25	Financial constraints	24	18
26	Financial crisis	53	31
27	Financial management	20	5
28	SMEs (Small and medium-sized enterprises)	39	31
29	Trade credit	12	12
Cluster 5: "Financial development"			
30	Credit	15	7
31	Financial development	52	34
32	Global financial crisis	14	2
33	Growth	14	16
34	Islamic Finance	31	8
35	Risk	19	18
Cluster 6: "Public and social finances"			
36	Education	12	6
37	Gender	12	10
38	Health financing	19	5
39	India	13	14
40	Performance-based financing	13	1
41	Public finance	18	8
Cluster 6: "Financial literacy"			
42	Financial inclusion	18	12
43	Financial literacy	37	22
44	Household finance	18	10
45	Personal finance	16	9
46	Sustainable development	12	9

Source: Own research.

Conclusions

We have presented a bibliometric mapping analysis of the latest research in the field of finance. A representative data set of titles, key words and abstracts of 3000 articles published in leading journals and other documents was constructed and subsequently analysed with the computer program VOSviewer. The term map that was produced contains seven clusters, namely Core Finance, Financing and Environmental Finance, Finance Networks, Financial Crisis and Financing Issues, Financial Development, Public and Social Finances, and Financial Literacy.

It can be concluded that financing, financial crisis, financial development, and financial literacy have been the most prominent topics over the last 18 months. Other important topics are small and medium-sized enterprises, China, Internet finance and Islamic finance.

The interpretation of a bibliometric map is not entirely straightforward. Because bibliometric mapping has a number of limitations, the interpretation of a map should always be done in a very careful manner. Essentially, there are two types of limitations of bibliometric mapping, namely limitations imposed by the data and limitations imposed by the map. A bibliometric map provides a tool that helps experts to improve their knowledge of the field in which they are active and makes all kinds of suggestions. These suggestions may confirm or contradict an expert's ideas on the state of his field. They may also assist an expert in developing new ideas. However, even with the help of a bibliometric map, complete consensus among experts seems unlikely to emerge. More likely, different experts will give somewhat different interpretations to a bibliometric map. For this point of view, it is always good to have the opinions of multiple experts (Heersmink et al. 2011: 244 and 249).

The study reported in this paper can be seen as the first step towards a dynamic analysis of the latest streams in finance research. Similar studies can be undertaken in the future and may then indicate the developments in this field. For example, concepts may attract or lose attention over time, relations between concepts may change, and, at a more global level, topics may disappear or new topics may emerge.

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