

## Bibliometric Insights from Scopus and Dimensions: Analyzing Exit Strategies in Private Equity and Venture Capital for Library Collections

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### ABSTRACT

The research paper presents a comprehensive bibliometric analysis and systematic review of literature of exit timing and exit routes within the domains of private equity and venture capital investments. Utilizing advanced methodological analysis such as VOS viewer and MS Excel, an in-depth examination through Statistical Keyword Analysis, publication patterns, prominent authors, and influential sources of publication were identified. Through multiple rounds of filtering of key words and data mining, the key geographical trends, collaboration patterns that provided key valuable insights into co-authorships within prominent research clusters were extracted and analyzed. Moreover, in this study focus themes and regions of interest of those clusters that contributed to a holistic understanding of the dynamic research landscape in the thriving field of PE-VC investments were categorized. Our study provides a better understanding of PE-VC Exit field and based on the results also provide a synopsis of future research avenues.

**Keywords:** Private Equity, Venture Capital, Exit Routes, Exit timing, Funding, Bibliometric, VOS viewer.

### INTRODUCTION

Private Equity (PE) and Venture Capital (VC) play significant roles in today's business environment, serving as crucial financiers for innovative startups and high-growth companies (Gompers & Lerner, 2004). These entities provide essential capital and strategic guidance, fostering economic growth and job creation through innovation (Kaplan & Schoar, 2005). The decision-making process regarding exit timing and route selection by PE and VC firms is instrumental in achieving anticipated returns. However, determining the optimal exit strategy and timing remains challenging due to the dynamic and multifaceted nature of markets. Cumming et al. (2012) argue that exit strategy selection largely depends on the industry sector, firm performance, and macroeconomic context. Similarly, Achleitner and Figge (2014) identify exit timing predictability based on industry cycles, public market conditions, and firm maturity. Common exit routes include Initial Public Offers, Secondary Buyouts, or trade sales, while timing can be influenced by factors such as market conditions, firm performance, and industry landscape (Acharya, Hahn, & Kehoe, 2011; Cumming, Schmidt, & Walz, 2010). Despite these valuable insights, a comprehensive understanding of the factors influencing the exit decisions of PE and VC firms remains limited due to fragmented research on this topic. Therefore, this paper aims to address these gaps through a bibliometric analysis, a method that facilitates a holistic view of the existing body of knowledge, uncovering understudied topics and linkages (Zupic & Čater, 2015). This bibliometric analysis has the potential to shed light on prevailing trends, prominent authors, critical themes, and developmental trajectory concerning PE and VC exit, thereby guiding future research directions. In this sense, the main objective of this study is to conduct a bibliometric analysis of the existing literature on private equity and venture capital selection of exit routes and timing.

#### 1.1 Exit Routes and timing of Exit

Private equity and venture capital investors use various exit routes to realize returns on their investments and exit their positions in the companies they have invested in. The choice of exit route depends on factors such as the

stage of the company, industry dynamics, market conditions, and the investor's investment horizon. Here are some common exit routes available to PE-VC investors:

- **Initial Public Offering (IPO):** An Initial Public Offering (IPO) represents one of the most esteemed and profitable exit avenues (Fan, 2019). In this process, the investee company goes public by listing its shares on a stock exchange. Investors then sell their shares to the public at a price higher than their initial investment, resulting in significant gains (Maximilian & Gupta, 2018). However, executing an IPO necessitates thorough preparation, regulatory adherence, and favorable market conditions to ensure a successful offering (Zhong et al., 2020).
- **Merger or Acquisition:** This exit route means selling the company to another strategic purchaser, often a larger company in the same industry (Startup M&A | Acquisition | Exit Strategy | Getting Acquired, n.d). Mergers and acquisitions (M&A) can be an attractive exit option if the company has achieved significant growth and attracted interest from potential acquirers. The transaction may take the shape of a cash payout, stock swap, or a combination of both (Thompson & Kim, 2020).
- **Secondary Sale:** In a secondary sale, the private equity or venture capital investors sell their stake in the company to another investor, such as another private equity firm, a family office, or a strategic investor (Strategic exits in secondary venture capital markets, n.d). This type of exit allows investors to liquidate their positions and realize returns without the company going public or being acquired.
- **Management Buyout (MBO) or Management Buy-in (MBI):** In an MBO, the company's existing management team buys out the PE-VC investors to gain majority ownership of the business. In contrast, an MBI involves an external management team taking over the company (Management buy-in (MBI) - Marktlink, n.d). These options can be appealing when the management team has confidence in the company's potential and desires to steer its course
- **Secondary Public Offering (SPO):** In a SPO, the company presents additional shares to the public subsequent to the initial public offering (Andrieu & Groh, 2019). This grants private equity or venture capital investors an opportunity to divest more of their shares and attain additional gains.
- **Write-off or Liquidation:** In some cases, the investee company may face challenges, and the investors may not be able to achieve favorable exit options (Laine & Torstila, 2005)(Private equity exit strategies to create value | McKinsey, n.d). In such situations, the investors may decide to write off their investment or liquidate the company, attempting to recover as much value as possible(Giot & Schwienbacher, 2003).
- **Earn-outs:** In certain deals, the exit may involve earn-out provisions. Here, a portion of the purchase price is contingent upon the company achieving specific financial or operational targets in the future(L. G. Barbopoulos et al., 2018). This structure aligns the interests of the buyer and seller and allows the seller to benefit from the company's future success(L. Barbopoulos & Wilson, 2011).

The exit timing in private equity and venture capital pertains to the strategic decision-making process to decide the crucial time at which these investors opt to divest or liquidate their investments in a portfolio company. Exit timing is critical as it directly impacts the returns on investment and the overall success of the venture. According to Cumming and MacIntosh (2003), exit timing involves determining the most opportune moment to sell or dispose of the investment to maximize profits or achieve desired investment objectives. This decision is influenced by various factors such as the maturity of the investment, market conditions, industry trends, the company's growth potential, and the investor's exit strategy.

The timing of exit is a crucial aspect of the investment cycle and requires careful consideration and analysis by investors to optimize returns and mitigate risks. The decision to exit too early or too late can significantly impact the success of the investment, and thus, investors need to be prudent in their exit timing strategies (Kaplan & Strömberg, 2009). Exit timing in the realm of private equity and venture capital involves the strategic divestment of investments in portfolio companies, playing a crucial role in determining the ultimate success of the investment venture.

## **1.2 Keyword Analysis of PE-VC**

To delve into field of PE-VC Exit we need to do Keywords Analysis which we have done using the VOSviewer, as it is one of the crucial steps within the field of bibliometric analysis and research mapping. Through these insights into evolutions of a particular field and emerging theme could be ascertained regarding a particular item. Fig 1a shows the graphical output from VOSviewer as a result of keyword analysis.

Keyword Analysis result shows that More than 50% of research was focused on the Venture Capital from 2010 till 2014-16 but on later stage since 2017 research has shown interest towards private equity and entrepreneurship also , the researchers has shown interest in the research on Investment in Venture Capital and exit with an routeof Initial Public Offer, later on private equity their investment , exit and exit strategy got attention, Through the keyword analysis using vosviewer , we found 10 keywords including Venture Capital , private equity , entrepreneurship, exits , initial public officer, investment , exit strategy, syndication from these 4 cluster were found Name cluster 1 including Private equity, governance and entrepreneurship , Cluster 2 consisting of exits,

Initial public offer and investment, cluster 3 Syndication, Venture Capital and real options, cluster 4 consisting Exit strategy.

This keyword analysis provided us with a deep analysis of development of themes over the topic of PE-VC exit routes and timing, there has been gradual increase in the field by academicians and researchers since 2010 with centralized initial focus on Venture capital later shifting including private equity with exit Routes, strategy and with other related words including entrepreneurship and governance. Although the focus on strategy was significantly focused on IPO only other options of exit i.e, merger & acquisition , trade sales , liquidation were given less attention.

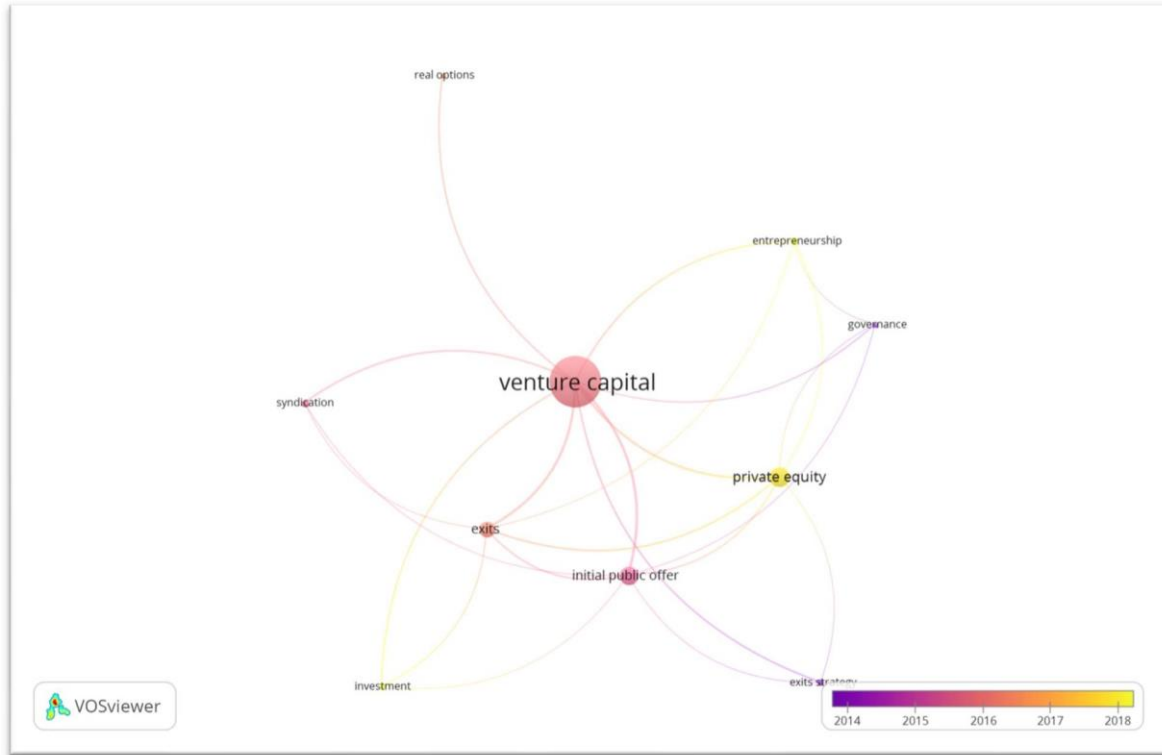


Fig 1a VOS Viewer Output for Keyword Analysis

## 2. Objectives and Research Question

Developing a set of clear and focused research questions is an integral part of the research process. The proposed questions for this bibliometric analysis aim to provide a comprehensive understanding of the existing body of literature on the exit strategies and the timing of exit in the context of PE-VC. The Initial Four questions (RQ1-4) aim towards the examination of fundamental bibliometric indicators: publication patterns, contributions and the impact of the research carried out (Koehler, 2016). The understanding developed from these questions will help us identify key trends, leading contributors and major landmark studies in the field of VC and PE exit strategies. Questions 5 focus on the geographical distribution of the literature. These will shed light on regional research robustness, underserved areas, offering insights into global research trends and potential academic niches (Archambault et al., 2006). The last set, RQ6, is focused on evaluating the collaborations pattern among authors and underlying themes in the field. (Janssens et al., 2006). Each question corresponds to a critical position within the holistic understanding of the field and enables the researchers to draw connections among the variables under study (Mattick et al., 2018).

RQ1. What are the publication trends concerning exit routes and timing within the domains of "Private Equity – Venture Capital"?

RQ2. Who are the most prominent and effective authors in the realms of " Private Equity – Venture Capital " when it comes to exit routes and timing?

RQ3. Which sources have demonstrated the highest prominence and effectiveness within the domains of " Private Equity – Venture Capital " regarding exit Routes and timing?

RQ4. Which papers have the highest citation counts in the domains of " Private Equity – Venture Capital " concerning exit routes and timing?

Objectives for RQ5:

RQ5. What geographic regions have been concentrated on scholarly research within the domains of " Private Equity – Venture Capital " concerning exit routes & timing? Additionally, which regions have been relatively overlooked by researchers?

Objectives for RQ6:

RQ6. How do cooperation trends look within the domains of “Private Equity – Venture Capital” when it comes to exit routes and timing?

### **2.1. Hypothesis**

Besides the Research questions, two hypotheses are also framed to test-

- I. Whether the distribution of academicians and researchers focus, and efforts remains uniform across emerging and established economies.

Null Hypothesis (H0): There is no significant difference in the focus of academic research between emerging economies and established economies.

Alternate Hypothesis (H1): There is a significant difference in the focus of academic research, with a greater emphasis on emerging economies.

- II. Whether the academicians and researchers have significantly focused on Timing & Exit of Private equity Venture capital in their research.

Null Hypothesis (H0): There is no significant emphasis by academicians and researchers on Timing & Exit in Private Equity Venture Capital (PEVC) in their research.

Alternate Hypothesis (H1): Academicians and researchers have significantly focused on Timing & Exit in Private Equity Venture Capital in their research.

### **3. Methodology**

To conduct the bibliometric analysis for this study on exit routes and timing in private equity (PE) and venture capital (VC), we employed VOS viewer, a specialized software tool developed by van Eck and Waltman (2010). Software VOSviewer is uniquely crafted to build and graphically represent bibliometric networks, including journals, researchers, or individual publications. These networks can be created based on various types of relations, such as bibliographic coupling, citation, co-authorship, or co-citation enabling comprehensive insights into research patterns and collaborations (van Eck & Waltman, 2010). The software will be used to map the co-occurrence network of the keywords found in the title, abstract, and author keywords of the extracted publications. This will enable us to identify the most frequently discussed topics and the associations between various themes in the existing literature (van Eck & Waltman, 2011). Simultaneously, VOS viewer will also be used to conduct a citation analysis. This will help in identifying the most influential papers, authors, and journals in the field and the nature of their influence on research trends. Finally, the visualization maps created through VOS viewer will be interpreted and discussed, providing a detail view of the themes, interactions, and patterns in the research field of exit strategies and timing in PE and VC.

“Private Equity and Venture Capital Exit Routes and timing of Exit”, The SCOPUS and DIMENSIONS.AI database was utilized for this research, and multiple rounds of filtering were employed to identify pertinent literature from the initial keyword search. The initial keyword search included terms such as "private equity" for research on private equity, "venture capital" for research on venture capital, and terms related to exit timing (e.g., "Exit Timing," "Exit Routes," "Exit Time," "Exit Options").

Following the keyword search, numerous studies in the relevant areas were identified. To refine the scope and facilitate a focused examination of the present research landscape in both private equity and venture capital, the results were refined based on relevant SCOPUS categories, including Accounting, Auditing, Business Finance, Business, Management, Investments, and Economics. This refinement process resulted in a final dataset consisting of 1493 documents.

After data extraction, further filtering was conducted to ensure that the research remains concentrated on exit routes and timing specifically related to private equity and venture capital. This additional filtering allowed the researchers to concentrate on the most pertinent literature and gain in-depth insights into the exit strategies and timing in these domains.

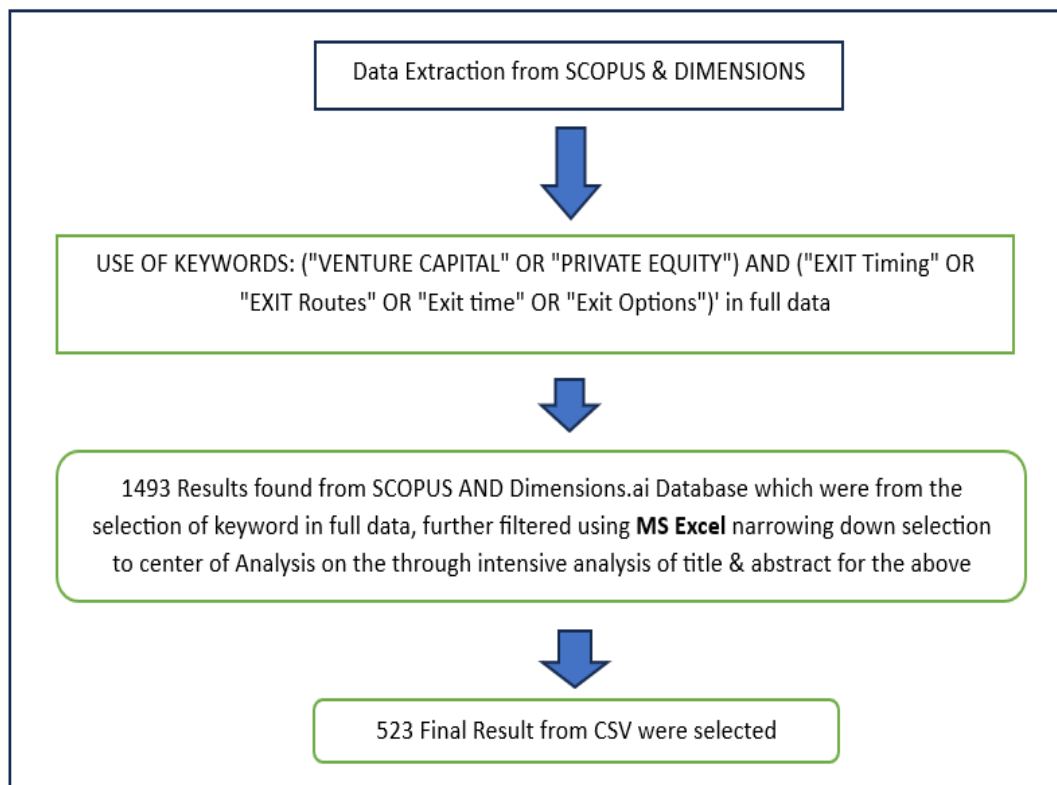


Fig1. Steps for Data Filtration using MS Excel from CSV

Note: The above figure is based on researchers' analysis

Table-1 Aligning Research Objectives with Methodological Approaches

Criteria for Inclusion and Exclusion	
<b>Inclusion Criteria</b>	Article published in peer-reviewed journal
	Empirical or non-empirical article
	Article in English language
	Keywords included in the article's title, abstract, or keywords
<b>Exclusion criteria</b>	Comments, book chapters, book reviews, working papers, and conference papers
	Keyword not mentioned anywhere in article (error in article search); keyword appearing only in reference list
	The article does not focus on religion and entrepreneurship

Table-2 Aligning Research Objectives with Methodological Approaches

Study Goals	Analytical Approach	Research Instruments	Data Type	Technological Resources
To conduct a performance analysis in the domain of PE-VC Exit Routes and timing	Elucidate publication and citation patterns of authors and their contributions	Performance analysis	Publications • Citations	Database: • SCOPUS • Dimension.ai  Analytical tools: • VOS viewer • MS Excel
To perform a study of the Geographical focuses in domain of PE-VC Exit Routes and timing	Exploring geographical inclinations of publications	Descriptive Analysis	Geographical Collaboration and publishing pattern	
To conduct a science mapping in domain of PE-VC Exit Routes and timing	Creating thematic grouping	Co-authorship analysis	• Authors • References	

Note: The above figure is based on researchers' analysis

#### 4. Study and Analysis for accomplishing study goals

##### 4.1 Performance analysis of Research on Exit Routes and Timing of Exit by Private Equity-Venture Capital

Our four research questions focused on performance analysis of this field, Q1 deals with analysis of patterns of publication in the field of Exit Routes and timing of Exit PE-VC, there is a consistent publication trend in the field since year 2008 consistent per year growth in the publication is seen and from 2014 average publication has increased to 37 papers in this field and this suggests that research within the field has experienced steady growth over the years, indicating an organic development. This implies that the research is not driven by any external factors or specific events, and this sustained output signifies a continuous and self-driven pursuit of knowledge within the field, independent of external influences.

The Consistent line in Figure 2 displays the trend of publication for research in Private equity-venture capital. As evident from the trend (RQ1), there has been significant growth in the field's research over the years. The charts illustrate a clear increase in research pertaining to Private equity-venture capital exit routes and timing since 2008, with an average of around 32 publications per year.

Table 3 presents the list of Most prominent and Table 4 presents most effective authors (RQ2) within the domains of PE-VC exit routes and exit timing, in this most prolific author in this field is Wright mike with 21 Documents, followed by Cumming Douglas with 11 documents, followed by Detienne, Dawn R. and Mohamed, Abdulkadir with 10 Documents each. Most Impactful authors in this field are Detienne, Dawn R. with 1458 citations, followed by Cumming, Douglas. with 801 citations, followed by Wright, Mike with 727 citations

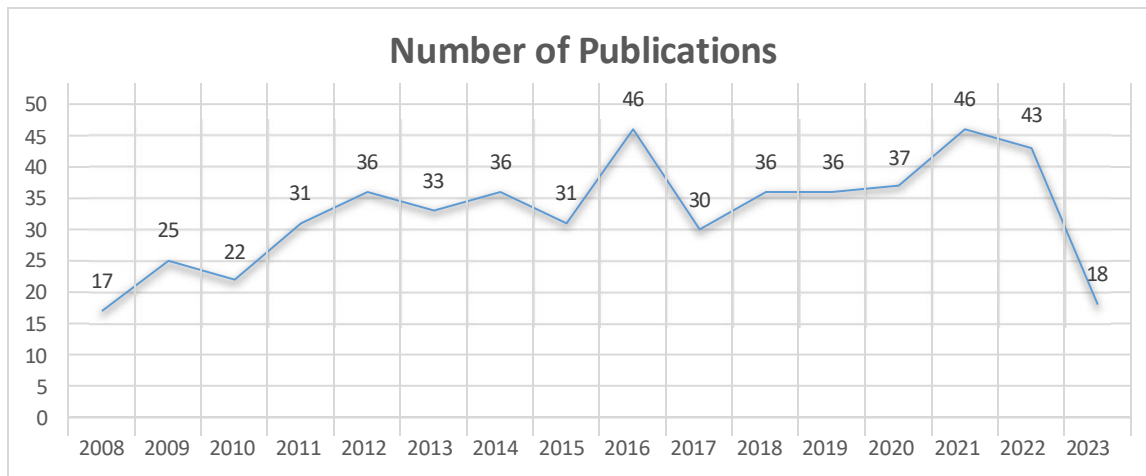


Fig.2 Year wise Number of publications

Note: The above figure is based on output of VOSviewer and MS Excel

Table 5 presents the list of Most prominent Source within the domain of Private equity- Venture Capital Exit Routes and exit timing (RQ3), The journal "Venture Capital" emerges as the most productive source in this domain, contributing 28 documents. It is closely followed by "Small business economics" with 21 documents and "Journal of Corporate Finance" with 21 documents. In Table 6, Researchers observe that the most influential sources (RQ 3) in this field are the "Journal of Business Venturing" with 1914 citations, succeeded by the "Journal of Financial Economics" with 1160 citations, and "Journal of International Business Studies" with 823 citations.

Table 3 Most prominent Authors in the field of the domain of PE-VC Exit Routes and timing

S.no	Authors	Documents
1	Wright, Mike	21
2	Cumming, Douglas	11
3	Detienne, Dawn R.	10
4	Mohamed, Abdulkadir	10
5	Schwienbacher, Amin	9
6	Caselli, Stefano	8
7	Klonowski, Darek	8
8	Manigart, Sophie	8
9	Zhang, Xubo	8
10	Khurshed, Arif	7
11	Vismara, Silvio	6
12	Ahlers, Oliver	5
13	Espenlaub, Susanne	5

Note: The above figure is based on VOSviewer Output

Table 4 Most Effective Authors in the field of the domain of PE-VC Exit Routes and timing

S.No	Authors	Citations
1	Detienne, Dawn R.	1458
2	Cumming, Douglas	801
3	Wright, Mike	727
4	Schwiebacher, Amin	294
5	Vismara, Silvio	276
6	Manigart, Sophie	214
7	Mohamed, Abdulkadir	155
8	Khurshed, Arif	129
9	Espenlaub, Susanne	118
10	Ahlers, Oliver	91
11	Caselli, Stefano	28
12	Klonowski, Darek	27
13	Zhang, Xubo	27

Note: The above figure is based on VOS viewer Output

Table 5 The most Prominent sources for the domain of PE-VC Exit Routes and timing

S.No	Source	Document
1	Venture Capital	28
2	Journal Of Corporate Finance	21
3	Small Business Economics	21
4	Journal Of Business Venturing	19
5	Journal Of Banking & Finance	11
6	Entrepreneurship Theory And Practice	9
7	Journal Of Financial Economics	9
8	International Small Business Journal Researching Entrepreneurship	8
9	Journal Of International Business Studies	7
10	Private Equity And Venture Capital In Europe	7
11	Financial Management	6
12	Journal Of Financial And Quantitative Analysis	6
13	Strategic Change	6
14	Journal Of Applied Corporate Finance	5
15	Journal Of Business Economics	5
16	Managerial And Decision Economics	5
17	Private Equity In China	5
18	The Routledge Companion To Management Buyouts	5

Note: The above figure is based on VOSviewer Output.



Table 6 The most effective sources for the domain of PE-VC Exit Routes and timing

S.No	Source	Citations
1	Journal Of Business Venturing	1914
2	Journal Of Financial Economics	1160
3	Journal Of International Business Studies	823
4	Entrepreneurship Theory And Practice	514
5	Small Business Economics	512
6	International Small Business Journal Researching Entrepreneurship	439
7	Venture Capital	433
8	Journal Of Financial And Quantitative Analysis	379
9	Journal Of Corporate Finance	340
10	Journal Of Banking & Finance	266
11	Financial Management	157

Note: The above figure is based on VOSviewer Output

The table 7 show The articles with the highest citation counts in the field of Exit Routes and timing of Private Equity and Venture Capital(RQ4), in which Paper titled by (Nahata, 2008)Venture capital reputation and investment performance published in 2008 received highest citation of 504, followed by paper by(Wennberg et al., 2010)Reconceptualizing entrepreneurial exit: Divergent exit routes and their drivers gained 356 citations, Paper (DeTienne, 2010) “Entrepreneurial exit as a critical component of the entrepreneurial process: Theoretical development” received 346 Citation.

Table 7 Most cited Articles in the field of PE-VC Exit Routes and timing

S.No	Journal	Title	Authors	Citations	Year
1	J. Financial Economics	Venture Capital Reputation and Investment Performance	Nahata, Rajarishi	504	2008
2	J. Business Venturing	Reconceptualizing Entrepreneurial Exit: Divergent Routes and Drivers	K. Wennberg, J. Wiklund, R. Dawn, DeTienne, S. Mellisa, Cardon	356	2010
3	J. Business Venturing	Entrepreneurial Exit as Component of Process: Theoretical Development	DeTienne, R. Dawn	346	2010
4	J. Int'l Business Studies	Private Equity Returns and Global Disclosure	D. Cumming, U. Walz	309	2009
5	Rev. Financial Studies	Trust Importance for Investment: Evidence from Venture Capital	L. Bottazzi, M. Da Rin, T. Hellmann	249	2016

<b>6</b>	J. Int'l Business Studies	Institutions and Internationalization of US Venture Capital Firms	I. Guler, M. F. Guillén	237	2009
<b>7</b>	Res. Policy	Government, Venture Capital, and Growth of European High-Tech Entrepreneurial Firms	L. Grilli, S. Murtinu	228	2014
<b>8</b>	J. Financial Economics	What do private equity firms say they do?	P. Gompers, S. N. Kaplan, V. Mukharlyamov	196	2016
<b>9</b>	Small Business Economics	Impact of Founder Experience on Exit Intentions	D. R. DeTienne, M. S. Cardon	186	2010
<b>10</b>	Int'l Small Business Journal Researching Entrepreneurship	What to we really mean when we talk about an exit? A critical review of research on Entrepreneurial Exit	K. Wennberg, D. R. DeTienne	170	2014
<b>11</b>	Handbook of Economics of Finance	A Survey of Venture Capital Research	M. Da Rin, T. Hellmann, M. Puri	168	2013
<b>12</b>	J. Business Venturing	Making sense of entrepreneurial exit strategies: A typology and test	D. R. DeTienne, A. McKelvie, G. N. Chandler	142	2015
<b>13</b>	Entrepreneurship Theory and Practice	Valuing University-Based Firms: The effects of academic affiliations on IPO performance	D. Bonardo, S. Paleari, S. Vismara	141	2011

Note: The above figure is based on VOSviewer and MS Excel output

#### **4.2 A study of the Geographical focuses in domain of PE-VC Exit Routes and timing**

To answer RQ 5, Table No. 8 present analysis of focus on geographical areas on the research of Exit Routes and Exit Timing of PE-VC, Fig No. 3 the image extract from VOS viewer, define overlay visualization of geographical area in this field.

Table No 8 Geographical Focus Analysis in Private Equity-Venture Capital Exit Routes and Timing Research

S.No	Country	Documents	Citations	Total Link Strength
1	UNITED STATES	107	4646	828
2	UNITED KINGDOM	81	2587	590
3	CHINA	48	463	156
4	GERMANY	44	966	412
5	CANADA	39	1287	291
6	ITALY	34	1371	188
7	FRANCE	29	593	226
8	INDIA	28	105	85
9	NETHERLANDS	23	1050	225
10	BELGIUM	20	578	161
11	SWITZERLAND	15	400	145
12	AUSTRALIA	13	160	80

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13	SWEDEN	8	620	184
14	FINLAND	7	211	38
15	SPAIN	7	297	64
16	JAPAN	6	79	47
17	NORWAY	6	101	48
18	SOUTH KOREA	6	54	24
19	PORTUGAL	5	95	44

Note: The above figure is based on VOSviewer Output

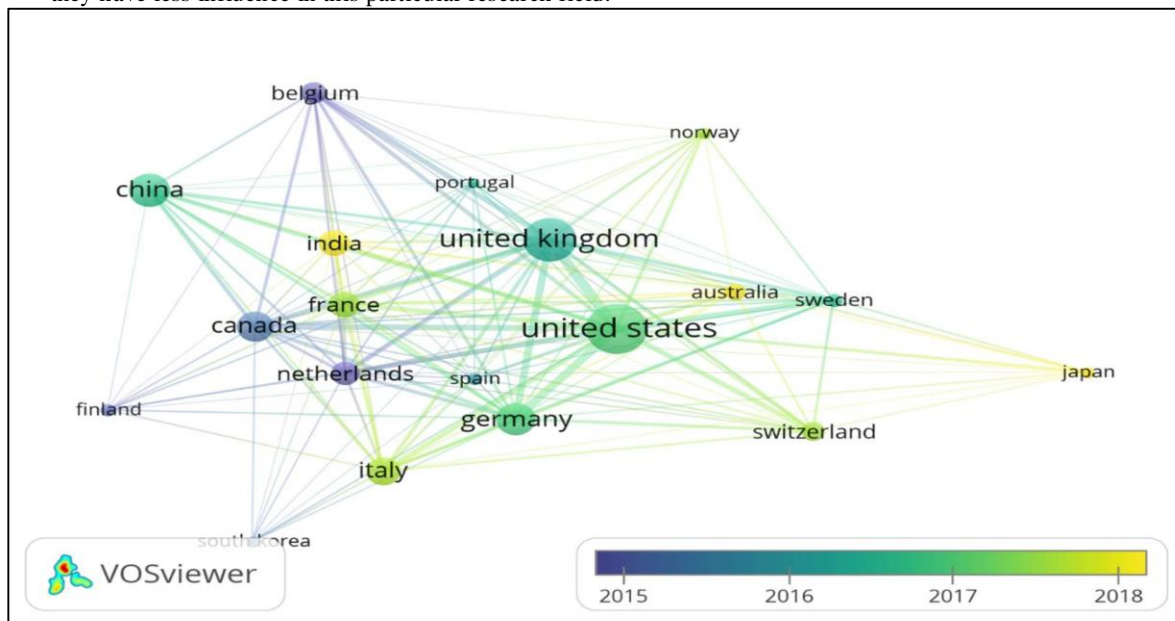
The table presents a bibliometric analysis from VOSviewer, focusing on the geographical distribution and influence of research output on a given topic:

- Country: Represents the country of origin for each listed research work.
- Documents: The number of research works published from each country. This number indicates volume but not necessarily the quality or impact of research.
- Citations: The number of times these works have been cited by other researchers. High citation counts usually show that a research work was influential in its field.
- Total Link Strength: A direct measure of collaboration between authors in a given country. High total link strength usually indicates a strong network among researchers in that country.

From the presented data, the United States stands out as the most productive and influential country, with the highest results across all metrics. Moreover other part of the globe , such as the United Kingdom, Germany, and Italy, also show prominent results. China and India might have fewer documents, but they still show considerable

citations and link strength, suggesting growing research influence.

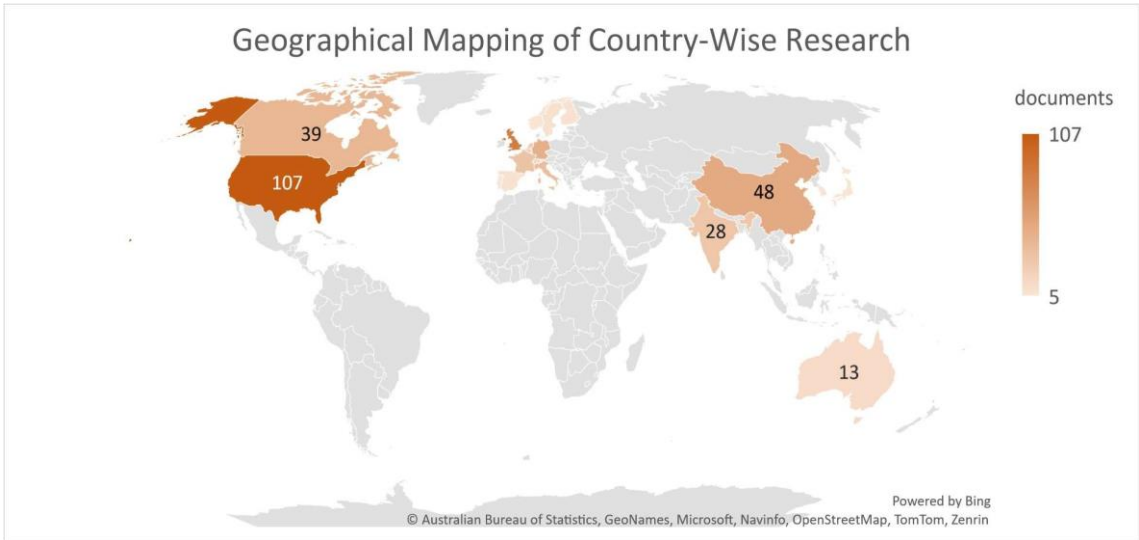
Countries at the lower end, like New Zealand and South Africa, have lower research volume and citations, implying they have less influence in this particular research field.



Note: The above figure is based on VOSviewer Output

Fig 3 Overlayvisualization of Geographical collaboration

According to the analysis, several countries, namely the United States, United Kingdom, Finland, Netherlands, Belgium and Canada, have been actively involved in research in this specific field for an extended period. The average year of publication for these countries' research papers is around 2015-2016. This suggests that they have been contributing to the advancement of knowledge in this field for quite some time, and their research output has been established and recognized over the years.



Note: The above figure is based on VOSviewer Output

**Fig No 4 Geographical mapping of Research Publication**

Conversely, the analysis reveals that emerging economies like India, Australia, Japan, and the United Arab Emirates are emerging in research in the same field. The average year of publication for research papers from these countries is approximately 2017-2018. This implies that these countries have started to increase their research activities and are actively making more contributions to the field recently. While they may not have a long history of research in this specific area compared to the previously mentioned countries, their involvement and impact in the field are on the rise. Overall, the analysis provides valuable insights into the research landscape of this field, highlighting the established research efforts of some countries and the growing research contributions of others. It also suggests that research interest and activity in the field are dynamic, with countries' roles and contributions evolving over time. These findings can be essential for understanding the distribution of research efforts globally and identifying potential collaboration opportunities among countries with similar research interests.

**4.3 Analysis for thematic analysis of exit routes and timing of PE-VC:**

**Science mapping**

We conducted an analysis of co-authorship (RQ5) to achieve our third research goal. This process enabled us to identify numerous key author groups that have profoundly impacted the venture capital industry (Source 2). We developed the co-authorship network, concentrating on authors whose work has been included in at least five publications in this field. Numerous clusters were revealed because of this research. Three significant clusters with two or more writers received the most attention, Figure 5 shows the network of author collaborations, while Table 9 gives an overview of the author groups.

When performing co-authorship analysis, VOSviewer creates a network of authors. In this network representation, individual authors are depicted as nodes, while the connections between authors are visualized as edges linking these nodes. The "Total Link Strength" for a particular author is calculated by summing up the number of co-authored papers that the author has with all other authors in the network.

For example, if Author A has co-authored 5 papers with Author B, 3 papers with Author C, and 2 papers with Author D, then the "Total Link Strength" for Author A would be  $5 + 3 + 2 = 10$ . This means that Author A has a relatively strong collaborative relationship with Author B, Author C, and Author D because they have collaborated on a total of 10 papers together.

Table-9

		Document	Total Link Strength	Publication Year	Theme Focus	Regions
Cluster 1	Susanne Espanlaub	5	9	2016	Venture Capital	EUROPE
	Arif Khurshed	7	12	2015.86	Syndication	
	Abdulkadir Mohamed	10	14	2017.2	IPO	
Cluster 2	Oliver Ahlers	5	2	2016	Buyout Exit Strategies	US,UK
	Sophie manigart	8	3	2015.12	Buyout Deals	EUROPE
	Mike Wright	21	5	2013.52		

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Cluster 3	Douglas Cumming	11	3	2011.82	IPO	JAPAN,US A
	Armin Schweinbacher	9	6	2013.78	Investment Performance	CHINA

Note: The above figure is based on VOSviewer and MS Excel Output

#### Cluster 1:

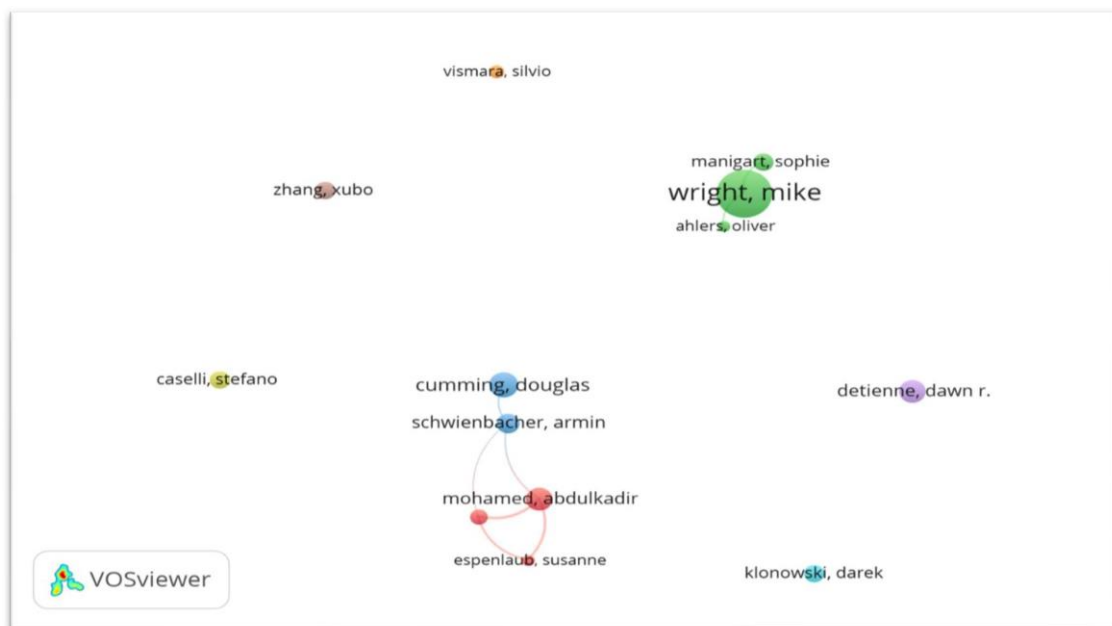
The bibliometric analysis identifies a productive author cluster comprising Abdulkadir Mohamed, Susanne Espanlaub, Arif Khurshed. They have sustained a high level of collaboration, attested by a total link strength of 11.6, signifying strong co-authorship connections. This cluster is named after Abdulkadir Mohamed as he has highest number of papers, they have five documents collectively penned, primarily around the year of 2016, this group shows consistent scholarly output. Their research themes revolve around pertinent topics like "Venture Capital," "Syndication," and "IPO," contributing substantially to the discourses within these subject areas. The research focus of these authors is primarily European, specifying the geographical concentration of this cluster's influence.

#### Cluster 2:

Key authors includes Wright, Mike; Ahlers, Oliver and Manigart, Sophie: This team's synergy occurs with a total link strength of 3.33, indicating a prominent level of co-authorship connections amongst these researchers. Their collaboration has resulted in a total of five published documents, the majority of which were released around the average year of 2016. The highlighted theme within their collective body of work primarily revolves around "Buyout Exit Strategy" and "Buyout Deals." Notably, these authors hold strong geographic affiliations across Europe, the US, and the UK, showcasing their broad reach and influence. Their combined contributions provide meaningful insight into the understanding of exit routes and timing strategies within the realm of private equity and venture capital.

#### Cluster 3:

This cluster derived from the bibliometric analysis comprises distinguished scholars Douglas, Cumming; and Armin Schweinbacher. This academic collaboration is strong, with a total link strength of 4.5, indicative of a substantial level of co-authorship connections within this group. Their joint academic efforts have culminated in Nine scholarly documents, chiefly published around the average year of 2012. These authors have intensely focused their research on "Investment Performance", "IPO" thereby contributing significantly to this facet of the field. Further emphasizing their influence, their academic affiliations are prominently European, underscoring the regional reach and impact of their collective work.



Note: The above figure is based on VOSviewer Output

Figure 5

#### 4.4 Results

- (i) Alternate Hypothesis (H1) Accepted: The outcomes of our bibliometric analysis strongly support the acceptance of the alternate hypothesis (H1), signifying a noteworthy shift in the focus of academicians and researchers towards emerged economies. Notably, the research efforts are concentrated on regions such as the United States, China, Germany, Canada, and others, as indicated by the geographical map presented in Figure 4. This suggests a heightened interest in comprehending the economic dynamics and challenges in these established economies. The spatial representation in Figure 4 vividly illustrates the geographical distribution of research focus, highlighting a significant emphasis on emerged economies.
- (ii) Null Hypothesis (H0) Accepted: Our investigation through thematic analysis supports the acceptance of the null hypothesis (H0) regarding the focus academicians and researchers on the timing of exit in Private Equity Venture Capital (PEVC). The results of the thematic analysis highlight an apparent omission in the research landscape, wherein scholars and researchers have not adequately addressed the timing of exits by Private Equity and Venture Capital firms although the Exit routes have gain significant attention. The analysis suggests that the temporal aspects related to exit strategies in these financial entities have been overlooked, signaling a gap in the current scholarly focus.

#### 5. Future Research and its Avenues

The Ultimate goal of the bibliometric analysis and review of literature is get in depth the knowledge of What has been explored in this field ?, How and Who has explored those areas? And eventually also leads to finding What is required to be focused in the research regarding the particular field, In this research we showed that there is significant rise in the research in this field across the globe. The existing literature on PE-VC regarding the exit routes and timing has described well the meaning and significance of the topics, but there has been many critical point which are yet to be focused and explored by the academicians and researchers, however, to ascertain the future avenues regarding the exit routes and timing and what is already being discovered and described by various authors has been explained in below table by classification finding of literature already explored in category of “What is known” and untouched or explored areas kept in category “What is to be known”.

	What is Known	What is to be Known
1	Consistent and gradual growth in research, indicating sustained interest.	Optimal Strategy to maximize gain and Reduce loss in Exits by PE-VC
2	Geographical analysis shows both developed and emerging economies has contributed to the Research.	Understanding of how exit patterns differ across various markets and economic contexts, especially in emerging economies.
3	Existing Literature focus on types of Exits but timing is still unexplored.	Exploration of new themes and emerging trends in exit routes and timing, and how these can inform policy and practice.
4	The bibliometric analysis underscores the importance of understanding exit strategies for informed decision-making and prosperous outcomes for stakeholders.	Development of practical tools and frameworks to assist investors and entrepreneurs regarding exit routes and timings.

In the field of PE-VC there is a need for development of practical tools and guiding frameworks that to help investors as well as entrepreneurs to take this crucial strategic decision, and before development of any such tool or framework more emphasis on the determinants affecting the Exit timing shall also be made. Different industry and markets can have reacted to various determinants and factors affecting Exit Routes and timing accordingly, so industry and market specific responses should also be taken into consideration to before clearly specifying the optimal exit Strategy of PE-VC.

## 6. References

- Acharya, V. V., Hahn, M., & Kehoe, C. (2011). *Corporate Governance and Value Creation: Evidence from Private Equity*. *Review of Financial Studies*.
- Achleitner, A.-K., Bauer, O., Figge, C., & Lutz, E. (2012). *Exit of Last Resort? Empirical Evidence on the Returns and Drivers of Secondary Buyouts as Private Equity Exit Channel*. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.2066514>
- Andrieu, G., & Groh, A. P. (2019). *Strategic Exits in Secondary Venture Capital Markets*. *SSRN Electronic Journal*, Jan-00. <https://doi.org/10.2139/ssrn.3515926>
- Archambault, É., Vignola-Gagné, É., Côté, G., Larivière, V., & Gingras, Y. (2006). *Benchmarking scientific output in the social sciences and humanities: The limits of existing databases*. *Scientometrics*.
- Barbopoulos, L. G., Paudyal, K., & Sudarsanam, S. (2018). *Earnout deals: Method of initial payment and acquirers' gains*. *European Financial Management*, 24(5), 792-828. <https://doi.org/10.1111/eufm.12135>
- Barbopoulos, L., & Wilson, J. O. S. (2011). *The Valuation Effects of Earnouts in Mergers and Acquisitions of US Financial Institutions*. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.1940218>
- Baum, J. A., & Silverman, B. S. (2004). *Picking winners or building them? Alliance, intellectual, and human capital as selection criteria in venture financing and performance of biotechnology startups*. *Journal of Business Venturing*, 19(3), 411-436.
- Bonardo, D., Paleari, S., & Vismara, S. (2011). *Valuing University-Based Firms: The Effects of Academic Affiliation on IPO Performance*. *Entrepreneurship Theory and Practice*, 35(4), 755-776. <https://doi.org/10.1111/j.1540-6520.2010.00369.x>
- Bottazzi, L., Da Rin, M., & Hellmann, T. (2016). *The Importance of Trust for Investment: Evidence from Venture Capital*. *Review of Financial Studies*, 29(9), 2283-2318. <https://doi.org/10.1093/rfs/hhw023>
- Citation Context Analysis as a Method for Conducting Rigorous and .... (n.d). <https://journals.sagepub.com/doi/full/10.1177/1094428120969905>
- Cumming, D., & MacIntosh, J. (2003). *A cross-country comparison of full and partial venture capital exits*. *Journal of Banking & Finance*, 27(3), 511-548.
- Cumming, D., & Johan, S. A. (2013). *Venture capital exits in Canada and the United States*. *Journal of Business Venturing*, 28(5), 708-728.
- Cumming, D., & Walz, U. (2009). *Private equity returns and disclosure around the world*. *Journal of International Business Studies*, 41(4), 727-754. <https://doi.org/10.1057/jibs.2009.62>
- Cumming, D., Schmidt, D., & Walz, U. (2010). *Legality and Venture Capital Exits*. *Journal of Corporate Finance*.
- Da Rin, M., Hellmann, T. F., & Puri, M. (2011). *A Survey of Venture Capital Research*. *SSRN Electronic Journal*, Jan-00. <https://doi.org/10.2139/ssrn.1942821>
- DeTienne, D. R. (2010). *Entrepreneurial exit as a critical component of the entrepreneurial process: Theoretical development*. *Journal of Business Venturing*, 25(2), 203-215. <https://doi.org/10.1016/j.jbusvent.2008.05.004>
- DeTienne, D. R., & Cardon, M. S. (2010). *Impact of founder experience on exit intentions*. *Small Business Economics*, 38(4), 351-374. <https://doi.org/10.1007/s11187-010-9284-5>
- DeTienne, D. R., McKelvie, A., & Chandler, G. N. (2015). *Making sense of entrepreneurial exit strategies: A typology and test*. *Journal of Business Venturing*, 30(2), 255-272. <https://doi.org/10.1016/j.jbusvent.2014.07.007>
- Fan, W. (2019, January 1). *Research on Venture Capital Investment Exit in China*. <https://scite.ai/reports/10.4236/me.2019.102031>
- Giot, P., & Schwenbacher, A. (2003). *IPOs, Trade Sales and Liquidations: Modelling Venture Capital Exits Using Survival Analysis*. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.461840>
- Gompers, P. A., & Lerner, J. (2004). *The venture capital cycle* (2nd ed.). MIT Press.
- Gompers, P. A., Kaplan, S. N., & Mukharlyamov, V. (2014). *What Do Private Equity Firms Say They Do?* *SSRN Electronic Journal*, Jan-00. <https://doi.org/10.2139/ssrn.2447605>
- Gompers, P., & Lerner, J. (2004). *The Venture Capital Cycle*. MIT Press.

- Grilli, L., & Murtinu, S. (2012). *Government, Venture Capital and the Growth of European High-Tech Entrepreneurial Firms*. SSRN Electronic Journal, Jan-00. <https://doi.org/10.2139/ssrn.2066867>
- Guler, I., & Guillén, M. F. (2009). *Institutions and the internationalization of US venture capital firms*. *Journal of International Business Studies*, 41(2), 185-205. <https://doi.org/10.1057/jibs.2009.35>
- Huang, C. Y., & Hsu, Y. C. (2015). *Private equity and venture capital exit strategies in Taiwan*. *Emerging Markets Finance and Trade*, 51(4), 696-709.
- Janssens, F., Leta, J., & Glänzel, W. (2006). *Towards mapping library and information science*. *Information Processing & Management*.
- Kaplan, S. N., & Schoar, A. (2005). *Private Equity Performance: Returns, Persistence, and Capital Flows*. *Journal of Finance*. <https://doi.org/10.1111/j.1540-6261.2005.00780.x>
- Kaplan, S. N., & Strömberg, P. (2009). *Leveraged buyouts and private equity*. *Journal of Economic Perspectives*, 23(1), 121-146.
- Koehler, T. (2016). *A comparison of citation patterns in the social sciences*. *Informetrics*
- Kumar, V., & Nidugala, G. K. (2020, January 1). *Impact of primary market on total factor productivity: A cross-country analysis*. <https://scite.ai/reports/10.1080/23322039.2020.1786293>
- Laine, M., & Torstila, S. (2005). *The Exit Rates of Liquidated Venture Capital Funds*. *The Journal of Entrepreneurial Finance*, 10(1), 53-73. <https://doi.org/10.57229/2373-1761.1225>
- Li, X., & Prather-Kinsey, J. (2020). *Venture capital exit timing and returns: a systematic review*. *Journal of Business Research*, 110, 194-203
- Management buy-in (MBI) - Marktlink. (n.d). <https://www.marktlink.com/management-buy-in/>
- Maximilian, J., & Gupta, J.. (2018, January 12). *Market Performance of Sponsor-Backed Initial Public Offerings: An Empirical Analysis of the German Market*. <https://scite.ai/reports/10.22158/jepf.v4n1p31>
- Nahata, R. (2008). *Venture capital reputation and investment performance*. *Journal of Financial Economics*, 90(2), 127-151. <https://doi.org/10.1016/j.jfineco.2007.11.008>
- Private equity exit strategies to create value | McKinsey. (n.d). <https://www.mckinsey.com/industries/private-equity-and-principal-investors/our-insights/private-equity-exits-enabling-the-exit-process-to-create-significant-value>
- Startup M&A | Acquisition | Exit Strategy | Getting Acquired. (n.d). <http://www.venturearchetypes.com/work/exit/startup-acquisitions.html>
- Strategic exits in secondary venture capital markets. (n.d). <https://www.sciencedirect.com/science/article/pii/S0883902618309066>
- Thompson, E. K., & Kim, C. (2020, April 8). *Post-M&A Performance and Failure: Implications of Time until Deal Completion*. <https://scite.ai/reports/10.3390/su12072999>
- Understanding Venture Capital Exit Strategies - NEXEA. (n.d). <https://www.nexea.co/understanding-venture-capital-exit-strategies/>
- van Eck, N. J., & Waltman, L. (2010). *Software survey: VOSviewer, a computer program for bibliometric mapping*. *Scientometrics*.
- van Eck, N. J., & Waltman, L. (2011). *Text mining and visualization using VOSviewer*. *ISSI newsletter*
- Wennberg, K., & DeTienne, D. R. (2014). *What do we really mean when we talk about 'exit'? A critical review of research on entrepreneurial exit*. *International Small Business Journal Researching Entrepreneurship*, 32(1), Apr-23. <https://doi.org/10.1177/0266242613517126>
- Wennberg, K., Wiklund, J., DeTienne, D. R., & Cardon, M. S. (2010). *Reconceptualizing entrepreneurial exit: Divergent exit routes and their drivers*. *Journal of Business Venturing*, 25(4), 361-375. <https://doi.org/10.1016/j.jbusvent.2009.01.001>
- Zhong, H., Yan, R., Li, S., & Chen, M. (2020, July 8). *The Psychological Expectation of New Project Income Under the Influence of the Entrepreneur's Sentiment from the Perspective of Information Asymmetry*. *Frontiers in Psychology*, 11. <https://doi.org/10.3389/fpsyg.2020.01416>
- Zupic, I., & Cater, T. (2015). *Bibliometric Methods in Management and Organization*. *Organizational Research Methods*.