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A bibliometric analysis of venture capital research

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Abstract

Purpose – The purpose of this study is to present the evolution of academic research in venture capital (VC) research between 1990 and 2014.

Design/methodology/approach – The study analyzes the most influential journals in VC research by analyzing papers, which were published on the Web of Science database.

Findings – Results show a steady increasing rate of VC research during the past 25 years. The paper reports the 40 academic journals that permanently publish articles about VC research.

Originality/value – The main contribution of this work is to develop a general overview of the leading journals in VC research, which leads to the development of a future research agenda for bibliometric analysis, such as the review of the most productive and influential authors, universities and countries in VC research.

Keywords Web of science, Journals, Bibliometrics, Venture capital

Paper type Research paper

Introduction

There are different instruments, both public and private, which support the development and growth of new enterprises through the provision of financial resources. Venture capital (VC) is included among these instruments, which not only provides financial support for business growth but also offers business expertise, customer networks and good management practices (Gompers and Lerner, 2006; Gompers *et al.*, 2008; Dushnitsky and Lenox, 2006; Hochberg *et al.*, 2010). According to Cornelius and Persson (2006), venture capitalists are financial intermediaries who collect excess capital from those who have it and provide it to those who require it for the development of a business venture. Although a considerable amount of literature has been published on specific topics about VC in the past ten years (Jääskeläinen, 2012), there are few studies that have analyzed VC research from a bibliometric analysis perspective (Cornelius and Persson, 2006). In this decade, there are no new papers that present the evolution of VC research. This is the aim of our paper.

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This work found a practical way to analyze VC research over a period of 25 years by using bibliometric indicators. Bibliometrics is the field that quantitatively studies bibliographic material (Broadus, 1987). Bibliometric studies are becoming very popular in the scientific literature, strongly motivated by the access to bibliographic information. Many authors have developed bibliometric analysis in a wide range of fields including management (Podsakoff *et al.*, 2008), economics (Coupé, 2003), entrepreneurship (Landström *et al.*, 2012), accounting (Merigó and Yang, 2016), pricing research (Leone *et al.*, 2012), health economics (Wagstaff and Culyer, 2012) and innovation (Merigó *et al.*, 2016).

In general, VC research has grown considerably compared to other disciplines. The citation structure identifies the citation level that this field has obtained, being able to see the location of the most cited papers over the past 25 years. Additionally, it shows the number of papers with lower levels of citations including those that have not received any citations yet. The article also develops a journal analysis identifying the leading ones in the field. In particular, this work describes that there are certain specialized journals that publish more in VC research with respect to other journals, for example, *Journal of Business Venturing*, *Entrepreneurship Theory and Practice* and *Small Business Economics*. It also highlights other journals for having a high number of citations, even if they publish a large number of articles in VC research, such as the *Journal of Finance*, *Journal of Financial Economics*, *Research Policy*, *Strategic Management Journal*, *Academy of Management Journal*, *Administrative Science Quarterly*, among others. Moreover, a temporal analysis is developed to see which journals have been the most influential ones throughout time.

This paper continues as follows: Section 2 develops the literature review regarding VC research. Section 3 describes the research method by describing the bibliometric study and its cluster analysis. Section 4 presents the results of our bibliometric analysis. Finally, Section 5 offers a discussion with concluding remarks.

Literature review

Gompers and Lerner (2006) define VC as the process which starts with raising a venture fund; proceeds with investing in, monitoring and adding value to firms; continues as the venture capitalist exits successful deals and returns capital to their investors; and renews itself with the venture capitalist raising additional funds. Hence, VC research explores several processes, which involve the pre-investment phase of VC, the management of VC and the exit strategies of VC. In the pre-investment phase, VC research explores how changes in public market signals affected VC (Gompers *et al.*, 2008) or the conditions to facilitate the creation of greater firm value after receiving VC (Dushnitsky and Lenox, 2006). Research in this stage also analyses the process of creating relationships between venture capitalists and entrepreneurs (Hochberg *et al.*, 2010). Research in the management stage focused its attention on companies when they receive VC. For example, researchers have explored the links between the influence and control of VC firms (Bottazzi *et al.*, 2008) and the management skills and expertise of entrepreneurs and new ventures, such as entrepreneurial orientation (Stam and Elfring, 2008). Finally, research in the exit stage reviews how firms can develop either their initial public offering (IPO) or their buyout. Nahata (2008) suggests that companies backed by more reputable VCs by IPO capitalization share are more likely to exit successfully, access public markets faster and have higher asset productivity at IPOs.

Even though VC research has three stages of analysis, VC research encompasses wide range of academic areas, without a particular discipline leading scientific research in this field. Academics from disciplines such as Finance, General Management, Innovation, Law, Public Policy, Sociology and Economics present a wide range of research on venture capital, which is very valuable because it brings different perspectives to analyze the problem of financing new businesses. For example, from a Finance perspective, [Berger and Udell \(1998\)](#) explain that firms are viewed through a financial growth cycle paradigm in which different capital structures are optimal at different points in the cycle. They show the sources of small business finance, and how capital structure varies with firm size and age. From a psychology perspective, [Krueger et al. \(2000\)](#) argue that promoting entrepreneurial intentions by promoting public perceptions of feasibility and desirability is not just desirable; but also thoroughly feasible. From a sociology perspective, [Podolny \(2001\)](#) draws an analytical distinction between two types of market uncertainty: egocentric, which refers to a focal actor's uncertainty regarding the best way to convert a set of inputs to an output desired by a potential exchange partner, and altercentric, which denotes the uncertainty confronted by a focal actor's exchange partners regarding the quality of the output that the focal actor brings to the market. From a public policies perspective, [Di Gregorio and Shane \(2003\)](#) provide insight into why some universities generate more new companies to exploit their intellectual property than do others. The above examples show that the analysis of VC research is varied and can derive from different disciplines. On the one hand, it could be positive to have different perspectives to try to understand the problem. On the other hand, analysis from different disciplines could be negative, especially if we want to know the specific group of authors in VC research who have more influence and productivity.

Research methodology

Bibliometric research is a field that quantitatively studies bibliographic material ([Broadus, 1987](#)) providing a general overview of a research field according to a wide range of indicators. There are different ways of ranking material in a bibliometric analysis. The most common approaches use the total number of articles or the total number of citations. Another useful indicator is the h-index ([Hirsch, 2005](#)) that combines articles with citations indicating the number of studies X that have received X or more citations. The general assumption is that the number of articles shows the productivity while the total cites reflect the influence of a set of articles. Note that this study follows the methodology developed by [Merigó et al. \(2015\)](#) and [Cancino et al. \(2017a, 2017b\)](#).

To search for articles that have focused on VC research, the study uses the keywords "venture capital*" or "business venturing" or "corporate venturing" in the title, abstract and keywords of any work available in WoS[1] between 1990 and 2014, to capture as many possible combinations of terms related to venture capital. This search finds 2,086 articles that have become 1,820 studies by only considering articles, reviews, letters and notes. The search was developed in October 2015 and January 2016.

Results

This section presents the results of the paper. First, the study analyzes the publication evolution of VC research during the past 25 years. Next, the work analyzes the citation structure indicating the number of articles that reach a specific citation threshold. Finally,

the article analyzes the most influential journals in VC research according to WoS (general analysis and by quinquennials).

Evolution of publications in venture capital research

Over the past 25 years, 1,820 articles have been published in VC research. Figure 1 presents the evolution of the number of papers published annually.

In general, the growth of VC research over the past 25 years is higher than the growth of science worldwide. This growth is usually between 5 and 10 per cent, and achieved over 20 per cent in 1991, 1998, 2000 and 2008.

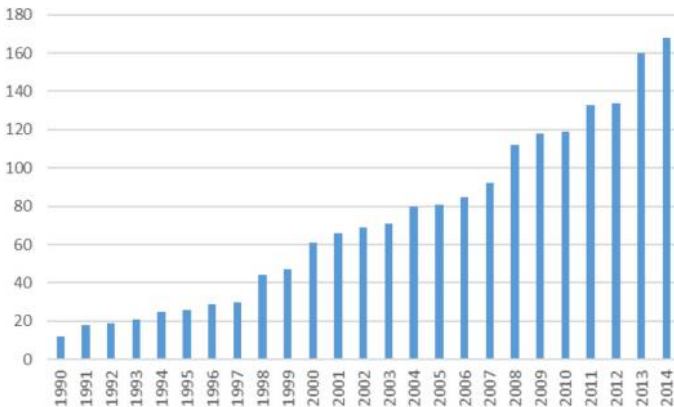
Citation structure in venture capital research

Table I presents the number of articles that reach a certain citation threshold to see the citation level that VC articles obtain. The analysis was developed between 1990 and 2014 and considers the citation thresholds of 200, 100, 50, 20, 10, 5 and 1. The total number of cites obtained by papers published each year is also included.

As we can see, most of the highly cited studies in VC were published in the late 1990s and beginning of the new millennium. The number of articles published in VC increases every year so the number of highly cited works also tends to increase. In general, only 2 per cent of the articles have received more than 200 and more than half of the articles received at least five citations. Only 20 per cent of the work did not receive any citations. Among the most cited papers it is possible to identify the following articles in VC research: Stuart *et al.* (1999), Zucker *et al.* (1998), Sahlman (1990), Megginson and Weiss (1991), Powell *et al.* (2005), Krueger *et al.* (2000), Berger and Udell (1998), Lee *et al.* (2001), Sorenson and Stuart (2001), McDougall *et al.* (1994), Shane and Stuart (2002), Kaplan and Stromberg (2003) and Podolny (2001).

Leading journals in venture capital research

There are many journals in the scientific community that publish material related to VC research. Table II presents a list of the 20 journals with the highest *h*-index in VC research (HV). This article performed the ranking analysis by identifying the rank (R), the total number of publications in VC research (TPV), the total number of citations in



Source: Own elaboration

Figure 1. Annual number of studies in venture capital

| Year | ≥200 | ≥100 | ≥50 | ≥20 | ≥10 | ≥5 | ≥1 | TC | TP |
|--------------|-----------|-----------|------------|------------|------------|--------------|--------------|---------------|--------------|
| 1990 | 2 | 2 | 3 | 5 | 7 | 7 | 7 | 1,041 | 12 |
| 1991 | 1 | 1 | 1 | 5 | 7 | 7 | 11 | 718 | 18 |
| 1992 | 0 | 1 | 7 | 12 | 12 | 14 | 16 | 782 | 19 |
| 1993 | 0 | 1 | 4 | 6 | 7 | 9 | 15 | 439 | 21 |
| 1994 | 3 | 7 | 10 | 16 | 18 | 19 | 23 | 1,926 | 25 |
| 1995 | 2 | 2 | 7 | 13 | 14 | 17 | 20 | 1,118 | 26 |
| 1996 | 1 | 6 | 7 | 10 | 14 | 17 | 24 | 1,146 | 29 |
| 1997 | 0 | 1 | 7 | 15 | 20 | 21 | 25 | 860 | 30 |
| 1998 | 4 | 10 | 15 | 22 | 27 | 31 | 41 | 3,281 | 44 |
| 1999 | 3 | 5 | 10 | 17 | 17 | 21 | 26 | 2,104 | 47 |
| 2000 | 3 | 7 | 13 | 20 | 23 | 29 | 41 | 2,362 | 61 |
| 2001 | 4 | 7 | 14 | 27 | 32 | 36 | 46 | 3,005 | 66 |
| 2002 | 4 | 7 | 18 | 31 | 37 | 44 | 54 | 3,010 | 69 |
| 2003 | 5 | 13 | 30 | 42 | 51 | 56 | 69 | 4,320 | 71 |
| 2004 | 2 | 11 | 21 | 35 | 42 | 50 | 56 | 2,951 | 80 |
| 2005 | 1 | 7 | 17 | 49 | 58 | 63 | 73 | 3,095 | 81 |
| 2006 | 0 | 2 | 17 | 38 | 55 | 63 | 78 | 2,223 | 85 |
| 2007 | 1 | 4 | 11 | 47 | 70 | 89 | 103 | 2,712 | 92 |
| 2008 | 0 | 0 | 15 | 31 | 47 | 64 | 75 | 1,929 | 112 |
| 2009 | 0 | 0 | 7 | 31 | 59 | 79 | 106 | 1,818 | 118 |
| 2010 | 0 | 0 | 5 | 26 | 48 | 78 | 106 | 1,546 | 119 |
| 2011 | 0 | 1 | 2 | 22 | 49 | 73 | 110 | 1,397 | 133 |
| 2012 | 0 | 1 | 2 | 9 | 35 | 61 | 107 | 1,063 | 134 |
| 2013 | 0 | 0 | 0 | 2 | 13 | 45 | 119 | 575 | 160 |
| 2014 | 0 | 0 | 1 | 3 | 10 | 19 | 99 | 414 | 168 |
| <i>Total</i> | <i>36</i> | <i>96</i> | <i>244</i> | <i>534</i> | <i>772</i> | <i>1,012</i> | <i>1,450</i> | <i>45,835</i> | <i>1,820</i> |
| <i>%</i> | <i>2</i> | <i>5</i> | <i>13</i> | <i>29</i> | <i>42</i> | <i>56</i> | <i>80</i> | | |

Table I.
Citation structure of
venture capital

Source: Own elaboration

VC research (TCV), the total number of citations over the total number of publications in VC research (C/P1), the total number of publication of the journal (TP), the total number of citation of the journal (TC), the global h-index (H), the total number of citations over the total number of publications (C/P2) and the total number of publications in VC research over the total number of publications in any discipline (per cent PV).

It is seen that only the first journal publishes about 20 per cent of its total articles on venture capital, only one publishes about 10 per cent, three publish about 5 per cent and the rest does not publish more than 2 per cent. However, these have high numbers of citations, which explains the results of the *h*-index. Clearly, scientific analysis on VC comes from many disciplines, and it is not possible to identify a specific group of journals leading the discipline. This is evident if the group of the twenty most cited papers in VC research is analyzed. For this group it is possible to identify 12 different journals: *Administrative Science Quarterly*, *American Economic Review*, *American Journal of Sociology*, *Journal of Banking & Finance*, *Journal of Business Venturing*, *Journal of Finance*, *Journal of Financial Economics*, *Management Science*, *Rand Journal of Economics*, *Research Policy*, *Review of Economic Studies* and *Strategic Management Journal*. Among this group, three journals (*Journal of Financial Economics*, *Journal of Finance* and *American Journal of Sociology*) present three articles each on the list of the 20 most cited papers in VC research.

| R | Journal | Venture capital | | | | | Global | | | | |
|----|---|-----------------|-------|----|-------|-------|----------|-----|-------|------|--|
| | | TPV | TCV | HV | C/P1 | TP | TC | H | C/P2 | %PV | |
| 1 | <i>Journal of Business Venturing</i> | 164 | 6,976 | 48 | 42,5 | 836 | 36,562 | 98 | 43,7 | 19,6 | |
| 2 | <i>Journal of Finance</i> | 23 | 2,923 | 21 | 127,1 | 1,972 | 1,70,112 | 199 | 86,3 | 1,2 | |
| 3 | <i>Journal of Financial Economics</i> | 35 | 2,884 | 21 | 82,4 | 1,791 | 1,06,449 | 153 | 59,4 | 2,0 | |
| 4 | <i>Entrepreneurship Theory and Practice</i> | 49 | 1,070 | 21 | 21,8 | 515 | 15,361 | 62 | 29,8 | 9,5 | |
| 5 | <i>Research Policy</i> | 37 | 1,609 | 20 | 43,5 | 2,059 | 87,374 | 141 | 42,4 | 1,8 | |
| 6 | <i>Small Business Economics</i> | 67 | 833 | 16 | 12,4 | 1,252 | 21,557 | 63 | 17,2 | 5,4 | |
| 7 | <i>Strategic Management Journal</i> | 25 | 1,477 | 15 | 59,1 | 1,726 | 1,79,035 | 202 | 103,7 | 1,4 | |
| 8 | <i>Journal of Management Studies</i> | 23 | 624 | 14 | 27,1 | 1,252 | 47,442 | 101 | 37,9 | 1,8 | |
| 9 | <i>Journal of Banking Finance</i> | 25 | 1,024 | 13 | 41,0 | 3,561 | 49,728 | 78 | 14,0 | 0,7 | |
| 10 | <i>Journal of Corporate Finance</i> | 35 | 569 | 13 | 16,3 | 723 | 8,678 | 43 | 12,0 | 4,8 | |
| 11 | <i>Technovation</i> | 30 | 396 | 13 | 13,2 | 1,538 | 24,024 | 59 | 15,6 | 2,0 | |
| 12 | <i>Academy of Management Journal</i> | 19 | 916 | 11 | 48,2 | 1,490 | 1,80,389 | 218 | 121,1 | 1,3 | |
| 13 | <i>Review of Financial Studies</i> | 26 | 763 | 10 | 29,3 | 1,377 | 60,715 | 116 | 44,1 | 1,9 | |
| 14 | <i>Harvard Business Review</i> | 26 | 634 | 10 | 24,4 | 4,847 | 65,716 | 113 | 13,6 | 0,5 | |
| 15 | <i>Management Science</i> | 14 | 966 | 9 | 69,0 | 3,247 | 1,51,121 | 166 | 46,5 | 0,4 | |
| 16 | <i>Entrepreneurship and Regional Development</i> | 18 | 300 | 9 | 16,7 | 381 | 5,525 | 35 | 14,5 | 4,7 | |
| 17 | <i>Administrative Science Quarterly</i> | 8 | 1,050 | 8 | 131,3 | 512 | 1,02,142 | 168 | 199,5 | 1,6 | |
| 18 | <i>Organization Science</i> | 16 | 613 | 8 | 38,3 | 1,301 | 1,13,095 | 154 | 86,9 | 1,2 | |
| 19 | <i>Financial Management</i> | 14 | 494 | 8 | 35,3 | 832 | 10,680 | 47 | 12,8 | 1,7 | |
| 20 | <i>Journal of International Business Studies</i> | 11 | 260 | 8 | 23,6 | 1,162 | 61,441 | 121 | 52,9 | 0,9 | |
| 21 | <i>R D Management</i> | 13 | 231 | 8 | 17,8 | 781 | 13,961 | 54 | 17,9 | 1,7 | |
| 22 | <i>Journal of Financial Intermediation</i> | 13 | 185 | 8 | 14,2 | 395 | 7,486 | 43 | 19,0 | 3,3 | |
| 23 | <i>Journal of Small Business Management</i> | 17 | 184 | 8 | 10,8 | 622 | 10,391 | 47 | 16,7 | 2,7 | |
| 24 | <i>Regional Studies</i> | 10 | 311 | 7 | 31,1 | 1,805 | 29,878 | 68 | 16,6 | 0,6 | |
| 25 | <i>Journal of Financial and Quantitative Analysis</i> | 11 | 182 | 7 | 16,5 | 958 | 22,384 | 73 | 23,4 | 1,1 | |
| 26 | <i>European Planning Studies</i> | 16 | 148 | 7 | 9,3 | 1,174 | 8,769 | 36 | 7,5 | 1,4 | |
| 27 | <i>European Financial Management</i> | 10 | 104 | 7 | 10,4 | 340 | 2,706 | 24 | 8,0 | 2,9 | |
| 28 | <i>California Management Review</i> | 10 | 260 | 6 | 26,0 | 730 | 30,914 | 86 | 42,3 | 1,4 | |
| 29 | <i>Journal of Business Finance Accounting</i> | 12 | 135 | 6 | 11,3 | 533 | 3,446 | 24 | 6,5 | 2,3 | |
| 30 | <i>International Journal of Technology Management</i> | 32 | 131 | 6 | 4,1 | 1,810 | 9,342 | 33 | 5,2 | 1,8 | |
| 31 | <i>Strategic Entrepreneurship Journal</i> | 17 | 126 | 6 | 7,4 | 155 | 2,502 | 26 | 16,1 | 11,0 | |
| 32 | <i>Journal of Technology Transfer</i> | 13 | 118 | 6 | 9,1 | 322 | 2,295 | 22 | 7,1 | 4,0 | |
| 33 | <i>Journal of Business Research</i> | 14 | 99 | 6 | 7,1 | 3,214 | 53,711 | 87 | 16,7 | 0,4 | |
| 34 | <i>Industrial and Corporate Change</i> | 10 | 95 | 6 | 9,5 | 598 | 12,070 | 53 | 20,2 | 1,7 | |
| 35 | <i>Health Affairs</i> | 8 | 56 | 6 | 7,0 | 5,495 | 92,245 | 108 | 16,8 | 0,1 | |
| 36 | <i>Journal of Management</i> | 7 | 484 | 5 | 69,1 | 1,100 | 80,900 | 135 | 73,5 | 0,6 | |
| 37 | <i>Journal of Economics Management Strategy</i> | 13 | 200 | 5 | 15,4 | 672 | 10,496 | 51 | 15,6 | 1,9 | |
| 38 | <i>Accounting Review</i> | 6 | 150 | 5 | 25,0 | 1,167 | 34,321 | 82 | 29,4 | 0,5 | |
| 39 | <i>International Small Business Journal</i> | 12 | 119 | 5 | 9,9 | 371 | 4,090 | 28 | 11,0 | 3,2 | |
| 40 | <i>Corporate Governance an International Review</i> | 11 | 62 | 5 | 5,6 | 606 | 6,798 | 34 | 11,2 | 1,8 | |

Source: Own elaboration

Table II.
Most influential journals in venture capital

Leading journals in venture capital by periods of time

In this section, let us focus on the evolution of leading journals in innovation research throughout time. To do this, the study considers five-year periods between 1990 and 2014. In each period, a list with the journals that have published the highest number of articles in VC is presented. The analysis uses similar indicators to [Table II](#). [Tables III](#), [IV](#), [V](#) and [VI](#) present the results (period 2000-2004 was omitted in this version of the paper).

Journal of Business Venturing and *Journal of Financial Economics* have been the main leaders during the last twenty-five years. In the 1990s, there were few specialized journals in

| R | Journal | TPV | TCV | HV | C/P1 | TP | TC | H | C/P2 |
|----|---|-----|-------|----|-------|-----|--------|-----|-------|
| 1 | <i>Journal of Business Venturing</i> | 29 | 1,543 | 20 | 53,2 | 149 | 8.551 | 55 | 57,4 |
| 2 | <i>Journal of Financial Economics</i> | 3 | 1,091 | 3 | 363,7 | 154 | 18.034 | 65 | 117,1 |
| 3 | <i>Financial Management</i> | 3 | 418 | 3 | 139,3 | 254 | 3.661 | 30 | 14,4 |
| 4 | <i>Harvard Business Review</i> | 3 | 72 | 2 | 24,0 | 900 | 19.538 | 63 | 21,7 |
| 5 | <i>Technovation</i> | 3 | 30 | 2 | 10,0 | 180 | 1.400 | 19 | 7,8 |
| 6 | <i>Journal of Finance</i> | 2 | 703 | 2 | 351,5 | 417 | 42.723 | 104 | 102,5 |
| 7 | <i>Academy of Management Journal</i> | 2 | 286 | 2 | 143,0 | 268 | 42.520 | 119 | 158,7 |
| 8 | <i>Strategic Management Journal</i> | 2 | 162 | 2 | 81,0 | 300 | 45.300 | 114 | 151,0 |
| 9 | <i>Long Range Planning</i> | 2 | 42 | 1 | 21,0 | 397 | 3.295 | 29 | 8,3 |
| 10 | <i>Organization Science</i> | 1 | 96 | 1 | 96,0 | 141 | 31.823 | 70 | 225,7 |
| 11 | <i>Management Science</i> | 1 | 45 | 1 | 45,0 | 575 | 35.956 | 99 | 62,5 |
| 12 | <i>Journal of Management Studies</i> | 1 | 19 | 1 | 19,0 | 175 | 8.395 | 49 | 48,0 |
| 13 | <i>California Management Review</i> | 1 | 15 | 1 | 15,0 | 152 | 6.339 | 38 | 41,7 |
| 14 | <i>Health Affairs</i> | 1 | 4 | 1 | 4,0 | 549 | 6.947 | 37 | 12,7 |
| 15 | <i>Journal of Portfolio Management</i> | 1 | 0 | 0 | 0,0 | 259 | 1.940 | 19 | 7,5 |
| 16 | <i>Administrative Science Quarterly</i> | 0 | 0 | 0 | 0,0 | 113 | 40.473 | 90 | 358,2 |
| 17 | <i>Journal of Management</i> | 0 | 0 | 0 | 0,0 | 196 | 23.883 | 85 | 121,9 |
| 18 | <i>Review of Financial Studies</i> | 0 | 0 | 0 | 0,0 | 142 | 14.424 | 67 | 101,6 |
| 19 | <i>Journal of International Business Studies</i> | 0 | 0 | 0 | 0,0 | 167 | 12.182 | 62 | 72,9 |
| 20 | <i>Research Policy</i> | 0 | 0 | 0 | 0,0 | 174 | 8.379 | 46 | 48,2 |
| 21 | <i>Accounting Review</i> | 0 | 0 | 0 | 0,0 | 235 | 6.256 | 46 | 26,6 |
| 22 | <i>Journal of Product Innovation Management</i> | 0 | 0 | 0 | 0,0 | 120 | 6.059 | 45 | 50,5 |
| 23 | <i>Journal of Financial and Quantitative Analysis</i> | 0 | 0 | 0 | 0,0 | 177 | 5.155 | 42 | 29,1 |
| 24 | <i>Journal of Law & Economics</i> | 0 | 0 | 0 | 0,0 | 121 | 5.081 | 39 | 42,0 |
| 25 | <i>Journal of Business Research</i> | 0 | 0 | 0 | 0,0 | 257 | 5.535 | 38 | 21,5 |
| 26 | <i>Journal of Banking Finance</i> | 0 | 0 | 0 | 0,0 | 315 | 5.533 | 38 | 17,6 |
| 27 | <i>Regional Studies</i> | 0 | 0 | 0 | 0,0 | 276 | 4.650 | 34 | 16,8 |
| 28 | <i>Chimia</i> | 0 | 0 | 0 | 0,0 | 450 | 3.406 | 28 | 7,6 |
| 29 | <i>Ieee Transactions on Engineering Management</i> | 0 | 0 | 0 | 0,0 | 197 | 2.688 | 26 | 13,6 |
| 30 | <i>RD Management</i> | 0 | 0 | 0 | 0,0 | 126 | 2.312 | 26 | 18,3 |
| 31 | <i>Small Business Economics</i> | 0 | 0 | 0 | 0,0 | 90 | 1.417 | 20 | 15,7 |
| 32 | <i>Journal of Economics Management Strategy</i> | 0 | 0 | 0 | 0,0 | 68 | 1.200 | 17 | 17,6 |
| 33 | <i>Research Technology Management</i> | 0 | 0 | 0 | 0,0 | 238 | 1.155 | 17 | 4,9 |
| 34 | <i>International Journal of Technology Management</i> | 0 | 0 | 0 | 0,0 | 56 | 306 | 9 | 5,5 |
| 35 | <i>Technology Analysis Strategic Management</i> | 0 | 0 | 0 | 0,0 | 30 | 160 | 6 | 5,3 |
| 36 | <i>Journal of Technology Transfer</i> | 0 | 0 | 0 | 0,0 | 6 | 2 | 1 | 0,3 |
| 37 | <i>Entrepreneurship Theory and Practice</i> | 0 | 0 | 0 | 0,0 | 0 | 0 | 0 | 0,0 |
| 38 | <i>Journal of Corporate Finance</i> | 0 | 0 | 0 | 0,0 | 0 | 0 | 0 | 0,0 |
| 39 | <i>Entrepreneurship and Regional Development</i> | 0 | 0 | 0 | 0,0 | 0 | 0 | 0 | 0,0 |
| 40 | <i>Journal of Financial Intermediation</i> | 0 | 0 | 0 | 0,0 | 0 | 0 | 0 | 0,0 |

Source: Own elaboration

Table III.
Leading journals in
VC between
1990-1994

VC indexed in WoS. Since 2005, journals with the highest proportion of VC items over total publications have appeared.

In the first five-year period analyzed it is possible to see that academic papers in VC research are published mainly in journals of General Management and Finance. In the second quinquennial, in addition to journals of General Management and Finance, several papers were published in specialized journals in Innovation and Entrepreneurship research. In the last quinquennial (Table VI), it is possible to see that there are several journals, from a wide spectrum of disciplines, publishing papers in VC research.

| R | Journal | TPV | TCV | HV | C/P1 | TP | TC | H | C/P2 |
|----|---|-----|-------|----|-------|-----|--------|-----|-------|
| 1 | <i>Journal of Business Venturing</i> | 24 | 1.481 | 20 | 61,7 | 131 | 8.107 | 51 | 61,9 |
| 2 | <i>Small Business Economics</i> | 10 | 228 | 8 | 22,8 | 215 | 5.116 | 36 | 23,8 |
| 3 | <i>Journal of Banking Finance</i> | 8 | 752 | 6 | 94,0 | 391 | 9.011 | 48 | 23,0 |
| 4 | <i>Journal of Management Studies</i> | 6 | 139 | 5 | 23,2 | 188 | 6.691 | 47 | 35,6 |
| 5 | <i>Technovation</i> | 6 | 109 | 5 | 18,2 | 256 | 3.643 | 41 | 14,2 |
| 6 | <i>Harvard Business Review</i> | 5 | 253 | 5 | 50,6 | 688 | 20.775 | 70 | 30,2 |
| 7 | <i>Journal of Financial Economics</i> | 3 | 653 | 3 | 217,7 | 249 | 26.749 | 90 | 107,4 |
| 8 | <i>Journal of Finance</i> | 3 | 568 | 3 | 189,3 | 371 | 49.983 | 122 | 134,7 |
| 9 | <i>Journal of Law & Economics</i> | 2 | 168 | 2 | 84,0 | 120 | 4.075 | 39 | 34,0 |
| 10 | <i>Research Policy</i> | 2 | 61 | 2 | 30,5 | 279 | 16.886 | 70 | 60,5 |
| 11 | <i>International Journal of Technology Management</i> | 4 | 4 | 1 | 1,0 | 530 | 3.183 | 23 | 6,0 |
| 12 | <i>Long Range Planning</i> | 2 | 9 | 1 | 4,5 | 368 | 4.881 | 32 | 13,3 |
| 13 | <i>Administrative Science Quarterly</i> | 1 | 730 | 1 | 730,0 | 124 | 35.632 | 91 | 287,4 |
| 14 | <i>Academy of Management Journal</i> | 1 | 133 | 1 | 133,0 | 279 | 53.250 | 126 | 190,9 |
| 15 | <i>Management Science</i> | 1 | 130 | 1 | 130,0 | 656 | 39.825 | 102 | 60,7 |
| 16 | <i>Review of Financial Studies</i> | 1 | 117 | 1 | 117,0 | 175 | 11.199 | 59 | 64,0 |
| 17 | <i>RD Management</i> | 1 | 113 | 1 | 113,0 | 132 | 2.293 | 26 | 17,4 |
| 18 | <i>California Management Review</i> | 1 | 72 | 1 | 72,0 | 155 | 13.695 | 57 | 88,4 |
| 19 | <i>Regional Studies</i> | 1 | 37 | 1 | 37,0 | 341 | 6.884 | 40 | 20,2 |
| 20 | <i>Health Affairs</i> | 1 | 18 | 1 | 18,0 | 708 | 14.189 | 57 | 20,0 |
| 21 | <i>Journal of Business Research</i> | 1 | 10 | 1 | 10,0 | 341 | 9.294 | 92 | 27,3 |
| 22 | <i>Journal of Small Business Management</i> | 1 | 2 | 1 | 2,0 | 171 | 3.128 | 33 | 18,3 |
| 23 | <i>Advances in Strategic Management A Research Annual</i> | 1 | 2 | 1 | 2,0 | 23 | 212 | 9 | 9,2 |
| 24 | <i>Journal of Portfolio Management</i> | 1 | 1 | 1 | 1,0 | 235 | 1.702 | 20 | 7,2 |
| 25 | <i>Strategic Management Journal</i> | 0 | 0 | 0 | 0,0 | 310 | 55.319 | 116 | 178,4 |
| 26 | <i>Organization Science</i> | 0 | 0 | 0 | 0,0 | 218 | 28.238 | 93 | 129,5 |
| 27 | <i>Journal of International Business Studies</i> | 0 | 0 | 0 | 0,0 | 195 | 14.909 | 71 | 76,5 |
| 28 | <i>Journal of Management</i> | 0 | 0 | 0 | 0,0 | 189 | 15.815 | 70 | 83,7 |
| 29 | <i>Journal of Product Innovation Management</i> | 0 | 0 | 0 | 0,0 | 141 | 8.608 | 52 | 61,0 |
| 30 | <i>Journal of Financial and Quantitative Analysis</i> | 0 | 0 | 0 | 0,0 | 135 | 5.385 | 43 | 39,9 |
| 31 | <i>Accounting Review</i> | 0 | 0 | 0 | 0,0 | 130 | 7.589 | 39 | 58,4 |
| 32 | <i>Ieee Transactions on Engineering Management</i> | 0 | 0 | 0 | 0,0 | 187 | 3.997 | 35 | 21,4 |
| 33 | <i>Chimia</i> | 0 | 0 | 0 | 0,0 | 504 | 4.550 | 32 | 9,0 |
| 34 | <i>Journal of Economics Management Strategy</i> | 0 | 0 | 0 | 0,0 | 120 | 2.903 | 30 | 24,2 |
| 35 | <i>Financial Management</i> | 0 | 0 | 0 | 0,0 | 150 | 2.137 | 27 | 14,2 |
| 36 | <i>Technology Analysis Strategic Management</i> | 0 | 0 | 0 | 0,0 | 141 | 2.596 | 25 | 18,4 |
| 37 | <i>Journal of Financial Intermediation</i> | 0 | 0 | 0 | 0,0 | 70 | 1.744 | 24 | 24,9 |
| 38 | <i>Research Technology Management</i> | 0 | 0 | 0 | 0,0 | 210 | 1.957 | 22 | 9,3 |
| 39 | <i>Economic Development Quarterly</i> | 0 | 0 | 0 | 0,0 | 145 | 1.423 | 20 | 9,8 |
| 40 | <i>Entrepreneurship Theory and Practice</i> | 0 | 0 | 0 | 0,0 | 0 | 0 | 0 | 0,0 |

Source: Own elaboration

Table IV.
Leading journals in VC between 1995-1999

Mapping journals in venture capital research with VOS viewer software

A further interesting issue to consider is mapping the leading journals to visualize their publication and citation structure. To do so, this work uses VOS viewer software (Van Eck and Waltman, 2010). VOS viewer is very useful for collecting bibliographical material providing visualizations of the bibliographic connections of documents, journals, authors and universities by using a wide range of techniques including bibliographic coupling (Kessler, 1963) and co-citation (Small, 1973).

First, this work studied bibliographic coupling between journals in VC research. Recall that bibliographic coupling (Kessler, 1963) occurs when two documents cite the same third document.

| R | Journal | TPV | TCV | HV | C/P1 | TP | TC | H | C/P2 |
|----|---|-----|-------|----|-------|------|--------|----|------|
| 1 | <i>Journal of Business Venturing</i> | 44 | 1.530 | 25 | 34,8 | 185 | 7.896 | 51 | 42,7 |
| 2 | <i>Entrepreneurship Theory and Practice</i> | 32 | 973 | 20 | 30,4 | 234 | 10.276 | 55 | 43,9 |
| 3 | <i>Research Policy</i> | 14 | 753 | 13 | 53,8 | 550 | 23.611 | 78 | 42,9 |
| 4 | <i>Journal of Financial Economics</i> | 12 | 535 | 10 | 44,6 | 458 | 24.741 | 83 | 54,0 |
| 5 | <i>Small Business Economics</i> | 17 | 210 | 9 | 12,4 | 282 | 6.773 | 44 | 24,0 |
| 6 | <i>Journal of Corporate Finance</i> | 11 | 286 | 8 | 26,0 | 211 | 4.345 | 35 | 20,6 |
| 7 | <i>Technovation</i> | 12 | 174 | 7 | 14,5 | 458 | 10.467 | 50 | 22,9 |
| 8 | <i>Journal of Financial Intermediation</i> | 7 | 162 | 7 | 23,1 | 112 | 1.755 | 23 | 15,7 |
| 9 | <i>Entrepreneurship and Regional Development</i> | 7 | 157 | 6 | 22,4 | 122 | 2.186 | 26 | 17,9 |
| 10 | <i>Journal of Business Finance Accounting</i> | 7 | 121 | 6 | 17,3 | 297 | 2.756 | 23 | 9,3 |
| 11 | <i>Strategic Management Journal</i> | 6 | 326 | 6 | 54,3 | 336 | 23.028 | 85 | 68,5 |
| 12 | <i>Journal of Management Studies</i> | 6 | 262 | 6 | 43,7 | 313 | 13.248 | 64 | 42,3 |
| 13 | <i>Journal of Banking Finance</i> | 6 | 141 | 6 | 23,5 | 913 | 16.012 | 50 | 17,5 |
| 14 | <i>Journal of Technology Transfer</i> | 6 | 107 | 6 | 17,8 | 107 | 1.279 | 19 | 12,0 |
| 15 | <i>European Planning Studies</i> | 11 | 78 | 5 | 7,1 | 369 | 3.686 | 27 | 10,0 |
| 16 | <i>Journal of Finance</i> | 5 | 523 | 5 | 104,6 | 332 | 21.160 | 83 | 63,7 |
| 17 | <i>Academy of Management Journal</i> | 5 | 370 | 5 | 74,0 | 298 | 28.004 | 95 | 94,0 |
| 18 | <i>Organization Science</i> | 5 | 206 | 5 | 41,2 | 265 | 16.307 | 78 | 61,5 |
| 19 | <i>Review of Financial Studies</i> | 5 | 165 | 5 | 33,0 | 366 | 16.744 | 68 | 45,7 |
| 20 | <i>Accounting Review</i> | 5 | 151 | 5 | 30,2 | 255 | 7.684 | 46 | 30,1 |
| 21 | <i>Management Science</i> | 5 | 133 | 5 | 26,6 | 700 | 25.463 | 74 | 36,4 |
| 22 | <i>Strategic Entrepreneurship Journal</i> | 5 | 92 | 5 | 18,4 | 56 | 1.792 | 25 | 32,0 |
| 23 | <i>International Journal of Technology Management</i> | 13 | 69 | 4 | 5,3 | 439 | 2.127 | 19 | 4,8 |
| 24 | <i>Journal of Small Business Management</i> | 5 | 47 | 4 | 9,4 | 145 | 3.075 | 33 | 21,2 |
| 25 | <i>Administrative Science Quarterly</i> | 4 | 227 | 4 | 56,8 | 89 | 7.371 | 49 | 82,8 |
| 26 | <i>Journal of International Business Studies</i> | 4 | 139 | 4 | 34,8 | 313 | 15.442 | 66 | 49,3 |
| 27 | <i>Financial Management</i> | 4 | 57 | 4 | 14,3 | 132 | 1.590 | 17 | 12,0 |
| 28 | <i>Management Decision</i> | 6 | 21 | 3 | 3,5 | 276 | 2.228 | 21 | 8,1 |
| 29 | <i>Research Technology Management</i> | 5 | 14 | 3 | 2,8 | 175 | 1.080 | 15 | 6,2 |
| 30 | <i>R D Management</i> | 4 | 53 | 3 | 13,3 | 175 | 4.173 | 34 | 23,8 |
| 31 | <i>Advances in Strategic Management A Research Annual</i> | 4 | 26 | 3 | 6,5 | 88 | 428 | 10 | 4,9 |
| 32 | <i>Health Affairs</i> | 4 | 21 | 3 | 5,3 | 1431 | 29.033 | 76 | 20,3 |
| 33 | <i>Journal of Economics Management Strategy</i> | 3 | 58 | 3 | 19,3 | 180 | 2.871 | 26 | 16,0 |
| 34 | <i>European Financial Management</i> | 3 | 47 | 3 | 15,7 | 162 | 2.092 | 22 | 12,9 |
| 35 | <i>Journal of Business Research</i> | 4 | 51 | 2 | 12,8 | 789 | 17.616 | 59 | 22,3 |
| 36 | <i>Harvard Business Review</i> | 3 | 86 | 2 | 28,7 | 1072 | 9.235 | 45 | 8,6 |
| 37 | <i>Industrial and Corporate Change</i> | 3 | 61 | 2 | 20,3 | 200 | 4.479 | 34 | 22,4 |
| 38 | <i>Long Range Planning</i> | 3 | 12 | 2 | 4,0 | 128 | 2.153 | 26 | 16,8 |
| 39 | <i>Journal of Management</i> | 2 | 119 | 2 | 59,5 | 214 | 13.710 | 62 | 64,1 |
| 40 | <i>Ieee Transactions on Engineering Management</i> | 2 | 31 | 2 | 15,5 | 227 | 4.068 | 33 | 17,9 |

Source: Own elaboration

Table V.
Leading journals in
VC between
2005-2009

Figure 2 shows the results. Note that the figure considers journals with at least X documents in VC and the one hundred most representative connections in the bibliographic network.

The *Journal of Business Venturing* is at the core of the field confirming the results seen in the previous tables. It is worth noting that some leading management and financial journals also have a significant position in the field publishing a significant number of articles.

Next, let us analyze co-citation between journals in venture capital. Recall that co-citation (Small, 1973) occurs when two documents receive a citation from the same third document. Figure 3 presents the map considering a minimum threshold of X citations and the one hundred most representative connections.

| R | Journal | TPV | TCV | HV | C/P1 | TP | TC | H | C/P2 |
|----|--|-----|-----|----|------|-------|-------|----|------|
| 1 | <i>Journal of Business Venturing</i> | 38 | 578 | 14 | 15,2 | 217 | 3.088 | 31 | 14,2 |
| 2 | <i>Small Business Economics</i> | 30 | 153 | 8 | 5,1 | 421 | 2.126 | 20 | 5,0 |
| 3 | <i>Strategic Management Journal</i> | 12 | 170 | 8 | 14,2 | 436 | 5.480 | 36 | 12,6 |
| 4 | <i>Review of Financial Studies</i> | 17 | 212 | 7 | 12,5 | 498 | 6.124 | 67 | 12,3 |
| 5 | <i>Entrepreneurship Theory and Practice</i> | 16 | 102 | 7 | 6,38 | 254 | 3.038 | 27 | 12,0 |
| 6 | <i>Research Policy</i> | 14 | 143 | 7 | 10,2 | 628 | 6.986 | 34 | 11,1 |
| 7 | <i>Journal of Financial Economics</i> | 10 | 144 | 6 | 14,4 | 615 | 7.989 | 39 | 13,0 |
| 8 | <i>International Entrepreneurship and Management Journal</i> | 13 | 69 | 5 | 5,31 | 165 | 1.003 | 18 | 6,1 |
| 9 | <i>Strategic Entrepreneurship Journal</i> | 12 | 58 | 5 | 4,83 | 99 | 710 | 16 | 7,2 |
| 10 | <i>Academy of Management Journal</i> | 10 | 85 | 5 | 8,5 | 323 | 6.947 | 45 | 21,5 |
| 11 | <i>Journal of Financial and Quantitative Analysis</i> | 8 | 87 | 5 | 10,9 | 284 | 1.699 | 21 | 6,0 |
| 12 | <i>Journal of Management Studies</i> | 8 | 76 | 5 | 9,5 | 293 | 4.456 | 32 | 15,2 |
| 13 | <i>Journal of International Business Studies</i> | 7 | 147 | 5 | 21 | 288 | 3.772 | 29 | 13,1 |
| 14 | <i>Industrial and Corporate Change</i> | 7 | 43 | 5 | 6,14 | 276 | 1.636 | 18 | 5,9 |
| 15 | <i>Journal of Corporate Finance</i> | 19 | 72 | 4 | 3,79 | 413 | 1.648 | 18 | 4,0 |
| 16 | <i>Review of Finance</i> | 9 | 40 | 4 | 4,44 | 191 | 813 | 14 | 4,3 |
| 17 | <i>Corporate Governance an International Review</i> | 8 | 39 | 4 | 4,88 | 156 | 887 | 12 | 5,7 |
| 18 | <i>Journal of Banking Finance</i> | 8 | 30 | 4 | 3,75 | 1.450 | 7.019 | 27 | 4,8 |
| 19 | <i>European Financial Management</i> | 7 | 73 | 4 | 10,4 | 178 | 614 | 12 | 3,4 |
| 20 | <i>Organization Science</i> | 7 | 45 | 4 | 6,43 | 455 | 6.255 | 37 | 13,7 |
| 21 | <i>Journal of Financial Intermediation</i> | 6 | 38 | 4 | 6,33 | 139 | 1.275 | 17 | 9,2 |
| 22 | <i>Asia Pacific Journal of Management</i> | 6 | 32 | 4 | 5,33 | 227 | 1.374 | 16 | 6,1 |
| 23 | <i>Journal of Finance</i> | 5 | 117 | 4 | 23,4 | 332 | 5.508 | 35 | 16,6 |
| 24 | <i>International Small Business Journal</i> | 9 | 27 | 3 | 3 | 200 | 995 | 13 | 5,0 |
| 25 | <i>Journal of Business Research</i> | 8 | 25 | 3 | 3,13 | 1.305 | 5.952 | 25 | 4,6 |
| 26 | <i>Journal of Economics Management Strategy</i> | 8 | 16 | 3 | 2 | 189 | 610 | 11 | 3,2 |
| 27 | <i>Financial Management</i> | 7 | 39 | 3 | 5,57 | 194 | 713 | 11 | 3,7 |
| 28 | <i>Entrepreneurship and Regional Development</i> | 6 | 33 | 3 | 5,5 | 177 | 973 | 15 | 5,5 |
| 29 | <i>Harvard Business Review</i> | 6 | 11 | 3 | 1,83 | 1.363 | 2.030 | 17 | 1,5 |
| 30 | <i>California Management Review</i> | 5 | 27 | 3 | 5,4 | 135 | 760 | 14 | 5,6 |
| 31 | <i>Journal of Business Finance Accounting</i> | 5 | 23 | 3 | 4,6 | 236 | 690 | 11 | 2,9 |
| 32 | <i>Journal of Product Innovation Management</i> | 5 | 20 | 3 | 4 | 430 | 2.699 | 22 | 6,3 |
| 33 | <i>Technovation</i> | 5 | 16 | 3 | 3,2 | 283 | 2.573 | 24 | 9,1 |
| 34 | <i>Regional Studies</i> | 4 | 25 | 3 | 6,25 | 479 | 2.357 | 19 | 4,9 |
| 35 | <i>R D Management</i> | 4 | 23 | 3 | 5,75 | 164 | 994 | 15 | 6,1 |
| 36 | <i>Journal of Technology Transfer</i> | 7 | 26 | 2 | 3,71 | 209 | 1.014 | 16 | 4,9 |
| 37 | <i>International Review of Financial Analysis</i> | 6 | 13 | 2 | 2,17 | 315 | 475 | 8 | 1,5 |
| 38 | <i>Management Science</i> | 5 | 30 | 2 | 6 | 747 | 5.678 | 28 | 7,6 |
| 39 | <i>Journal of Small Business Management</i> | 4 | 21 | 2 | 5,25 | 167 | 904 | 15 | 5,4 |
| 40 | <i>Journal of Management</i> | 3 | 19 | 2 | 6,33 | 297 | 6.286 | 41 | 21,2 |

Source: Own elaboration

Table VI.
Leading journals in
VC between
2010-2014

The *Journal of Business Venturing* is the most influential journal, although the *Journal of Finance* and the *Journal of Financial Economics* also receive numerous citations. Moreover, several management journals are also very influential in the field including the *Strategic Management Journal* and the *Academy of Management Journal*.

Conclusions

This work presents a general overview of the leading journals in VC research between 1990 and 2014. Different analyses were performed, both at a general level for the described period, and also at the quinquennial level.

Business Venturing which is the most productive, is also the most influential journal. Evidently, this is the only specialized journal in VC research. Interestingly, some cases, such as *Journal of Finance*, *Strategic Management Journal* and *Journal of Banking & Finance*, present an important number of citations (more than 1,000) in less than 25 papers. These three journals, despite not being specialized in VC research, publish very influential papers. The work also develops a graphical visualization of the publication and citation structure between journals by using VOS viewer software with bibliographic coupling and co-citation.

A quinquennial analysis, five periods of five years each, allowed us to recognize the transition among journals which focus on VC research. Specifically, in the first quinquennials analyzed, less than 15 journals published papers on venture capital, and the journals that accepted these articles come from a Finance and General Management perspective. Currently, this situation is very different. The last quinquennials analyzed show that more than 40 journals normally accept and publish papers on venture capital. This group of journals does not come from a few disciplines; in fact, a wide range of perspectives that include psychology, law, innovation and sociology, among others, represents it.

Clearly, VC research will continue growing, and it is necessary to deepen the analysis of the authors, countries and universities that lead research in this discipline, who are not only the most productive players but also the most influential actors.

Note

1. Web of Science (WoS) is one of the most popular databases for classifying scientific research worldwide. The assumption is that it only includes those journals that are evaluated with the highest quality.

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