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Landström, Hans; Harirchi, Gouya; Åström, Fredrik

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PO Box 117
221 00 Lund
+46 46-222 00 00

Innovation and Entrepreneurship Studies: One or Two Fields of Research?

Hans Landström^{1,2}, Gouya Harirchi³ and Fredrik Åström⁴

¹ Sten K Johnson Centre for Entrepreneurship, Lund University, Lund, Sweden

² Institute for Small Business Management and Entrepreneurship, Vienna University of Economics and Management, Vienna, Austria

³ Department of Innovation and Organizational Economics, Copenhagen Business School, Copenhagen, Denmark

⁴ Lund University Libraries, Lund University, Lund, Sweden

Abstract

Innovation and industrial dynamics have grown in importance over the last 40-50 years as we have moved towards a more knowledge intensive society. In an effort to understand these developments in society new research fields have emerged such as innovation and entrepreneurship studies. In general, these two research fields are regarded as rather closely interlinked. In this study we elaborate on the question: Should innovation and entrepreneurship be seen as one or two fields of research? We have taken a cognitive approach in which we analyze the knowledge platforms in innovation and entrepreneurship studies.

We use a methodology in which we have built a unique database consisting of all references in twelve “state-of-the-art” books in entrepreneurship. The chapters in these “state-of-the-art” books are written by experts within the field, and it can be assumed that the most frequently cited references in these chapters represent “core knowledge” in entrepreneurship research. We have analyzed the references cited in these chapters in order to identify core contributors and core works within entrepreneurship research. In addition, we have compared our results with a similar study conducted by Fagerberg et al. (2012) on the knowledge basis in the field of innovation studies.

The study shows that we are talking about two more or less separate fields of research. Despite common roots in Schumpeter and some interrelated works, the two fields seem to have drifted apart over the last decades. However, there seems to be some elements of overlaps, for example, in the interest in the evolutionary approaches, and in the interest in topics such as innovation management (corporate entrepreneurship) and in technology-based ventures.

Keywords: Innovation studies, entrepreneurship studies, new research fields, knowledge base

1. Introduction

Innovation and entrepreneurship are often regarded as tightly interlinked concepts and areas of interest. For example, innovation and entrepreneurship are often seen as necessary and integrated ingredients in creating growth and industrial renewal in society (Braunerhjelm et al., 2009), and both concepts are often included together in the title of conferences (e.g. European Conference on Innovation and Entrepreneurship 2012), journals (e.g. *Journal of Innovation and Entrepreneurship* and *International Journal of Entrepreneurship and Innovation Management*), and in academic courses – indicating that we are talking about one field of research.

However, we can also argue in the opposite direction, that we are talking about two different fields. For example, we need to bear in mind that not all new ventures can be regarded as innovative, and not all new knowledge generate viable business opportunities. In addition, when we use of the concepts “innovation” and “entrepreneurship” in daily speech, people often interpret the concepts in different ways. When asking people in general to define innovation, concepts such as “inventions”, “newness”, “new technologies”, “R&D” and “creativity” often will be expressed, whereas when asking about entrepreneurship people will often mention concepts such as “start-ups”, “commercialization”, “business ideas” and “the entrepreneur as an individual”.

In this paper we will elaborate on the relationship between innovation and entrepreneurship by taking a cognitive approach and analyzing the knowledge platforms in innovation and entrepreneurship

studies. We will ask the questions: Who are the leading knowledge producers in innovation and entrepreneurship research? and What core works can be identified in innovation and entrepreneurship research? In addition, to give an understanding to which extent innovation and entrepreneurship research can be regarded to be a part of a single broader scientific field which share and contribute to the same knowledge base, we will compare the core scholars and core works within the fields of innovation and entrepreneurship research.

In the study we are using a unique database consisting of all references included in twelve “state-of-the-art” books or “handbooks” published within the field of entrepreneurship since the 1980s. The chapters in these “state-of-the-art” books are written by experts and prominent scholars within the field, and it can be assumed that the most frequently cited references in these surveys represent the “core literature” of entrepreneurship research. In our analysis we will compare our results on the core scholars and core works in entrepreneurship studies with a similar study conducted by Fagerberg et al. (2012) on the knowledge basis in innovation studies.

Our analysis shows that there are very few overlaps in the knowledge platforms in innovation and entrepreneurship research, indicating that we are talking about more or less two separate fields of research. Although innovation and entrepreneurship studies both have common roots in Schumpeter and some interrelated works, the two fields seem to have drifted apart over the last decades. However, some overlaps can be found in evolutionary approaches, and in the interest in innovation management (corporate entrepreneurship) and in technology-based ventures.

The rest of the paper consists of three sections. In section 2 we will elaborate in more details on the methodology we have used in the study. Section 3 consists of a description of the historical evolution of innovation and entrepreneurship research. Finally, in section 4 a comparison is made with regards core scholars and core works in innovation and entrepreneurship research, and a discussion regarding innovation and entrepreneurship seen as one or two fields of research.

2. Methodology

2.1 Bibliometric analysis – problems when analyzing emerging fields of research

Bibliometric analysis is based on the assumption that if a researcher cites a work he/she has found it useful in some way, and therefore the more frequently a work is cited, the greater its role in the scholarly community (Garfield, 1972). This leads to the reinforcement and institutionalization of certain opinions and, as a consequence, individual researchers end up playing a substantial role in the development of a research field (Crane, 1972). However, bibliometric analysis is not without limitations. For example, there are limitations in the databases typically used for bibliometric analysis (Watkins, 2005) such as the Social Science Citation Index (SSCI) using the Web of Science. Although the SSCI is a wonderful resource for citation analysis, the literature indexed in the databases consists primarily of scholarly journals (although we know that in emerging fields of research “books” play a significant role for the intellectual development of the field), the databases covers primarily English language journals, and not least, it takes time for journals in emerging fields to be included in the SSCI databases and as a consequence emerging fields like innovation and entrepreneurship are significantly less well-covered than more mature fields of research. Thus, citation databases such as SSCI have limitations when analyzing emerging fields such as innovation and entrepreneurship research.

2.2 Methodological approach in this study

In an attempt to eliminate some of the major disadvantages of using generally available databases in bibliometric analysis, in this study we exploit the fact that a number of authoritative contributions aimed at surveying the evolution of innovation and entrepreneurship research already exist, i.e. a tradition of publishing “handbooks” or “state-of-the-art books” on innovation and entrepreneurship. Such handbooks are usually edited by senior academics in the field, and the purpose of these books is to introduce readers to the most important scholarly work on a topic within the broader area covered in the handbooks. Therefore, it is reasonable to assume that the references in these handbooks will include the most important contributions of relevance for the topic, as the authors of the handbook chapters normally are experts on the topics they survey. In these handbooks some contributions will

be referred to in many different chapters simply because they are generally considered to be of significant importance by the collective body of authors involved in the handbooks. This subset of highly cited contributions is referred to as the “core works” within the fields of innovation and entrepreneurship.

In this study we have used a databasis that we have conducted on entrepreneurship research covering twelve “state-of-the-art” books within the field (see Landström et al., 2012 for a more detailed presentation of the methodology and the results), and we have compared our results with a similar study conducted by Fagerberg et al. (2012) including eleven “state-of-the-art” books on innovation research. The handbooks that are included in our study and the study by Fagerberg et al. (2012) are presented in Table 1.

Table 1: List of handbooks included in the analysis

| INNOVATION | | | | | | ENTREPRENEURSHIP | | | | | |
|------------|------------------------------|--|------|-------------|-----------|------------------|-------------------------------|--|------|-------------|-----------|
| No | Author(s) | Title | Year | No of chapt | No of ref | No | Author(s) | Title | Year | No of chapt | No of ref |
| 1 | Cozijnsen & Vrakking | Handbook of Innovation Management | 1993 | 9 | 280 | 1 | Kent, Sexton & Vesper | Encyclopedia of Entrepreneurship | 1982 | 18 | 630 |
| 2 | Dodgson & Rothwell | Handbook of Industrial Innovation | 1994 | 35 | 1247 | 2 | Sexton & Smilor | The Art and Science of Entrepreneurship | 1986 | 11 | 381 |
| 3 | Stoneman | Handbook of the Economics of Innovation and Technological Change | 1995 | 13 | 1630 | 3 | Sexton & Kasarda | The State of the Art of Entrepreneurship | 1992 | 22 | 1547 |
| 4 | Shavinina | International Handbook on Innovation | 2003 | 71 | 4303 | 4 | Katz & Brockhaus | Advances in Entrepreneurship, Firm Emergence, and Growth, Vol. 1 | 1993 | 5 | 335 |
| 5 | Fagerberg, Mowery & Nelson | The Oxford Handbook of Innovation | 2004 | 22 | 1688 | 5 | Katz & Brockhaus | Advances in Entrepreneurship, Firm Emergence, and Growth, Vol. 2 | 1995 | 8 | 657 |
| 6 | Poole & Van de Ven | Handbook of Organizational Change and Innovation | 2004 | 13 | 1958 | 6 | Katz & Brockhaus | Advances in Entrepreneurship, Firm Emergence, and Growth, Vol. 3 | 1997 | 7 | 852 |
| 7 | Karlsson | Handbook of Research on Innovation and Clusters | 2008 | 24 | 1465 | 7 | Sexton & Smilor | Entrepreneurship 2000 | 1997 | 18 | 907 |
| 8 | Shane | Handbook of Technology and Innovation Management | 2008 | 16 | 1494 | 8 | Sexton & Landström | The Blackwell Handbook of Entrepreneurship | 2000 | 22 | 1427 |
| 9 | Lundvall, Joseph & Chaminade | Handbook of Innovation Systems and Developing Countries | 2009 | 13 | 974 | 9 | Acs & Audretsch | Handbook of Entrepreneurship Research | 2003 | 19 | 1687 |
| 10 | Hall & Rosenberg | Handbook of the Economics of Innovation | 2010 | 29 | 4518 | 10 | Alvarez, Agarwal & Sorenson | Handbook of Entrepreneurship Research: Disciplinary Perspectives | 2005 | 11 | 652 |
| 11 | Gallouj & Djellal | The Handbook of Innovation and Services | 2010 | 32 | 1756 | 11 | Casson, Yeung, Basu & Wadeson | Oxford Handbook of Entrepreneurship | 2006 | 27 | 2079 |
| | | | | | | 12 | Parker | The Life Cycle of Entrepreneurial Ventures | 2006 | 17 | 1627 |
| | | | | 277 | 21313 | | | | | 185 | 12781 |

In the study made by Fagerberg et al. (2012) on innovation and our own study on entrepreneurship a total of 21,313 references in innovation research and 12,781 references in entrepreneurship research were used. To ensure a fair comparison of the number of references and taking into account when the work was published, we calculated and used an age-adjusted J-index – the index reflects how important a work is perceived to be within the field of innovation and entrepreneurship respectively (as judged by experts within the field):

$$(1) \quad J = (A * 100) / M$$

where M = the maximum citation for any work as one citation per chapter in any handbook published at least one year after the publication of the work in question.

A = the actual number of citation for the work in question.

In order to select approximately the top one per cent of works in innovation and entrepreneurship research, the threshold level for core works in innovation were set to the J-index of 3.25, i.e. works cited less than once per thirty chapters (of those chapters that could potentially have cited it), giving a set of 130 core works in innovation, and in entrepreneurship the J-index of 4.0 gave 135 core works in entrepreneurship.

3. The evolution of innovation and entrepreneurship studies

3.1 The “take-off” and growth of innovation and entrepreneurship studies

As society has moved towards a “knowledge society”, innovation and entrepreneurship as scholarly fields have grown in importance over the last 40-50 years. In spite of some early contributions in the 19th century and early 20th century (Landström, 2010), for example, by scholars such as Joseph Schumpeter (1912/1934) and Frank Knight (1921) that provided important theoretical building blocks for later works on innovation and entrepreneurship, a broader knowledge base within the area began to emerge after the Second World War, first in the field of innovation and somewhat later in entrepreneurship. Despite early contributions by Schumpeter (1912/1934, 1942) the interest in innovation studies did not really exist as an identifiable research field until the late 1960s, largely confined to researchers in the two leading industrial powers of the time, the US and the UK, and particularly emerging in two disciplines, economics and sociology. In this respect, three organizations outside academia, RAND Corporation (a think-tank for the US Department of Defense), the Federation of British Industry in the UK, and the OECD based in Paris, came to play a crucial role in providing necessary resources as well as influencing the research agenda of the emerging group of scholars that showed an interest in the area. Entrepreneurship as a field of research emerged somewhat later, in the 1980s, mainly driven by the economic and political changes occurring in society during the 1960s and 1970s – a period in which new technologies were gaining ground, changes were taking place in industrial structure, and attitudes toward entrepreneurship were evolving – and in the 1980s supported by politicians such as Ronald Reagan in the US and Margaret Thatcher in the UK. Against this background, innovation as well as entrepreneurship gained more attention in society as well as in academia (Fagerberg et al., 2012b).

Since the “take-off phase” of innovation and entrepreneurship research, the fields of innovation and entrepreneurship have grown significantly over the last decades. As shown in Figure 1, which illustrate the evolution of core literature in innovation and entrepreneurship over time (based on the databases in the two studies on which this paper are based), we can find that the two fields developed relatively slowly until the 1970s when literature on innovation studies started to grow more rapidly, and somewhat later the growth of literature on entrepreneurship (in the 1980s).

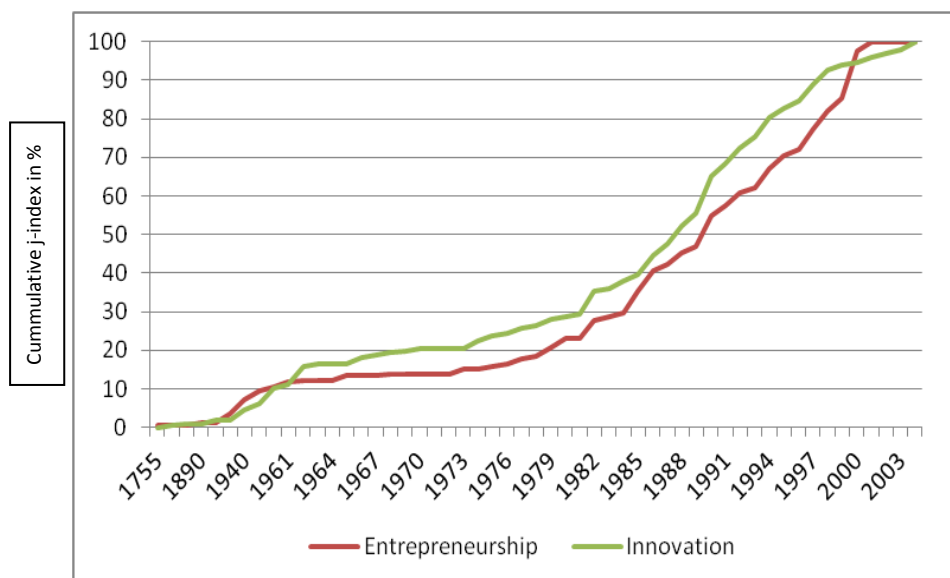


Figure 1: The evolution of the core literature in innovation and entrepreneurship studies

3.2 Innovation studies

Following the description made by Fagerberg et al. (2012a, b), the emergence of innovation study as a research field was heavily influenced by the establishment of the British research institute Science Policy Research Unit (SPRU), which was set up in 1966 at the recently founded University of Sussex with Christopher Freeman as the Director. The research at SPRU could be characterized as problem-oriented (rather than disciplinary-oriented), it took a system approach on R&D and innovation, and the research at the centre was to a high extent multi- and cross-disciplinary. SPRU quickly became a global hub for research on innovation, with a large number of scholars from all over the world visiting the centre. Many new centres on innovation studies emerged around the world which took inspirations from SPRU and Freeman. In addition the leading journal on innovation studies, *Research Policy*, was started in 1971 with Freeman as the head editor.

Some significant theoretical and empirical contributions were published in the 1970s and 1980s. For example, Freeman published his book *The Economics of Industrial Innovation* in 1974 which contained a synthesis of the available knowledge within the field at that time, and the book proved very influential within the field over the next decades. In 1982 Richard Nelson and Sidney Winter published *An Evolutionary Theory of Economic Change* in which they tried to develop formal models of economic evolution and describe how firms and industries change over time. Influential works were also published with regards differences in innovation across industries and sectors (Pavitt, 1984), and the role of innovation and learning at a firm-level of analysis (Cohen and Levinthal, 1990), but also by economic historians such as Nathan Rosenberg (1976, 1982) on technological and institutional changes over time.

Innovation studies as a research field grew significantly in the 1980s and 1990s, with scholars from many different disciplinary backgrounds, and several new journals within the field were launched as well as the establishment of professional associations (e.g. International Joseph Schumpeter Society, the Technology and Innovation Management (TIM) Division within the (American) Academy of Management, and DRUID). From a cognitive perspective, the evolution of innovation research took a new twist after the 1980s. Earlier works had mainly been focused on firms and industries, but attention now shifted towards the role of innovation in the entire economy, and how institutions and policies could adjust in order to benefit from innovation and its diffusion, i.e. studies in “national systems of innovation” (Freeman, 1987; Lundvall, 1992) quickly attracted a lot of attention among researchers and policy-makers. Another major development in innovation studies was an increased interest among scholars in business and management, initiated by Porter (1990) and followed by, for example, Teece et al. (1997).

Today, the field of innovation studies is quite large, international and diverse in terms of research interests and disciplinary backgrounds (Fagerberg and Verspagen, 2009). According to Fagerberg et al. (2012a) there are now two large issues of interest within the field, one oriented towards economic, social and political issues, and the other associated with the rapidly growing field of business and management, but there are no common theory, publication channel or meeting place that bind these two issues together.

Finally, we could ask the questions: Who are the core scholars within the field of innovation studies? and Which are the core works published within the field? Based on the analysis made by Fagerberg et al. (2012a) the core scholars and works in innovation studies are summarized in Table 2.

Table 2: Core scholars and core works in innovation studies

| CORE SCHOLARS | | | CORE WORKS | | | | | |
|---------------|---------------------|---------------|------------|------------------------|--|-------------|------|---------|
| Rank | Scholar | Total J-index | Rank | Author(s) | Title | Type | Year | J-index |
| 1 | Richard Nelson | 37.6 | 1 | Nelson & Winter | An evolutionary theory of economic change | Book | 1982 | 18.8 |
| 2 | Christopher Freeman | 35.5 | 2 | Nelson | National innovation systems | Book | 1993 | 15.7 |
| 3 | Nathan Rosenberg | 33.4 | 3 | Porter | The competitive advantage of nations | Book | 1990 | 14.4 |
| 4 | Joseph Schumpeter | 27.4 | 4 | Schumpeter | The theory of economic development | Book | 1934 | 14.1 |
| 5 | Michael Porter | 24.9 | 5 | Rogers | Diffusion of innovations | Book | 1962 | 14.1 |
| 6 | Zvi Griliches | 24.2 | 6 | Lundvall | National innovation systems. Towards a theory of innovation and interactive learning | Book | 1992 | 13.4 |
| 7 | Eric von Hippel | 20.2 | 7 | Freeman | The economics of industrial innovation | Book | 1974 | 12.6 |
| 8 | Bengt-Åke Lundvall | 19.1 | 8 | Cohen & Levinthal | Absorptive capacity: A new perspective on learning and innovation | Article | 1990 | 11.9 |
| 9 | Keith Pavitt | 15.5 | 9 | Pavitt | Sectoral patterns of technical change | Article | 1984 | 11.6 |
| 10 | Alfred Chandler | 14.8 | 10 | Arrow | Economic welfare and allocation of resources for invention | Book chapt. | 1962 | 10.5 |
| 11 | Everett Rogers | 14.1 | 11 | Saxenian | Regional advantage | Book | 1994 | 9.9 |
| 12 | David Teece | 12.8 | 12 | Freeman | Technology policy and economic performance: Lessons from Japan | Book | 1987 | 9.7 |
| 13 | Sid Winter | 12.5 | 13 | von Hippel | The source of innovation | Book | 1988 | 9.7 |
| 14 | Wesley Cohen | 12.4 | 14 | Christensen | The innovator's dilemma | Book | 1997 | 9.5 |
| 15 | Paul Romer | 12.3 | 15 | Teece | Profiting from technological innovation | Article | 1986 | 9.4 |
| 16 | Giovanni Dosi | 11.9 | 16 | Kline & Rosenberg | An overview of innovation | Book chapt. | 1986 | 9.4 |
| 17 | Kenneth Arrow | 10.5 | 17 | Henderson & Clark | Architectural innovation | Article | 1990 | 9.4 |
| 18 | Adam Jaffe | 10.3 | 18 | Rosenberg | Inside the black box | Book | 1982 | 9.0 |
| 19 | AnnaLee Saxenian | 9.9 | 19 | Schumpeter | Capitalism, socialism and democracy | Book | 1942 | 7.9 |
| 20 | Edward Mansfield | 9.9 | 20 | Tidd, Bessant & Pavitt | Managing innovation | Book | 1997 | 7.7 |

3.3 Entrepreneurship studies

In accordance with the analysis made by Landström and Benner (2010), the emerging interest in entrepreneurship studies was mainly driven by the “creative destruction” that could be identified in many western societies during the 1960s and 1970s and which made entrepreneurship and industrial dynamics a prominent theme among politicians and policy-makers. In this respect, the seminal work by David Birch *The Job Generation Process* published 1979 played an influential role in making the phenomenon of entrepreneurship and small businesses “visible”. In the report Birch showed that the majority of new jobs in the US were created by new and small firms – not large established companies. The report provided an intellectual foundation for the incorporation of entrepreneurship and small businesses into the analyses of economic development, and as a consequence, many scholars from different fields, not least management studies, rushed into this promising field of research. The research community at this point in time could be characterized as fragmented and individualistic, but rather early many initiatives were taken to stimulate communication within this group of scholars – academic conferences were launched (e.g. the Babson Conference in the US, the RENT Conference in Europe, the Small Firms Policy and Research Conference in the UK), professional organizations were created (e.g. an interest group on entrepreneurship was created within the (American) Academy of Management while the European Council of Small Business was formed on

the European scene), and scientific journals were established such as the *Journal of Business Venturing*, *Entrepreneurship and Regional Development* and *Small Business Economics*.

Since the early 1990s there has been an enormous growth in entrepreneurship research, which is obvious irrespective of the measurement employed. In a cognitive sense the field was characterized by a large scale migration of scholars into the field, but also a high degree of mobility of scholars in and out of the field. The research within the field showed a strong empirical focus in which scholars tried to understand the phenomenon from many different angles. Taken together, this made the field of entrepreneurship research very fragmented. On the other hand, the 1990s was to a very large extent characterized by the building of a strong infrastructure within academia in terms of new chairs that were established at different universities around the world, new journals and conferences were launched, and there was an increase in the number of courses and education programs in entrepreneurship and related topics.

Entrepreneurship studies in the 2000s could be characterized in term of a “search for maturity”, in which the article by Shane and Venkataraman (2000) in the *Academy of Management Review* could be regarded as the trigger for an intense debate regarding the domain of entrepreneurship research, but also initiating an increased interest in research on opportunity recognition and a renewed interest among entrepreneurship scholars in the Austrian School of Economics. In addition, over time, the research issues and the research community involved in entrepreneurship have become more heterogeneous in character, and various different subgroups of scholars have emerged. Today, it appears that the field of entrepreneurship research continues to search for an identity of its own, founded on concepts and theories that can play a “boundary-defining” role (Landström, 2010).

Finally, who have been the core scholars in entrepreneurship studies and what core works could be identified within the field? According to the analysis made by Landström et al. (2012) the core scholars and works are summarized in Table 3.

Table 3: Core scholars and core works in entrepreneurship studies

| CORE SCHOLARS | | | CORE WORKS | | | | | |
|---------------|-----------------------|---------------|------------|----------------------|--|------------|------|---------|
| Rank | Scholar | Total J-index | Rank | Author(s) | Title | Type | Year | J-index |
| 1 | Joseph Schumpeter | 47.0 | 1 | Schumpeter | Theory of economic development | Book | 1934 | 33.5 |
| 2 | William Gartner | 29.5 | 2 | Shane & Venkataraman | The promise of entrepreneurship as a field of research | Article | 2000 | 23.0 |
| 3 | Israel Kirzner | 29.3 | 3 | Shane | Prior knowledge and the discovery of entrepreneurial opportunities | Article | 2000 | 16.2 |
| 4 | Howard Aldrich | 29.2 | 4 | Knight | Risk, uncertainty and profit | Book | 1921 | 15.7 |
| 5 | Scott Shane | 27.7 | 5 | Schumpeter | Capitalism, socialism and democracy | Book | 1942 | 13.5 |
| 6 | Sankaran Venkataraman | 21.9 | 6 | Gartner | Who is an entrepreneur? Is the wrong question | Article | 1988 | 12.8 |
| 7 | William Baumol | 17.1 | 7 | Bhidé | The origin and evolution of new businesses | Book | 2000 | 12.2 |
| 8 | David Audretsch | 16.6 | 8 | Kirzner | Competition and entrepreneurship | Book | 1973 | 11.9 |
| 9 | Frank Knight | 15.7 | 9 | McClelland | The achieving society | Book | 1961 | 11.9 |
| 10 | David Birch | 14.6 | 10 | Storey | Understanding the small business sector | Book | 1994 | 11.6 |
| 11 | Amarnath Bhidé | 12.2 | 11 | Kirzner | Entrepreneurial discovery and the competitive market process | Article | 1997 | 11.5 |
| 12 | David Blanchflower | 11.9 | 12 | Casson | The entrepreneur: An economic theory | Book | 1982 | 11.4 |
| 13 | David McClelland | 11.9 | 13 | Aldrich & Zimmer | Entrepreneurship through social networks | Book chap. | 1986 | 10.9 |
| 14 | David Storey | 11.6 | 14 | Saxenian | Regional advantage: Culture and competition in Silicon Valley and Route 128 | Book | 1994 | 10.8 |
| 15 | Mark Casson | 11.4 | 15 | Venkataraman | The distinctive domain of entrepreneurship | Book chap. | 1997 | 10.4 |
| 16 | Jay Barney | 11.1 | 16 | Stinchcombe | Social structure and organizations | Book chap. | 1965 | 9.7 |
| 17 | Michael Porter | 11.0 | 17 | Penrose | Theory of the growth of the firm | Book | 1959 | 9.7 |
| 18 | Josh Lerner | 10.9 | 18 | Nelson & Winter | An evolutionary theory of economic change | Book | 1982 | 9.6 |
| 19 | David Evans | 10.9 | 19 | Hamilton | Does entrepreneurship pay? An empirical analysis of the returns to self-employment | Article | 2000 | 9.5 |
| 20 | AnnaLee Saxenian | 10.8 | 20 | Aldrich | Organizations evolving | Book | 1999 | 9.4 |

4. One or two fields?

The aim of this study is to analyze the knowledge platforms in innovation and entrepreneurship studies, in order to give an understanding to which extent the two fields of research can be regarded to be a part of a single broader scientific field. To become a part of broader scientific field, one would expect that the core literature of the two fields overlap to some extent. However, if we make an analysis from a cognitive approach it appears that this is not the case with regards innovation and entrepreneurship studies. In Table 4 (based on Fagerberg et al., 2012b) the overlap between innovation and entrepreneurship studies is shown. The analysis is based on the top-100 works in each of the two fields. In the analysis it is shown that twelve out of the top-100 most important works in innovation and entrepreneurship overlap both fields. However, few works are included in the top-20 of both fields (Schumpeter, 1934, 1942; Nelson & Winter, 1982; Saxenian, 1994).

Table 4: Overlap between innovation and entrepreneurship studies (among the top-100 works in each field)

| Work | Rank in innovation studies | Rank in entrepreneurship studies |
|--|----------------------------|----------------------------------|
| Nelson & Winter (1982): An evolutionary theory of economic change | 1 | 18 |
| Schumpeter (1934): The theory of economic development | 4 | 1 |
| Cohen & Levinthal (1990) Absorptive capacity: A new perspective on learning and innovation | 8 | 35 |
| Saxenian (1994): Regional advantage: Culture and competition in Silicon Valley and Route 128 | 11 | 14 |
| Schumpeter (1942): Capitalism, socialism and democracy | 19 | 5 |
| Marshall (1890): Principles of economics | 26 | 47 |
| Penrose (1959): The theory of the growth of the firm | 69 | 17 |
| Audretsch & Feldman (1996): Spillovers and the geography of innovation and production | 78 | 67 |
| Aldrich (1999): Organizations evolving | 80 | 20 |
| Williamson (1985): The economic institutions of capitalism | 88 | 89 |
| Krugman (1991): Geography and trade | 94 | 99 |
| Teece, Pisano & Shuen (1997): Dynamic capabilities and strategic management | 98 | 64 |

Our conclusion is that despite common roots in Schumpeter and some interrelated works there are few overlaps in the knowledge platforms, and the major conclusion to be made is that we are talking about two more or less separated fields of research. However, there are some interesting connections between the fields. For example, evolutionary aspects seem to be important elements in the overlap between the two fields, which could be applied in the contributions by Schumpeter, Nelson and Winter, but also the works by Penrose, Aldrich and Cohen and Levinthal. Another connection that can be found is the common interests in topics such as innovation management (corporate entrepreneurship) and an interest in new technology-based firms.

Our argument that we are talking about two separate fields of research is supported by Bhupatiraju et al. (2012) and Persson (2010). Their studies confirm that there are rather little interactions, as measured by cross-citations, between the fields – most of the cross-citations are internal to the two fields – indicating that the division between the fields is relatively clear-cut. In addition, the analysis by Bhupatiraju et al. (2012) indicates that the boundaries between the fields were less clear a few decades ago than they are today, i.e. the two fields seem to have drifted apart more and more over the last decades. Thus, the overlap appears to have more to do with the basic theoretical foundations (or “roots”) of the two fields than with the more recent contributions to the two fields. Their conclusion is that the two fields, although they share some research themes, have evolved largely on their own and in relative isolation from each other.

Major explanations that might explain the differences between the fields are the disciplinary roots of the fields, and accordingly, the level of analysis in innovation and entrepreneurship studies. Innovation studies seem to be rooted in economics and sociology with a focus on more aggregated levels of analysis, whereas entrepreneurship studies are rooted in management studies with a focus on the firm and individual levels of analysis.

In this paper we have taken a cognitive approach of the two fields. Of course, we can analyze the fields from other perspectives, and the results show more or less similar conclusions:

- From a network perspective, the two fields also seem to develop in different directions, with their own separate meeting places (e.g. conferences and professional associations). For example, Gartner et al. (2006), based on an analysis of membership of the (American) Academy of Management, show that scholars in innovation and entrepreneurship belongs to different “divisions” of the organization.
- From a publication channels perspective, it seems that scholars in innovation and entrepreneurship publish their contributions in different outlets. For example, Fagerberg et al. (2012a) and Landström et al. (2012) shows that among the top-ten journals in the two fields, only one journal appear in both analyses, namely *Research Policy*.
- From an organizational perspective the two fields seem to have more in common, and scholars in innovation and entrepreneurship tend to be attached to the same local research organizations (Clausen et al., 2012).
- From a policy perspective, Lindholm-Dahlstrand and Stevenson (2007) argue that innovation policy and entrepreneurship/small business policy are rarely integrated in policy interventions by governments.

In the evolution of innovation and entrepreneurship research we have seen that the fields tend to drift apart and pursue different trajectories, i.e. innovation and entrepreneurship can more and more be regarded as two separate fields of research, and the same holds true for different parts within both fields, i.e. the fields become more diverse thematically as well as methodologically. The evolution of the fields may have negative consequences for scientific progress, but also creates new possibilities for new forms of integrations between the two fields.

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