

Origin and Emergence of Entrepreneurship as a Research Field

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Abstract

This paper seeks to map out the emergence and evolution of entrepreneurship as an independent field in the social science literature from the early 1990's to 2009. Our analysis indicates that entrepreneurship has grown steadily during the 1990's but has truly emerged as a legitimate academic discipline in the latter part of the 00's. The field has been dominated by researchers from Anglo-Saxon countries over the past twenty years, with particularly strong representations from the US, UK, and Canada. The results from our structural analysis, which is based on a core document approach, point to five large knowledge clusters and further 16 sub-clusters. We characterize the clusters from their cognitive structure and assess the strength of the relationships between these clusters. In addition, a list of most cited articles is presented and discussed.

1. Introduction

The present study aims at presenting findings from the analysis of the emergence and evolution of entrepreneurship as an independent field in the social science literature from the early 1990's to 2009. As an emerging area, the entrepreneurship field has already attracted the attention of bibliometricians – the studies by Cornelius, Landström and Persson (2006) on research fronts in entrepreneurship and research by Schildt, Zahra and Sillanpää (2006) on scholarly communities being the best known and most notable efforts to date. Both studies draw on co-citation analysis.¹ While Cornelius et al. explore the development of the field over time and study a comparatively large data set, Schildt et al. go deeper, zooming in on various specialities developing in entrepreneurship research but focus on a much shorter period of time and smaller dataset.

Proceeding from these results we seek to develop a longitudinal perspective on how research fronts developed and specialties of entrepreneurship have emerged, established themselves (or vanished). While other bibliometric studies applied co-citation analysis, we draw mostly on bibliographic coupling. More specifically, we use the approach developed by Glänzel and Thijs (2010) that draws on a combination of shared references and key phrases to link data. This allows us to overcome an important limitation in studying research communities. Citation-based matrices are extremely sparse and underestimate links while text-based methods have usually lower discriminative power and thereby tend to overestimate links and cause “dimensionality” problems. First results of this approach have been included in previous preliminary studies of this issue (cf. Meyer et al., 2011; Meyer et al., 2012).

Our analysis indicates that entrepreneurship has grown steadily during the 1990's but has truly emerged as a legitimate academic discipline in the latter part of the 2000's. The field has been dominated by researchers from Anglo-Saxon countries over the past twenty years, with

¹ See also the more recent work by Teixeira (2011) as well as the exhaustive overview by Landström & Persson (2010).

particularly strong representations from the US, UK, and Canada. The results from our structural analysis, which is based on a core document approach, point to five large knowledge clusters representing different sub-topics in entrepreneurship research. We characterize these clusters in detail and assess the strength of the relationships between the clusters. The application of the same methodology leads to further substructures represented by two-five further sub-clusters per each identified sub-topic. Finally we complement the cognitive analysis by a list of most cited papers in each of the five sub-topics.

2. Methods and data retrieval

2.1 Data retrieval

Our research is based on data from Thomson-Reuter's Web of Knowledge; we used the *Social Sciences Citation Index* (SSCI) and added a small number of articles from the *Arts & Humanities Citation Index* (A&HCI). We retrieved entrepreneurship articles, notes, proceedings papers, reviews and letters for the period 1991-2009. Unlike previous studies, which adopted a search strategy that was based exclusively on the truncated string 'entrep', we adopted an approach that included:

- all papers in the *Journal of Business Venturing* and journals that carry the string 'entrepren' in their title (so e.g. *Entrepreneurship Theory and Practice*),
- all papers that have the truncated strings 'entrepren' or 'new venture' in their title,
- all papers that have as a topic 'entrepreneurship' or a combination of the truncated string 'entrepren' with either *spin off*, *spin out*, *start up*, *venture*, *new firm*, *NTBF* (*new technology based firms*), *SME* (*small and medium sized enterprises*), *technology transfer* and *university-industry* (we allowed for spelling variations).

In light of the rapid growth of the field over the past few years, we felt that a more restrictive search strategy has become appropriate, as too many irrelevant records would be retrieved with a strategy solely based on 'entrep' as a topic. Several strategies were tested, where the above-described version has finally been accepted by experts who have, furthermore, helped clean the final document list. As a result of this validation process, a small number of SSCI papers were excluded and only 18 A&HCI papers were added to the database. This way we retrieved a total of 5,029 papers.

2.2 Structural analysis

The structural analysis is based on three recently developed methods, particularly, hybrid textual-citation based clustering (e.g., Janssens et al, 2008), the "core-document representation" of clusters (Glänzel and Thijs, 2010) and the diachronic analysis of clusters (Glänzel and Thijs, 2011). In a first step the data set has undergone a cluster analysis according to the hybrid text-citation approach suggested by Janssens et al (2008) and modified and used by Glänzel and Thijs (2010). The notion of a 'core' of literature has its roots in co-citation analysis (Small, 1973). Core documents were re-introduced by Glänzel and Czerwon (1996) to identify hubs, that is, important nodes in the network of scholarly communication. They defined core documents as those publications that are *strongly linked with at least a given number of other documents* based on similarity measures derived from *bibliographic coupling*. Glänzel and Thijs (2010) extended this notion extended to a hybrid approach, namely the combination of bibliographic coupling and text mining, where a linear combination of the angles in the vector space underlying the citation- and text-based similarities has been used for the identification of the core documents. In a second step, core documents have been identified for each cluster to be used to represent and to describe the corresponding cluster and, in the third step, to analyse the inter-cluster relationship of the whole topic.

3. Results

3.1 Emergence of the field

As Figure 1 indicates, entrepreneurship was a comparatively small area of research in the early 1990s. At the beginning of the decade less than 100 papers were published. The level of activity doubled during this decade; by the end a critical mass of 1,000 articles was reached. Since then the pace of growth has increased dramatically. At the end of the year 2000, the number of entrepreneurship papers was just over 1,500; at the beginning of the year 2010, this number has grown by 2.5 times and now exceeds 5,000. The *Average Annual Growth Rate* amounts to 12.1%.

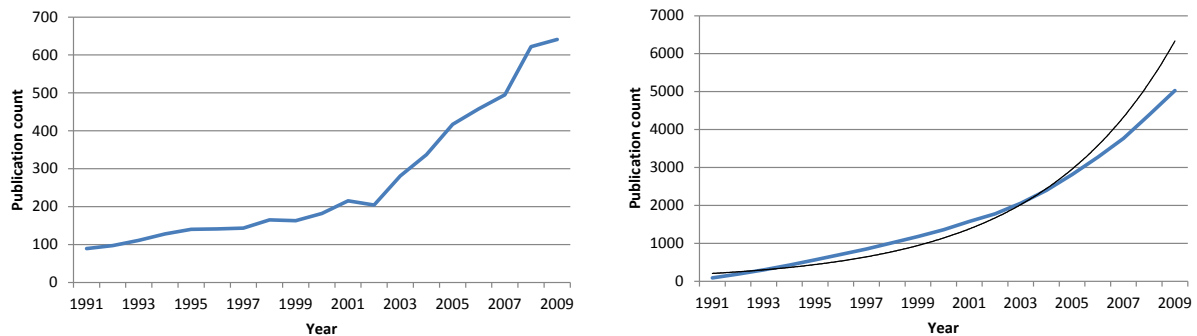


Figure 1. Evolution of Entrepreneurship research
(left: annual growth, right: cumulative output with exponential trend line)
[Data source: Thomson Reuters, Web of Science]

3.2 Hubs of entrepreneurship research

The Anglo-Saxon countries are dominant in this emerging area. The US, UK and Canada account for 75.4% of all entrepreneurship papers in the first period between 1991 and 2002. In the second period from 2003 to 2009, the three countries still account for 70.8% of all publications. If one included Australia, which has increased its activities for the past ten years, this figure would be even more pronounced. The relative weakness of large countries outside the Anglo-Saxon world is noteworthy. France, Italy, Spain and also China (even in recent years) are on par in terms of output with smaller nations, such as Belgium, the Netherlands, or Finland.

We use the Mean Observed Citation Rate (MOCR) as an indicator of impact (cf., Glänzel et al., 2009). This indicator is defined as the ratio of citation count to publication count here calculated for three-year citation windows each. MOCR reflects the factual citation impact of unit (here: country). As the topic under study is rather small, and can be considered fairly homogeneous from the bibliometric viewpoint, the national MOCR values can directly be compared with the world standard of the corresponding year. Although the observed citation impact generally increased in most fields over the last decades, the strong growth of the MOCR value of the world total might also reflect the growing importance of this research topic. The first observation concerns the evolution of the topic. As one would expect, the mean observed citation rate has gone up from the 1990s to the 2000s. Secondly, we can observe some variation between countries. The US and the UK along with Finland, the Netherlands, and Singapore were the countries achieving the highest MOCR rate 1993-2003. Having said this, one needs to bear in mind that the level of publication activity was initially very low. Especially outside Anglo-Saxon countries, publication activity (and also citation) can often be attributed to individual researchers or research groups. This is an issue we will explore further in the future. Changes in impact between countries across our two observational periods are also noteworthy. Australia, Belgium, Canada, Switzerland have

increased their impact dramatically in relation to other countries. The US belongs also to the group of leading countries. Interestingly, Singapore is the only country in our group whose MOCR ratio declined.

Table 1. Countries active in entrepreneurship research: Publication counts and Citation impact
[Data source: Thomson Reuters, Web of Science]

Country	1993–2002		2003–2007	
	Papers	MOCR	Papers	MOCR
Australia	36	0.89	66	3.08
Belgium	17	0.88	41	3.05
Canada	98	1.11	168	3.18
China	12	1.08	52	2.23
Finland	9	2.00	41	2.39
France	29	1.38	40	2.60
Germany	42	1.40	137	2.29
Italy	24	0.83	56	1.96
Netherlands	38	1.58	89	2.66
Singapore	18	1.89	35	1.26
Spain	8	0.50	49	2.80
Sweden	37	0.86	72	2.49
Switzerland	9	1.33	30	3.93
UK	221	1.81	362	2.62
USA	881	2.02	877	3.27
<i>World</i>	<i>1592</i>	<i>1.53</i>	<i>1988</i>	<i>2.58</i>

3.3 The cluster analysis

We carried out a cluster analysis following the core document approach described above on a set of 4,014 documents with type ‘Article’ or ‘Review’. Five broad clusters could be distinguished, which are visualised in the dendrogram of Figure 2.

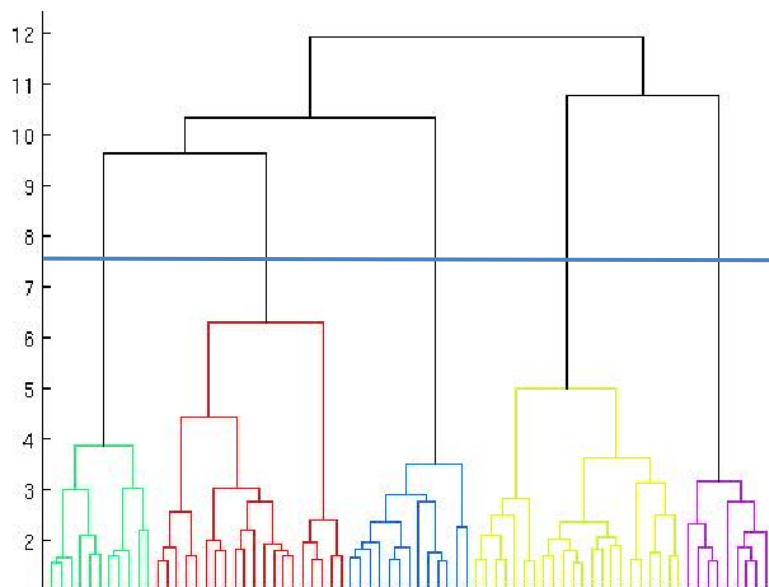


Figure 2. Dendrogram: clusters in entrepreneurship research.
[Data source: Thomson Reuters, Web of Science]

The clusters were labelled based on keywords and the titles of *core documents* representing them. Core documents are defined as documents that have at least $n > 0$ links of at least a given strength according to the underlying similarity measure. Since core documents are, by definition, strongly linked with a large number of other documents in the same cluster, based on the similarity measure used for the clustering, they are expected to form the very cognitive nodes of the topics they represent. Below we give a short description of the five clusters supplemented by five selected core documents for each topic. All data are sourced from Thomson Reuters' Web of Science.

Cluster A: Cognitive aspects of entrepreneurship (n = 615)

This cluster comprises papers that deal primarily with the cognitive aspects of entrepreneurship: how entrepreneurs discern and identify attractive market opportunities, the antecedents of opportunity recognition, probing the motivations to engage in entrepreneurial behavior, how entrepreneurs make decisions, how researchers measure opportunities and opportunity recognition. This cluster is very homogenous and contains only a few outliers (some economics-oriented entrepreneurship papers).

The following core documents are typical for this cluster.

- Experiential learning within the process of opportunity identification and exploitation
- Still searching (systematically)(1) for entrepreneurial discoveries
- The distinctive and inclusive domain of entrepreneurial cognition research
- General conditions of founding enterprises – An analysis of the "entrepreneurial events" in international comparison
- Aspirations, market offerings, and the pursuit of entrepreneurial opportunities

Scholars, such as *Sarasvathy, Shepherd, Dew, Covin, Lumpkin, Wiklund, and Kuratko* belong to the more prolific authors within this cluster. *Entrepreneurship Theory and Practice* and the *Journal of Business Venturing* contain the most core documents. *Small Business Economics* takes a prominent role in terms of core documents with a focus on the entrepreneurial society and economy as well as opportunity recognition whereas journals, such as *Research Policy* and *Higher Education*, contain core documents with a focus on the entrepreneurial university.

Cluster B: Demographic and personality determinants of entrepreneurship (n = 1027)

This cluster is slightly more eclectic and comprises papers that deal primarily with the demographic (human capital, social capital) and personality-related determinants of entrepreneurship and explores the role of entrepreneurship in the macro economy, especially from the viewpoint of labor economists.

Again, five core documents are used to aid the cognitive description of this topic.

- Declining self-employment in Japan
- Low risk aversion encourages the choice for entrepreneurship: an empirical test of a truism
- Homo entrepreneurus?
- Self-employment among older US workers
- Setting up shop - Self-employment among Canadian college and university graduates

Baron, Wright, Westhead, Ram, Boyd, and (again) Shepherd are among the most prolific authors in this cluster. These authors are associated mostly with work related to entrepreneurial success, social and human capital as well as small firm growth. *Small Business Economics, Journal of Business Venturing, Entrepreneurship Theory and Practice* as well as, to some extent, the *International Small Business Journal* are again the journals in

which much of the research is published. Interestingly, core documents are often associated also with other journals, such as *Harvard Business Review*, *Entrepreneurship and Regional Development*, *American Economic Review* as well as the *Small Business Management Journal* are amongst the journals that feature a considerable number of core documents. The *International Migration Review* as well as *Relations Industrielles/Industrial Relations* cover core documents on ethnic entrepreneurship.

Cluster C: Theoretical perspectives on entrepreneurship (n = 715)

This is again a very homogenous cluster in the sense that it comprises primarily conceptual papers that propose different theoretical lenses to study the origins, process and impacts of entrepreneurship. In addition, a fair amount of review papers are included here that address different aspects of entrepreneurship research. This cluster also contains the emergent strand of institutional entrepreneurship research.

The following selected core document stand for the content of this topic.

- Guest editors' introduction: Alternative perspectives on entrepreneurship research
- Notes for a panel on entrepreneurship in business history
- The institutional entrepreneur as modern prince: The strategic face of power in contested fields
- Introduction to the special issue: Towards building cumulative knowledge on women's entrepreneurship
- Reflections on developments in institutional theory: Toward a relational approach

Zahra and *Audretsch* are the most prolific authors amongst this set of papers. *Thurik* and *Acs* are the other prolific contributors. Interestingly, the cluster can be divided by contributions by economists 7economic geographers, around *Audretsch* and colleagues, which feature prominently in journals, such as *Small Business Economics*, a group of scholars around *Zahra* or *Ireland* with a more organizational orientation, published in journals such as *ETP*, *JBV* but also the *Journal of Management* or *Organization Studies*; and finally institutional entrepreneurship researchers with core documents almost exclusively in outlets, such as *Organization Studies*, *Organization*, or the *Academy of Management Journal*.

Cluster D: Entrepreneurial and innovation finance (n = 469)

This cluster highlights contributions in entrepreneurial finance (venture capital, business angels, exit strategies, financing instruments), governance issues with regards to new ventures and SMEs, and public policies to support the initiation, nurturing and growth of new ventures and SMEs.

The list of selected core documents reflects the specialisation of the smallest amongst the identified topics.

- Taxation of a venture capitalist with a portfolio of firms
- Staged financing in venture capital: moral hazard and risks
- Stage financing and the role of convertible securities
- The optimal portfolio of start-up firms in venture capital finance
- Start-ups, venture capitalists, and the capital gains tax

In this cluster the *Journal of Business Venturing* is the key journal and *Shepherd* a key author. Having said this, core documents feature prominently in economics and finance journals.

Cluster E: Eclectic approaches on entrepreneurship (n = 1188)

This is perhaps the most heterogeneous cluster. Papers here deal with a variety of issues, such as the importance of networks, alliances, partnerships for the survival and growth of new ventures and for innovative and financial performance. The cluster also comprises a fair amount of strategy papers that explain how resources and different tactics/strategies might explain superior performance. Furthermore, a number of papers are included that focus on internationalization patterns and strategies of new and small ventures. A few governance-related papers are also to be found.

In order to reflect some aspects of the heterogeneity of this topic we list seven core documents that mainly focus on new and small ventures.

- Predictors of satisfaction with the succession process in family firms
- Regional economy as a determinant of the prevalence of family firms in the United States: A preliminary report
- Trends and directions in the development of a strategic management theory of the family firm
- How family firms solve intra-family agency problems using interlocking directorates: An extension
- The internationalization of SMEs: developing and testing a multi-dimensional measure on Slovenian firms
- The impact of different kinds of knowledge for the internationalization process of Born Globals in the biotech business
- Spinouts from academic institutions: a literature review with suggestions for further research

In this cluster, authors, such as *Wright* (esp. on the technology transfer end), *Shane* (academic entrepreneurship), *Fritsch* and *Acs* (both from a regional development angle) as well as *Chrisman* and *Chua* (family business) are among the most prolific contributors. Combining a range of topics, including family business and international entrepreneurship, academic entrepreneurship as well as regional development, this cluster has a considerable number of contributions published also in journals, such as *Research Policy*, *Regional Studies*, *Entrepreneurship and Regional Development* or the *Journal of Technology Transfer*.

3.4 Relationships between clusters and further substructures

The map displayed in Figure 3 offers another way of illustrating the way in which clusters are related to each other. The first cluster contains papers focused on the cognitive aspects of entrepreneurship. A related second cluster comprises papers that elucidate the demographic and personality-related determinants of entrepreneurship. A third, very homogenous cluster is made up primarily of conceptual papers that study the origins, processes and impacts of entrepreneurship. A fourth cluster deals with entrepreneurial finance and governance arrangements in new ventures. The final and most heterogeneous cluster contains papers that investigate topics ranging from networks and alliances, strategies employed by new ventures to gain a competitive advantage, to entry strategies devised to target international markets.

We observed a very strong relationship between the first and third cluster of papers, a finding indicative of the conceptual nature of papers in both clusters. A strong link between *Cluster A* and *Cluster C* can be observed. The moderately strong link between *Clusters A* and *B* may be explained by the opportunity recognition and personality-related determinants of entrepreneurship. *Cluster B* is only weakly connected with *D* and *E*.

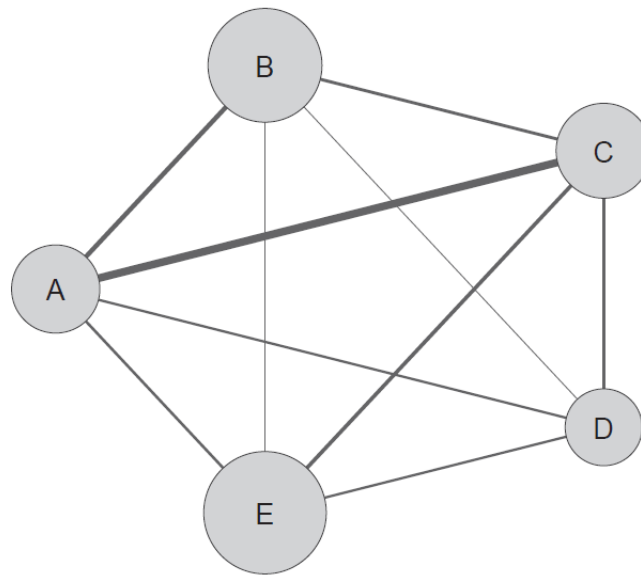


Figure 3. The five main clusters in entrepreneurship research
[Data source: Thomson Reuters, Web of Science]

The same methodology as used above allows further analysis of the clusters and enables us to zoom in on the detected structure. The substructures obtained from the clustering procedure are presented in the following list.

Cluster A: Cognitive aspects of entrepreneurship

- A1: Education and start-ups (including self-efficacy)
- A2: Entrepreneurial society (building them at large, nationally and locally)
- A3: University as an entrepreneurial actor (focus on research policy, tech transfer and higher education)
- A4: Entrepreneurial orientation (at organizational level)
- A5: Opportunities and opportunity recognition

Cluster B: Demographic and personality determinants of entrepreneurship

- B1: Politics, society and entrepreneurship (social entrepreneurship included, large number of practitioner literature HBR)
- B2: Gender and psychological perspectives (including Social capital, social, ethnic & migrant entrepreneurship)
- B3: Ethnic entrepreneurship (mostly non-entrepreneurship journals except for ERD)
- B4: Self-employment across nations

Cluster C: Theoretical perspectives on entrepreneurship

- C1: Study of entrepreneurship in different
- C2: Study of entrepreneurship in core journals (includes also prior bibliometric studies)
- C3: Development, entrepreneurship and growth (economic perspectives)
- C4: Institutional entrepreneurship

Cluster D: Entrepreneurial and innovation finance

- D1. Venture capital and new venture creation
- D2. Finance and private equity

Cluster E: Eclectic approaches on entrepreneurship

- E1. Tech transfer, spin-off and academic innovation (general)

- E2. Entrepreneurial university: specific domains or technologies
- E3. Regional issues (including small business and growth)
- E4. Internationalization (strong economics focus, regional development in an international context, growth)
- E5. Family business

The complexity of these structures and the classification provided by them is convincingly demonstrated by the core documents listed in subsection 3.3. The thematic scope of the seven documents representing Cluster E, for instance, embraces almost all sub-topics (E1–E5) of this cluster. Even their assignment to one particular sub-topic (family firms, regional issues, internationalisation process) is not quite unique. This also substantiate that deeper and still meaningful structural levels might be obtained for entrepreneurship research as topic. The cognitive links and relationships among the subtopics are already too strong and their sizes too small for any further clustering.

3.5 Most cited documents

That core documents form the cognitive nodes of a cluster has already been mentioned. Glänzel and Czerwon (1986) have shown that they are also fairly, often even highly cited. However, their definition does not imply that they are necessarily highly cited. Therefore, we also provide a list of the top cited articles for each individual cluster. Since the publication period underlying our study comprises 20 years, counting citations till the present places the older papers at a clear advantage over the more recent ones. On the other hand, a fixed citation window would be restricted to three years each since the last complete publication year of the period under study is 2009. Therefore we decided to apply a cumulative citation window even if this solution is to the detriment of recent publications. This way we were able to identify real “citation classics”. In particular, we have selected the top five most cited documents for each cluster. The bibliographic data of these documents as well as the number of citations received till the present are listed below. All data were retrieved on 29 December 2012 and are sourced from Thomson Reuters’ Web of Science.

Cluster A

Cites	Document
642	Shane (2000), Prior knowledge and the discovery of entrepreneurial opportunities. <i>Organization Science</i> , 11, 448–469.
418	Autio et al. (2000), Effects of age at entry, knowledge intensity, and imitability on international growth. <i>Academy of Management Journal</i> , 43, 909–924.
250	McGrath (1999), Falling forward: Real options reasoning and entrepreneurial failure. <i>Academy of Management Review</i> , 24, 13–30.
235	Etzkowitz et al. (2000), The future of the university and the university of the future: evolution of ivory tower to entrepreneurial paradigm. <i>Research Policy</i> , 29, 313–330.
227	Ardichvili et al. (2003), A theory of entrepreneurial opportunity identification and development. <i>Journal of Business Venturing</i> , 18, 105–123.

Cluster B

Cites	Document
374	Davidsson & Honig (2003), The role of social and human capital among nascent entrepreneurs. <i>Journal of Business Venturing</i> , 18, 301–331.
226	Hamilton (2000), Does entrepreneurship pay? An empirical analysis of the returns to self-employment. <i>Journal of Political Economy</i> , 108, 604–631.
203	Krueger et al. (2000), Competing models of entrepreneurial intentions. <i>Journal of Business Venturing</i> , 15, 411–432.

- 182 Baum et al. (2001), A multidimensional model of venture growth. *Academy of Management Journal*, 44, 292–303.
- 168 Portes et al. (2008), Transnational entrepreneurs: An alternative form of immigrant economic adaptation ital. *American Sociological Review*, 67, 278–298.

Cluster C

Cites	Document
1235	Shane & Venkataraman (2000), The promise of entrepreneurship as a field of research. <i>Academy of Management Review</i> , 25, 217–226.
263	Hoang & Antoncic (2003), Network-based research in entrepreneurship – A critical review. <i>Journal of Business Venturing</i> , 18, 165–187.
241	McDougall & Oviatt (2000), International entrepreneurship: The intersection of two research paths. <i>Academy of Management Journal</i> , 43, 902–906.
236	Alvarez & Busenitz (2001), The entrepreneurship of resource-based theory. <i>Journal of Management</i> , 27, 755–775.
228	Maguire et al. (2004), Institutional entrepreneurship in emerging fields: HIV/AIDS treatment advocacy in Canada. <i>Academy of Management Journal</i> , 47, 657–679.

Cluster D

Cites	Document
490	Stuart et al. (1999), Interorganizational endorsements and the performance of entrepreneurial ventures. <i>Administrative Science Quarterly</i> , 44, 315–349.
464	Zahra et al. (2000), International expansion by new venture firms: International diversity, mode of market entry, technological learning, and performance. <i>Academy of Management Journal</i> , 43, 925–950.
283	Lee et al. (2001), Interorganizational endorsements and the performance of entrepreneurial ventures. <i>Strategic Management Journal</i> , 22, 615–640.
249	Shane & Stuart (2002), Organizational endowments and the performance of university start-ups. <i>Management Science</i> , 48, 154–170.
234	Kaplan & Stromberg (2003), Financial contracting theory meets the real world: An empirical analysis of venture capital contracts. <i>Review of Economic Studies</i> , 70, 281–315.

Cluster E

Cites	Document
451	Amit & Zott (2001), Value creation in e-business. <i>Strategic Management Journal</i> , 22, 493–520.
429	Yli-Renko et al. (2001), Social capital, knowledge acquisition, and knowledge exploitation in young technology-based firms. <i>Strategic Management Journal</i> , 22, 587–613.
401	Teece (2007), Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. <i>Strategic Management Journal</i> , 28, 1319–1350.
384	Peng (2003), Institutional transitions and strategic choices. <i>Academy of Management Review</i> , 28, 275–296.
339	Sambamurthy et al. (2003), Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary firms. <i>MIS Quarterly</i> , 27, 237–263.

4. Conclusions and outlook

This paper has presented the first findings from a study of the emergence of entrepreneurship as a research field. Our initial analysis has indicated that researchers in Anglo-Saxon countries have dominated the field for the past 20 years. The relative strong impact of Nordic and the Low countries is noteworthy. Using bibliographic coupling as a novel bibliometric technique we discerned five distinct, albeit large knowledge clusters in the entrepreneurship

research literature. The first cluster contains papers focused on the cognitive aspects of entrepreneurship. A related second cluster comprises papers that elucidate the demographic and personality-related determinants of entrepreneurship. A third, very homogenous cluster is made up primarily of conceptual papers that study the origins, processes and impacts of entrepreneurship. A fourth cluster deals with entrepreneurial finance and governance arrangements in new ventures. The final and most heterogeneous cluster contains papers that investigate topics ranging from networks and alliances; strategies employed by new ventures to gain a competitive advantage; to entry strategies devised to target international markets. We observed a very strong relationship between the first and third cluster of papers, a finding indicative of the conceptual nature of papers in both clusters. Our results show the need for a more detailed analysis of the knowledge structure of the entrepreneurship field to identify smaller, emerging or vanishing topics in that fast growing literature.

Even though core journals dominate almost all of the five main clusters, at sub-cluster level, we found indications for specialisation.

We have found highly cited papers in each of the five topics, some of which can be considered citation classics. Practically all highly cited documents have been published around 2000. Above all the paper by Shane and Venkataraman (Cluster C) on the creation of a conceptual framework for entrepreneurship research published in the *Academy of Management Review* in 2000 with the exceptional high citation rate of more than 1200 citations is worth mentioning.

We made a conscious choice not to include innovation as one of search terms as our primary focus is the entrepreneurship research field. The importance of entrepreneurship as research topic can be seen in the relative prominence of journals, such as *Research Policy*, and topics, such as regional development.

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