

The Emergence of Entrepreneurship as a Research Field

Martin Meyer¹, Dirk Libaers², Bart Thijs³, Wolfgang Glänzel^{4,5}

¹*m.s.meyer@sussex.ac.uk*

Department of Business & Management, University of Sussex, Mantell Building, Brighton BN1 9RH (UK) and
Katholieke Universiteit Leuven, ECOOM and Dept. MSI, Waisstraat 6, B-3000 Leuven (Belgium)

²*libaersd@umkc.edu*

Institute of Entrepreneurship and Innovation, Henry W. Bloch School of Management, University of Missouri-
Kansas City, Kansas City, MO 64110 (US)

³*Bart.Thijs@econ.kuleuven.be*

Katholieke Universiteit Leuven, ECOOM and Dept. MSI, Waisstraat 6, B-3000 Leuven (Belgium)

⁴*Wolfgang.Glanzel@econ.kuleuven.be*

Katholieke Universiteit Leuven, ECOOM and Dept. MSI, Waisstraat 6, B-3000 Leuven (Belgium)

⁵*glanzw@iif.hu*

Hungarian Academy of Sciences, Institute for Research Policy Studies (IRPS), Budapest (Hungary)

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 first results from our structural analysis, which is based on a core document approach, point to five large knowledge clusters. We characterize the clusters in detail and assess the strength of the relationships between the clusters. We offer some initial concluding thoughts on our results.

Introduction

This research-in-progress paper aims to present first findings from a study on the emergence of the entrepreneurship field. 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.

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. 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 specialties developing in entrepreneurship research but focus on a much shorter period of time and smaller dataset.

We seek to complement these studies by pursuing a longitudinal and deeper approach. In this initial research report we will limit ourselves to describing the emergence and development of the research field overall as well as with respect to the most active players at country level.

We will also present the results of an initial cluster analysis that distinguishes 5 broad clusters of entrepreneurship research.

Methods and 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). The SSCI proved to have a sufficient coverage of the field of entrepreneurship research, which is reflected by previous studies drawing on the SSCI as the main data source. 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 and the above described version has finally been accepted by experts who have, furthermore, helped clean the final document list. In particular, a small number of SSCI papers were excluded; only 18 A&HCI papers were added to the data base. This way we retrieved a total of 5,029 papers.

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.

Results

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%.

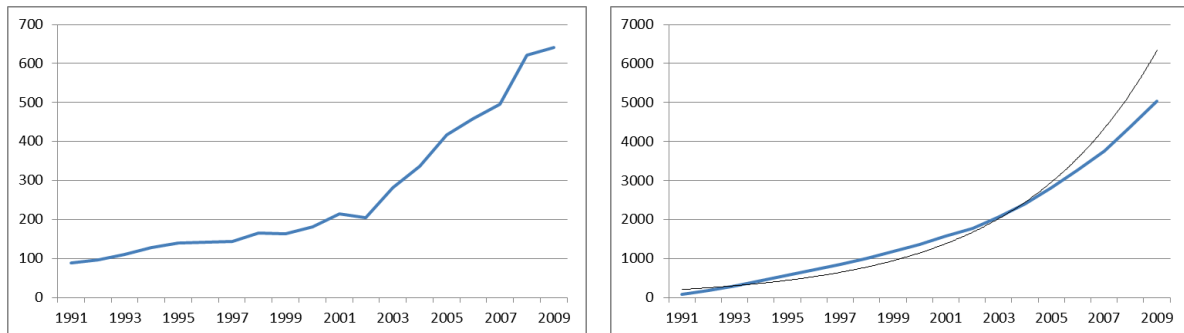


Figure 1. Evolution of Entrepreneurship research (left: annual growth, right: cumulative output with exponential trend line) [Data source: Thomson Reuters, Web of Science]

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. 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 frequency and Mean Observed Citation Rate. [Data source: Thomson Reuters, Web of Science]

<i>Country</i>	<i>1993–2002</i>		<i>2003–2007</i>	
	<i>Publ</i>	<i>MOCR</i>	<i>Publ</i>	<i>MOCR</i>
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>

First results from the cluster analysis

We carried out a first cluster analysis following the core document approach described earlier. Five broad clusters could be distinguished (see Figure 2).

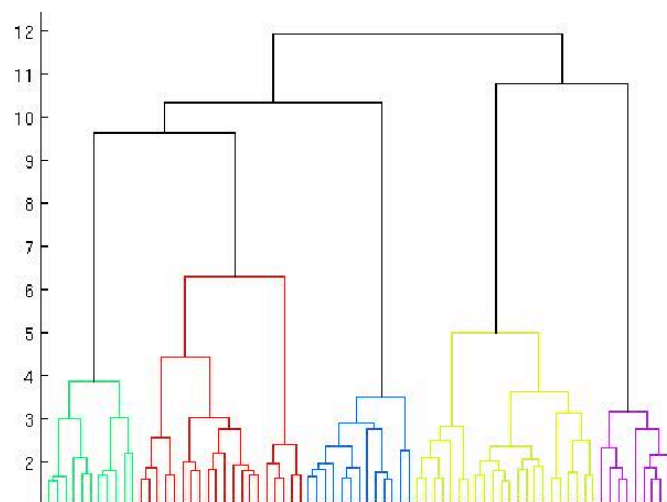


Figure 2. Dendrogram: clusters in entrepreneurship research. [Data source: Thomson Reuters, Web of Science]

Cluster A: Cognitive aspects of entrepreneurship

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).

Cluster B: Demographic and personality determinants of entrepreneurship

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.

Cluster C: Theoretical perspectives on entrepreneurship

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.

Cluster D: Entrepreneurial and innovation finance

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.

Cluster E: Eclectic approaches on entrepreneurship

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.

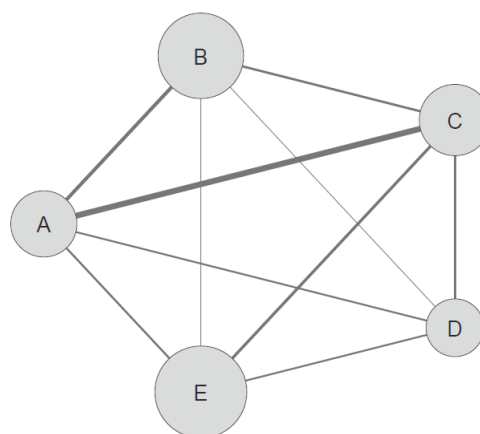


Figure 3. The five main clusters in entrepreneurship research.
[Data source: Thomson Reuters, Web of Science]

Relationships between clusters

The map displayed in Figure 3 offers another way of illustrating the way in which clusters are related to each other. A strong link between *Cluster A* and *Cluster C* can be observed. This is

plausible as *Cluster A* contains mostly conceptual papers and *Cluster C* theoretical approaches. 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*.

Initial 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.

Acknowledgement

The methodology has partially been developed in the context of the ERACEP project within the Coordination and Support Actions (CSAs) of the ERC work programme. The authors wish to acknowledge this support.

References

- Glänzel, W. & Czerwon, H.J. (1996), A new methodological approach to bibliographic coupling and its application to the national, regional and institutional level. *Scientometrics*, 37, 195–221.
- Glänzel, W. & Thijs, B. (2010), Using ‘core documents’ for the representation of clusters and topics. Paper presented at the 11th International Conference on Science and Technology Indicators, Leiden 9–11 September 2010, Book of abstracts, p. 102–104.
- Glänzel, W. & Thijs, B. (2011), Using ‘core documents’ for detecting new emerging topics. Paper to be presented at the 13th International Conference on Scientometrics and Informetrics, Durban, South Africa, 4–8 July 2011.
- Glänzel, W., Schubert, A., Thijs, B., Debackere, K. (2009), Subfield-specific normalized relative indicators and a new generation of relational charts: Methodological foundations illustrated on the assessment of institutional research performance. *Scientometrics*, 78 (1), 2009, 165–188.
- Janssens, F., Glänzel, W. & de Moor, B. (2008), A hybrid mapping of information science. *Scientometrics*, 75 (3), 607–631.
- Cornelius, B., Landström, H. & Persson, O. (2006), Entrepreneurial Studies: the dynamic research front of a developing social science. *Entrepreneurship-Theory and Practice*, 30 (3), 375–398.
- Schildt H., Zahra, S.A. & Sillanpää, A. (2006), Scholarly communities in entrepreneurship research: a co-citation analysis. *Entrepreneurship-Theory and Practice*, 30 (3), 399–415.
- Small, H. (1973), Cocitation in scientific literature - new measure of relationship between 2 documents. *Journal of the American Society for Information Science*, 24 (4), 265–269.