A bibliographic analysis of Entrepreneurship at the interface of ICT and Economic Development – an international perspective

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ABSTRACT: Efforts of international development organizations such as the World Bank to foster economic development, an increasing base of socially conscious consumers supporting fair trade, and large corporations' engagement in corporate social responsibility demonstrate the increasing importance of economic development issues in the public and private context alike. Governments' realization of the positive growth impact of entrepreneurship and the acknowledged potential of ICT to contribute to the implementation of the Millennium Development Goals represent two promising research strands within the economic development literature. However, whereas some empirical evidence already exists for the significance of entrepreneurship and ICT in the economic development process, limited research activity exists at the intersection of these three literature strands. This paper aims at exploring this interface in terms of researchability by means of a semantic network analysis employing the software package CATPACII^{TM}.

1   Introduction

"[...] charity might feel good, but it rarely solves the problem in a scaleable and sustainable fashion." (Prahalad 2005, p.16)

In the 1990s international economic development resurfaced on international political agendas. The first manifestation of this significant turn towards a more socially enhanced programme was the design of the International Development Goals in 1996, later formalised as the Millennium Development Goals (Heeks 2008). Along with these political developments and with the increased importance of corporate social responsibility practices in large corporations, research activity within this domain also experienced an increase in intensity.

1.1   Economic Development and Entrepreneurship

The growing importance of small firms in countries' shifting industry structures (Carree and Thurik 2003), the social and developmental consequences of this shift (Schildt, Zahra, and Sillanpää 2006), the differences in new venture internationalisation from developing as opposed to developed countries (Cuervo-Cazurra and Genc 2008; Ping 2003; Yeung 1994), as well as governments' perception of entrepreneurship as a *"gateway to economic vitality"* (West, Bamford, and Marsden 2008) have been progressively attracting scholarly attention throughout the last decades. Entrepreneurial activity's most important contribution to economic growth is seen as a growing tax revenue base, self-generating

innovation, future growth, and qualitative improvements of an area's social and economic structure (Acs 1996; West, Bamford, and Marsden 2008). Yet, more research on the role of entrepreneurship in economic development and growth becomes a fortiori critical as it may help uncover and explain underlying structures and processes which on their part may significantly contribute to the development of *"scalable and sustainable"* social and economic problem solving, especially in emerging economies (Prahalad 2005: p. 16; West, Bamford, and Marsden 2008) but also developed countries' economically marginalised rural areas.

1.2 Economic Development and ICT

In the period between 2000 and 2008 there has been an increase in worldwide Internet usage of 336.1% with the strongest growth encountered in Africa, the Middle East, Latin America, and Asia (1100%, 1296.2%, 820.7%, and 469% respectively)[1]. This trend coupled with Information and Communication Technologies for Development (ICT4D) projects to alleviate poverty (Heeks 2008), small and micro firms' creative ICT use to bypass dissemination barriers such as illiteracy (James 2006), and their integration of New Technologies into their business practices (Prahalad 2005) such as mobile technology into micro-enterprise supply chains (Jagun, Heeks, and Whalley 2008) already point to ICTs' potential to contribute to least developed countries' economic development. Moreover, Piatkowski (2006) suggests that both ICT production and adoption play an important role in transition economies' development by positively impacting on employment creation, exports, innovation, increased productivity and other 'spillover' effects. Information and Communication Technologies' ability to alleviate credit barriers for small firms in disadvantaged rural areas represents another case in point (Clark, Ilberry, and Berkeley 1995; Felsenstein and Fleischer 2002). Furthermore, the recognition of international development organisations such as the World Bank and numerous nongovernmental organisations (NGOs) for ICTs' import in realising the Millennium Development Goals (MDGs) triggered research on their application for a range of development objectives (Heeks 2008; Prakash and De' 2007).

1.3 Economic Development, Entrepreneurship and ICT

Despite existing research activity on the respective significance of entrepreneurship (including international entrepreneurship) and ICT for economic development, and in spite of

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[1] http://www.internetworldstats.com/stats.htm

a growing body of literature on the role of ICT in the small business context, there seems to be a gap at the intersection of these three literature strands as micro and small businesses cannot be equated with the notion of entrepreneurship (Carree and Thurik 2003). This gap is also apparent in recent co-citation maps (Cornelius, Landström, and Persson 2006; Grégoire et al. 2006; Reader and Watkins 2006; Schildt, Zahra, and Sillanpää 2006). The successful past use of this bibliometric technique acted as an enhancer of the field's ongoing mapping process. However, while high-technology entrepreneurship primarily concerned with transforming scientific discoveries into new ventures already appears among the results of co-citation analyses (Schildt, Zahra, and Sillanpää 2006), the entrepreneurship literature on Information and Communication Technologies still seems to be too insignificant to show a visible impact (Braam, Moed, and van Raan 1991). Consequently, the exploration of ICTs' importance for entrepreneurship is yet to be determined.

This study aims at determining whether there is a researchable interface between Entrepreneurship (including international aspects), Information and Communication Technologies, and Economic Development. For this purpose Shildt et al.'s (2006) proposition of a systematic literature screening coupled with a neural network analysis will be undertaken. The structure of the paper is as follows: Section 2 begins with a short introduction of the software package CATPACII^{TM} followed by a detailed description of data collection. Section 3 gives an in depth account of the analysis and the results. Subsequently, a discussion of the identified conceptual streams is presented in Section 4. The paper concludes with suggestions for future research.

2 Methodology

Even though co-citation analysis is an effective tool in identifying major research trends, emerging themes due to their recency do not dispose of the citation impact of more established topics, and consequently often do not feature on the output maps. This is one of the major short-comings of this technique often being subject to criticism in the literature (Braam, Moed, and van Raan 1991). The software package CATPACII^{TM} offers a valuable complement to co-citation analyses presenting a practicable solution to the problem of citation time lags. It is capable of mapping the underlying structure of a selected body of literature by focusing on key terms (Doerfel and Marsh 2003).

2.1 The Software

CATPACII[TM] differs from other text analysis programmes like NVivo (Richards 2000), in that the latter cannot function without the researcher using tree nodes, modeller and coding (Samkin and Schneider 2008). CATPACII[TM], on the other hand, is based on human biology (Jörgensen 2005) and is thus capable of independent observing and learning and is *"well suited for tasks a human being might do, but, for one reason or another, can't or won't do"* (Woelfel 1998b). In this particular context, while it is possible for a researcher to read 800 pages of text and to code it manually in order to identify trends and patterns, the time-consuming nature of the process may cause the researcher to reduce the amount of data. Yet, despite the considerable acceleration of the analysis process a substantial loss in depth and quality will be suffered. CATPACII[TM]'s ability to read and understand text allows the user to analyse large data sets in a relatively short period of time without substantial quality impairment. The software identifies the most frequently used words and finds patterns in how these words were applied in the text under scrutiny (Woelfel 1998a). The programme discards insignificant words such as articles, prepositions, etc. from a formerly specified "exclude" file. In addition to this prewritten list of words, users can add their own list of words they wish to exclude from the analysis. Subsequently, CATPACII[TM] assigns an artificial neuron for each remaining word representing that particular word (Woelfel 1993). When reading through the text, the software moves a scanning window through the entire text. On each occasion when a specific word is in the scanning window, the neuron representing that word is activated. CATPACII[TM]'s learning happens by the employment of a simple Pavlovian conditioning rule:

$$w_{ij} = w_{ij} + a_i a_j h^2$$

h... "learning constant",

a_i and a_j... activation of the ith and jth nodes

This suggests that:

> "When two or more neurons are simultaneously active, the connection among them is strengthened. This means, quite simply, that neurons that have behaved similarly in the past are likely to behave similarly in the future." (Woelfel 1998b: 9)

CATPACII[TM] has been successfully used in studies in numerous disciplines for numerous purposes (Samkin and Schneider 2008). However, the most frequent application of the programme is in the domain of interview, focus group discussion, and textual data analysis (Woelfel 1993).

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[2] (Woelfel 1993)

2.2 Data collection and preparation

The data collection was carried out in a multi-stage process designed on the basis of procedures described by Noyons and van Raan (1998). In order to identify scholarly journals for later selection a systematic search was carried out in electronic databases such as ABI/Inform and EBSCO. The keywords "international", "global", "entrepreneurship", "entrepreneurial", "technology", "Internet", and "economic development" have been specified as screening criteria. The search resulted in 5,837 abstracts from 46 scholarly journals between the period of 2000 and 2008 which were subsequently exported into the reference manager software EndNote^{TM}.

This first stage gave a picture about the journal landscape. After screening through the journals, 23 journals affiliated with different domains were selected i.e. management, international business, economics, policy, development, entrepreneurship, international entrepreneurship, and technology. Next, the abstracts were carefully read in order to filter out papers which were not relevant to the topics. For this purpose a coding scheme based on the formula employed by Marino et al. (2006) was developed to facilitate the selection process:

1. If the title of the article contains a reference to (i) entrepreneurship including international aspects such as IE, new venture formation, or born globals, (ii) ICT (e-commerce, Internet, e-business, etc.), or (iii) economic development (emerging markets, developing countries, economic development policy, etc.) in conjunction with ICT and/or entrepreneurship, select it. The coupling of ED and Entrepreneurship/ICT is necessary in order to insure the collection of a sample which can inform about the existence of a topical interface.

2. If the title does not include a clear reference to any of the main topic areas read the abstract of the article. If the abstract is connected to entrepreneurship, ICT, and/or economic development, select it.

3. If after reading the abstract, it is still not clear whether the paper can be affiliated with one of the topic areas, skim through the paper. If it can be deemed relevant, select it.

4. Delete editorials, book reviews, and papers exclusively focusing on methodological issues or on detecting trends.

Despite the specified coding scheme the classification of the papers are to some extent based on subjective judgement. Hence, it is necessary to control for the reliability and reproducibility of the selection process. This involves the engagement of a second judge. The coding instructions and the abstracts from a selected Journal (Entrepreneurship Theory and

Practice) were presented to a PhD student (see Table 1). The person was then asked to follow the instructions and select the abstracts which she deemed relevant. Next, the results have been compared and Cohen's kappa coefficient of agreement was calculated (Cohen 1960).

Table 1: Level of agreement

(ETP N=120)	Judge #2				
		yes	(chance)	No	(chance)	total
Judge #1	yes	0.79	0.69	0.03	0.14	0.83
	no	0.04	0.15	0.13	0.03	0.18
		0.83		0.17		1

Note: see Cohen (1960)

$$K = \frac{p_o - p_c}{1 - p_c} = 0.92$$

$p_o \ldots$ observed agreement

$p_c \ldots$ calculated agreement by chance

The score of 0.92 indicates a very high level of agreement. Minor disagreements which occurred have been discussed and subsequently resolved. After having satisfied the reliability criteria, the remaining 1,377 journal abstracts were analysed. The proportion of relevant articles identified in each journal is presented in Table 3.

The abstracts were then fed into a Word^{TM} file. The next step involved data preparation for analysis in CATPACII^{TM}. As Samkin and Schneider pointed out (2008) the user manual did not explicitly treat data preparation issues. Despite the software's ability to recognise the most frequently occurring terms in a text and establish patterns of similarity based on their use, in order to obtain coherent results, the importance of coding should not be underestimated. For this reason in this paper Samkin and Schneider's (2008) approach was followed. First, the text has been checked for spelling mistakes. Foreign language abstracts as well as copyright statements have been deleted. In the second instance a uniform way of spelling was established. Grammatical derivatives and synonyms have been recoded in order to allow for the surfacing of key concepts. For example, the terms "enterprise/s" and "businesses" have been replaced by the word "firm" and the expressions "strategy", "strategies", and "strategic" have been substituted by the noun "strategy". Additionally, the text had to be repeatedly read carefully to identify homonyms. For instance the word "development" may stand in different contexts for different concepts e.g. it stands for growth

and progress in conjunction with economic development, and for creation and improvement in conjunction with products and processes.

3 Analysis and Results

The number of unique words required for the analysis was set to 70. The default value of the software is 25, however as the aim of the analysis is to gain a better understanding whether, and if yes how, the three topic areas relate, it was deemed appropriate to choose a larger number of unique concepts. The maximum number of unique words CATPACII^{TM} can handle is 160. In that case, however, the results would have been less transparent. The window size was set at 5 meaning that the software reads five words at a time. Although the default value is 7, a size of 5 words is *"sufficiently wide to accommodate the subject-verb-object syntax of English and not so wide as to allow words that are not semantically unrelated to appear to be related"* (Salisbury 2001, p. 71). The slide size was left at the default level of 1. This value indicates how many words the window will skip before reading the text, i.e. CATPACII^{TM} will read words 1 through 5, 2 through 6, 3 through 7, etc. The number of cycles referring to the analysis process was also left at the default setting of 1 as it is judged the most appropriate setting for most analyses by the software authors (Samkin and Schneider 2008; Woelfel 1998b).

After converting the Word^{TM} file into an ASCII text file, a hierarchical cluster analysis was carried out followed by the generation of a perceptual map based on multidimensional scaling (MDS). Both outputs use the same data, however they allow for observation from different perspectives. It is important to look at both outputs as concepts next to each other in the hierarchical cluster may be visually far apart on the perceptual map (Samkin and Schneider 2008). These output variations are due to differences in the two procedures. While, in a hierarchical cluster analysis, words are bundled together based on their co-occurrences *"in an ordinal or discrete way"*, MDS algorithms show underlying dimensions by predominantly focusing on key terms (Doerfel and Marsh 2003, p. 221).

Figure 1: Perceptual map
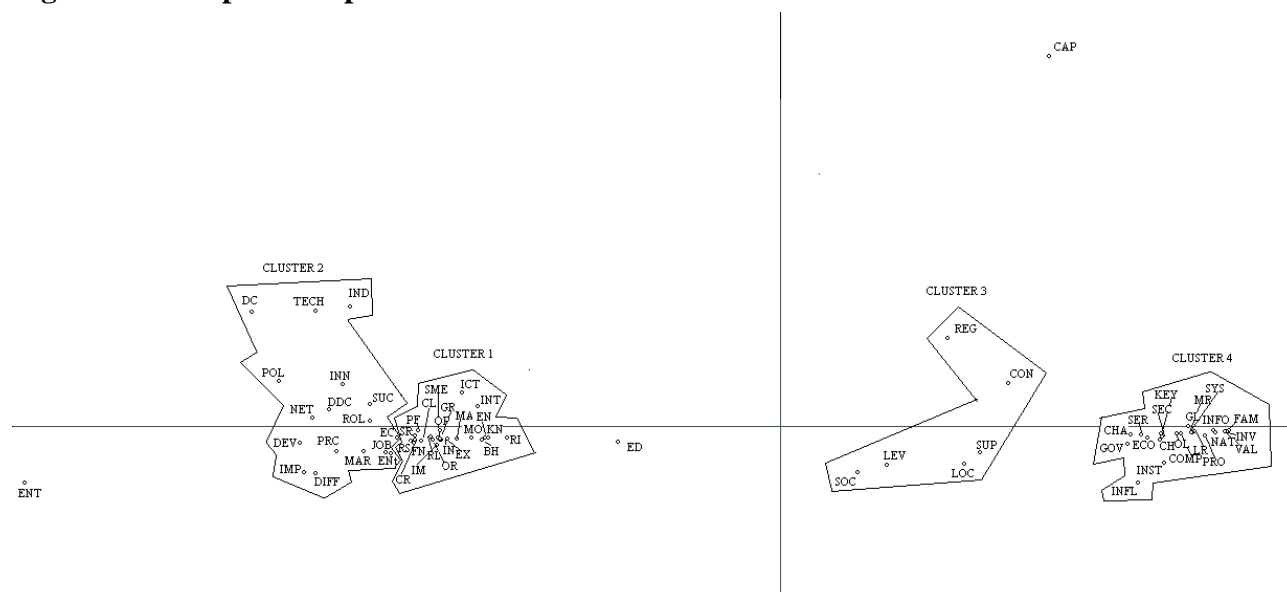
The data text contained a total number of 28,776 words in 11,025 lines (see Figure 4). A list of abbreviations is provided in Table 3 in the Appendix. While Figure 2 displays the results of the hierarchical cluster analysis using Ward's method, Figure 1 depicts how the concepts relate to each other.

The concepts "Economic Development", "Capability" and "Entrepreneurship" seemingly do not belong to any of the four clusters on the perceptual map. However, the hierarchical cluster output suggests that these terms represent the cornerstones of the results. Each cluster can be affiliated with at least one of these core concepts. The findings can be deemed robust as there is no discrepancy between the hierarchical and the MDS clusters regarding the concepts contained.

CLUSTER 1

The first cluster emerged around the concepts "strategy", "international experience", "opportunity", "motivation", "orientation", "environmental knowledge", "behaviour", "risk", "relationship", "culture", "finance", "performance", "SME growth", "resources", and "ICT". As they all can be associated with firm level international/entrepreneurship drivers, Cluster 1 is labelled **"MICRO-DRIVERS"**.

Figure 2: Hierarchical Cluster Output
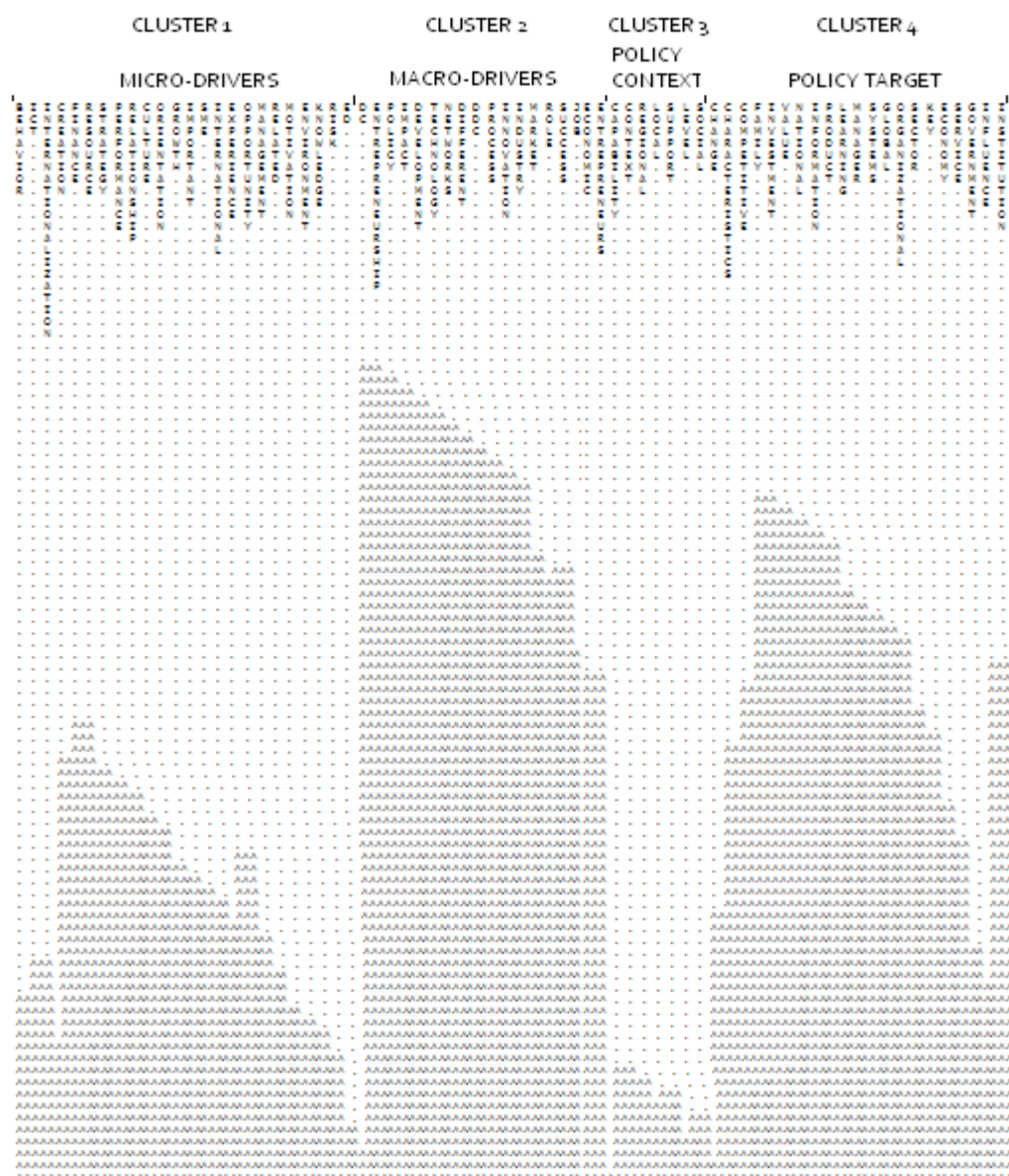
The closest concept on the map to "ICT" is "internationalisation". "Opportunity", "management", "motivation", "behaviour", "knowledge", and "environment" are also within reasonable proximity to indicate a conceptual connection. The "opportunity" concept is positioned at an equal distance between "performance" and "management". The unique words "relationships", "orientation", "importance", "SME growth", "international experience", and "culture" can also be found in its immediate vicinity. While "orientation" is close to "relationships", "management", "opportunity", and "international", the concept "performance" is surrounded by "strategy", "resources", "finance", and "creation". "Culture" is to be found at an equal distance to "relationships", "finance", and "performance".

CLUSTER 2

Cluster 2 contains concepts which can be affiliated with factors driving entrepreneurship at a national level such as "technology", "policy", "innovation", "job market", and "networks". Thus, it is labelled **"MACRO-DRIVERS"**.

Within this cluster, two sub-clusters emerged. The first one is concerned with differences between developing (DC) and developed (DDC) countries in terms of entrepreneurial activities. The concepts which emerged closest to "DC" on the perceptual map are "technology" and "industry". The second sub-cluster unites the concepts "economic", "role", and "entrepreneurs". The unique word "job" emerged directly next to "entrepreneurs" and at a minor distance from "market".

While "policy" is positioned at an equal distance between "DC" and "DDC", there appears to be a conceptual connection between "innovation", "success", and "policy" in conjunction with developed countries. "DDC" is further linked to the concepts "role" and "networks". "Impact" and "differences" also seem to form a unit in direct proximity to "development", "process", and "markets" not far away from the unique words "job" and "entrepreneurs".

CLUSTER 3

Cluster 3 is positioned between "Economic Development" and "Capabilities" and contains the concepts "social", "level", "local", "support", "context", and "region". In the hierarchical cluster output, the word "capability" has to be read together with the word "context", thus Cluster 3 can be termed **"POLICY CONTEXT"** indicating the different levels where governments can support entrepreneurial capability development.

CLUSTER 4

"National information", "institutional influence", "key sector characteristics", "managerial learning systems", "economy service", "organisational competitiveness", and "family investment" are the central joint concepts emerging in Cluster 4. As these concepts describe areas where government policy can help owner-managers to develop certain competencies, this cluster is termed **"POLICY TARGET"**. The unique concepts "government", "service", "change", and "economy" form a sub-cluster in direct proximity to the "key sector change" sub-cluster. The concept "global" is closely positioned to "managers" and "systems". "Economy" is surrounded by "change", "key sector", "service", "characteristics", and "government". "Competitive" and "institutions" are also relatively close to each other on the map. The word "product" is positioned at equal distance between "information", "national", "manager", "learning" and "systems". It is also close to "family", involvement" and "value", concepts that seem to form a close conceptual unit.

4 Discussion

The perceptual map indicates that factors driving entrepreneurship and government policy issues are the two major themes which emerged at the interface of the three literature streams under scrutiny. On the driver side of the output, the closeness of "ICT" to "internationalisation" within the cluster and its relative proximity to "Economic Development" outside the cluster indicates a nascent scholarly interest in ICT's role in the internationalisation process (e.g. Arenius, Sasi, and Gabrielsson 2005; Berry and Brock 2004; Loane 2005) as well as in its ability to foster economic development (e.g. Izyumov and Razumnova 2000; Oxley and Yeung 2001; Shih, Kraemer, and Dedrick 2007).

The sub-cluster containing the concepts "motivation", "environmental knowledge", "behaviour", and "risk" can be regarded as another topical unit. The proximity of motivation to behaviour indicates a close relationship (e.g. Taormina and Lao 2007; Ven, Tigineh, and Lanny 2007). The link between motivation and risk also deserves attention (e.g. Dimitratos and Plakoyiannaki 2003; Littunen 2000; Schindehutte, Morris, and Allen 2006; Tajeddini and Mueller 2008). At this point, it needs to be noted that the term "risk" on the concept map subsumes both "uncertainty" and "risk".

Another topic apparent from the MDS output emerged around "opportunity". While entrepreneurial opportunity already constitutes an interesting research topic in itself (e.g. Lee and Venkataraman 2006; Plummer, Michael, and Godesiabois 2007), ICT's role in opportunity exploitation, the opportunity-performance, opportunity-firm-growth, opportunity-motivation, and opportunity-international-experience relationships also seem to represent areas with ample research prospects.

Despite its primary affiliation with Cluster 2, the concept "Entrepreneur" is positioned at a relatively close distance to "orientation" implying a considerable role of entrepreneurial orientation within this body of literature (e.g. Clercq, Sapienza, and Crijns 2005; Frishammar and Andersson 2008; Tang et al. 2007; Wiklund and Shepherd 2005). The relationship between entrepreneurial orientation and firm performance/growth (e.g. Covin, Green, and Slevin 2006; Frishammar and Andersson 2008; Lee, Lee, and Pennings 2001) is already well documented in the literature. However, the concept's proximity to "strategy" (e.g. Frese, Brantjes, and Hoorn 2002), "motivation" (e.g. Ramsey and Ibbotson 2005), "culture" (e.g. Lee and Peterson 2000), "international experience" (e.g. Zucchella, Palamara, and Denicolai 2007), and "ICT" (e.g. Fillis, Johansson, and Wagner 2003; Ramsey and Ibbotson 2005) also indicates interest in combination of these topic areas.

Seen together, technology and industry point to the important role of the technology-industry for developing country entrepreneurship (e.g. Bruton and Rubanik 2002; Thukral et al. 2008). In conjunction with developed country entrepreneurship the concepts "innovation" (e.g. Beugelsdijk 2007; Bramwell, Nelles, and Wolfe 2008) and "networks" (e.g. Andersen and Ploger 2007; Andersson and Wictor 2003) emerged. Yet, this result merely indicates that research attention within this particular body of literature is focused on networks and innovation in developed countries rather than in developing countries. It by no means implies that these two concepts are without relevance for developing country research.

Policy, being positioned at an equal distance between developed and developing countries can be interpreted as playing an imperative role in the development of entrepreneurship (e.g. Audretsch and Fritsch 2002; Blackburn and Ram 2006). The self-employing function of entrepreneurs (e.g. Pietrobelli, Rabellotti, and Aquilina 2004; Smith 2005; Stel and Carree 2004) is a further topic area detected on the perceptual map. Its proximity to "economy", "market", "process", "strategy", "resource", and "finance" points to research interest in these directions.

The role of governments in fostering entrepreneurship by providing SME support in terms of information and economic services at local and regional level can be regarded as the central theme on the map's policy side. "Competitive" and "institutions" are situated at a relatively close distance to each other offering the interpretation that institutions play an important role in firms' ability to develop competitive advantages (e.g. Busenitz, Gomez, and Spencer 2000). Furthermore, the role and "influence" of "institutions" in shaping "key sectors" and enhancing "economic development" is another topic area emerging from the concept map.

The sub-cluster "global", "learning", "system", "manager", "product", "organisational", and "competition" in conjunction with the conceptual closeness of "government" and "institutions" on the MDS output also point towards the importance and implications of policy measures in fostering international entrepreneurship through enabling and supporting firms to develop capabilities allowing for international expansion (e.g. Carayannis et al. 2006; Clercq, Sapienza, and Crijns 2005)

5 Conclusion and implications

This paper set out to investigate the intersection of three literature strands in terms of researchability. The perceptual map produced by CATPACII[TM] clearly indicated a positive answer to this question with ICT representing an important factor in the internationalisation

process and being positioned at a reasonable proximity to both concepts "economic development" (ED) and to both "entrepreneurs" (ENt) and "entrepreneurship" (ENT). The conceptual links identified in the cluster outputs serve two complementary purposes. First of all they give a clear picture about the underlying concept structure of the selected literature streams allowing for determining researchable interfaces between conceptual units. The concept map also serves as an artificial brain storming output facilitating the detection of new possible connections between concepts and allowing for new interpretations. A second way of using the results is to reverse the traditional search process. Based on the visual cluster outputs, selected key words can be traced back within the EndNote database generating a pool of research papers to that topic area. Subsequently, the isolated problem can be subject to reformulation with the intention of identifying new aspects of this already established problem for further research (Sarasvathy 2004).

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Table 2: Journal distribution

Domain	Journal	Abbr.	No. Articles	Percent
Management	Academy of Management Journal	AMJ	56	4%
	Journal of Management	JM	25	2%
	Journal of Management Studies	JMS	15	1%
	Management Science	MS	31	2%
	Strategic Management Journal	SMJ	22	2%
Economics and Policy	Journal of Evolutionary Economics	JEE	30	2%
	Small Business Economics	SBE	93	7%
	European Planning Studies	EPS	13	1%
	Regional Studies	RS	115	8%
IB	Journal of International Business Studies	JIBS	56	4%
	International Small Business Journal	ISBJ	48	3%
	Journal of World Business	JWB	49	4%
	Management International Review	MIR	28	2%
	Journal of International Development	JID	36	3%
IE	Journal of International Entrepreneurship	JIE	74	5%
	International Journal of Entrepreneurial Behaviour & Research	IJEBR	43	3%
Entrepreneurship	New England Journal of Entrepreneurship	NEJE	40	3%
	Journal of Small Business and Enterprise Development	JSBED	86	6%
	Entrepreneurship: Theory and Practice	ETP	99	7%
	Journal of Business Venturing	JBV	74	5%
	Technovation	Techn	180	13%
	Journal of Developmental Entrepreneurship	JDE	120	9%
	Entrepreneurship and Regional Development	ERD	43	3%
	Total		1376	100%

Table 3: List of abbreviations for perceptual map output

context	CON	local	LOC
creation	CR	management	MA
culture	CL	manager	MR
developed country	DDC	market	MAR
developing country	DC	motivation	MO
development	DEV	national	NAT
different	DIFF	networks	NET
economic	EC	opportunity	OP
economic development	ED	organisational	OL
economy	ECO	orientation	OR
entrepreneur	ENt	performance	PF
entrepreneurship	Ent	policy	POL
environment	EN	process	PRC
experience	EX	product	PRO
family	FAM	resource	RS
finance	FN	regional	REG
global	GL	related	R
government	GOV	relationship	RL
growth	GR	risk	RI
ICT	ICT	role	ROL
impact	IMP	sector	SEC
important	IM	service	SER
industry	IND	SME	SME
influence	INFL	social	SOC
information	INFO	strategy	ST
innovation	INN	success	SUC
institution	INST	support	SUP
international	IN	systems	SYS
internationalization	INT	technology	Tech
investment	INV	value	VAL

Figure 3: CATPACII[TM] general output

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TOTAL WORDS          30203    THRESHOLD           0.000
TOTAL UNIQUE WORDS      70    RESTORING FORCE     0.100
TOTAL EPISODES       30199    CYCLES              1
TOTAL LINES          11013    FUNCTION            Sigmoid (-1 - +1)
                              CLAMPING            Yes
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DESCENDING FREQUENCY LIST					ALPHABETICALLY SORTED LIST				
WORD	FREQ	PCNT	CASE FREQ	CASE PCNT	WORD	FREQ	PCNT	CASE FREQ	CASE PCNT
ENTREPRENEURSHIP	3787	12.5	12443	41.2	BEHAVIOR	194	0.6	902	3.0
ICT	1075	3.6	3778	12.5	CAPABILITY	227	0.8	1004	3.3
TECHNOLOGY	971	3.2	3852	12.8	CHANGE	235	0.8	1030	3.4
SME	896	3.0	3609	12.0	CHARACTERISTICS	201	0.7	944	3.1
DEVELOPMENT	883	2.9	3949	13.1	COMPETITIVE	242	0.8	1136	3.8
DDC	871	2.9	3551	11.8	CONTEXT	222	0.7	1060	3.5
IMPACT	800	2.6	3642	12.1	CREATION	294	1.0	1355	4.5
DC	735	2.4	2843	9.4	CULTURE	324	1.1	1360	4.5
STRATEGY	674	2.2	2961	9.8	DC	735	2.4	2843	9.4
INTERNATIONALIZATION	642	2.1	2421	8.0	DDC	871	2.9	3551	11.8
INNOVATION	605	2.0	2572	8.5	DEVELOPMENT	883	2.9	3949	13.1
MARKET	580	1.9	2568	8.5	DIFFERENT	504	1.7	2260	7.5
INTERNATIONAL	546	1.8	2324	7.7	ECONOMIC	435	1.4	1997	6.6
INDUSTRY	535	1.8	2277	7.5	ECONOMY	238	0.8	1082	3.6
KNOWLEDGE	519	1.7	2148	7.1	ED	384	1.3	1689	5.6
PROCESS	519	1.7	2391	7.9	ENTREPRENEURS	217	0.7	998	3.3
PERFORMANCE	513	1.7	2215	7.3	ENTREPRENEURSHIP	3787	12.5	12443	41.2
JOB	511	1.7	2066	6.8	ENVIRONMENT	333	1.1	1484	4.9
DIFFERENT	504	1.7	2260	7.5	EXPERIENCE	198	0.7	895	3.0
POLICY	487	1.6	2154	7.1	FAMILY	167	0.6	618	2.0
FINANCE	484	1.6	1935	6.4	FINANCE	484	1.6	1935	6.4
NETWORKS	471	1.6	1925	6.4	GLOBAL	212	0.7	975	3.2
RELATIONSHIP	464	1.5	2125	7.0	GOVERNMENT	207	0.7	954	3.2
ECONOMIC	435	1.4	1997	6.6	GROWTH	393	1.3	1673	5.5
LEVEL	413	1.4	1849	6.1	ICT	1075	3.6	3778	12.5
REGIONAL	405	1.3	1675	5.5	IMPACT	800	2.6	3642	12.1
GROWTH	393	1.3	1673	5.5	IMPORTANT	307	1.0	1499	5.0
ED	384	1.3	1689	5.6	INDUSTRY	535	1.8	2277	7.5
OPPORTUNITY	351	1.2	1545	5.1	INFLUENCE	184	0.6	899	3.0
SUCCESS	348	1.2	1544	5.1	INFORMATION	209	0.7	932	3.1
ROLE	346	1.1	1664	5.5	INNOVATION	605	2.0	2572	8.5
RESOURCE	338	1.1	1483	4.9	INSTITUTION	271	0.9	1179	3.9
ENVIRONMENT	333	1.1	1484	4.9	INTERNATIONAL	546	1.8	2324	7.7
CULTURE	324	1.1	1360	4.5	INTERNATIONALIZATION	642	2.1	2421	8.0
RISK	308	1.0	1207	4.0	INVESTMENT	188	0.6	809	2.7
IMPORTANT	307	1.0	1499	5.0	JOB	511	1.7	2066	6.8
SOCIAL	295	1.0	1201	4.0	KEY	190	0.6	918	3.0
CREATION	294	1.0	1355	4.5	KNOWLEDGE	519	1.7	2148	7.1
MANAGEMENT	290	1.0	1341	4.4	LEARNING	253	0.8	1040	3.4
INSTITUTION	271	0.9	1179	3.9	LEVEL	413	1.4	1849	6.1
LEARNING	253	0.8	1040	3.4	LOCAL	216	0.7	952	3.2
MANAGER	252	0.8	1134	3.8	MANAGEMENT	290	1.0	1341	4.4
COMPETITIVE	242	0.8	1136	3.8	MANAGER	252	0.8	1134	3.8
SUPPORT	241	0.8	1135	3.8	MARKET	580	1.9	2568	8.5
ECONOMY	238	0.8	1082	3.6	MOTIVATION	183	0.6	785	2.6
SERVICE	237	0.8	1029	3.4	NATIONAL	183	0.6	869	2.9
CHANGE	235	0.8	1030	3.4	NETWORKS	471	1.6	1925	6.4
ORIENTATION	235	0.8	1059	3.5	OPPORTUNITY	351	1.2	1545	5.1
PRODUCT	232	0.8	1008	3.3	ORGANIZATIONAL	218	0.7	1002	3.3
CAPABILITY	227	0.8	1004	3.3	ORIENTATION	235	0.8	1059	3.5
CONTEXT	222	0.7	1060	3.5	PERFORMANCE	513	1.7	2215	7.3
ORGANIZATIONAL	218	0.7	1002	3.3	POLICY	487	1.6	2154	7.1
ENTREPRENEURS	217	0.7	998	3.3	PROCESS	519	1.7	2391	7.9
LOCAL	216	0.7	952	3.2	PRODUCT	232	0.8	1008	3.3
GLOBAL	212	0.7	975	3.2	REGIONAL	405	1.3	1675	5.5
INFORMATION	209	0.7	932	3.1	RELATED	178	0.6	844	2.8
GOVERNMENT	207	0.7	954	3.2	RELATIONSHIP	464	1.5	2125	7.0
CHARACTERISTICS	201	0.7	944	3.1	RESOURCE	338	1.1	1483	4.9
EXPERIENCE	198	0.7	895	3.0	RISK	308	1.0	1207	4.0
BEHAVIOR	194	0.6	902	3.0	ROLE	346	1.1	1664	5.5
KEY	190	0.6	918	3.0	SECTOR	190	0.6	877	2.9
SECTOR	190	0.6	877	2.9	SERVICE	237	0.8	1029	3.4
INVESTMENT	188	0.6	809	2.7	SME	896	3.0	3609	12.0
INFLUENCE	184	0.6	899	3.0	SOCIAL	295	1.0	1201	4.0
MOTIVATION	183	0.6	785	2.6	STRATEGY	674	2.2	2961	9.8
NATIONAL	183	0.6	869	2.9	SUCCESS	348	1.2	1544	5.1
SYSTEMS	182	0.6	779	2.6	SUPPORT	241	0.8	1135	3.8
RELATED	178	0.6	844	2.8	SYSTEMS	182	0.6	779	2.6
FAMILY	167	0.6	618	2.0	TECHNOLOGY	971	3.2	3852	12.8
VALUE	165	0.5	735	2.4	VALUE	165	0.5	735	2.4

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WARD'S METHOD
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