25 Years of Research on Absorptive Capacity:

A Bibliometric Investigation

ABSTRACT

Since its introduction by Cohen & Levinthal in 1989, the concept of Absorptive Capacity (ACAP) has become one of the most actively researched topics in the management literature. However, the definitions components, antecedents, and outcomes of ACAP have been extremely heterogeneous and had hindered the progress of the ACAP literature. This study presents an extensive bibliometric co-citation analysis to explain the advancement of ACAP research to decipher the rather fragmented yet burgeoning growth of ACAP literature.

Keywords: Absorptive capacity, co-citation analysis, organizational learning, strategic management

INTRODUCTION

Since its introduction by Cohen & Levinthal in their 1989 study published in the Economic Journal, Absorptive Capacity (henceforth: ACAP) has become one of the most actively researched concepts in management. ACAP refers to the *"ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends."* (Cohen & Levinthal, 1990) and has been cited in over 25,000 published studies, chapters, and conference proceedings across disciplines including strategic management (Lane, Salk, & Lyles, 2001), economics (Cockburn & Henderson, 1998), international business (Minbaeva, Pedersen, Björkman, Fey, & Park, 2003) , and marketing (Narasimhan, Rajiv, & Dutta, 2006). Although ACAP has been implemented in various domains of research, it is still fragmented with a lack of consensus on the understanding and construct's components (Lane, Koka, & Pathak, 2006; Todorova & Durisin, 2007; Zahra & George, 2002). By way of illustration, Lane and Lubatkin (1998) were among the first to highlight the contextual nature of ACAP. They argued that ACAP varies with the specific relationship, which they denoted as relative ACAP. To date, we still lack an understanding of the extent to which the ACAP is the same across an organization or varies with, for example, location, counterpart, or function (Minbaeva et al., 2014).

Similar to Lane et al. (2006), we believe that these variations in its conceptualization might have fueled the richness and multiplicity of studies on ACAP and have also come to preclude scholars from grasping its basic tenets, current status, and future prospects. This lack of clarity can inhibit further progress of the theory and accumulation of knowledge. Therefore, there is a need

to assess how the ACAP construct has evolved since its inception; how it might continue to progress; and more importantly, what the important directions for future research might be.

Our study responds to the above challenge by employing the extensive bibliometric co-citation analysis to explain the structural evolution of the ACAP research. The results from 96 highly cited articles enable us to better understand the intellectual core of ACAP domain. From 25 years of research on ACAP, our study observed six clusters emerging from factor analysis of co-cited articles: 1) knowledge management and transfer, 2) strategic alliances, 3) innovation and new product development, 4) dynamic capabilities, 5) absorptive capacity and 6) organizational ambidexterity. These clusters represent the intellectual core of ACAP research that have been dominating the field. Furthermore, we utilize multidimensional scaling technique (MDS) to provide a visualized map and show the relationships between articles. Our MDS map contains thematic orientations of the six clusters: knowledge management vs. dynamic capabilities and intra-organizational activities vs. inter-organizational activities. We discuss each cluster and theme at length following section.

Our analysis advances ACAP knlowedge three significance areas. First, this study engages in an ongoing debates related to the fragmentation of the ACAP research and attempts to consolidate the construct by showing its evolution and structure over the past 25 years. Second, we are able to highlight the diversity of ACAP applications across various themes organizational research. These variations are critical to understanding the current status of ACAP research as well as advancing future research. Third, we apply extensive bibliographic co-citation analysis in

capturing relationships between major studies and provide quantitative justification of the analysis. Hence we believe that employing of co-citation analysis would advance the understanding and future application of ACAP research.

The article is organized as follow. The next section discusses the overview of ACAP construct, its diversity and fragmentation. Then, we discuss the methodology used in our review followed by discussion of our findings. Finally, we conclude with suggestions with schematic orientation classifying ACAP research.

ABSORPTIVE CAPACITY: AN OVERVIEW OF THE CONCEPT

The concept of ACAP has been defined as a set of firm's abilities in enhancing knowledge (Zahra & George, 2002). The application of ACAP has been widely used in dispersed definitions. For example, prior studies emphasize ACAP for the realization of technological change (Kedia & Bhagat, 1988) or the exploitation of outside knowledge (Koza & Lewin, 1988). However, explicit definition of ACAP is from Cohen & Levinthal (1990), who defined ACAP as *firm's ability to value, assimilate and apply new knowledge*. These dimensions are crucial indicators of firm's strategic performance by imitating other firms' products or processes and also exploiting the emerging opportunities (Lane et al., 2006). Furthermore, ACAP provides unique conceptualization that also overlap with other growing domains of organizational research such as organizational learning, strategic alliances, knowledge management and resource-based view of the firm (Lane et al., 2006), and resulting in its rapid development and implementation by various disciplines.

Though conceptualization of ACAP by Cohen & Levinthal (1990) has proliferated across a broad range of studies based on this construct, there is still a lack of consensus on the understanding and the interpretation of ACAP (Lane, Koka, & Pathak, 2006; Todorova & Durisin, 2007; Zahra & George, 2002). For instance, in their review, Zahra & George (2002) criticize prior studies as rudimentary and neglecting the role of individuals in the organization critical for knowledge utilization and exploitation. They identify two types of ACAP (i.e., potential and realized) and argue that more attention should be devoted to studying realized ACAP as it emphasized the firm's capacity to leverage the knowledge previously absorbed. However, Todorova & Durisin (2007) argue that Zahra & George (2002) exclude some of the basic tenets from the original conceptualization of absorptive capacity and do not incorporate all important research contributions on learning and innovation. Recognized as a dynamic capability (Zahra, Sapienza, & Davidsson, 2006), ACAP has been widely used and biased toward knowledge exploitation as opposed to exploration. Lane et al. (2006) also suggest that ACAP literature has been biased toward knowledge exploitation and that the number of studies on exploration has been disproportionately low. ACAP literature has also been criticized for lack of a clear focus, especially on the process of organizational learning (Duchek, 2013; Lane et al., 2006; Roberts, Galluch, Dinger, & Grover, 2012).

More importantly, it has been suggested that the definitions that are used, and the components, antecedents, and outcomes of ACAP are extremely heterogeneous (Duchek, 2013). According to Lane et al., (2006) this heterogeneity, caused by researchers employing the construct to fit their

personal biases, has hindered the conceptual development of ACAP. Todorova & Durisin (2007) attributed much of this discord to the distinction proposed by Zahra & George (2002) into potential ACAP and realized ACAP and called for discontinuing the use of the two variations.

The arguments above exhibit fragmented understanding and implementation of ACAP from current literature. This can happen when the construct are widely used with significant variation. However, this issue generally resolved over time by the articles published in major academic outlets. Selected articles with high citations will influence the literature and resolve the fragmentation issue of the construct (Di Stefano, Peteraf, & Verona, 2010). ACAP studies that published in high impact factor journals are more likely to be read, and thereby, are cited in future publications. Thus we believe it is crucial for scholars to consolidate the fundamental understanding of a construct for future implication. Therefore, we respond to this challenge by bibliometrically reviewing the highly cited studies on ACAP to scrutinize the evolution and the structure of the construct.

METHODOLOGY

There have been surprisingly few review studies for this large research stream, that are brief reviews presented in support of an extension of the construct's definition (Lane et al., 2006). In general, systematic literature reviews provide a list and qualitative assessment of scholars' areas of interest in the ACAP construct along with corresponding suggestions about areas that need a

greater research focus. While these systematic reviews are critical to the field's development, researchers can benefit from a quantitative analysis of the evolution of the knowledge structure in the ACAP literature. To that end, we propose a bibliometric co-citation analysis aimed at identifying the most influential documents and analyzing the relational links between them while objectively examining the core tenets of ACAP. Such emergent approaches have been encouraged in the literature (Tsai & Wu, 2010) and have the potential to offer unique insights for the theoretical advancement of ACAP. A bibliometric investigation of the literature on ACAP will allow us to step back and take stock of the imprints that have shaped the discipline over last three decades. Co-citation analysis is a very useful tool for this purpose as it records the number of papers that have cited any particular pair of documents and measures the similarity of content among the documents (Wang, 2012).

Data

The intellectual core of the topic under study was identified through a search on Thomson- ISI Web of Science with the terms "Absorptive Capacity – A New Perspective on Learning and Innovation" and "Cohen & Levinthal". This initial search resulted in 4919 scholarly articles in the Social Science Citation Index (SSCI) over the period 1990 – 2014. At this point, we retrieved papers published in the Business and Management categories of ISI Web of Science database with titles, abstracts or keywords containing expressions of "Absorptive Capacity".

Restricting the analysis to papers published in the field of management (1870) and including papers with at least 1 citation, we refined this further to 1461 (Di Stefano, Peteraf, & Verona,

2010). While the average citations per paper was 30, further refinement by limiting the list to articles with at least 100 citations allowed us to retain only the most influential articles that shape the field of ACAP research over the past 25 years. This resulted in a core of 10315 articles citing 96 papers that are considered the core influencers related with ACAP in 23 academic journals, we use co-citation analysis to decipher the underlying structure with variations in degree of relatedness. The strength of the relationship is reflected in the number of times the articles are cited together and belong to the same "invisible college" (Crane, 1972) or seek to address the same research question (Di Stefano et al., 2010). Below tables list the journals and various articles that were cited with at least 100 citations.

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The data was then gathered and coded assigning unique id number. Using frequency counts to identify most highly cited articles; we developed a co-citation matrix, and standardized the resultant co-citation data for further analysis by using these unique identifiers. Later on we employed the metric multidimensional scaling (MDS) to ensure the model for instability (Chabowski, Samiee, & Hult 2013).

FINDINGS

We employ two techniques that are predominantly used in co-citation analyses (Di Stefano et al., 2010; McCain, 1990) namely – *factor analysis* and *multi-dimensional scaling* (MDS) to reduce and decipher the core of ACAP research.

As a data reduction tool, factor analysis allows us to classify the core articles into grouped sets that are closely related. The grouped factors are considered homogenous and represent a sub field, research domain or common theme. We have adopted the principal component extraction method, varimax rotation and Kaiser criterion together with a scree test to determine the extracted factors. As reflected in Table 3, the analysis resulted in 6 factors explaining 95.4% of the variance. We include only loadings higher than 0.7, resulting in 60 articles as they are reflective of high correlation highlighting prominent themes.

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As a next step, we employ multidimensional scaling (MDS) using Pearson correlation coefficients that reflect the conceptual proximity between the 96 papers analyzed. We employed proxscale MDS (SPSS) method on the full correlation matrix of highly cited articles with proximities treated as similarities and ordinal transformation. The initial configuration was set to simplex.

Initial review of the MDS map highlights the critical importance of co-citation frequency and is reflective of the themes that ACAP has influenced. To objectively characterize the factors and to label the factors, the authors worked independently to arrive at the grouped themes.

Subsequently, these were compared and acceptable characterizations were agreed upon. The six factors are labeled as:

1. Knowledge Management and Transfer
2. Strategic Alliances
3. Innovation and New Product Development
4. Dynamic Capabilities
5. Absorptive Capacity
6. Organizational Ambidexterity

Findings from Factor Analysis

Factor 1 –Knowledge Management and transfer comprises 17 articles that comprise papers that revolve around knowledge management and transfer among firms. The role of network structure and the transfer of knowledge between and within organizations form the core of this group. This factor builds on Cohen & Levinthal's (1990) proposition that organizational units also differ in their ability to assimilate and replicate new knowledge gained from external sources. Additionally, it recognizes that an organizational unit's network position and ACAP represent its ability to leverage useful knowledge residing in other parts of its organization (Tsai, 2001). As ACAP tends to develop cumulatively and builds on prior related knowledge, the importance of organizational learning, human resource management practices and relationships are key factors that comprise this group. The manifestation of these knowledge management practices has been tested in a number of contexts such as international joint ventures, multinational corporations and subsidiaries.

Factor 2 – Strategic Alliances comprises 15 articles that acknowledge the critical importance of relational capacity in dyadic organizational relationships. Strategic alliance formation and partner selection criteria are strategic decisions that deliver competitive advantages to both firms. A significant portion of the articles in this group (10 out of 15) is from the 1990 – 2002 timeframe while ACAP concept was still nascent. The manifestation and testing of strategic knowledge sharing among alliance partners comprise the more recent articles. This group addresses how knowledge transfer happens among the partners and also discusses the critical role of trust (Krishnan, Martin, & Niels 2006), partner-specific alliance experiences (Laursen & Salter, 2004) and implications in new product success.

Factor 3 - Innovation and New Product Development focuses on strategic management of internal vs. external capabilities in the pursuit of innovation. ACAP plays a key role in organizational success especially in knowledge based industries, as the critical difference lies in how firms access and practice science. Whether they establish credible linkages with the scientific community— matters to the production of valuable innovations (Gittelman & Kogut, 2003). The role of individuals who drive the R&D and innovation is included in this factor group as the 11 articles focus on business networks (Guiliani, 2007), knowledge clusters (Guiliani & Bell, 2005), industry-university linkages (Laursen & Salter, 2004) and technology entrepreneurship (Dushintsky & Lenox, 2005).

Factor 4 – Dynamic Capabilities revolves around the recognition that across time and projects, organizations and their individual units must have the capacity to absorb new knowledge into their operations to create innovation (Irland, Hitt & Sirmon, 2003). The role of organizational

learning in providing strategic flexibility and the degrees of freedom to adapt and evolve (Zahra & George, 2002) are of critical importance to firms. We believe this is important as ACAP affects the level and range of exploration the firm conducts to recognize and exploit entrepreneurial opportunities (Van den Bosch et al., 1999). This factor establishes the key role of ACAP in impacting a firm's performance as it influences the ability of the firm to manage its resources strategically. The 11 articles in this group range on a variety of unique capabilities that enhance the firm's ability to achieve sustainable competitive advantage. These include cognitive ability (Alvares and Busenitz, 2001), resource based view as a strategy (Ireland, Hitt and Sirmon, 2003) and acknowledgement of the recursive nature of a firm's operations (Jarzabkowski, 2004) and need to adapt to dynamic environments (Sirmon, Hitt, and Ireland, 2007).

Factor 5 – Absorptive Capacity is unique and appears as a standalone factor comprising of Cohen & Levinthal's (1990) seminal paper. This group provides the conceptual understanding and the definitional framework. Absorptive capacity, defined as the ability to value, assimilate, and apply external knowledge (Cohen & Levinthal, 1990). The broad based definition and the promise to be useful for commercial ends have made ACAP a widely accepted construct across varied strategic decisions made by firms.

Factor 6 – Organizational Ambidexterity encompasses 5 articles that analyze the organization's ability to be adaptive to changes in the environment. The pursuit of new opportunities requires two fundamentally different learning activities – exploitation and exploration between which firms divide their attention and resources (March, 1991). While exploitation is associated with activities such as "refinement, efficiency, selection, and

implementation," exploration refers to notions such as "search, variation, experimentation, and discovery". The identification of the appropriate strategy to pursue largely depends on prior knowledge of firm and the ability to balance the two learning approaches (Levinthal, 1993).

Findings from MDS

MDS provides a graphical representation of the articles under review and utilizes the Pearson correlation coefficients on a bi-dimensional map. As MDS demonstrates the co-citation links among the articles, contributions that are close to the (0,0) point signify that they have been cited together. Papers that are located very close to the center imply that they are heterogeneous and are potentially linked to multiple thematic areas. Figure 1 shows that many papers are spread across the map and away from the center suggesting that ACAP research has manifested and if being applied across a number of topical areas and contexts.

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Insert Figure 1 about here
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The lines show the broad thematic areas where the factors identified earlier are positioned on the map. The MDS map provides 4 themes that pertain broadly to the 6 factors identified. The MDS classifications we have adopted are as follows:

- Knowledge Management
- Dynamic Capabilities
- Intra-organizational Activities
- Inter-organizational Activities

Majority of the papers in factor 1 and 3 are clustered together indicating a similarity of co-

citation profiles within the group. Additionally, there also seems to be tight clustering among the papers in these groups that suggests the existence of close ties between the two factors. This is also very consistent with the secondary factor loadings observed in the factor analysis (not presented in results). In addition to the visual representation that demonstrates the connections between the articles, it is important to discern the content-based interpretation that emerges.

The x-axis represents the range of a firm's strengths or resources that provide it competitive advantage. We have identified them as spanning the range extending from ***"Knowledge Management"*** to ***"Dynamic Capabilities".*** While knowledge management and transfer is a critical aspect in the context of organizational learning, we consider that a firm's ability to harness and leverage the knowledge that are integral to it is of critical importance. At the other end of the spectrum, we position dynamic capabilities as they help with the organizations ability to mobilize resources and strategically deploy them.

The y-axis has been framed to reflect activities of the organization that are within or across organizations. While the top end of the axis reflects the ***"Intra-Organizational Activities"***, they provide organizations with abilities to mange both knowledge and capabilities across various sub-units to enhance efficiencies. At the lower end of the y-axis, we have positioned "***Inter-Organizational Activities***" such as strategic alliances and joint ventures. This spread of within and across organizational use of ACAP allows for research to be spread and overlap between the 2 domains. Aspects such as partner selection and alliance dynamics decide the competitive advantage derived. The ability to use prior knowledge, acquire additional knowledge and at the same time leverage its capabilities to either explore or exploit opportunities in terms of alliances

holds the key to successful business strategy.

CONCLUSION

Though recent studies by Maldonado et al. (2015) and Song & Gynawali (2015) provide perspective and an understanding of the ACAP research, these studies suffer from methodological deficiencies. While meta-analyses are a great tool to integrate findings from empirical studies, we believe that the intellectual core of a research area lies in its conceptual papers. Co-citation analysis thus allows us to objectively analyze the themes and evolution over the decades. This is very critical to a topic such as ACAP that permeates across a number of disciplines. By unraveling the intellectual core of ACAP, we clarify the differences that exist and pave the way for future development of the construct. We believe our study is of strategic importance as we thoroughly review one of the most important research areas (i.e., ACAP) at the nexus of organizational learning and innovativeness. ACAP has relatively large scope of interest and acceptance across multiple research areas and disciplines as a key theoretical construct in strategic management that enhances competitive advantage.

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APPENDICES

Table 1: Distribution of Absorptive Capacity Articles by Journal

	Journal	Number of Articles
1	Strategic Management Journal	17
2	Academy of Management Journal	11
3	Organization Science	10
4	Academy of Management Review	8
5	Journal of International Business Studies	7
6	Management Science	7
7	Research Policy	7
8	Journal of Management	5
9	Journal of Management Studies	5
10	Administrative Science Quarterly	2
11	International Journal of Management Reviews	2
12	Journal of Marketing	2
13	MIS Quarterly	2
14	Cambridge Journal of Economics	1
15	Entrepreneurship Theory and Practice	1
16	Information Systems Research	1
17	Journal of Economic Geography	1
18	Journal of Engineering and Technology Management	1
19	Journal of Industrial Economics	1
20	Journal of Management Information Systems	1
21	Management Learning	1
22	Review of Economics and Statistics	1
23	Technovation	1

TOTAL	**95**

Table 2: The Intellectual Core of Absorptive Capacity Research

Core Research Articles	Times Cited
Cohen, WM; Levinthal, DA , Administrative Science Quarterly , 1990 , 35 (1)	6437
Szulanski, G , Strategic Management Journal , 1996 , 48 (2)	1860
Zahra, SA; George, G , Academy of Management Review , 2002 , 27 (2)	1405
Lane, PJ; Lubatkin, M , Strategic Management Journal , 1998 , 19 (5)	1107
Mowery, DC; Oxley, JE; Silverman, BS , Strategic Management Journal , 1996 , 17 (S2)	840
Tsai, WP , Academy of Management Journal , 2001 , 44 (5)	703
Yli-Renko, H; Autio, E; Sapienza, HJ , Strategic Management Journal , 2001 , 22 (6-7)	557
Anand, BN; Khanna, T , Strategic Management Journal , 2000 , 21 (3)	465
Lane, PJ; Salk, JE; Lyles, MA , Strategic Management Journal , 2001 , 22 (12)	440
Ahuja, G; Katila, R , Strategic Management Journal , 2001 , 22 (3)	373
Hitt, MA; Dacin, MT; Levitas, E; Arregle, JL; Borza, A , Academy of Management Journal,2000,43 (3)	328
Koza, MP; Lewin, AY , Organization Science , 1998 , 9 (3)	311
Cockburn, IM; Henderson, RM , Journal of Industrial Economics , 1998 , 46 (2)	299
Alvarez, SA; Busenitz, LW , Journal of Management , 2001 , 27 (6)	295
Andersson, U; Forsgren, M; Holm, U , Strategic Management Journal , 2002 , 23 (11)	270
Ireland, RD; Hitt, MA; Vaidyanath, D , Journal of Management , 2002 , 28 (3)	270
Van den Bosch, FAJ; Volberda, HW; de Boer, M , Organization Science , 1999 , 10 (5)	261
Sivadas, E; Dwyer, FR , Journal of Marketing , 2000 , 64 (1)	246
Kim, L , Organization Science , 1998 , 9 (4)	241
Vermeulen, F; Barkema, H , Academy of Management Journal , 2001 , 44 (3)	241
Veugelers, R; Cassiman, B , Research Policy , 1999 , 28 (1)	239
Barringer, BR; Harrison, JS , Journal of Management , 2000 , 26 (3)	238
Veugelers, R , Research Policy , 1997 , 26 (3)	218
Boynton, Ac; Zmud, Rw; Jacobs, GC , MIS Quarterly , 1994 , 18 (3)	212
Lewin, AY; Long, CP; Carroll, TN , Organization Science , 1999 , 10 (5)	189
Kumar, R; Nti, KO , Organization Science , 1998 , 9 (3)	158
Inkpen, AC , Journal of Management Studies , 2000 , 37 (7)	151
Cohen, Wm; Levinthal, Da , Management Science , 1994 , 40 (2)	147
Buckley, PJ; Clegg, J; Wang, CQ , Journal of International Business Studies , 2002 , 33 (4)	139
Steensma, HK; Lyles, MA , Strategic Management Journal , 2000 , 12 (8)	135
Reuer, JJ; Zollo, M; Singh, H , Strategic Management Journal , 2002 , 23 (2)	131
Roth, AV; Jackson, WE , Management Science , 1995 , 41 (11)	123

Core Research Articles	Times Cited
Mowery, DC; Oxley, JE , Cambridge Journal of Economics , 1995 , 19 (1)	113
Sorenson, O; Sorensen, JB , Strategic Management Journal , 2001 , 22 (6-7)	100
Reagans, R; McEvily, B , Administrative Science Quarterly , 2003 , 48 (2)	618
Borgatti, SP; Cross, R , Management Science , 2003 , 49 (4)	401
Rothaermel, FT; Deeds, DL , Strategic Management Journal , 2004 , 25 (3)	379
Sirmon, DG; Hitt, MA.; Ireland, RD, Academy of Management Review , 2007,32 (1)	372
Lane, PJ.; Koka, BR.; Pathak, S, Academy of Management Review , 2006 , 31 (4)	325
Jansen, Justin J. P.; Van den Bosch, Frans A. J.; Volberda, Henk W. , Management Science,2006,52 (11)	280
Zaheer, A; Bell, GG , Strategic Management Journal , 2005 , 26 (9)	271
Jansen, JJP; Van den Bosch, FAJ; Volberda, HW , Academy of Management Journal , 2005 , 48 (6)	259
Zahra, SA; Sapienza, HJ; Davidsson, P , Journal of Management Studies , 2006 , 43 (4)	253
Lavie, D , Academy of Management Review , 2006 , 31 (3)	239
Minbaeva, D; Pedersen, T; Bjorkman, I; Fey, CF; Park, HJ , Journal of International Business Studies,2003,34 (6)	238
Giuliani, E; Bell, M , Research Policy , 2005 , 34 (1)	231
Ireland, RD; Hitt, MA; Sirmon, DG , Journal of Management , 2003 , 29 (6)	225
Tallman, S; Jenkins, M; Henry, N; Pinch, S , Academy of Management Review , 2004 , 29 (2)	214
Lavie, D; Rosenkopf, L , Academy of Management Journal , 2006 , 49 (4)	212
Mayer, KJ; Argyres, NS , Organization Science , 2004 , 15 (4)	210
Raisch, S; Birkinshaw, J , Journal of Management , 2008 , 34 (3)	210
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Table 3: Factor Analysis[a]

	1	2	3	4	5	6
Cohen & Levinthal, 1990					0.706	
Szulanski, G, 1996						
Zahra & George, 2002						
Lane & Lubatkin, 1998						
Mowery, et al., 1996						
Tsai, 2001	0.762					
Yli-Renko et al., 2001						
Anand, BN; Khanna, T, 2000		0.895				
Lane et al., 2001						
Ahuja & Katila, 2001						
Hitt et al., 2000		0.83				
Koza, MP; Lewin, AY, 1998		0.847				
Cockburn & Henderson, 1998			0.707			
Alvarez & Busenitz,2001				0.915		
Andersson et al.,2002	0.877					
Ireland et al., 2002		0.946				
Van den Bosch et al., 1999						
Sivadas & Dwyer, 2000		0.715				
Kim, L, 1998						
Vermeulen & Barkema, 2001						
Veugelers & Cassiman, 1999			0.783			
Barringer & Harrison, JS, 2000		0.961				
Veugelers, 1997			0.726			
Boynton et al., 1994						
Lewin et al., 1999						0.8
Kumar & Nti, 1998		0.92				
Inkpen, 2000		0.827				
Cohen & Levinthal, 1994						
Buckley et al., 2002						
Steensma & Lyles, 2000		0.766				
Reuer et al.,2002		0.961				
Roth & Jackson,1995						
Mowery & Oxley,1995						

Sorenson & Sorensen, 2001	0.802					
Reagans & McEvily, 2003	0.939					
Borgatti & Cross, 2003	0.977					
Rothaermel & Deeds, 2004						
Sirmon et al., 2007				0.825		
Lane et al., 2006						
Jansen et al., 2006						0.844
Zaheer, A; Bell, GG,2005						
Jansen et al., 2005						
Zahra et al., 2006				0.793		
Lavie, 2006		0.754				
Minbaeva et al., 2003	0.792					
Giuliani & Bell, 2005			0.733			
Ireland et al., 2003				0.896		
Tallman et al., 2004						
Lavie et al., 2006						0.77
Mayer & Argyres, 2004		0.925				
Raisch & Birkinshaw,2008						0.858
Todorova & Durisin, 2007						
Oxley & Sampson, 2004		0.914				
Song et al., 2003						
Dhanaraj et al., 2004	0.716					
Malhotra et al., 2005						
Krishnan et al., 2006		0.902				
Griffith et al., 2004			0.78			
Cummings & Teng, 2003	0.784					
Laursen & Salter, 2004			0.836			
Raisch et al., 2009						0.913
Hoang & Rothaermel, 2005		0.908				
Vohora et al., 2004				0.894		
McFadyen & Cannella, 2004	0.91					
Barnett, 2007						
Zahra, 2005				0.837		
Meyer, 2004						
Nooteboom et al., 2007						

Hitt et al., 2004						
Hansen et al.,2005	0.984					
Simonin,2004						
Gittelman & Kogut, 2003			0.86			
Kang et al., 2007	0.928					
Schreyoegg et al., 2007				0.856		
Jarzabkowski, P, 2004				0.758		
Giuliani, Elisa, 2007			0.71			
Caloghirou et al., 2004						
Wang et al., 2007				0.849		
Bjorkman et al., 2004	0.91					
Pavlou, et al., 2006						
Stern, S,2004			0.884			
Cross & Sproull, 2004	0.952					
Rothaermel & Hess, 2007						
Lichtenthaler, 2009						
Adams et al., 2006			0.701			
Haas & Hansen, 2005	0.898					
Sorescu et al., 2003						
Stam & Elfring, 2008				0.71		
McGrath, RG; Nerkar, A, 2004						
Van Wijk et al., 2008	0.828					
Tiwana & Mclean, 2005	0.758					
Politis, 2005				0.857		
Dushnitsky & Lenox,2005			0.708			
Bapuji & Crossan, 2004	0.706					
Uhlenbruck et al., 2003						

[a] Extraction Method: Principal Component Analysis; Rotation Method: Varimax with Kaiser Normalization. Variance explained: 95.4%. Only factor loadings higher than 0.4 are reported.

Figure 1: Multidimensional Scaling