

CRANFIELD UNIVERSITY

Alessandro Giudici

**DYNAMIC CAPABILITIES:
WHAT DO WE 'ACTUALLY' KNOW?
A SYSTEMATIC ASSESSMENT OF THE
FIELD AND A RESEARCH AGENDA**

Cranfield School of Management

Master of Research

MRes Dissertation

2008/2009

Supervisor: Prof. Patrick Reinmoeller

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**This thesis is submitted in partial fulfilment of the requirements
for the Degree of Master of Research**

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Abstract

How organizations deal and manage strategic change is a fundamental problem in management studies. An important way increasingly chosen to implement strategies is through programmes. Programme Management is an emerging discipline that aims to research how programmes could be more effective in delivering their expected strategic benefits. In order to obtain this, it is recognised that successful programmes require a continuous development of capabilities at different levels and on a context-dependent basis.

My research project aims to use the theoretical lens of dynamic capabilities to explore how different capabilities could be integrated, built, and reconfigured in a context of Programme Management. In order to establish robust bases for the PhD, this thesis presents a systematic literature review (and its formal protocol) of the dynamic capabilities view of the firm.

In doing so, in this MRes thesis I test for the level of reification of the concept of dynamic capabilities and highlight some major theoretical challenges. I observe that the field is currently affected by a conversational misalignment that is hindering the potential for further research. In particular, the argument is that empirical and conceptual developments have grown from the same foundations but with low mutual influence. In addition, I utilize content and thematic analysis to explore areas where future efforts may be fruitfully directed. Overall, findings show how dynamic capabilities are an emerging field where several research gaps may be identified. However, they also highlight how it is fundamental to clarify on which theoretical foundations any research builds.

Finally, I introduce some interesting findings that may be of help for an operationalization in a Programme Management context. In particular, I suggest that a high-potential and unexplored theme is how dynamic capabilities are created and sustained in the inter-organizational relationship between business service providers and their client firms.

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If there is any quality in this thesis it is thanks to the precious help from some people that I am glad to acknowledge. First, I would like to thank my supervisors, Prof. Patrick Reinmoeller and Dr. David Partington, who in different ways granted their invaluable time and comments as well as a good dose of their patience. Second, in these months I gained useful ideas from helpful and open suggestions offered me by the other members of the panel, Dr. Harvey Maylor and Dr Stephanie Hussels. I am fully in debt for them. Third, really important had been the support of Ms Wendy Habgood, Ms Irena Pidlyskij and Mrs Audrey Dunmall: their constant and friendly help allowed me to go through all those little (and big!) daily problems that ‘affect’ the very act of writing and thinking a thesis. I am also grateful to Sutthipong Meeyai who offered me so much help for the submission. Furthermore, fruitful discussions with other PhD students (at Cranfield and in Pisa), with people at ICPM and with the participants at EDAMBA Summer School gave me the intellectual motivation to proceed. Finally, invaluable and lovely support came from my wife. I would have not been here without her.

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Chapter 1

INTRODUCTION

How organizations deal and manage strategic change is a fundamental problem in management studies. An important way increasingly chosen to implement strategies is through programmes. Programme Management is an emerging discipline that aims to research how programmes could be more effective in delivering their expected strategic benefits. Indeed its role has been increasingly recognized in the literature as a key approach to strategy implementation (Mc Elroy, 1996; Partington, Pellegrinelli & Young, 2005) with particular regard to how organizations manage change (Lycett, Rassau & Danson, 2004; Pellegrinelli, Partington, Hemingway, Mohdzain & Shah, 2007).

Specifically, Programme Management has been defined “as the integration and management of a group of related projects with the intent of achieving benefits that would not be realised if they were managed independently” (Lycett, Rassau & Danson, 2004) and programmes, similarly, as “sets of inter-related projects that have been brought together to achieve an objective that would not be possible through stand-alone projects” (Maylor, Partington, Lupson & Franken, 2008). Moreover, some scholars have recognised that this recent and growing discipline has many points of contact with others such as strategic management (Balogun and Hope Hailey, 1999; Pellegrinelli, Partington, Hemingway, Mohdzain & Shah, 2007) and knowledge management (Lycett, Rassau & Danson, 2004). Finally, it could be seen as an entrepreneurial tool since it is strongly linked with the exploration and the exploitation of opportunities (Balogun & Hope Hailey, 1999; Zahra, Sapienza and Davidsson, 2006).

As Pellegrinelli et al. (2007) argues, programmes are emergent phenomena and have indeterminate time horizons so that they can be hardly studied using common project concepts. The same authors clearly recognize that successful programmes require a continuous development of capabilities at both individual and organization levels as well as a deep understanding of the context, internal and external, of the organization.

How to create and evolve capabilities over time is the core theme of the dynamic capability view of the firm. Therefore, my PhD project aims to investigate the development of Programme Management capabilities building on the dynamic capability view of the firm (e.g. Eisenhardt & Martin, 2000; Teece, Pisano & Shuen, 1997, Zollo & Winter, 2002; Winter 2003). The dynamic capabilities perspective is chosen because it naturally integrates different paradigms such as competitive forces (Porter, 1980), strategic conflict (Shapiro, 1989) and RBV (Penrose, 1959), as well as others concepts such core competences (Danneels, 2002; Hamel & Prahalad, 1994; Markides & Williamson, 1994) and firm performance (Zahra, Sapienza and Davidsson, 2006). Dynamic capabilities are also “connected to the knotty problem of change management, which is of great importance to managers and the bread and butter of countless consulting practices” (Easterby-Smith et al., 2009). In sum, it is a good theoretical candidate for exploring how Programme Management capabilities are built, integrated and reconfigured in order to manage strategic change dynamics.

Notwithstanding this discussion, the dynamic capabilities literature still suffers a lack of terminological and conceptual agreement as well as empirical support. Problems in Programme Management are either similar or complementary: overall there is a lack of theoretical literature but wide empirical support.

In order to overcome these limitations and to build proper and robust foundations for the PhD project, this MRes thesis presents a systematic literature review of the dynamic capabilities view of the firm. In this way I aim to produce a transparent, internally consistent, and relevant review that may critically assess the literature and identify substantial research gaps. A systematic literature review, build on transparent and reproducible steps, is indeed “an efficient method of identifying where research is currently lacking” (Petticrew, 2001: 101). This approach may generate better foundations than standard reviews since these usually “lack a means for making

sense of what the collection of studies is saying” (Tranfield et al., 2003) and tends to be only “thinly disguised annotated bibliographies” (Hart, 1998: 1).

Following this discussion, this MRes thesis builds the systematic review following a specific process developed at Cranfield School of Management. However, given the particular complexity of the literature on dynamic capabilities, I slightly depart from common approaches. In particular I build my steps integrating other systematic methodologies already published in high profile journals. The main difference is that I also conduct a test for the level of reification (Lane et al., 2006) of the dynamic capabilities framework. Consistently, the thesis of the systematic review is that there is a conversational misalignment in the literature in the sense that conceptual and theoretical works have developed from the same foundations but with low mutual influence. Consequently, the objective of the analysis is to understand how dynamic capabilities are conceptualized and operationalized in the academic conversation in order to highlight potential research gaps. For doing this, I utilize content and thematic analysis on a systematically developed sample of 105 papers from 16 peer-reviewed journals. Finally, these research gaps need to be evaluated in terms of their usefulness in a Programme Management context. Therefore, I maintain a particular focus on this problem across all pages.

Structure of the MRes thesis

This work is structured in these three main chapters:

- *Chapter 2: Systematic Literature Review Protocol.* First of all I report a synthetic version of a formal Protocol that, following Cranfield School of Management’s guidelines, I submitted and discussed in front of an official panel in May 2009. This Protocol

follows strictly in its structure the guidelines and therefore it is divided in stand-alone parts. However, I incorporate in it an account of a preliminary semi-systematic Scoping Study of the literature and its conclusions. Moreover, I deeply explain the methodology on which the systematic review is built. I then develop and select of a specific Research Area in which I want to position my PhD project and I state two Research Questions in their current form of conceptualization. Finally, I conclude stating one general Review Question that forms the basis of the systematic review. In addition, I include three specific sub-review questions that are worth of additional attention given the results of the Scoping Study.

- *Chapter 3: Systematic Literature Review.* This chapter is thought to be the basis for a potential publishable extension. Therefore it is written in a hybrid form. Specifically, it includes its own abstract and an extensive justification of the methodology, plus its own introduction and conclusions. The methodology, in particular, includes content and thematic analysis. However, given that this review is part of the MRes thesis, I continuously clarify its links to the Scoping Study and the Protocol. It is also worth mentioning that, since its focus is on the dynamic capabilities view of the firm, little is said about Programme Management in this chapter. Nevertheless, I hold a specific focus on research gaps that might be useful for an operationalization in this context.
- *Chapter 4: Conclusions.* This final chapter presents a synthesis of the findings of the Systematic Literature Review. Here I also integrate them with Programme Management themes, as discussed in the Scoping Study. The aim is twofold. First, I justify how, on one side, Programme Management may benefit from a dynamic capabilities perspective. On the other, I show how the literature on dynamic capabilities offers fruitful research gaps that might be successfully fulfilled in a Programme Management context.

Chapter 2

SYSTEMATIC REVIEW PROTOCOL

Version: 2.0

Date: 14/08/09

Title: Dynamic capabilities: What do we “actually” know? A systematic assessment of the field and a research agenda

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Supervisor: Prof. Patrick Reinmoeller

1. CHARACTERISTICS OF A SYSTEMATIC LITERATURE REVIEW

1.1. What is a literature review? (Definition – less than 50 words)

A literature review is an analysis of a particular domain of published knowledge with the purpose of delineating reasonable theoretical and/or empirical foundations for a specific research question(s).

1.2. What is a systematic literature review? (Definition – less than 50 words)

A systematic literature review is a critical analysis of a particular domain of published knowledge with the purpose of delineating reasonable theoretical and/or empirical foundations for a specific research question(s) through the application of transparent and replicable criteria.

1.3. What are the components of a “good” literature review? (More than 10 descriptive words)

(Expressed as adjectives) Comprehensive; Clearly delimited; Purposeful; Of clear relevance for the research question; Internally Consistent; Synthetic; Structured; Organised; Well written; Built on reasonably good sources.

1.4. What are the additional components of a “good” systematic literature review?

(Expressed as adjectives) Transparent; Systematic; Critical; Replicable.

2. MAIN SOURCES

2.1. Texts that have informed your thinking (10-20 papers)

In the following Tables 1-3, I have listed the 16 papers that I considered fundamental for my thinking at the time of the Scoping Study. They are divided in respect of the different areas of interest within the systematic literature review.¹

Table 1: Core papers within the dynamic capabilities view of the firm

N	The dynamic capability view of the firm	Type
1	Teece, D. J., Pisano, G., & Shuen, A., 1997. Dynamic capabilities and strategic management. <i>Strategic Management Journal</i> , 18: 509–533.	C
2	Eisenhardt, K. M., & Martin, J. A., 2000. Dynamic capabilities: What are they?". <i>Strategic Management Journal</i> , 21: 1105– 1121.	C
3	Zollo, M., & Winter, S. G., 2002. Deliberate learning and the evolution of dynamic capabilities. <i>Organization Science</i> , 13: 339–351.	C
4	Winter, S. G., 2003. Understanding dynamic capabilities. <i>Strategic Management Journal</i> . 24(10): 991-995.	C
5	Zahra, S. A., Sapienza, H. J. & Davidsson, P., 2006. Entrepreneurship and Dynamic Capabilities: A Review, Model and Research Agenda. <i>Journal of Management Studies</i> , 43(4): 917-955.	C
6	Helfat, C.E., Finkelstein, S., Mitchell, W., Peteraf, M., Singh, H., Teece, D. & Winter, S., 2007. <i>Dynamic Capabilities: Understanding Strategic Change in Organizations</i> . London: Blackwell.	C/R
7	Teece, D.J., 2007. Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. <i>Strategic Management Journal</i> , 28: 1319-1350.	C
8	Wang, C. L. & Ahmed, P. K., 2007. Dynamic capabilities: A review and research agenda", <i>International Journal of Management Reviews</i> , 9(1): 31-51.	LR
9	Ambrosini, V. & Bowman, C., 2009. What are dynamic capabilities and are they a useful construct in strategic management?. <i>International Journal of Management Reviews</i> , 11(1): 29-49.	LR
10	Easterby-Smith, M., Lyles, M.A., & Peteraf, M.A., 2009. Dynamic capabilities: Current debates and future directions. <i>British Journal of Management</i> , 20: S1–S8.	LR

Table 2: Core papers within the literature on programme management

N	Programme Management	Type
11	McElroy, W., 1996. Implementing strategic change through projects. <i>International Journal of Project Management</i> , 14(6):325–9.	C
12	Lycett, M., Rassau, A. & Danson, J., 2004. Programme management: a critical review. <i>International Journal of Project Management</i> , 22: 289-299.	LR
13	Partington, D., Pellegrinelli, S. & Young, M., 2005. Attributes and levels of programme management competence: an interpretive study. <i>International Journal of Project Management</i> . 23: 87-95.	R
14	Pellegrinelli, S., Partington, D., Hemingway, C., Mohdzain, Z. & Shab, M., 2007. The importance of context in programme management: An empirical review of programme practices. <i>International Journal of Project Management</i> ., 25: 41-55.	R

¹Type: Conceptual (C); Literature Reviews (LR); Research Literature (R).

Table 3: Core papers about the methodology for the systematic literature review

N	Methodology for the Systematic Literature Review	Type
15	Lane, P. J., Koka, B. R. & Pathak, S., 2006. The reification of absorptive capacity: A critical review and rejuvenation of the construct. <i>Academy of Management Review</i> 31(4): 833–63.	LR
16	Newbert, S., 2007. Empirical research on the resource-based view of the firm: an assessment and suggestions for future research. <i>Strategic Management Journal</i> , 28: 121–146.	LR

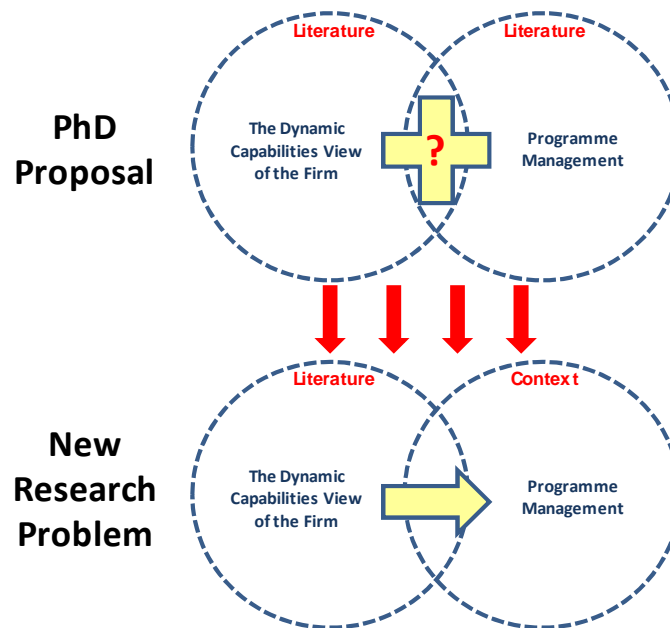
Finally, as requested for the protocol, I synthesised in Appendix 1 the main aspects of the first three groups of papers.

3. MAPPING THE RESEARCH PROBLEM²

3.1. Evolution of the research problem

Trying to integrate the literature on dynamic capabilities and programme management had been a challenging task. This was mainly due to the following reasons: a) the former is wide, terminologically chaotic and tends to be “omni-comprehensive”, whilst b) the latter is more operations-oriented and in general limited. Therefore, following an early advice of my supervisor, I modified the approach hold in the PhD proposal towards a new one as showed in Figure 1.

Figure 1: The research problem after the beginning of the MRes Programme



From this step, my research problem was defined in the following way:

“How to operationalize the dynamic capability view of the firm in a programme management context?”

Consequently, the focus of the systematic literature review became the dynamic capability view of the firm. Thus, this scoping study aims to clarify how I plan to break down the field in order to address this new research problem.

² This chapter presents a short version of the Scoping Study Paper that I submitted in April.

3.2. Approaching a complex literature

The dynamic capability view of the firm is a complex, emergent field to which scholars from different groups are trying to contribute. This is not surprising, because its founding article “Dynamic capabilities and strategic management”³, written by Teece, Pisano and Shuen and published on the Strategic Management Journal in 1997, was offered as an effort of synthesis.

As suggested in this important paper (Teece, Pisano & Shuen, 1997), this framework naturally integrates different paradigms such as competitive forces (Porter, 1980), strategic conflict (Shapiro, 1989) and RBV (Barney, 1991; Penrose, 1959). However, over time the concept grew up incorporating contributions from several other streams, such as, for example, core competences (Danneels, 2002; Hamel & Prahalad, 1994; Markides & Williamson, 1994), core capabilities (Leonard-Barton, 1992), and entrepreneurship (Zahra, Sapienza and Davidsson, 2006).

However, notwithstanding several years of contributions, it is hard to disagree with Dosi et al.’s comment that the field seems to be affected by a “terminological flotilla”, where concepts, definition, methodologies are still emerging. As observed by Easterby-Smith et al. (2009, pag.S3) in one of the most recent reviews:

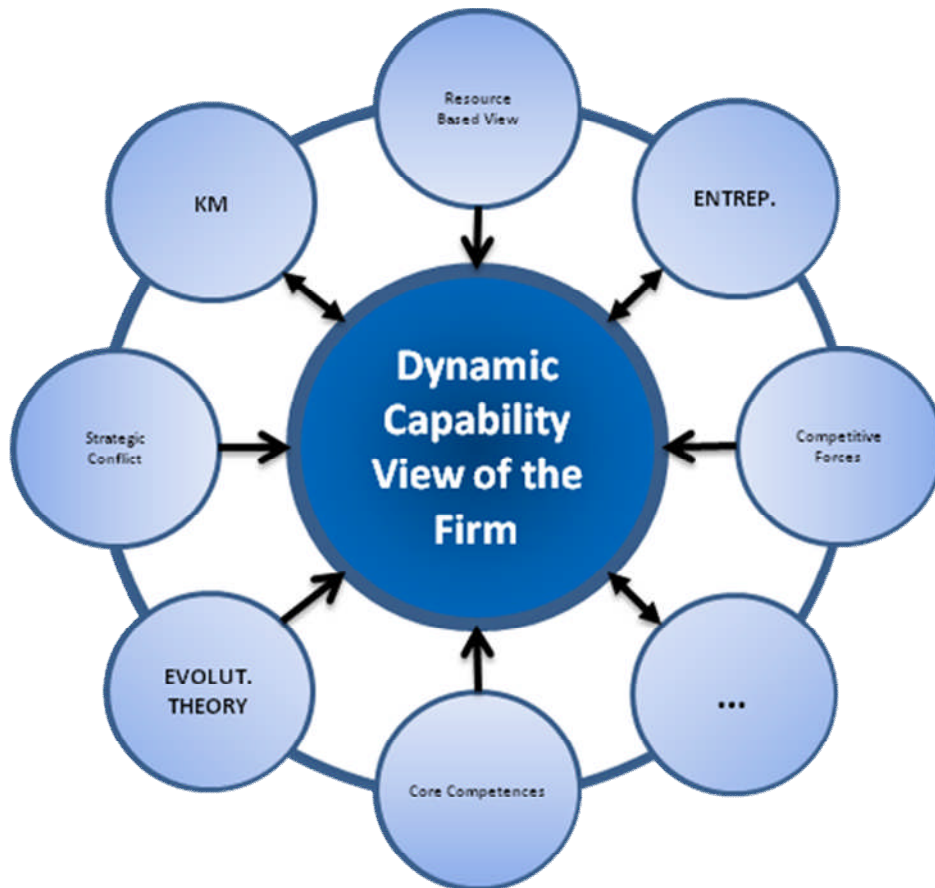
“Without a unifying foundation of the sort that this attempt represents⁴, research on dynamic capabilities will ultimately falter, despite the enthusiasm for the concept. With a unifying foundation in place, the stage is set to build upon this base and accumulate a deep store of knowledge about the dynamic capabilities construct in theory and in practice”.

³ It is worth noting, however, that the framework was presented for the first time in 1990 (Teece, Pisano & Shuen, 1990) and again 1994 (Teece & Pisano, 1994), although it didn’t really start to gain its popularity until the article in 1997. This paper was recognized in 2005 as the most cited paper in 1995-2005 in the Science Watch index of Scientific Research in Economics and Business.

⁴ The reference is to the joint effort of several leading scholars in the field offered in Helfat et al. (2007).

In sum, from the point of view of a student involved in the process of a systematic literature review, the field of dynamic capabilities is hard to represent in a diagram with 3 or more circles, because of its tendency of being an omni-comprehensive framework in management studies. Figure 2 helps to give an idea of the challenge.

Figure 2: Some of the fields contributing to and contributed by the dynamic capability view of the firm



3.3. Breaking down the dynamic capability view of the firm

In order to deal with this problematic literature, I therefore decided to start from a different point of which I give now a full account. What I did was a sort of mini literature review that could help me to set the boundaries of my search. Although it was far from being systematic in the sense of the Cranfield process, I argue that the process I followed was systematic enough to justify my subsequent steps. Moreover, this process was as a useful complement of the loose reading I continued to do. In total, including the results of this preliminary literature review, I based the Scoping Study on the knowledge gained from approximately 150 papers, 3 books and 500 abstracts⁵.

In brief, I made the assumption that, after more than 10 years of research and a so wide popularity, the keyword of “dynamic capability*” was powerful enough to give me all the interesting articles I need. Obviously, I had to recognize that this keyword was going to exclude any article that used different words for the same concept (e.g.: Danneels, 2002 and 2008) as well as all additional articles recognized as fundamental for the field by the research community (e.g.: Amit & Schoemaker, 1993). Similarly books weren’t included in the search. However, my prior experience of the literature suggested me that these problems were of limited size and eventually addressable in a second moment using external suggestions and cross referencing. Following several counter tests I did between December 2008 and April 2009, no evidence of important missing references was found. Thus I believe that the process I followed can be considered as robust to the extent of its utility for the purposes of this scoping study.

⁵This number includes also articles found using cross referencing as well as working papers. Obviously some papers were found of no interest or too far away from my purposes. Nevertheless, arguably this scoping process gave me a good understanding of the field.

In order to have a certain degree of systematicity, I built on the steps suggested by Newbert (2007)⁶ and Lane et al. (2006) in their systematic review of the resource based view and absorptive capacity⁷.

The process of this preliminary literature review followed these steps:

1. A search was run on four important databases using the keyword “dynamic capabilit*” in titles, abstracts and keywords (where appropriate⁸). The results are exposed in Table 4.

Table 4: Results of the first step of the preliminary literature review

Database	Results
<i>EBSCO</i>	165
<i>EMERALD</i>	308
<i>PROQUEST</i>	282
<i>SCOPUS</i>	438
TOTAL	1193

Keyword: dynamic capabilit*
Where: Title, Abstract, Keywords
03/12/08

2. Using RefWorks, I then read all 1193 titles and eliminated all duplications. Total articles: 682. Subsequently, I ran a test on a fifth database (Winley): No additional entries were found.

⁶This article was given us by Dr.Partington during the MRes first term as a good example of a published systematic literature review.

⁷ In their article, Lane et al. (2006, pag.858) researched the level of reification of the concept of absorptive capacity and ended their discussion suggesting that “future studies (...) should view absorptive capacity as a capability rather than a “thing” that is divorced of its context”, building on the definition of absorptive capacity as a dynamic capability offered by Zahra and George (2002).

⁸Due to the fact that some databases don’t allow for searches on “keywords” or put together different fields such as “Title, Abstract, Keywords” (e.g. ABI Proquest), etc., I adapted my searches in respect of the database structure, although the main features didn’t change.

3. In addition, I read all titles again and deleted those that were clearly not relevant⁹. Where there was a doubt, I checked the whole article. 524 articles were left.

4. Following the same process, I then read in full all the 524 remaining abstracts in order to identify eventual additional irrelevant articles. 385 articles were left and they were divided in three codified groups: a) **Conceptual** (147): articles that didn't include any empirical test of whatever sort; b) **Mixed** (100): articles that exposed a new development of a theory or a new theory and then operationalized one or more hypotheses or propositions; c) **Empirical** (138): articles that only tested previous theorizations with minor changes.

5. Since my purpose was to understand the field as much as I could, I made the assumption that a great deal of understanding could have come from a deep reading of all existing reviews in the field. Thus, I ran a sub-search¹⁰ on the group with conceptual papers using the keywords "review" or "literature" in the abstracts. 39 articles were found.

6. Finally, I read in full all these 39 articles and codified them in respect of the quality of their review of the literature, using 4 codes: a) Papers that included an acceptably comprehensive review¹¹ of the literature were codified with "1"; b) Papers with a medium quality review but with well developed theorizations were codified with "1/2"; c) Papers that were found not relevant, either because they presented the

⁹ For example in the case of articles such as: Kheruntsev, P. E. (1978), "Accounting for Harmonic Components of a Rectified Current When Evaluating the Maximum Dynamic Capabilities of a Thyristorized Positioning Electric Drive.", *Izv Vyssh Uchebn Zaved Energ.*, no. 2, pp. 47-51.

¹⁰ In MS Word, where all abstracts were transferred from RefWorks.

¹¹ Following Lane *et al.* (2006) I purposefully used broad categories in order to make my search as much conservative as I could. In this sense the "quality" of the literature review was checked in a broad sense. Therefore in categories 2 and 3 I left articles that clearly didn't present any sort of review of the dynamic capabilities field.

keywords due to other purposes or simply because they were about a completely different topic, were codified with “2” or “3”. Table 5 shows what just exposed.

Table 5: Further steps of the preliminary literature review

STEP 1	1193	
STEP 2	682	
STEP 3	524	
STEP 4	<i>Empirical</i>	138
	<i>Mixed</i>	100
	<i>Conceptual</i>	147
STEP 5	<i>Conceptual (review* OR literature)</i>	39
STEP 6	1	11
	1/2	8
	2	16
	3	4

Excluding those articles codified as “3”, I further broke down the reviews, analysing them by journal ranking (Table 6), year (Table 7), and journal (Table 8). It is possible to notice how this group presents a quite wide and comprehensive picture of the field, with the inclusion of a majority of four and three stars journals and a good number of articles from less recognised publications. Given this result, I argue that my analysis was both strongly rooted in top journals and open enough to include different perspectives that perhaps sometimes are published somewhere else.

Table 6: Results of the preliminary review by the ABS journal ranking and quality coding

JOURNAL RANKING		Quality Coding			Tot
		1	1/2	2	
THE ABS	4	4	0	5	9
	3	2	3	6	11
	2	1	1	2	4
	1	2	2	3	7
	N	2	2	0	4
Tot		11	8	16	35

Note: N = no ranking

Table 7: Results of the preliminary review by year of publication and quality coding

Year	Quality Coding			Tot
	1	1/2	2	
2008	4	4	4	12
2007	3	3	2	8
2006	3	0	4	7
2005	0	1	1	2
2004	0	0	0	0
2003	0	0	3	3
2002	1	0	1	2
2001	0	0	1	1
Tot	11	8	16	35

Table 8 Results of the preliminary review by year and quality coding (2+ references only)

Rank	Journal	Articles
4*	<i>Academy of Management Review</i>	3
3*	<i>International Journal of Management Review</i>	3
1*	<i>Management Decision</i>	3
4*	<i>Journal of Product Innovation Management</i>	2
3*	<i>European Journal of Marketing</i>	2
3*	<i>R & D Management</i>	2
2*	<i>Journal of Knowledge Management</i>	2
1*	<i>Knowledge & Process Management</i>	2

Following this exercise, I decided to analyse in deep the 19 relevant reviews codified as “1” and “1/2” (see Appendix 2). Specifically, I did a cross reference analysis¹² in order to identify the most important papers in the field. In this way, I thought to be able to obtain two results: a) a justified way to re-include in my article database those papers or books that wasn’t possible to find using the keywords; b) a list of the most quoted papers in the field that could be useful as a quality filter for further steps of the systematic literature review.

¹² Although I understand that a proper cross reference analysis should be corrected by several factors, including temporal biases, following Lane *et al.* (2006), at this stage it represents a simple count of the number of references in the selected sub-sample. Nevertheless, the four articles in Table 9 are easily recognizable as fundamental in the field.

In total, I catalogued 1,036 references on an Excel spreadsheet. The most cited articles I found are reported in Appendix.3. Moreover, I highlighted in Table 9 those with more than 10 citations that are specifically part of the dynamic capability literature.

Table 9: The most cited articles in the dynamic capability field based on the preliminary literature review

N of Citations	Reference
18	Teece, D. J., Pisano, G., & Shuen, A., 1997. Dynamic capabilities and strategic management. <i>Strategic Management Journal</i> , 18: 509–533.
17	Eisenhardt, K. M., & Martin, J. A., 2000. Dynamic capabilities: What are they? <i>Strategic Management Journal</i> , 21: 1105– 1121.
12	Winter, S. G., 2003. Understanding dynamic capabilities. <i>Strategic Management Journal</i> . 24(10): 991-995.
12	Zollo, M., & Winter, S. G., 2002. Deliberate learning and the evolution of dynamic capabilities. <i>Organization Science</i> , 13: 339–351.

In sum, the preliminary literature review was important in order to explore a so broad field and to build a database useful as the first step of the systematic literature process.

Finally, since they presented additional good reviews, I decided to add the following three references that weren't highlighted in the process due to temporal reasons (Table 10):

Table 10: Additional literature reviews of the dynamic capability view of the firm

Year	Reference
2009	Easterby-Smith, M., Lyles, M.A., & Peteraf, M.A., 2009. Dynamic capabilities: Current debates and future directions. <i>British Journal of Management</i> , 20: S1–S8.
2009	Ambrosini, V. & Bowman, C., 2009. What are dynamic capabilities and are they a useful construct in strategic management? <i>International Journal of Management Reviews</i> , 11(1): 29-49.
2007	Helfat, C.E., Finkelstein, S., Mitchell, W., Peteraf, M., Singh, H., Teece, D. & Winter, S. 2007. <i>Dynamic Capabilities: Understanding Strategic Change in Organizations</i> . London: Blackwell.

3.4. Outcomes of the mapping process

In conclusion of this mapping process, it is possible to summarize the following points from the literature on dynamic capabilities¹³.

a) Dynamic capabilities are path dependent organizational processes in a broad sense and present the same ontological characteristics of organizational routines.

b) At the theoretical (ostensive) level dynamic capabilities show common features among different organizations, industries, networks, etc. These commonalities are presumably better researchable using quantitative research. Furthermore these high level dynamic capabilities have not been systematically researched so far. However, this preliminary literature review suggests that they can be similar to concepts such as absorptive capacity, ambidexterity and agility, as developed in other literature streams.

c) Similarly, dynamic capabilities present a performative part. This means that they are idiosyncratic in their details, that is context-dependent. At this performative level, they are presumably better researchable using qualitative methodologies.

d) Although some characteristics are clear, the field still doesn't offer a clear terminology and set of definitions. There are also clear signs that the construct could have been reified.

e) The empirical support is contradictory and practical implications are difficult to identify. Moreover, it is not clear if we are in need of additional quantitative or qualitative studies (or both).

In sum, there is a lot of literature about what dynamic capabilities are in abstract, but no clear indications about what they are in reality. Similarly it is still not clear how they are created and how they impact on firm performance and competitive advantage in practice. Nevertheless the

¹³ For a full account, see the extended version of the Scoping Study.

dynamic capabilities view of the firm is still on the edge of the research agenda as the most intriguing approach currently offered in strategic management.

4. SCOPING STUDY – ADDITIONAL POSITIONING PAPER¹⁴

4.1. Introduction

How organizations strategically deal with change is a fundamental problem in management studies. An important way increasingly chosen to implement strategies is through programmes. Programme Management is an emerging discipline that researches how programmes could be more effective in delivering their expected strategic benefits. To obtain this, it is recognised that successful programmes require a continuous development of capabilities on a context-dependent basis. My research project aims to use the theoretical lens of the dynamic capabilities view of the firm to explore how these capabilities could be integrated, built, and reconfigured in a context of Programme Management.

4.2. A business problem

“EDS, an HP company, is a leading global technology services provider delivering business solutions to its clients” (EDS website, 28/05/09). Its core business is to offer several services classified in three main categories: applications, business process outsourcing and infrastructure. Table 11 presents three examples of EDS’s delivered services from its website.

¹⁴ This chapter presents a short version of the additional positioning paper that I was asked to present after the Scoping Study review.

In business jargon, it is widely accepted a view of this type of organizations as bundles of capabilities/competences and other resources. Thus, expressions such as “IT capabilities” are not uncommon in the field where EDS makes its business. Consequently, each service EDS offers can be seen as a goal-oriented set of capabilities and complementary resources.

Table 11: Three examples of EDS's delivered services (Source: EDS website, 28/05/09)

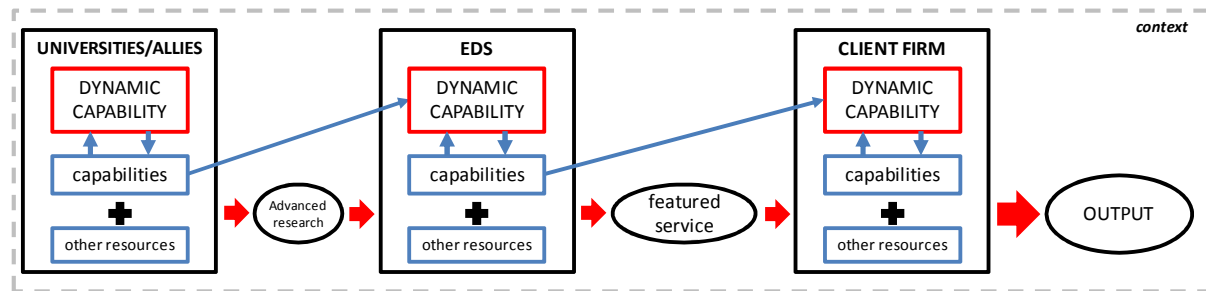
Client firm	Challenge	Answer	Results	Featured services
MOLSON COORS	To synergize the company's IT operations, increase the brewer's agility and position for future expansion and reduce application management costs.	EDS took over the day-to-day management of the brewer's technical operations, helped convert legacy applications and systems to a globally integrated solution and optimized its supply chain.	By using EDS' Best Shore [®] service Molson Coors has reduced its cost of applications management, consolidated infrastructure and implemented a managed storage solution for maximum cost-effectiveness of their storage environment.	<i>Applications Services; Management Services; Data Center Modernization Services; Network Management Services; Workplace Server Management Services</i> <i>Development Applications</i>
AMERICAN AIRLINES	To maximize the carrier's IT investments by reinvesting the savings to further reduce costs.	Applications services were migrated to EDS' Best Shore [®] capability centers in Brazil and Argentina that have transportation expertise and are in a time zone similar to American Airlines offices in Texas.	EDS helped American reduce its IT expenditures and introduced a model for future cost reductions as additional business applications are transitioned.	<i>Applications Services; Management Services; Data Center Modernization Services; Network Management Services; Service Desk and Site Support Services</i> <i>Development Applications</i>
TRAVELOCITY	Travelocity and parent company Sabre Holdings wanted to improve the efficiency and reliability of their IT services while keeping a lid on operational costs.	EDS provides the support required to process more than 2 billion transactions each day and to transition to a standards-based IT infrastructure.	By implementing a new infrastructure road map, Travelocity and Sabre Holdings stand to improve time to market, reduce internal complexity, better control operational costs and ensure the stability of mission-critical systems.	<i>Applications Services; Management Services; Enterprise Application Services; Transformation & Modernization Services; Data Center Services; Networking Services</i> <i>Development Applications</i>

Dynamic capabilities were indeed defined in the field's seminal paper as the “*the firm's ability to integrate, build, and reconfigure internal and external competences¹⁵ to address rapidly changing environments*” (Teece *et al.*, 1997: 516). From this perspective, a client firm needs to integrate internally built or externally supplied capabilities in order to address its changing environment. In this model, EDS can be seen as a supplier of external capabilities. Moreover, this conceptualization is powerful in highlighting how EDS presents a similar problem too: To maintain its performance, it has to evolve somehow its own capabilities as the environment changes. This is reflected, for example, in the fact that EDS is trying to develop external relationships with complementary allies (e.g.: the Agility Alliance) or university (e.g.: Cranfield SOM).

¹⁵ It is worth noting how terms such as competences and capabilities are often used as synonymous in the literature. Danneels' (2008) article offers a clear example of this.

From a dynamic capabilities perspective, “what EDS does” can be represented as in Figure 3.

Figure 3: Capability development and external relationships



In sum, this model offers a clear conceptualization of the business problem companies such as EDS or its client firms face: If performances are a function of how an organization manages its own resources/capabilities better than rivals (Amit & Schomeaker, 1993), how can it develop them when the environment evolves? This problem is even more important in “rapidly changing environments” (Teece *et al.*, 1997) such as the IT outsourcing market.

Finally, the concept of dynamic capabilities helps to understand that this business problem is intrinsically a managerial problem: As explained by Teece *et al.* (1997: 515), “*the term ‘capabilities’ emphasizes the key role of strategic management in appropriately adapting, integrating, and reconfiguring internal and external organizational skills, resources, and functional competences to match the requirements of a changing environment*”.

Based on this discussion, I can now observe how EDS also offers a particular type of capabilities, namely in Programme Management. Therefore, programme management capabilities can be seen as a subset of those hold by EDS and offered to client firms. It follows, at the programme level, that successful Programme Management is possible only when, on one side, EDS’s specific programme management capabilities are appropriately integrated with client firms’ capabilities, and, on the other side, if EDS constantly develops its own programme management capabilities.

As observed by Winter (2003: 994), “*there is no general rule for riches*”. That is, given the constantly changing environment, organizations at any point of the relationship chain should never stop in trying to develop and adapt their capabilities and resources.

4.3. The current debate on dynamic capabilities

Strategic management is a broad research stream built on the premise that decision makers can somehow drive organizations’ fate (Salvato, 2009). The dynamic capabilities framework is an emerging approach within this literature that sees organizations as bundles of capabilities and “difficult-to-replicate co-specialized assets” (Augier & Teece, 2009: 418). In addition, it focuses the attention on the role of strategic managers in orchestrating them.

Recent reviews of the field has shown how scholars consider dynamic capabilities as high-level managerial processes through which a) organizations develop and evolve their operational capabilities and b) manage the resource base in order to generate and sustain their performance (Ambrosini & Bowman, 2009; Easterby-Smith et al., 2009; Wang & Ahmed, 2007). These managerial processes are also path dependent, that is based on prior knowledge and choices (i.e.: Teece *et al.*, 1997). Moreover, there is general consensus that dynamic capabilities present commonalities across different organizations but are fundamentally idiosyncratic in their details (Eisenhardt & Martin, 2000). As discussed by Teece (2007) these commonalities represent the micro-foundations of dynamic capabilities or, in other words, their creation processes (Ambrosini & Bowman, 2009).

However, two major limitations affect the debate. On one side it is surprisingly still unclear what a dynamic capability precisely is and which concrete properties it has (Easterby-Smith *et al.*,

2009)¹⁶. On the other side, after more than a decade of research, the dynamic capability framework is on the edge of the academic agenda, but still resistant to any managerial relevance (Ambrosini & Bowman, 2009)¹⁷.

4.4. On the empirical support of the dynamic capabilities view of the firm

In addition to current theoretical debates, empirical work may be of help to gain a better understanding of dynamic capabilities.

For example, Zott (2003) shows, using a computer simulation, how two organizations with similar dynamic capabilities can obtain completely different performances depending on how they make choices in terms of time, cost and learning. Similarly, Salvato (2009) explains, using both qualitative and quantitative methods, how project (short term) outcomes are intrinsically dependent on how individuals perform their day-to-day activities. Both these articles are consistent with the study presented by Rothaermel and Hess (2006) who points out, using a random-effects negative binomial analysis, how dynamic capabilities' antecedents exist at the same time at the firm, network and individual level. They also unexpectedly found that performances are more dependent on activities run by so-called "rank-and-file" scientists than by "star scientists", although the latter type is fundamental in order to enact the former (Rothaermel & Hess, 2006). Taken together, these results suggest that holders of external capabilities can enact the creation of dynamic capabilities in client firms. Nevertheless, performances are

¹⁶ "At some point, however, the lack of agreement will impede progress on both the conceptual and empirical fronts. Meaningful conversation and further conceptual development of the framework require some common understandings. Empirical work may be misdirected and may be of dubious worth without a well-developed construct and a clear set of testable predictions" (Easterby-Smith *et al.*, 2009: S3).

¹⁷ "If we understand how, in practice, dynamic capabilities are created, this would allow us to start developing guidance for managers about how they can deliberately develop dynamic capabilities. (...) Answering these questions would also facilitate our understanding of how contingent on the perceived and actual environment the effective deployment of certain types of dynamic capabilities is and, similarly, it would allow the design of managerial relevant prescriptions." (Ambrosini & Bowman, 2009: 45).

intrinsically dependent on how the client firm runs its day-to-day activities. On the same conceptual line, Chang (2003) utilizes a logistic regression model and highlights the context-dependent importance of inter-organizational co-operation for enhancing innovative dynamic capabilities.

Empirical literature also offers some insights about commonalities of dynamic capabilities, although it seems more variegated. However, it can be noticed how Wang and Ahmed (2007) identify dynamic capabilities creation process as correspondent to well known high-level constructs such as absorptive capacity, adaptive capability and innovation capability. They also offer several empirical insights from these literatures.

Finally, empirical work presents useful (but seminal) ideas about those problems on which I want to focus my research project, as discussed later in the paper. I identified few papers that can offer some insights. Firstly, Adner and Helfat (2003, pag.1023), using ANOVA, measure “the effect of specific corporate-level managerial decisions, driven by dynamic managerial capabilities, on the variance of performance”. Their claim that “corporate strategy matters” (Adner & Helfat, 2003, pag.1023) complements Rothaermel and Hess’ (2006, pag.916) statement that “individuals matter” in respect of business performance. Adner and Helfat’s notion of dynamic managerial capabilities leads to other two articles from Peteraf and Reed (2007, 2008) where these scholars analyse managerial choices under different constraints, developing a complex quantitative model. Interestingly, on one side, they present empirical evidence of how managers adapt to ‘industry recipes’; on the other, they strongly suggest that “managers can find ways to exercise strategic choice in achieving fit, even under the most restrictive of environmental conditions” (Peteraf & Reed, 2007, pag.1106). Using a sport analogy, although managers can’t make players run faster than their individual attributes or they are not allowed to decide the sequence of matches during a season, it still matters how they achieve fit between their given resources/capabilities and the

context. In other words, it still matters how “they read the match”. In Teece’s (2007) terms, it is fundamental how they orchestrated their capabilities and complementary assets. That is, how they deploy dynamic capabilities.

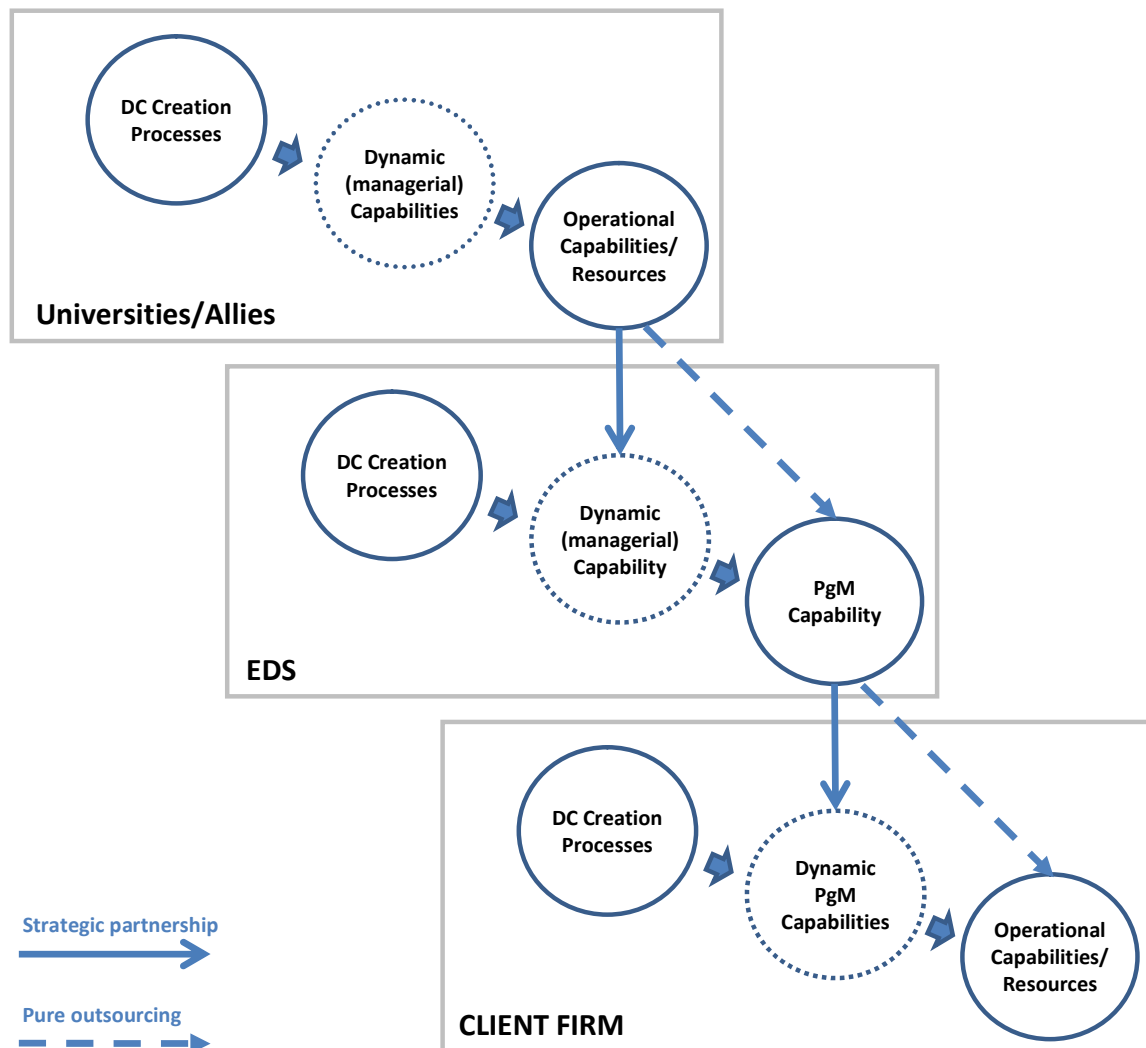
4.5. Dynamic capabilities and Programme Management

Given the previous discussion, for the purpose of my research project I suggest that Programme Management can be framed as in Figure 4.

In this descriptive model, the dotted arrows represent the case where a client firm outsources only some non strategic capabilities, generally without involving a long term relationship and often as an ad hoc solution (Winter, 2003). Moreover, given Winter’s (2003) observation that dynamic capabilities are only locally defined, the model considers EDS as a supplier of operational programme management capabilities. Therefore, dynamic programme management capabilities are created in client firms whilst EDS can develop its operational programme management capabilities through different dynamic managerial capabilities. This, unless it uses programmes to manage its own business.

In sum, the model points out at least two broad research areas: *a) how are dynamic capabilities in programme management created and how are they deployed in the relationship between EDS and its client firms?;*
b) how does EDS develop its Programme Management capabilities?

Figure 4: Programme Management from a DC perspective



The focus of my research is on the first of these areas. Specifically my research questions are so far:

- *How are internal and external capabilities purposefully integrated, built, and reconfigured in order to create firm-specific dynamic capabilities in a context of programme management?*
- *How are these dynamic programme management capabilities deployed in practice and what is their impact on programme performances?*

5. REVIEW QUESTIONS

The research questions I presented aims to fill a gap in the literature, as discussed.

At this point in time, I propose that the systematic literature review should answer these review questions in order to create the basis for the research design:

- **General question: *How are dynamic capabilities conceptualized and operationalized in the literature***¹⁸?

- ***RQ1a: Which are the dynamic capabilities creation processes in the literature?***
- ***RQ1b: What is the empirical evidence of these dynamic capabilities creation processes?***

Both Wang and Ahmed (2007) and Teece (2007) propose three of them and make suggestion for further research. However their triads are not systematically grounded in the literature. In my scoping studies I identify ambidexterity, absorptive capacity and agility as dynamic capabilities creation processes and I believe that they resemble other scholars' concepts. A systematic review of their role in the literature is fundamental for further steps.

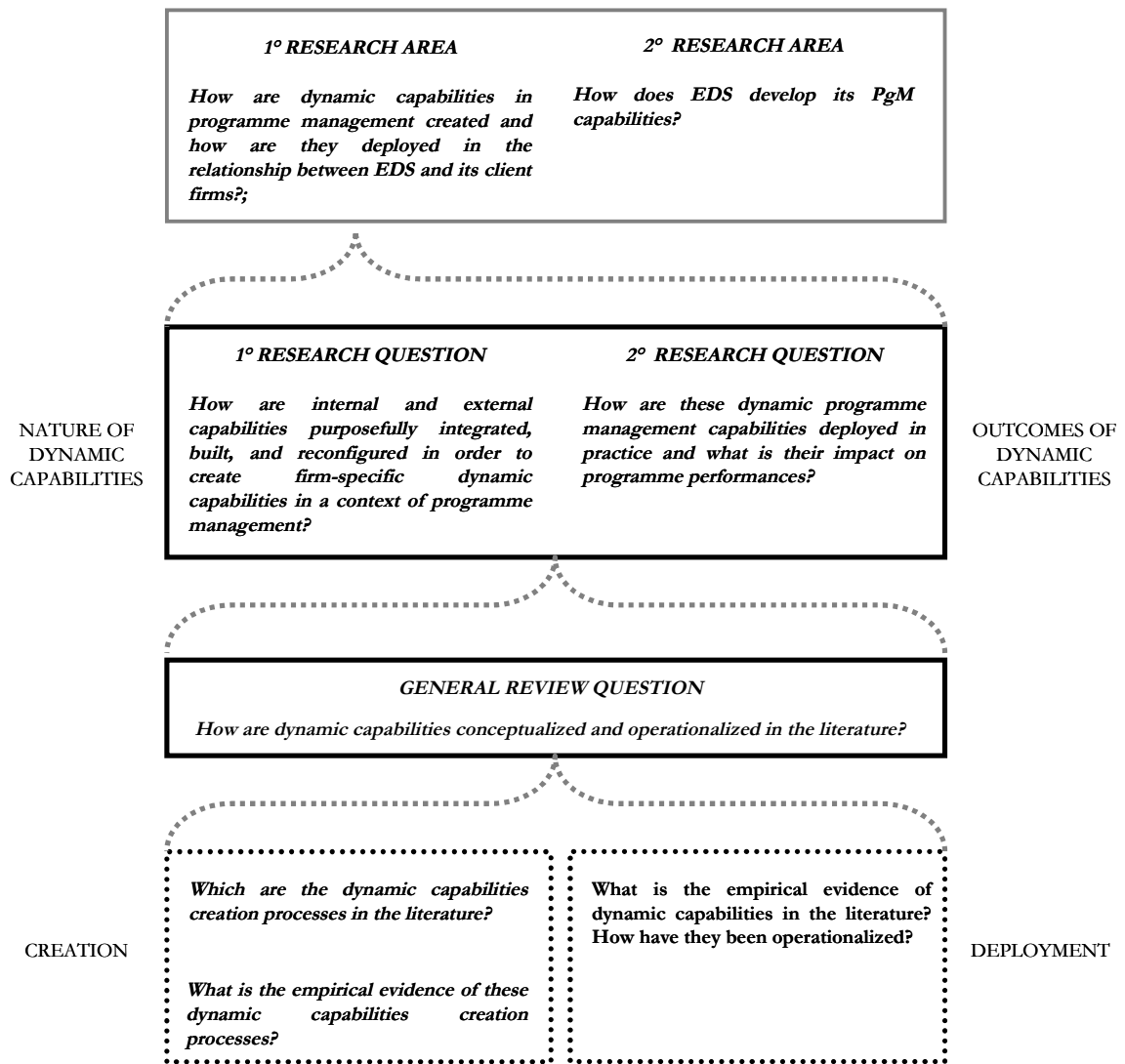
¹⁸ I personally believe that a powerful way to analyse the literature regarding this point is through the methodology used by Lane et al. (2006). I consider their reification test pretty systematic for assessing the field and identifying dynamic capabilities creation processes. However, the reification test is only a particular way of doing a systematic literature review and not the only valid.

- **RQ2: What is the empirical evidence of dynamic capabilities in the literature?**

This step can offer a deep understanding of how dynamic capabilities have been empirically researched and the several methodologies already tested.

In Figure 5 I delineate how my general Review question aims to answer to two specific Research questions, within the selected Research Area. In particular the Review question is directed to investigate the existence of potential research gaps in the literature on dynamic capabilities. These should be evaluated in terms of their usefulness for an operationalization in a context of Programme Management (Review questions), with particular regards to EDS and its client firms (1st Research Area). Given the findings of the Scoping Study, I also highlight two potential sub review questions that I should take in consideration during the analysis.

Figure 5: Structure of the research enquiry



Note: PgM=Programme Management

6. CONSULTATION GROUP/PANEL

At this stage, the consultation panel I would consider for the systematic literature review is that showed in Table 12.

Table 12: Members of the consultation panel

Person	Organization	Role
Prof. Patrick Reinmoeller	Professor of Strategic Management - Cranfield SOM	Supervisor
Dr. David Partington	Senior Lecturer in Project Management - Director, Management Research Programmes - Cranfield SOM	Advisor & Member of the panel
Dr. Harvey Maylor	Senior Lecturer - Centre Director of the International Centre for Programme Management - Cranfield SOM	Advisor & Member of the panel
Dr. Stephanie Hussels	Lecturer in Entrepreneurship - Bettany Centre for Entrepreneurial Performance and Economics – Cranfield SOM	Expert of the methodology & Member of the panel
Ms Heather Woodfield	Social Sciences Information Specialist - Cranfield University Library	Literature Search Advisor
Mr Dario Vuolo	PhD Student in Management - University of Pisa	External Advisor

Prof. Patrick Reinmoeller is currently my supervisor and is a Professor of Strategic Management that is the main area of interest for my systematic literature review. His research expertise includes management practices and concepts as well as knowledge management that are both quite correlated to the dynamic capability literature. Moreover he has an intense track record as a reviewer for top journals and he is helping me a lot to improve my writing and reviewing skills. I have regular meetings with him and I will continue to do so in the future.

Dr. David Partington is a Senior Lecturer in Project Management at the International Centre for Programme Management of Cranfield SOM. He has a long experience both as a practitioner and academic in Programme Management and his research interests include the relationship between Strategic Management and Programme Management, which is the main focus of my research project. He is also the current Director of the Management Research Programmes at Cranfield SOM and published a lot on research methods too. Finally he is also an expert of the systematic literature process and his help has been invaluable so far until possible.

Dr. Harvey Maylor is the Centre Director of the International Centre for Programme Management at Cranfield SOM and a Senior Lecturer in Project and Programme Management. Thus he is an expert of the target context of my research and is helping me already in defining some preliminary points of contacts with the literature. I consider his help as very important also because, given my lateral participation to some research activities of the Centre, he can help me in understanding better the potential practical outcomes of my systematic literature review in respect of research in Programme Management. I already discussed some of my ideas with him a couple of times and my hope is to set up in the future other meetings in order to be helped during the process to maintain a clear focus on my research's practical implication.

Dr. Stephanie Hussels is a Lecturer in Entrepreneurship at Bettany Centre for Entrepreneurial Performance and Economics at Cranfield SOM. She is also the chairman of my systematic review panel given her experience in the methodology. I consider her help in the process really important, with particular regard to the construction of this Protocol. In addition, since her expertise in the Economics and Entrepreneurship, I believe that she may advise me on the content of some parts of the systematic review that are relative to these topics.

Ms Heather Woodfield is a Social Sciences Information Specialist at the Library of Cranfield University and she has been so far really helpful with regards of any problem I had in respect of my searches on the literature. I consider her as the key point of contact with the Library in order to obtain support on databases, library systems, softwares etc during the process of the systematic literature review and after. I can't plan now in any way how I am going to have consultations with her, but I am sure that I will, and more than once, depending on the evolution of my research.

Mr Dario Vuolo is a friend and a colleague as a PhD Student in Management at the University of Pisa, Italy. His main research interest is on the dynamic capability view of the firm and he is currently collaborating with some important scholars in the field in Italy. I generally share all my ideas and literature with him and vice versa and thus there is a strong linkage between our research projects in terms of the literature, although mine is more focus on competences and Programme Management and his on the creation of some simulation models. I have regular conversations with him on a daily or weekly basis and we reciprocally read our papers and contributions. I consider him as an invaluable resource for my systematic literature review process because the discussion with him forces me to be more consistent in my argumentations, leaving at the same time the space for brainstorming and lateral thinking.

7. PERSONAL STATEMENTS

7.1. Why are you doing the review?

I am doing the review because I am strongly convinced that this process is powerful in order to create deep foundations for my PhD project. In particular, since the more I read the more I am annoyed by the average quality of the papers, I am coming to the understanding that a lot of the confusion and of the low quality in any field of management studies (and even more in my literature) is generated by the weakness of the theoretical and empirical foundations. For example, it is easy to find articles with good ideas but built on inconsistent bases. This at the end reduces the quality of the output. Another example is given by those articles (the majority of those I read so far) that build an argument “picking up” bits of literature without any coherence (and sometimes without even having read the reference): they fail too often in recognizing that most of problems were already addressed and usually in the same articles from which the specific bit was extracted. Similarly, I found articles in good journals where the key point was referenced from a paper in another good journal without any discussion: In this other article the same point was simply referenced from another paper and so on. Given the weakness of the last quotation, I usually checked the whole reference chain and, at the end of it, I sometimes found that everything was based on a weak article from a low quality journal on which normally one would have not linked a so important key passage. In my view this is a general problem but even more important in literature reviews that select articles often instrumentally in respect of the intended model that is proposed. The literature on dynamic capabilities is fully affected by this kind of problems and in addition presents an unclear and chaotic terminology. Notwithstanding what observed, I recognise that it is materially impossible (and probably not advisable) “to know” or “to quote” everything. Nevertheless I believe that it is important to reduce these “technical” biases to the minimum. This may help to build a piece of knowledge obviously incomplete but

reasonably reliable as a basis for future research. I consider the process of the systematic literature review quite powerful for this purpose.

7.2. What do you hope to achieve?

Given the previous answer, I am approaching my review in the aim of obtaining: a) a critical analysis of the state of the art of the concept of dynamic capabilities (and a test of its reification); b) a systematic analysis of the empirical support of the field that is unclear in the literature and in previous not systematic reviews. On these bases, I am confident to be able to define one or more research gaps in a context of programmes.

7.3. Any personal and intellectual biases?

For the best of the personal understanding of myself, I don't think I have any personal or intellectual bias. If I had to highlight a weakness of my thinking at this point in time, I would say that this absence of recognition of personal biases is a bias in itself. That is, I presume that the strong position about the field of dynamic capabilities that I am developing could reduce the potential for lateral thinking in a sort of competency trap. At the same time and in this sense, I appreciate the requirements of the process of the systematic literature review to have a consultation panel because it is probably the best way to overcome this kind of limitations.

7.4. Any conflicts of interest (e.g. sponsors), which may prejudice the review?

The answer to this question is twofold. On one side it is positive, because my research project is a part of a wider programme in the ICPM that is funded by a private company (specifically EDS). Therefore there is an obvious influence on the development of my thinking. In particular, I have always in my mind the potential necessity of operationalizing my conceptualization within that firm. On the other hand the answer is negative, because thanks to the clarification given me by Dr. David Partington at the beginning of my journey, I am considering Programme Management just as a specific context. Thus I am trying to developing a context-free conceptualization.

8. SEARCH STRATEGY

8.1. Search engines

Given my specific review questions, as developed in the Scoping Study, I now try to outline question-specific search strategies. Based on the experience I gained in doing the Scoping Study, I decided to utilize the only database used by Lane et al. (2006) in their review, ISI Web of Knowledge. Although this choice can potentially limit the number of papers in my final sample, it is worth noting that: a) this database allows for additional analysis¹⁹ that couldn't be run with a mix of sources; b) a pre-search test didn't show any relevant gap in respect to the Scoping Study's sample.

8.2. Search timeframe

Firstly, I must justify the timeframe for the search. This is from May 1997 to June 2009.

The starting point is given by the publication of the article by Helfat (1997)²⁰. The ending point is given by the fact that I will be running the search in June 2009.

¹⁹ In particular ISI could potentially be used for further analysis using a specific bibliometric analysis software called SITKIS (Schildt, 2002). I found this program already used both in Lane et al. (2006) and in other papers published in high profile journals.

²⁰ Although the accepted founding article of the field is that published by Teece, Pisano and Shuen in August 1997, the article by Helfat preceded it of few months. Nevertheless this article built on the definition offered by Teece and Pisano in a previous article in 1994 that is considered as an early version of the 1997's paper. This latter article is not considered for the definition of the timeframe because it has been replaced in practice by the following version. There are not other relevant articles published from 1994 to May 1997, as I tested in the preliminary literature review.

8.3. Search keywords and strings by review question

Given the particular nature of this systematic literature review, my search string will be composed only by the keywords “dynamic capabilities” and “dynamic capability”.

In addition, given the structure of the ISI Web of Knowledge database, these keywords will be searched in “Topic” and “Title” only.

However, the result of the preliminary literature review confirmed that these two keywords are relevant for the goal of my review questions.

9. SELECTION CRITERIA AND QUALITY APPRAISAL

9.1. Titles/Abstracts/References

Consistently with Lane et al. (2006) and Newbert (2007), I will include only papers that respect the following criteria:

- Only in scholarly published journals;
- From May 1997 to June 2009;
- No clear substantial irrelevance.

Given the nature of this systematic literature review, I won't include any additional filter at this stage.

9.2. Full text papers

With regards to the quality of full text papers, I will follow a three-step process:

a) I will codify all the articles in the sample using a scale of centrality built on Lane et al. (2006). Specifically, papers will be assessed depending on their degree of centrality in respect of the following levels:

1. High centrality: Theory or definition directly extended.
2. Medium centrality: Used for substantial theoretical or empirical development.
3. N/A: Used substantially in other ways.
4. Low centrality: Not substantially used in theoretical or empirical development.
5. Absence of centrality: Background or minor citation.

Only the papers with High, Medium, Low or N/A centrality will be retained.

- b) I will apply the set of quality criteria presented in Appendix 4. This table is built on a similar grid used by previous MRes/PhD students at the Centre for Business Performance at Cranfield SOM. I believe that it is suitable for my needs, with some minor amendments. I will exclude from the sample those papers that score 0 or 1 in more than one dimension (with the exclusion of N/A scores).
- c) Consistently with Lane et al. (2006), I will exclude papers from journals that published less than one article every two years in the timeframe (that is, with less than six papers in the sample). This is done under the assumption that the construct is not central to the conversation in the journal and thus the quality is presumably lower.

9.3. Other sources

None, consistently with Lane et al. (2006) and Newbert (2007).

10. DATA EXTRACTION

All selected references will be catalogued in a database using the framework presented in Appendix 5. I created this framework building on previous students' contributions and on the experience I gained during the preliminary literature review. An example is offered in Appendix 6.

11. SYNTHESIS

My first intention is to try to generate a systematic literature review of the dynamic capability view of the firm that includes a critical review of theoretical and empirical knowledge in the field. In doing this, I will try to prepare the ground for a potential articles. Therefore, I will try to include a chapter where the synthesis of the systematic literature review is offered in an article format. Second, I would like to build the theoretical foundations for my future research, investigating and highlighting potential research gaps too.

Chapter 3

DYNAMIC CAPABILITIES: WHAT DO WE ‘ACTUALLY’ KNOW? A SYSTEMATIC ASSESSMENT AND A RESEARCH AGENDA

Dynamic capabilities: What do we ‘actually’ know? A systematic assessment and a research agenda

Abstract

The dynamic capabilities approach is an increasingly popular framework in strategic management and other research streams. Though the academic debate is intense, no systematic analysis of the literature has been conducted. Therefore, building on validated methodologies, this paper presents a critical assessment of how dynamic capabilities have been conceptualized and utilized. Results from 105 papers in 16 journals show how theoretical and empirical works have developed from the same foundations but with low mutual influence. It is argued that this conversational misalignment has led to the reification of the construct and this is reducing its potential for empirical relevance. Suggestions for further research are also presented.

1. INTRODUCTION

The dynamic capabilities view of the firm is a curious one. Widely recognized as “the new touchstone firm-based performance-focused theory” (Arend & Bromiley, 2009: 75), it has attracted at least as many opponents as committed scholars. Debates around the topic continuously arise in the literature from many research streams. The interest is also evidenced by the increasing number of articles, special issues and conference presentations (Ambrosini & Bowman, 2009; Easterby-Smith et al., 2009) at “a rate of more than 100 per year” (Di Stefano et al., 2009, forthcoming). In contrast with the discussion about “cousin” themes, such as absorptive capacity and the resource base view (Lane et al. 2006; Newbert, 2007), dynamic capabilities are even at the centre of several literature reviews. However, two major limitations affect the debate. On one side it is still unclear what a dynamic capability precisely is and which concrete properties it has (Easterby-Smith et al., 2009)²¹. On the other side, after nearly two decades of research, the dynamic capability framework is still resistant to any managerial relevance (Ambrosini & Bowman, 2009)²². Other main critiques can be summarized as relative to “a lack of coherent theoretical foundations” (Arend & Bromiley, 2009: 75) and of accepted definitions (Wang & Ahmed, 2007; Zahra et al., 2006). Not surprisingly, Arend and Bromiley concluded their assessment of the field claiming that “if the dynamic capability view does not quickly develop a theoretical foundation, the field should move away” from it (2009: 87). In sum,

²¹ “At some point, however, the lack of agreement will impede progress on both the conceptual and empirical fronts. Meaningful conversation and further conceptual development of the framework require some common understandings. Empirical work may be misdirected and may be of dubious worth without a well-developed construct and a clear set of testable predictions” (Easterby-Smith et al., 2009: S3).

²² “If we understand how, in practice, dynamic capabilities are created, this would allow us to start developing guidance for managers about how they can deliberately develop dynamic capabilities. (...) Answering these questions would also facilitate our understanding of how contingent on the perceived and actual environment the effective deployment of certain types of dynamic capabilities is and, similarly, it would allow the design of managerial relevant prescriptions.” (Ambrosini & Bowman, 2009: 45).

the concept of dynamic capabilities is on the edge of the current academic agenda but, as observed by Ambrosini and Bowman (2009: 46):

“If the concept of dynamic capabilities is to be useful for strategic management as a field of study and for practitioners, it needs to be fully researched, and we will need to be able to answer positively the questions Collis was raising in 1994: ‘Where does this leave organizational capabilities? And how valuable are they as sources of sustainable competitive advantage?’ (Collis 1994, 150). ‘It depends’ was his answer then. Do we know much more now?”

This chapter aims to outline a positive answer for the question posed by Ambrosini and Bowman. However, the (extensive) knowledge of the literature obtained following the systematic review process at Cranfield School of Management (see the previous chapter) suggested me that the concept of dynamic capabilities could have been reified (Lane et al., 2006). To verify this, I firstly discuss the core foundations of the dynamic capabilities literature and their critiques. Then, I present the findings of a content and a thematic analysis on a specific sample of articles. Based on these, I also introduce and discuss a list of open research gaps.

Reification refers to a process “by which we forget the authorship of ideas and theories, objectify them (turn them into things), and then forget that we have done so” (Lane et al., 2006: 835). The recent observation by Arend and Bromiley that “these questions of foundation and clarity render the dynamic capabilities view susceptible of halo effects (...) (it) may become a talisman” (2009: 83) reinforces the hypothesis of the reification of the concept. As observed again by Lane et al. (2006: 833), “reification is problematic in theory building and testing because it means that some researchers have ceased to specify the assumptions that underlie the concept or construct and treat it like a general-purpose solution to an increasing range of problems”. An

important point to verify the reification of a concept (and its effects) is to test whereas scholars discussed its original meaning and dimensions or just fit it to their paper's needs or their personal preferences (Lane et al., 2006; Latour, 1987). Do scholars apply, extend and test Teece et al.'s original dynamic capabilities framework or simply take their (broad) definition as a fashionable panacea against “rapidly changing environments”? If the second, it is likely that the concept of dynamic capabilities has been reified. In reinforcement of this concern it is the case that research streams closely related to dynamic capabilities have already been found reified (e.g.: absorptive capacity in Lane et al., 2006), mystified (e.g.: organizational learning in Friedman et al., 2005) or still lacking strong empirical bases (e.g.: the resource based view in Armstrong & Shimizu, 2007, and Newbert, 2007). Since the literature on dynamic capabilities heavily incorporates insights from these “cousin” streams, it is likely to suffer similar problems.

Furthermore, although all previous reviews offer some discussions of the level of empirical support, to date no systematic assessment of the dynamic capabilities framework of it has been conducted. Taken together, the risk of reification and an unsystematic test of the empirical support generate some concerns about the content of what has been researched so far and therefore about its conclusions. If the concept is reified, it could be the case that our common understanding of dynamic capabilities is just the result of a theoretical patchwork of weakly related academic researches. For example, one of the risks of the reification is that the rigor and credibility of the literature on dynamic capabilities could be affected by too many “claims that earlier studies made claims or demonstrated evidence they did not” (Arend & Bromiley, 2009: 83).

To be clear, this is not to say that previous works' comments and critiques are not precise. As said, the majority of the concerns raised are valid, theoretically rigorous and academically challenging. Furthermore, although all reviews present some discussions of empirical works, they tend to be focus on conceptual “inconsistencies, overlapping definitions, and outright

contradictions” (Zahra et al., 2006: 2). In general, little is said about how the dynamic capabilities framework has been tested, extended or eventually disconfirmed. The only relatively large assessment in this sense is offered by Arend and Bromiley (2009). However, in addition to the fact that the size of the sample if not presented, their focus is more on the concerns posed by the type of empirical tests and unusual contexts (Arend & Bromiley, 2009) than on how the theoretical discussion is informed by empirical evidence and vice versa. Similarly, the only systematic assessment that is currently available, conducted by Di Stefano et al. (forthcoming), is more focused on bibliographical analyses of the theoretical origins of dynamic capabilities. Little is said about their empirical support. In addition Di Stefano et al. (forthcoming) narrowed their investigation on the main 40 papers in Management only. Although this is perfectly consistent with their focus on the conceptual core of dynamic capabilities, it means that the extensive literature on the topic has not been systematically assessed yet. Another example is the fact that some reviewers call for more quantitative research (Wang & Ahmed, 2007), whilst others for more qualitative papers (Ambrosini & Bowman, 2009), both suggesting that the opposite group is overlooked. What is actually missing, if anything?

If we accept all the critiques presented, as I do, we need to ask at least few, additional and important questions: a) if it is true that the field is full of inconsistencies and the empirical support is vague, what are we actually talking about when we use the expression “dynamic capabilities”? Which phenomenon do dynamic capabilities tackle or describe?; b) in their seminal paper, Teece et al. (1997: 530) called for a joint effort from researchers “in the fields of innovation, manufacturing, and organizational behaviour and business history”: What do we know from all these other areas? Does any research not from Management offer any helpful sparkle of clarity on dynamic capabilities?

Answering these questions is relevant given the raising intensity of the debate on dynamic capabilities. Whereas the framework is still emergent or already not useful for understanding

strategic change (as suggested by Arend and Bromiley, 2009: 87), a systematic assessment of its current (theoretical and empirical) development is fundamental. Eventually it could be reasonable to abandon the concept of dynamic capabilities (Arend & Bromiley, 2009), but I argue that the risk is, at this point, to “throw out the baby with the bath water”.

In line with this discussion, the main thesis of this chapter is that theoretical and empirical works have developed from the same foundations but with low mutual influence. In particular, whilst conceptual efforts have built in different ways on the work from Teece, Pisano and Shuen (1997), they have failed to incorporate important contributions from empirical works in fields different from Management. Conversely, empirical research is still building hypotheses and propositions mainly on the same foundations, but has not yet incorporated many theoretical developments. This conversational misalignment is even more surprisingly given the fact that few papers have really discussed and incorporated Teece et al.’s (1997) framework of processes, positions and paths. Most articles limited *ipso facto* their link to the literature to the definition of dynamic capabilities as “the firm’s ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments” (Teece et al., 1997: 516). As observed, this is likely to have led to the reification of the concept that, consequently, could have produced “some useful insights, but the insights can be idiosyncratic, since few researchers understand the assumptions and the definition of the construct they think they are using” (Lane et al, 2006: 835).

Therefore this chapter aims to complement prior efforts testing the level of reification and empirical support of the field. In doing this, I present a systematic literature review of dynamic capabilities with a methodology that follows closely those suggested by Lane et al. (2006), Di Stefano et al. (forthcoming) and Newbert (2007). The starting sample included 642 papers whilst

the final sample is composed by 105 papers from 16 peer-reviewed journals (Table 13)²³. In addition, a criterion of centrality (Lane et al., 2006) and the application of specific quality criteria, following the Cranfield process, guarantee a reasonable check of the bases on which this review is conducted. Overall, this sample represents a satisfying mix of journals with different quality ranking positions and scope.

Given the specific scope of an MRes thesis, I avoid doing further theory building at this stage. Thus I limit my conclusions to a set of open research gaps. Nevertheless, this chapter also suggests that future efforts could be invested in building an integrated model of dynamic capabilities common antecedents, idiosyncratic processes, and outcomes that may answer most of the current critiques.

The structure of the chapter is composed of five different and sequential parts. First, I described the key points of the core papers in the dynamic capabilities literature. Second, I outline a synthesis of prior reviews and their critiques. Third, I present and justify the methodology of the systematic review, based on the formal protocol composed in the previous chapter. Forth, I descriptively discuss the results of a content analysis on the selected sample. Finally, I conclude synthesising the findings of the systematic review with a broad description of main themes and a concise list of potential research gaps.

²³ Although this sample is not fully comprehensive and further extensions are planned, it is larger than those used by Lane et al. (2006; 288 then reduced to 64), Newbert (2007; 1,152 then reduced to 55) or Di Stefano et al. (forthcoming; 225 then reduced to 40).

Table 13: List of journals and article type

Source	C		M		QL		QT		R		S		TOTAL	
		%		%		%		%		%		%		%
<i>Strategic Management Journal</i> (4* + 4*)	9	9%	0	0%	1	1%	8	8%	2	2%	2	2%	22	21%
<i>Organization Science</i> (4* + 4*)	3	3%	2	2%	2	2%	3	3%	0	0%	0	0%	10	10%
<i>British Journal of Management</i> (3* + 4*)	4	4%	0	0%	3	3%	1	1%	1	1%	0	0%	9	9%
<i>Industrial and Corporate Change</i> (3* + 3*)	3	3%	1	1%	3	3%	0	0%	2	2%	0	0%	9	9%
<i>Int. J. of Oper. & Prod. Manag.</i> (3* + 3*)	1	1%	0	0%	4	4%	1	1%	1	1%	0	0%	7	7%
<i>I. J. of Technology Management</i> (3* + 2*)	2	2%	1	1%	3	3%	1	1%	0	0%	0	0%	7	7%
<i>Journal of Management Studies</i> (4* + 4*)	2	2%	0	0%	2	2%	2	2%	1	1%	0	0%	7	7%
<i>Technovation</i> (2* + 2*)	1	1%	0	0%	3	3%	3	3%	0	0%	0	0%	7	7%
<i>Academy of Management Review</i> (4* + 4*)	4	4%	0	0%	0	0%	0	0%	1	1%	0	0%	5	5%
<i>I. J. of Management Reviews</i> (3* + 3*)	1	1%	0	0%	0	0%	0	0%	4	4%	0	0%	5	5%
<i>J. of Inter. Business Studies</i> (4* + 4*)	0	0%	0	0%	2	2%	1	1%	0	0%	1	1%	4	4%
<i>J. of Operations Management</i> (4* + 4*)	2	2%	0	0%	0	0%	2	2%	0	0%	0	0%	4	4%
<i>R & D Management</i> (3* + 3*)	0	0%	0	0%	4	4%	0	0%	0	0%	0	0%	4	4%
<i>J. of Product Innovation Management</i> (4* + 4*)	1	1%	0	0%	1	1%	0	0%	0	0%	0	0%	2	2%
<i>Mis Quarterly</i> (4* + 4*)	1	1%	0	0%	0	0%	1	1%	0	0%	0	0%	2	2%
<i>Strategic Organization</i>	0	0%	0	0%	0	0%	0	0%	1	1%	0	0%	1	1%
TOTAL	34	32%	4	4%	28	27%	23	22%	13	12%	3	3%	105	100%

Notes: a) the first number in brackets represent the journal's Cranfield Ranking, whilst the second the ABS one; b) C=Conceptual; M=Mix methods; QL=Qualitative; QT=Quantitative; R=Review; S=Simulation.

2. FOUNDATIONS OF THE DYNAMIC CAPABILITIES FRAMEWORK

First of all, it is important to set the context for the review and to position the concept of dynamic capabilities within the set of its original characteristics (Lane et al., 2006). In order to do so, I briefly review the papers that represent the core structural content of the concept. As explained in the Protocol, I identified them through an extensive preliminary systematic review. However, my results are consistent with Di Stefano et al. (forthcoming)'s ones. These articles are presented in Table 14 and are now briefly summarized in turn²⁴.

Table 14: Core papers of the dynamic capabilities literature

<i>Year</i>	<i>Source</i>	<i>Author(s)</i>	<i>Title</i>
1997	<i>Strategic Management Journal</i>	Helfat, C. E.	Know-how and asset complementarity and dynamic capability accumulation: The case of R&D.
1997	<i>Strategic Management Journal</i>	Teece, D. J., Pisano, G., & Shuen, A.	Dynamic capabilities and strategic management.
2000	<i>Strategic Management Journal</i>	Eisenhardt, K. M., & Martin, J. A.	Dynamic capabilities: What are they?
2001	<i>Strategic Management Journal</i>	Makadok, R.	Toward a synthesis of the resource-based and dynamic-capability views of rent creation.
2002	<i>Organization Science</i>	Zollo, M., & Winter, S. G.	Deliberate learning and the evolution of dynamic capabilities.
2003	<i>Strategic Management Journal</i>	Winter, S. G.	Understanding dynamic capabilities.

²⁴ Here the papers from Helfat (1997) and Makadok (2001, extended in 2002) are not extensively summarized because of their narrower scope. In particular, Helfat (1997) presented the first empirical research based on the concept of dynamic capabilities even before the publication of the Teece et al.'s (1997) article. However, this paper didn't present any discussion of Teece et al.'s framework although it interestingly underlined the role of asset complementarities in a R&D context. Makadok's two articles, instead, introduced and developed a mathematical model that, in the aim of integrating the two perspectives, clarified some of the relationships between the resource-based view and dynamic capabilities. Specifically, he discussed how the phenomena of resource picking in the former and of capability development in the latter are complementary in creating and sustaining competitive advantage under some circumstances but substitutes in others. Nevertheless, this paper didn't consider in depth the Teece et al.'s framework. Taken together, although very interesting, these papers are consistent with the hypothesis of the reification of dynamic capabilities.

“Dynamic capabilities and strategic management” (Teece, Pisano & Shuen, 1997. Strategic Management Journal)

In this seminal paper Teece et al. (1997) introduced for the first time a full theoretical account of the dynamic capabilities framework²⁵. The framework was presented as a broad outline of an emerging theory about how organization can sustain their competitive advantage in a (rapidly) changing environment under a regime of Schumpeterian competition. Since the beginning, the concept was characterized in a particular way: the term “dynamic” referred “to the capacity to renew competences so as to achieve congruence with the changing business environment” (1997: 515), while the term “capabilities” was clearly referred to the role of strategic management in doing so. In addition, the unit of analysis of the framework was identified in the interrelationship among so called processes, positions and paths. In Teece et al.’s (1997: 518) words:

“We thus advance the argument that the competitive advantage of firms lies with its managerial and organizational processes, shaped by its (specific) asset position, and the paths available to it. By managerial and organizational processes, we refer to the way things are done in the firm, or what might be referred to as its routines, or patterns of current practices and learning. By position we refer to its current specific endowments of technology, intellectual property, complementary assets, customer base, and its external relations with suppliers and complementors. By paths we refer to the strategic alternatives available to the firm, and the presence or absence of increasing returns and attendant path dependencies. Our focus throughout is on asset structures for which no ready market exists, as these are the only assets of strategic interest”

²⁵ Although the concept had already been diffused in a working paper in 1990 and in a published article in 1994, it is only from the 1997’s paper that it started to gain momentum. In addition, the 1997’s version is the first that presented a full account of the framework with a deep discussion of its characteristics.

They then clarified that capabilities necessarily present a hierarchical structure. This means, for example, that capabilities at the shop floor, in R&D, in the executive board and the way things are put together have intrinsically different functions (1997: 518). They also specified that managerial processes “have three roles: coordination/integration (a static concept); learning (a dynamic concept); and reconfiguration (a transformational concept)” (1997: 518). Moreover, they pointed out that, in their conceptualization, managers are at least bounded rational. Finally claiming that the firm “is much more than the sum of its parts” (1997: 24), they assigned to dynamic capabilities a synergistic effect.

In sum, the dynamic capabilities view was offered to the academic community as a framework complementary to previous theoretical approaches such as competitive forces (Porter, 1980), strategic conflict (Shapiro, 1989) and the resource base view (Penrose, 1959; Rumelt, 1984; Wernerfelt, 1984). The complementary part was strongly assigned to the role of processes, positions and path in the generation of (sustainable) competitive advantage.

Surprisingly enough, the subsequent academic conversation has focused its attention on debates about the terminology, hierarchies of capabilities, or, at most, specific problems such as learning, capability development and so on. The focus on the interrelationships between processes, paths and positions has been largely put aside.

“Dynamic capabilities: What are they?” (Eisenhardt & Martin, 2000. *Strategic Management Journal*)

Arguably the most influential paper in the field after Teece et al.’s (1997), the perspective offered by Eisenhardt and Martin represented a clear breakthrough in the discussion, since they

depart considerably from what Teece and colleagues proposed. First of all, Eisenhardt and Martin (2000: 1106) took a clear stance observing that:

“First, dynamic capabilities consist of specific strategic and organizational processes like product development, alliancing, and strategic decision making that create value for firms within dynamic markets by manipulating resources into new value-creating strategies. (...) Second, these capabilities (...) exhibit commonalities across effective firms or what can be termed ‘best practice’. Therefore, dynamic capabilities have greater equifinality, homogeneity, and substitutability across firms (...). Third effective pattern of dynamic capabilities vary with market dynamism. When markets are moderately dynamic (...) dynamic capabilities resemble the traditional conception of routines. (...) In contrast, in high-velocity markets (...) they are simple, experiential, unstable processes that rely on quickly created new knowledge and iterative execution to produce adaptive, but unpredictable outcomes. Finally, well-known learning mechanisms guide the evolution of dynamic capabilities and underlie path dependence.”

In this sense, they affirmed that dynamic capabilities are well-know learning-based routines whose features are dependent on market dynamism. In their view dynamic capabilities present clear and measurable commonalities across firms, but are idiosyncratic in action. This is a well-defined position that fundamentally discards any relevance to the interrelationship between processes, paths and positions as defined by Teece et al. (1997). Schreyogg and Kliesch-Eberl (2007) even characterize these two positions as intrinsically different in the conceptualization of the term “dynamic”. In their well developed argumentation, they describe Eisenhardt and Martin’s approach as radically dynamized, whilst Teece et al.’s is seen as more integrative of both static and dynamic elements (Schreyogg & Kliesch-Eberl, 2007).

Notwithstanding the difference in terms of dynamization of the concept, the most important difference lies in the fact that Eisenhardt and Martin conceptualized dynamic capabilities as nothing more than an extension of the resource based view in dynamic environments. For these

scholars, competitive advantage still lies in the resource configuration and not, as in Teece et al. (1997), in dynamic capabilities themselves (2000: 1118). This difference may appear not really substantial. However, it is particularly important for the role given to the concept in theoretical models. As observed by Arend and Bromiley (2009: 76-78) about the difference between these two approaches: “If researchers do not roughly agree on the place of dynamic capabilities in their models, they may be giving the dynamic capability label to very different constructs”. The very fact that this distinction is not often recognized represents another sign of the potential reification of dynamic capabilities. Indeed, these papers are usually cited together with little or no discussion about their interrelationships and differences.

“Deliberate learning and the evolution of dynamic capabilities” (Zollo & Winter, 2002. Organization Science)

Classified by Schreyogg and Kliesch-Eberl (2007) as an approach based on innovation routines, the view suggested by Zollo and Winter characterizes dynamic capabilities as “learned and stable pattern(s) of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness” (2002: 340).

First of all this definition avoids “the near tautology of defining capability as ability” (2002: 340). Moreover, they suggest the presence of high level “learning mechanisms to develop a firm’s routines” (Schreyogg & Kliesch-Eberl, 2007: 923) as well as dynamic capabilities. These learning mechanisms are identified in experience accumulation, knowledge articulation and knowledge codification and are seen as example of second-order dynamic capabilities (2002: 340). In this respect, this paper has been the first to open the discussion of the hierarchical nature of dynamic capabilities since the seminal contribution from Collis (1994). However, notwithstanding its

value for the academic conversation, this conceptualization presents the same limitations of routines: as observed by Schreyogg and Kliesch-Eberl (2007: 924): “Whatever level we approach the essential logic (of routines) remains the same, namely that routines are likely to concurrently turn valuable capabilities into rigidities”.

In addition, although Zollo and Winter extended some parts of Teece et al.’s framework, they didn’t discuss it in terms of its core of processes, paths and positions. This leads the analysis to similar conclusion as for Eisenhardt and Martin (2000).

“Understanding dynamic capabilities” (Winter, 2003. Strategic Management Journal)

This paper from Winter is probably one of the most interesting, most cited and least challenged in the literature. It is basically impossible to find a paper that disagrees with any of the points made by Winter here. Furthermore, it is usually cited in support of critiques to this literature. Even the papers that challenged the dynamic capabilities view the most, such as Arend and Bromiley (2009) and Schreyogg and Kliesch-Eberl (2007), made a use of this Winter’s contribution for sustaining their claims.

Although there could be different reasons for this (strange) phenomenon, including political and relational ones as well as the worldwide recognized level of Winter’s thinking, in my understanding the most likely is the simplest. Winter successfully tackled the dynamic capability view at his core, although not addressing it in terms of processes, paths, and positions. Specifically, Winter developed a deep, although short and clear, analysis of the hierarchical view of capabilities in general. Moving from this starting point, he logically challenged the very existence and necessity of dynamic capabilities from different angles, including their cost. He concluded (2003: 994-995):

“Probably some of the mystery and confusion surrounding the concept of dynamic capability arises from linking the concept too tightly to notions of generalized effectiveness at dealing with change and generic formulas for sustainable competitive advantage. The argument here is that clarity is served by breaking this linkage. There is no way to hedge against every contingency. There is no general rule for riches. That investing in dynamic capabilities (of whatever order) can be a partial hedge against the obsolescence of existing capability, and can sometimes yield relatively sustainable advantage, is obvious from the nature of ‘dynamic capability,’ as defined here. (...) The concept of dynamic capability is a helpful addition to the tool kit of strategic analysis, but strategic analysis itself remains a matter of understanding how the idiosyncratic attributes of the individual firm affect its prospects in a particular competitive context.”

In particular, he observed how successful organizational change is not necessarily related to the presence of dynamic capabilities. Firms can change thanks to a so called “ad hoc problem solving” approach, depending on costs and benefits of the alternatives. In Winter’s words: “Ad hoc problem solving and the exercise of dynamic capabilities are two different ways to change – or two categories comprising numerous different ways to change” (2003: 993).

Moreover, observing that the terminological distinction between operational (zero-level) and dynamic capabilities is only locally defined²⁶ (2003), he raised a fundamental logical problem in the literature. If dynamic capabilities are only locally distinguishable from operational capabilities, how can anyone really claim to “have identified a dynamic capability” in any organizational domain? How can R&D be a dynamic capability at the absolute level? How can alliancing? How product development or innovation? From whatever side one observes the literature, it has to be noticed how, given Winter’s observation, dynamic capabilities can eventually exist only as

²⁶ The notion of definitional locality is explained by Winter in the following way: “It is worth noting that the ‘zero level’ is only locally defined. For a firm that does its own R&D, the producing and selling the product is zero-order activity. For an independent R&D lab, developing new products is zero order activity” (Winter, 2003: 992).

context-dependent phenomena. This is currently an open paradox in the literature, although Schreyogg and Kliesch-Eberl (2007) and Lavie (2006) indirectly offer some useful contributions for his resolution, as discussed later.

Notwithstanding this discussion, Winter's thinking is obviously largely consistent with the paper from Zollo and Winter (2002) and thus intrinsically subject to the same critiques. In sum, taking also in consideration that it challenged the common understanding of dynamic capabilities at the general level, this paper supports the hypothesis that the concept could have been reified.

Reprise

In this section I have briefly summarized the main points that compose the foundations of the dynamic capabilities view of the firm (Di Stefano et al., forthcoming). As shown by Di Stefano et al. (forthcoming), these key articles are comprehensibly among the most cited in the literature. Although one of this work's aims is to verify the level of reification of the concept of dynamic capabilities, I must observe how these papers are widely considered as interconnected by the scholarly community. Therefore, any useful synthesis of the field can't avoid taking them into account as key building blocks. Apart from Teece et al. (1997), this means that their lack of discussion in terms of processes, paths and positions has to be put in the right perspective. These articles are essentially compatible and focus on different sub problems. The only point of view from which they are orthogonal is their approach to the problem of capability dynamization, as discussed by Schreyogg and Kliesch-Eberl (2007). However, Schreyogg and Kliesch-Eberl (2007) also offer a solution to this problem in respect of which the remaining contributions are fully consistent. I will discuss this later.

For now, it is worth summarizing the key features of dynamic capabilities as emerged from their conceptual foundations. They are:

- Dynamic capabilities are high level (strategic) management processes through which an organization can eventually change (Teece et al., 1997; Winter, 2003).
- Dynamic capabilities can present strong or weak routine-based components, developed and rooted in learning mechanisms, depending on environmental dynamism (Eisenhardt & Martin, 2000; Zollo & Winter, 2002).
- However, dynamic capabilities are only locally defined and context-dependent. Thus they represent a class of intentional (managerial) asset structures that modify normal routines and the resource base (Teece et al., 1997; Winter, 2003; Zollo & Winter, 2002). They exhibit commonalities across firms but in action they are fundamentally idiosyncratic (Eisenhardt & Martin, 2000).
- Dynamic capabilities can potentially lead to competitive advantage depending on the resource configuration, the complementary assets (Eisenhardt & Martin, 2000; Helfat, 1997; Teece et al., 1997) as well as the strategic alternatives that an organization has (Teece et al., 1997). In addition, they are bounded by prior choices and path dependencies (Eisenhardt & Martin, 2000; Teece et al., 1997; Zollo & Winter, 2002).
- From this perspective, the relationship between dynamic capabilities and competitive advantage lies in different mix of resource picking and capability development activities, depending on the circumstances (Makadok, 2001, 2002).

3. CRITIQUES TO THE DYNAMIC CAPABILITIES VIEW OF THE FIRM

While in the previous section I summarized the core characteristics of dynamic capabilities that are widely recurrent across the literature, I now list and exemplify the main critiques that other reviews (Table 15) have already reported. On one side, the aim is to offer a clear picture of conceptual strengths and weaknesses of the dynamic capabilities framework as they commonly appear to the academic community. On the other, these two sections build the ground on which I will incorporate the systematic review.

Table 15: Published reviews on dynamic capabilities

<i>Year</i>	<i>Source</i>	<i>Author(s)</i>	<i>Title</i>
2006	<i>Journal of Management Studies</i>	Zahra, S. A., Sapienza, H. J., & Davidsson, P.	Entrepreneurship and dynamic capabilities: A review, model and research agenda.
2007	<i>International Journal of Management Reviews</i>	Wang, C. L., & Ahmed, P. K.	Dynamic capabilities: A review and research agenda.
2009	<i>International Journal of Management Reviews</i>	Ambrosini, V., & Bowman, C.	What are dynamic capabilities and are they a useful construct in strategic management?
2009	<i>British Journal of Management</i>	Easterby-Smith, M., Lyles, M. A., & Peteraf, M. A.	Dynamic capabilities: Current debates and future directions
2009	<i>Strategic Organization</i>	Arend, R. J. and Bromiley, P.	Assessing the dynamic capabilities view: spare change, everyone?
<i>Forthcoming</i>	<i>Industrial and Corporate Change</i>	Di Stefano, G., Peteraf, M.A., Verona, G.	Dynamic capabilities deconstructed: A bibliographical investigation into the origin, development, and future directions of the research domain.

Table 16, integrating Arend and Bromiley's (2009) list, presents all main prior critiques.

The problems in the literature could be summarized in four broad areas: a) Lack of theoretical foundations; b) Nature and definitions; c) Empirical support and managerial relevance; d) Relationships with (sustainable) competitive advantage and performance.

Although these categories would need to be fully exploited for a publishable paper, for the scope of the MRes thesis is important to focus the attention on two important points.

First, although Di Stefano et al. (forthcoming) deeply investigated the theoretical antecedents of the dynamic capabilities view of the firm, the field still suffers of mixing assumptions in terms of (bounded) rationality, equilibrium conditions and market efficiency (Arend & Bromiley, 2009). Although it is clear (Di Stefano et al., forthcoming) that its conceptual roots lie in evolutionary economics (Nelson & Winter, 1982), resource based view (Wernerfelt, 1984), knowledge based view (Kogut and Zander, 1992), transaction cost economics (Williamson, 1975), behavioural theory (Cyert and March, 1963) and the positioning view (Porter, 1980), it is less obvious how all these different perspectives can be merged together. Critiques have also pointed out how these theories often build from completely different philosophical positions (Nightingale, 2008). This is an open problem in the literature and any future research work needs to clarify on which foundations their conclusions are built. Otherwise, the risk is to produce a piece of (empirical or conceptual) research that is not useful for advancing the academic conversation. In this sense, given recent efforts in bridging dynamic capabilities and particular streams of Austrian Economics (Sambamurthy et al., 2003; Teece, 2007), the work of Sautet (2000), based on Kirzner's thinking (1999, 2009), could maybe offer some insights for more robust theoretical foundations.

Table 16: Main critiques to dynamic capabilities

<i>Critiques</i>	<i>Reference</i>	<i>Example</i>
Lack of theoretical foundations	Arend & Bromiley (2009)	"Causal mixing of assumptions of rationality, market efficiencies, etc. across papers. Creates inconsistencies of assumptions across papers explaining the same view" (Arend & Bromiley, 2009: 81).
Unclear nature of DCs	Ambrosini & Bowman (2009); Arend & Bromiley (2009); Easterby-Smith et al. (2009); Wang & Ahmed (2007)	Are DCs structured and persistent (Zollo & Winter, 2002) or emergent and evolving (Rindova & Kotha (2001)? Are DC routine-based (Arend & Bromiley, 2009; Eisenhardt & Martin, 2000)? How are they created (Ambrosini & Bowman, 2009)? Are they firm-specific (Ambrosini & Bowman, 2009) or common across firms (Eisenhardt & Martin, 2000)? Definitions tend to be overly dependent on local conditions (Arend & Bromiley, 2009; Collis, 1994). It is unclear how DCs modify the resource base (Easterby-Smith et al., 2009). The relationships of DCs with luck or exogenous change is unspecified (Ambrosini & Bowman, 2009).
Mixed use of definitions and terminology	Ambrosini & Bowman (2009); Arend & Bromiley (2009); Easterby-Smith et al. (2009); Di Stefano et al. (forthcoming); Schreyogg & Kliesch-Eberl (2007); Wang & Ahmed (2007); Williamson (1999), Winter (2003), Zahra et al. (2006)	Definitions tend to be tautological, overly inclusive and elastic (Arend & Bromiley, 2009). A lack of a clear set of definitions could make difficult for the academic community to expand (Di Stefano et al., forthcoming; Easterby-Smith et al., 2009). DCs tend to be present everywhere without definitional boundaries (Arend & Bromiley, 2009). Contradictory conceptualization of the dynamization dimension of DCs (Ambrosini & Bowman, 2009; Schreyogg & Kliesch-Eberl, 2007; Wang & Ahmed, 2007).
Logical inconsistencies and contradictions in the use of the DC concept	Ambrosini & Bowman (2009); Arend & Bromiley (2009); Collis (1994); Di Stefano et al. (forthcoming); Easterby-Smith et al. (2009); Wang & Ahmed (2007); Winter (2003); Zahra et al. (2006)	There is no logical need to restrict DCs to dynamic environments (Arend & Bromiley, 2009; Easterby-Smith et al., 2009). A hierarchical logic in capability development could be a never-ending chain (Collis, 1994; Winter, 2003). It is not clear how DCs differ from standard capabilities and processes (Ambrosini & Bowman, 2009; Wang & Ahmed, 2007). It is unclear if a firm can have only one or more DCs and how they eventually coexist in practice (Ambrosini & Bowman, 2009; Easterby-Smith et al., 2009).
Problem in the operationalization	Arend & Bromiley (2009); Easterby-Smith et al. (2009); Zahra et al. (2006)	The concept is generally not explicated in empirical studies (Wang & Ahmed, 2007). It is still difficult to understand how to identify and measure DCs. As definitions tend to be tautological, empirical works tend to select post hoc DCs. This implies a multi-level bias in the sampling process (Arend & Bromiley, 2009). The context of application is often unusual (Arend & Bromiley, 2009) or too much unbalanced towards high-tech environments (Easterby-Smith et al., 2009).

<i>Critiques</i>	<i>Reference</i>	<i>Example</i>
Unclear empirical support and managerial relevance	Ambrosini & Bowman (2009); Arend & Bromiley, 2009; Williamson (1999)	It is not clear if we are in need of more quantitative studies (Arend & Bromiley, 2009; Wang & Ahmed, 2007) or qualitative (Ambrosini & Bowman, 2009). DCs still lack practical implications.
Unclear relationship of DCs with competitive advantage/performance and competition in general	Ambrosini & Bowmn (2009); Arend & Bromiley (2009); Easterby-Smith et al. (2009); Wang & Ahmed (2007); Williamson (1999)	
Halo effect of past research	Arend & Bromiley (2009)	"For example, Zott's (2003) discussion of timing as an important element explaining performance heterogeneity is well know in game theory: Interpreted in citing works as a choice but not modelled as one in his paper" (Arend & Bromiley, 2009: 81).
Incompleteness	Arend & Bromiley (2009); Easterby-Smith et al. (2009); Salvato, 2003	"Need to explain then not to change. Need to align with a theory of the organization. Need to specify pricing, opportunity costs, competitive equilibrium of multiple parties holding DCs" (Arend & Bromiley, 2009: 81). "Need to address ACME (awareness for change; capability to change expected; motivation for change; executed efficiency and effectiveness realized) to be a better view" (Arend & Bromiley, 2009: 81). The DC view still lacks an underlying theory at micro-level (Easterby-Smith et al., 2009; Salvato, 2003).
Limit of effect	Arend & Bromiley (2009); Easterby-Smith et al. (2009)	"The possibility of weak ties between DCs and successful change. Human capacity for change (in firm and in its supply chain), bounded rationality, etc. limit the ability to realize any changes intended" (Arend & Bromiley, 2009: 81)

Note: DCs=dynamic capabilities

Second, in the field there is a still growing “terminological flotilla” (Dosi et al., 2000) that could hinder any potentiality for future developments. In this sense, I fully agree with the critiques from Arend and Bromiley (2009) and Easterby-Smith et al. (2008) outlined in the introduction. At the same time, however, it is worth noting how empirical works have been mainly based on the interconnection between Teece et al. (1997) and Eisenhardt and Martin’s (2000) definitions. If there is something that seems accepted is that dynamic capabilities are high-level managerial processes through which organizations intentionally try to change their resource base (Ambrosini & Bowman, 2009). Maybe it is valuable to fully exploit this basic understanding before to build new theorizations. For example, open questions are: Why are these managerial processes created? At which point of an organization’s life? How do they differ from (operational) capabilities in practice? How do they influence, once established, long and short term performance?

I will discuss these points more in depth later in the paper when I synthesise empirical works on dynamic capabilities. Now, before to report the results of my systematic literature review, it is time to give a full account of its methodology.

4. A SYSTEMATIC LITERATURE REVIEW OF THE DYNAMIC CAPABILITIES VIEW OF THE FIRM

4.1. How has the concept of dynamic capabilities been used?

In order to assess the level of the reification and the empirical support of the dynamic capabilities framework, I identified a sample of articles building my methodological steps on the approaches used by Lane et al. (2006), Di Stefano et al. (forthcoming) and Newbert (2007)²⁷. Overall results support the hypothesis that dynamic capabilities has become a taken-for-granted concept in Management studies.

In particular, I followed seven main steps. Firstly I adapted the first part of Newbert's set of criteria to the specific characteristics of my domain of interest. Main differences from his methodology are that a) I searched on the ISI Web of Science database only, consistently with Lane et al. (2006) and Di Stefano et al. (forthcoming)²⁸; b) I used only two main keywords ("dynamic capability" and "dynamic capabilities"), under the assumption that they were enough

²⁷ Although important, I didn't test the level of cohesion of the academic community in the reification analysis (Lane et al., 2006). This was due to problems with the specific software for this analysis (Sitkis, created by Schildt, 2002). However, the results from the test on the utilization of the dynamic capabilities framework are even stronger than those obtained by Lane et al. (2006) on absorptive capacity. Therefore, with respect to the scope of this MRes dissertation, the conclusion are not substantially affected.

²⁸ This methodological choice is fully explained and justified in the Protocol (see the previous Chapter). There are few (3) exceptions since either ISI Web of Science didn't find few important articles or they were excluded by Lane et al.'s restrictive criteria. Given the process explained in the Protocol, I utilized and justified the reference when too important to be missed. This problem represents a clear limitation of searches made on one database only, as in Lane et al. (2006) and Di Stefano et al. (forthcoming). Although this thesis tries to follow closely Lane et al.'s methodology, I thought that I would have been unwise not to make few, justified exceptions. In the case where this chapter becomes the basis for an article, I will have to resolve these (important) limitations. For this reason, I will probably extend the official sample to other databases. Unfortunately this was not possible here because it would have raised the final number of papers to at least 200 papers (I did a preliminary check on this), thus exceeding the scope of this review. However, apart for these few exceptions, the preliminary literature review done in the scoping study gave me the confidence that the current final sample is a good representation of the whole literature.

to bound the literature of interest, consistently with Di Stefano et al. (forthcoming). The following is my set of criteria in detail²⁹:

- Search for published journal articles only, between 1997 and 2009³⁰.
- Search the ISI Web of Science database
- Ensure substantive relevance by requiring that selected articles contain at least one primary keyword in their title or topic (“dynamic capability” OR “dynamic capabilities”).
- Ensure substantive relevance by reading all remaining titles and abstracts for substantive context.

This first step returned 642 papers in total out of which 59 were eliminated because clearly irrelevant. This left 583 papers in the sample.

Secondly, I downloaded all 583 articles and I applied a revised version of the criteria used by Lane et al. (2007) in their review. Specifically, I classified all papers in the following way³¹:

- *How central the concept is to the paper's core topic.* All papers were classified in five categories: 1) the paper directly extends the theory or the definition; 2) the concept is used for substantial theoretical or empirical development; 3) the construct is used substantially in other ways³²; 4) the construct is used not substantially for theoretical or empirical

²⁹ An extensive description of these criteria and their rationale is discussed in the Protocol in the previous chapter.

³⁰ I run the search on the 22nd of June 2009.

³¹ In order to classify the articles, I firstly downloaded all of them and then I checked their content in details using sub-keywords in Adobe Acrobat. When the paper was not available online in PDF format I requested it through an interlibrary loan and read it in depth.

³² This is a residual category for papers that I couldn't classify under any other label.

development; 5) the paper uses the concept in the background or as a minor citation with little or no discussion.

I then pragmatically adapted Lane et al. (2006) excluding the 238 papers that I classified in the fifth category. This reduced the sample to 345.

Third, consistently with Lane et al. (2006) I applied a cut-off point represented by the exclusion of all articles appeared in journals that published less than six papers in the timeframe. As in Lane et al. (2006: 839), “an average of one (dynamic capabilities) paper every two years was the minimum needed to consider the construct a part of a journal’s research domain”. Thus this is likely to have increased the scholarly quality control on the construct. This step excluded from the sample additional 168 papers.

Forth, following Lane et al. (2006), I focused my attention on the papers that used the concept substantially, thus excluding other 71 articles.

Fifth, I applied the Cranfield quality criteria, as developed in the formal Protocol, and I excluded an additional group of three papers that didn’t pass through them. A breakout of the articles that were eliminated is offered in Table 17.

Table 17: Papers eliminated from the final sample

Number of papers not included in the review sample	
Not substantially used in theoretical or empirical development (71 papers; 12,2%)	71
In journals with <6 papers + lacking of quality criteria (171 papers; 29,2%)	168 + 3
Background or minor citation (238 papers; 40,6%)	238

Sixth, similarly to Lane et al. (2006), I re-included into the sample two papers, Arend and Bromiley (2009) and Di Stefano et al. (forthcoming), that weren't previously included due to time lags. This led the final sample to a number of 105 central articles.

Finally, I classified the obtained group accordingly to these following additional dimensions:

- *The number of dimensions of the dynamic capability framework that the paper discusses.* This analysis seeks to identify how the original framework has been understood and utilized. Similarly to Lane et al. (2006), since the dynamic capabilities framework includes three dimensions (processes, positions, and paths), I classified all papers in respect of the eight possible combinations. I considered a discussion of all three dimensions as evidence of the highest level of understanding and vice versa.
- *The type of paper.* In this case, I departed from Lane et al. (2006) because of the intrinsic difference of the literature on dynamic capabilities from the absorptive capacity one. A hypothesis would have been to classify papers in respect of their characterising dynamic capabilities as routine-based or not. However, the conceptual complexity of this literature suggested me to avoid this exercise. Indeed, many articles included directly or indirectly some routine-based comments with little or no discussion. Therefore, I simply classified all papers in respect of their type (Conceptual, Qualitative, Quantitative, Mixed methods, Simulation, Review). This automatically represented the safest way of filtering them for analysing the empirical support, differently from what Newbert (2007) did.

Consistently with Lane et al. (2006: 840), I used “very generous category definitions for each of these classifications to make the categories as broad as possible and, thus, to make this a conservative test of reification”. Consequently, the second and the third most substantive categories included any paper that mentioned dynamic capabilities in substantial ways in their

theoretical or empirical development (Lane et al., 2006). Similarly, with regards to the dimensions of the original framework, “only one mention of a given dimension was needed to have a paper coded” in it (Lane et al., 2006: 840).

Results

Table 18 shows the results from this first part of the reification test. Interestingly, out of 585 papers³³ only 105 (17,9% of the total set) made a substantial use of the concept of dynamic capabilities. Even more surprisingly, only 3,8 percent of the studies (22 papers) discussed all dimensions of the original Teece et al.’s framework (processes, paths, positions), whilst just an additional 9,7 percent (57 papers) presented at least a broad mention of one or two of them. However, even clearer insights are offered by the breakdown of results. In particular, out of the 22 papers that discussed processes, paths and positions, none made use of quantitative methods. Furthermore (and this is perhaps the most surprising result of this test), only 3, qualitative, papers made a direct empirical test of the original dynamic capabilities framework (Ma & Loeh, 2007; Montealegre, 2002; Mosey, 2005). This means than, overall, the dynamic capability framework, proposed by Teece et al. in 1997 in the most cited paper in Management studies of the last decade, has been directly tested and operationalized only in 0.5 percent of the global literature on the topic. Taken together, these first results of the content analysis strongly suggest that dynamic capabilities have become a reified concept.

³³ I will use 585 as the basis for the calculation of percentages, in order to be consistent with the way results were calculated in Lane et al. (2006). Nevertheless, there is a major difference in the process since Lane et al. (2006) applied their cut-off point of minimum two papers per years *before* to exclude papers in the last category. I instead decided to apply it *after* the check for the use of the concept as background citation. Obviously, this difference has an effect only on the way percentages are calculated. In terms of the composition of the final sample the application of these two filters doesn’t make any substantial difference. In addition, the dimension of my final sample sufficiently compensates for this methodological difference, since it is 65% bigger than Lane et al.’s one.

Table 18: Reification matrix

		Number of papers emphasizing each dimension of the construct										
		All three dimensions	Processes	Positions	Paths	Processes and Positions	Processes and Paths	Positions and Paths	None discussed	Type		
Number of papers for each construct usage	Theory or definition directly extended (25 papers; 4,3%)	8	2	0	0	2	2	0	1	15	2.6%	Conceptual
		0	0	0	0	0	0	0	2	2	0.3%	Qualitative
		0	0	0	0	0	0	0	1	1	0.2%	Quantitative
		0	0	0	0	0	0	0	0	0	0.0%	Mixed
		1	0	0	0	0	0	0	0	1	0.2%	Simulation
		2	0	0	0	0	0	2	0	2	6	1.0%
	Used for substantial theoretical or empirical development (70 papers; 12,0%)	3	4	1	0	1	2	1	3	15	2.6%	Conceptual
		4	5	1	0	4	3	0	8	25	4.3%	Qualitative
		0	8	2	0	4	1	0	6	21	3.6%	Quantitative
		2	2	0	0	0	0	0	0	4	0.7%	Mixed
		0	0	1	0	0	0	0	1	2	0.3%	Simulation
		1	1	0	0	0	1	0	0	3	0.5%	Review
	Others, with substantial use (10 papers; 1,7%)	1	2	0	0	0	0	0	1	4	0.7%	Conceptual
		0	0	0	0	1	0	0	0	1	0.2%	Qualitative
		0	0	0	0	1	0	0	0	1	0.2%	Quantitative
0		0	0	0	0	0	0	0	0	0.0%	Mixed	
0		0	0	0	0	0	0	0	0	0.0%	Simulation	
0		1	1	0	1	0	0	1	4	0.7%	Review	
Total	22	25	6	0	14	11	1	26	105	17.9%	17.9%	
	3.8%	4.3%	1.0%	0.0%	2.4%	1.9%	0.2%	4.4%				

At this stage it would be hard to disagree with the world of Lane et al. (2006: 841): “Including a construct as a ritual cite in a few papers may do no harm. However, when a construct is perceived as very important to a field because of high citation frequency, and when the vast majority of the citations turn out to be ritual, then the true importance of the construct, the extent to which its assumptions have been tested, and its contributions to a field are overstated”.

However, although these intermediate conclusions tend to confirm the strong critiques offered by Arend and Bromiley (2009), it is worth noting the other side of the coin. At this stage, it could be equally likely that the concept is still emergent and in need of a bigger effort from scholars in the field. As said, the risk is to move away from a potential fruitful idea without too much negative evidence of the contrary.

Furthermore, the theoretical conversation about this framework is quite intense but focused on single parts of it. Thus it could be the case that the literature on dynamic capabilities only

urges to be fully developed and properly tested. In doing this, it should of course incorporate those theoretical advances already proposed. In this sense, the fact that only 1 paper operationalized Teece et al.'s framework in Management studies (from Organization Science), whilst the other 2 in Operations studies (from the International Journal of Technology Management and the International Journal of Operations & Production Management) indirectly supports the thesis that there is a conversational misalignment between theoretical and empirical works. I will come back to this point later in the chapter.

Nevertheless, this first test strongly supports the reification of the concept of dynamic capabilities. Therefore, future research should carefully verify and justify the assumptions on which they utilize dynamic capabilities in order to avoid perpetuating the confusion and to gain real, internally valid results.

4.2. Which additional insights does the final sample of this review offer?

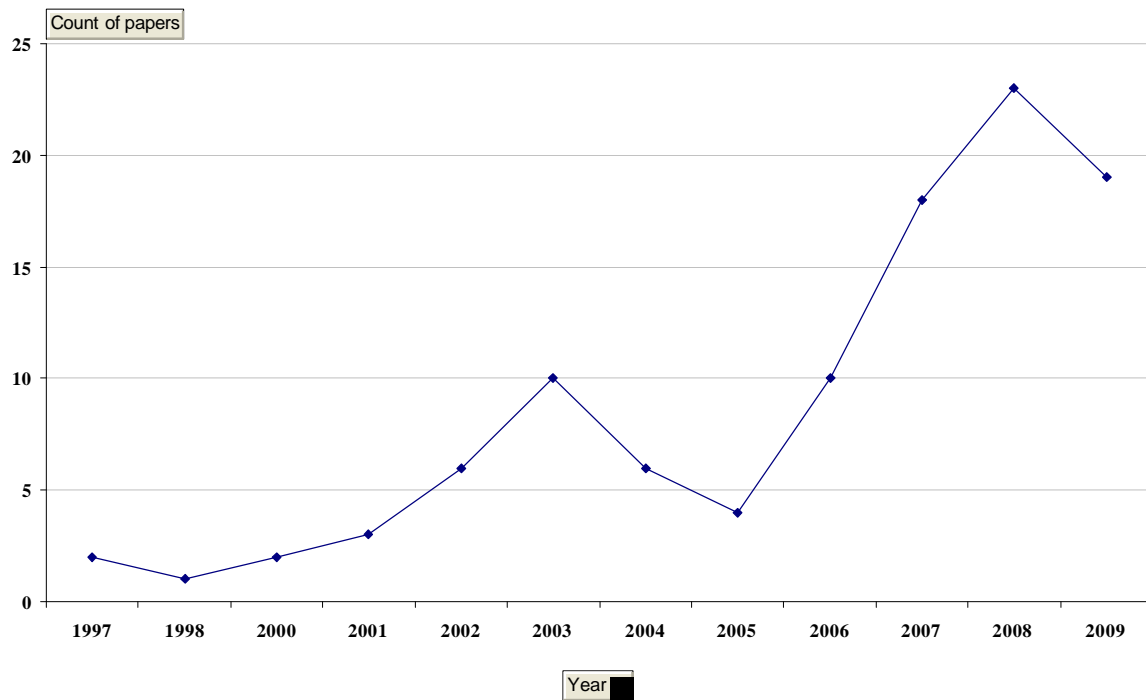
The previous test strongly suggested that dynamic capabilities have become a taken-for-granted concept. I now conclude this section discussing some additional information from the final sample (Appendix 7) of this systematic review. In order to do so, I utilize content analysis as a method with a particular focus on the locus of operationalization of empirical research. The aim is to verify if there are areas offering potential for further research and to challenge some common assumptions in the literature. Findings show interesting research gaps and confirm the reification of dynamic capabilities.

First of all, Figure 5 clearly shows how dynamic capabilities have been gaining real momentum since 2006³⁴. On one side the trend is influenced by time lag effects in publication. A

³⁴ In Appendix 8, there is an equivalent graph based on the whole sample of 644 papers. At the net of minor differences, I suggest that the final sample is a good time-based representation of the whole population.

concept obviously needs a minimum accumulation of shared knowledge before it starts to be widely utilized.

Figure 6: Papers in the final sample by year



On the other side, the breakdown of the curve discovers even more interesting insights (Table 19). Given the relative absence of theoretical contributions in 2004 and 2005, it is not surprising that most of the empirical articles published from 2006 on (36 papers) are still using (at most) the four foundational papers highlighted in Section 2. It will take a while before that the literature accumulates a sufficient body of knowledge that incorporates more recent theoretical developments (22 papers in the same period).

Table 19: Articles in the final sample by type and year

<i>Type</i>	<i>Year</i>															<i>subtot 2</i>	TOTAL
	<i>1997</i>	<i>1998</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>subtot 1</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>Forthc.</i>			
<i>C</i>	1		1	2	2	5	1		12	4	6	6	6		22	34	
<i>M</i>								1	1		1		2		3	4	
<i>QL</i>		1	1		2	2	4	3	13	1	3	6	5		15	28	
<i>QT</i>	1			1	1	1	1		5	3	5	7	3		18	23	
<i>R</i>						1			1	2	3	3	3	1	12	13	
<i>S</i>					1	1			2			1			1	3	
TOTAL	2	1	2	3	6	10	6	4	34	10	18	23	19	1	71	105	

Note: C=Conceptual; M=Mix methods; QL=Qualitative; QT=Quantitative; R=Review; S=Simulation.

Preliminary conclusions of these data are twofold: First, although it could eventually be that dynamic capabilities have already achieved the top of their life-cycle curve, it is more probable that they haven't. This confirms to a certain extent those claims that the field is still emerging (e.g.: Helfat & Peteraf, 2009). Therefore, Arend and Bromiley's (2009) valid critiques should be put in the right perspective: At least, it is too early to conclude that "the field should move away from the dynamic capabilities view" (Arend & Bromiley, 2009: 87). Second, the data suggest the presence of a conversational misalignment, as I put forward in the introduction. This represents another soft-proof that the concept is reified since, at this stage, theoretical and empirical works are proceeding from the same foundations (Teece et al., 1997; Eisenhardt & Martin, 2000; Zollo & Winter, 2002; and Winter, 2003) but with low mutual influence.

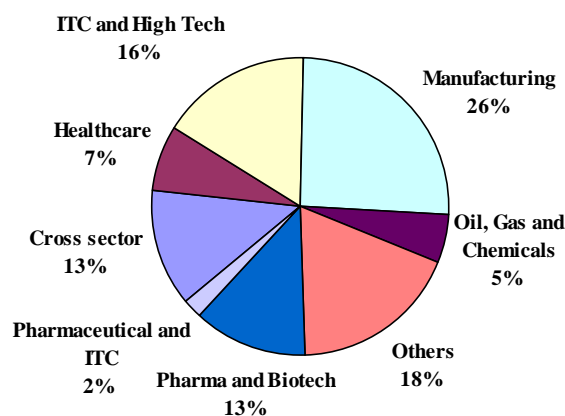
Other informative insights are relative to the content and the features of the empirical papers. Here I will consider all contributions that passed through the set of criteria previously presented. The aim is to verify if there are useful contributions for the concept of dynamic capabilities, though its use was at least not perfectly grounded, given the reification.

Firstly, it is worth noting how the debate about the need of more qualitative or quantitative studies ends in a draw (Ambrosini & Bowman, 2009; Arend & Bromiley, 2009; Wang & Ahmed, 2007). The difference between these two groups is not really relevant since the sample included 28 qualitative contributions and 23 quantitative. Vice versa, there are opportunities for

developing methodologies based on mixed methods (4 papers only so far). The fact that some recent empirical studies published on dynamic capabilities creatively building on them (e.g. Salvato, 2009) suggests that these methodologies could be fruitful for future research (Easterby-Smith et al., 2009).

Secondly, contrarily to what commonly believed (Easterby-Smith et al., 2009), only 31 percent of empirical research has been operationalized in so-called highly dynamic environments such as ICT, High-Tech, Pharmaceutical and Biotech (Figure 6). Similarly, it doesn't seem fully acceptable the critique that dynamic capabilities has been mostly contextualized in unusual settings (Arend and Bromiley, 2009), because the sample is indeed quite well balanced. However, since this chapter represents the first systematic assessment of the dynamic capability literature, these results indirectly confirm to a certain extent the concerns expressed in the introduction. It is likely that, when it turned to empirical studies, previous reviews unwillingly incorporated insights from papers that didn't really operationalize dynamic capabilities.

Figure 7: Paper in the sample by context type



Third, Table 20 presents some clear research gaps³⁵. Although dynamic capabilities have been strongly identified with large and multinational enterprises (e.g. Augier & Teece, 2007), recent years have seen the emergence of several contributions on their role in new and SME firms (e.g.: Bessant et al., 2001; Bierly & Daly, 2007; Doving & Gooderham, 2008; Garcia-Muina & Navas-Lopez, 2007; MacPherson et al, 2004; McKelvie & Davidsson, 2009; Mosey, 2005; Newbert et al., 2008; Sawers et al., 2008). However, to date, just 9 articles have operationalized dynamic capabilities in SMEs and only 2 in new firms. This result reinforces the concerns about a current misalignment between theoretical and empirical research.

Furthermore, although dynamic capabilities has been widely discussed as related to phenomena such as alliancing or partnerships (e.g.: Teece et al., 1997; Eisenhardt & Martin, 2000), to date only 4 papers have conducted substantial investigations at the network level. Finally, the small number of contribution operationalising dynamic capabilities as a multilevel concept confirms the lack of theoretical and empirical development at the micro-level (Easterby-Smith et al., 2009; Salvato, 2003). The fact that articles at this level present quite fruitful insights (Azadegan et al., 2008; Rothaermel & Hess, 2006; Salvato, 2009) simply demonstrates the potential for further research in this sense.

³⁵ In this figure the total is 49 although the final sample contains 55 empirical papers. The difference is given by 6 additional works in very particular contexts such as, for example, universities or foundations. In order to maintain the Table as clearer as possible they have not been included.

Table 20: Empirical research by size and level of analysis

<i>Size</i>	<i>Level</i>				TOTAL
	<i>Organizational</i>	<i>Industry</i>	<i>Network</i>	<i>Multilevel</i>	
<i>Cross size</i>	9	0	2	1	12
<i>Medium/Large</i>	24	2	0	2	28
<i>SMEs</i>	7	0	2	0	9
TOTAL	40	2	4	3	49

<i>Age</i>	<i>Level</i>				TOTAL
	<i>Organizational</i>	<i>Industry</i>	<i>Network</i>	<i>Multilevel</i>	
<i>Cross age</i>	16	0	4	2	22
<i>Mature</i>	22	2	0	1	25
<i>New</i>	2	0	0	0	2
TOTAL	40	2	4	3	49

Finally, taken together, these data on size and age identify at least other three research gaps in terms of research settings in cross-age medium/large and new organizations as well as in mature SMEs (Table 21).

Table 21: Empirical papers by size and age

<i>Size</i>	<i>Type</i>	<i>Cross age</i>		<i>Mature</i>		<i>New</i>		TOTAL	
			<i>%</i>		<i>%</i>		<i>%</i>		<i>%</i>
<i>Cross size</i>	M	2	4%	0	0%	0	0%	2	4%
	QL	4	8%	0	0%	0	0%	4	8%
	QT	6	12%	0	0%	0	0%	6	12%
subtotal		12	24%	0	0%	0	0%	12	24%
<i>Medium/Large</i>	M	0	0%	1	2%	0	0%	1	2%
	QL	2	4%	17	35%	0	0%	19	39%
	QT	2	4%	6	12%	0	0%	8	16%
subtotal		4	8%	24	49%	0	0%	28	57%
<i>SMEs</i>	QL	1	2%	1	2%	0	0%	2	4%
	QT	5	10%	0	0%	2	4%	7	14%
subtotal		6	12%	1	2%	2	4%	9	18%
TOTAL		22	45%	25	51%	2	4%	49	100%

Note: C=Conceptual; M=Mix methods; QL=Qualitative; QT=Quantitative; R=Review; S=Simulation.

In sum, this additional content analysis shows how the dynamic capabilities literature is a still emerging field and it is full of opportunities. However, it is important to recognize that its

theoretical development has not reached the maturity yet and therefore it is still affected by inconsistencies and confusion. Furthermore, broadly speaking, the empirical support is still limited and several areas offer interesting opportunities for further research. Indeed, it is worth noting how theory building has not yet fully incorporated new insights from empirical works and vice versa. This is mainly due to time lag effects and the growing reification of the original framework. In order to start resolving this conversational misalignment, the next section present a thematic synthesis of what we “actually” know from these two streams of literature.

4.3. Thematic findings of the systematic literature review

In this section I present the results of a thematic analysis on the content of the papers' final sample. Thematic analysis "can provide crucial insights to scholars in their review of 'what is known' to guide their research" (Boyatzis, 1998). Findings show how theory building and empirical research share several common themes but with low mutual influence. In addition, the analysis clarifies additional research gaps that may be of interest.

Following Lane et al. (2006) I proceeded in the following way. First, I wrote short summaries (10-20 lines) of the content of each paper with a particular focus on how dynamic capabilities were discussed. Then, I uploaded these summaries on NVivo, a specific software for analysing qualitative and textual data. Third, I codified the content of these summaries creating several free nodes. Finally, I aggregated these nodes into main themes. I sequentially followed these steps for both types of papers in the final sample.

At this stage, however, given the different focus of this systematic literature review in respect to the analysis conducted by Lane et al. (2006), I depart from the structure of their work in two ways: First, I don't investigate the underlying causes of the reification, because these could be summarized in the critiques already presented. I will discuss instead the most recent conceptual contributions on dynamic capabilities pointing out those points that can illuminate further empirical work. Second, I complement the content analysis investigating results and approaches utilized in empirical articles to understand what we "actually" know about dynamic capabilities. In doing so, I also try to summarize potential research gaps, not yet fully exploited. At the end of these steps, I then summarize their findings in a synthesis that, I hope, could be useful for reducing the conversational misalignment that currently affects the debate on dynamic capabilities.

4.3.1 Conceptual papers

The sample contains 50 conceptual papers that, taken together, present a quite broad spectrum of positions and topics. The main themes that I identified are: a) Dynamic capabilities creation processes; b) Outcomes of dynamic capabilities. I discuss them in turn.

a) Dynamic capabilities creation processes³⁶

As anticipated in the Scoping study, three important concepts are common across the literature. These concepts have their own research streams (Wang & Ahmed, 2007) but nevertheless they are increasingly correlated to dynamic capabilities. The thematic analysis identified them as: Ambidexterity, the ability of balancing exploitative and explorative activities; Agility, the ability of sensing and seizing opportunities; and Absorptive capacity, the ability of gaining access and learning from external knowledge. Although Wang and Ahmed (2007) have already theorized on the commonalities of dynamic capabilities, in this study they have been systematically identified. Notwithstanding some terminological differences, results are overall consistent with the dimensions of Wang and Ahmed's (2007)³⁷ results.

³⁶ Since Eisenhardt and Martin's (2000) observation that dynamic capabilities present common features and idiosyncratic details, scholars put some effort in trying to distinguish them. Although Wang and Ahmed (2007) discussed them in terms of basic component of dynamic capabilities, other scholars (e.g. Winter, 2003) defined them as high-level (second-order) dynamic capabilities. More recently Ambrosini and Bowman (2009) defined them as creation processes. In particular, the latter conceptualization observes how dynamic capabilities "do not appear as a fully formed capability" (Ambrosini & Bowman, 2009: 43), but are composed by learning and experiential mechanisms common among organizations. In this work I build on this most recent idea but I also observe how these common mechanisms exist in the literature with their meta-conceptualizations.

³⁷ In particular, Wang and Ahmed (2007) used the term 'adaptive capability' and 'innovative capability' in place of ambidexterity and agility. 'Adaptive capability' is defined as the "firm's ability to identify and capitalize on emerging market opportunities" with a focus "on effective search and balancing exploration and exploitation strategies" (Wang & Ahmed, 2007: 37). Innovative capabilities is instead defined as the "firm's ability to develop new products and/or markets, through aligning strategic innovative orientation with innovative behaviours and processes" (Wang & Ahmed, 2007: 39). Although it may appear that these concepts are conceptually distinct from ambidexterity and agility, it is worth noting how their content is not so different. Indeed agility refers to the firm's ability to identify

Ambidexterity

The first common theme in the literature is the fundamental role of dynamic capabilities in balancing exploitation and exploration activities. This is commonly associated to the concept of ambidexterity. In the sample this theme is interrelated with functional and structural characteristics of dynamic capabilities.

Since the seminal paper from Teece and his colleagues (1997), dynamic capabilities have incorporated a latent meaning as expression of (certain) entrepreneurial and managerial functions in organizations. However, this theme has not started to be further investigated until most recent years. Good examples of this could be seen contributions from Teece (2007), Augier and Teece (2009), and Chadwick and Dabu (2009). Concepts of entrepreneurial management (Teece, 2007) and managerial entrepreneurship (Chadwick & Dabu, 2009) are indeed complementary expressions of the same way of looking at dynamic capabilities. Fundamentally, these works consider dynamic capabilities as (collective) abilities of the entrepreneur or the top management team in governing strategic change. They are intrinsically seen as high level managerial systems based on firm specific processes (Ambrosini & Bowman, 2009). Consistent with this view is O'Connor's (2008) theoretical contribution on systems for major innovation as well as the systemic perspective that underlies the discussion on the productivity dilemma in Adler et al. (2009).

Similarly, Schreyogg and Kliesch-Eberl (2007) offer a perspective where dynamic capabilities are reconceptualised in terms of a “capability monitoring function”. Their

opportunities and to seize them in ways that can include strategic innovative outputs. Similarly, ambidexterity refers to the firm's ability to balance explorative and exploitative strategies in order to foster innovation. Finally, with respect to absorptive capacity, the concept is the same and therefore there is full coincidence. However, in Wang and Ahmed (2007) there is a particular focus on the commercialization of opportunities and products. Strangely, since this characteristics is commonly considered a part of (realized) absorptive capacity, Wang and Ahmed's (2007) triad suffers a slight problem of overlapping definitions. Agility, Ambidexterity and Absorptive Capacity, as defined in this thematic analysis, are instead orthogonal at the ostensive level (Ambrosini & Bowman, 2009), as discussed later in the chapter.

paper offers this view as an interesting solution to several theoretical paradoxes in the literature³⁸. This monitoring function may include several ways of modifying resources (Ambrosini et al, 2009; Bowman & Ambrosini, 2003) and reconfiguring capabilities (Lavie, 2006). The logic behind this function complements other views where dynamic capabilities are conceptualized in terms of organizational dual forms for balancing exploitation and exploration activities (Adler et al., 2009; Graetz & Smith, 2008; Schreyogg & Kliesch-Eberl, 2007). This, in turn, allows organizations to adapt and control their operational capabilities at the same time (Wiltbank et al., 2006). From this perspective dynamic capabilities are in nature build on (managerial and organizational) forms of ambidexterity (Adler et al., 2009; Benner & Tushman, 2003; Graetz & Smith, 2008) that, indeed, has recently been reconceptualised as a dynamic capability (O'Reilly & Tushman, 2008³⁹). However, from a purely theoretical point of view, ambidexterity may be seen as a component part (Wang & Ahmed, 2007) or a creation process (Ambrosini & Bowman, 2009) of dynamic capabilities.

Agility

Whereas several papers mention exploitation and exploration activities as founding parts of dynamic capabilities (Adler et al., 2009; Benner & Tushman, 2003; Bessant et al., 2001; Chadwick & Dabu, 2009; Easterby-Smith & Prieto, 2009; Graetz & Smith, 2008; O'Connor, 2008; Smart et al., 2007), a good number of scholars focus the attention on their role in sensing and seizing (entrepreneurial) opportunities (Augier & Teece, 2009; Jacobides, 2006; Li et al., 2006; Ng, 2007; Pandza & Thorpe, 2009; Sambamurthy et al.,

³⁸ In particular, they criticize the way previous work conceptualized dynamic capabilities in terms of their dynamization.

³⁹ This paper is not included in the final sample due to time lags. However, given its importance it is mentioned here.

2003; Teece, 2007, 2008; Wiltbank et al., 2006). This is what some scholars (e.g.: Sambamurthy et al., 2003) call agility.

An interesting evolution in this sense is the raising focus on contributions from Austrian economics. Although dynamic capabilities have been proposed as a way to address change in Schumpeterian environments, more recently the concept of Kirznerian entrepreneur (Kirzner, 1999; 2009; Sautet, 2000) has gained importance⁴⁰. For example, both Teece (2007), Li et al. (2006), Ng (2007) and Sambamurthy et al. (2003) discuss the relationship between dynamic capabilities and entrepreneurial alertness (Kirzner, 1999; 2000). They also suggest that the entrepreneur/manager's role is fundamentally one as a coordinator of resources to address market failures and disequilibrium (e.g. Teece, 2007; Sambamurthy et al., 2003). This is strongly related to the role of agility as a high-level dynamic capability (Bessant et al., 2001; Li et al., 2006; Ng, 2007; Sambamurthy et al., 2003). Agility, in this view, is indeed seen as an organizational capacity to sense and seize opportunities (e.g. Sambamurthy et al., 2003). Thus, as for ambidexterity, agility could be considered as a sort of basic component of dynamic capabilities or one of their creation processes.

Absorptive capacity

If ambidexterity and agility are 'internal' characteristics of dynamic capabilities, the third common theme is absorptive capacity that is related to the way organizations gain access to complementary external knowledge. Several papers discuss the role of

⁴⁰ In reality, as Kirzner explains (2009), the dichotomy between his and a Schumpeterian entrepreneur is only apparent. Although a Kirznerian entrepreneur is a coordinator and an equilibrium creator (Kirzner, 2009) whilst the Schumpeter's one is a creative equilibrium destructor, they are two sides of the same coin. The difference comes from the focus. In Schumpeter's (and even more in following scholars), the entrepreneur destroys the equilibrium from a market perspective, while for Kirzner he tries to recreate it from a firm's point of view. The underlying assumption, however, is a condition of structural disequilibrium, true uncertainty and market failure in efficiently allocating resources (Sautet, 2000). This is a quite different view from traditional equilibrium-based economics models (Sautet, 2000).

absorptive capacity as a dynamic capability (Zahra and George, 2002⁴¹) or as a complementary dimension of them (Chi & Seth, 2009; Lavie, 2006; Lee et al., 2002; Smart et al., 2007; Wang & Ahmed, 2007). The core of absorptive capacity is its role in strategic networks and strategic alliances (Zahra and George, 2002), partnerships (Chi & Seth, 2009) and diversification (Ng, 2007). It is also strongly related to discussions on a particular kind of capabilities, namely relational capabilities (Holcomb & Hitt, 2007; Smart et al., 2007).

Interesting is also the contribution from Holcomb and Hitt (2007) about strategic outsourcing. In this paper absorptive capacity and dynamic capabilities are utilized to analyse how organizations can install a specific function to supply or outsource capabilities and competences. This opens a potentially fruitful theoretical link between dynamic capabilities, the phenomenon of vertical disintegration (Jacobides, 2006) and the importance of intermediate markets (Holcomb & Hitt, 2007; Jacobides, 2006). Even more importantly, this perspective is quite in line with the seminal idea that dynamic capabilities may include external competences (Teece et al., 1997). To date, the role of dynamic capabilities in inter-organizational relationships has not been fully exploited and tends to be focused on alliances and acquisitions (Augier & Teece, 2009).

Finally, as already mentioned, Lane et al. (2006) built their article on a test of the reification of this concept calling for future research from a capability perspective. Indeed, even Wang and Ahmed (2007) directly identify absorptive capacity as a commonality of all dynamic capabilities.

⁴¹ This paper is not included in the sample of papers found on ISI Web of Science. However, it is obviously important and therefore mentioned here.

b) *Outcomes of dynamic capabilities*

Given the previous discussion, it is not surprising that Pandza and Thorpe (2009) discuss strategic sense making and creative search as two fundamental cognitive processes of managerial capabilities. If, indeed, dynamic capabilities are managerial processes to pursuit entrepreneurial (Kirznerian) rents (Chadwick & Dabu, 2009; Teece, 2007) via a balance of exploitative and explorative activities, the role of managerial and entrepreneurial cognition is fundamental. In this sense, a common theme in the papers is the way cognitive limits affect the perception on environmental uncertainty (Ambrosini & Bowman, 2009; Easterby-Smith et al., 2009; Helfat & Peteraf, 2003). It follows that dynamic capabilities are not seen anymore as constrained “in rapidly changing environment” (Zahra et al., 2006) because the pace of change is intrinsically a matter of managerial perceptions (Ambrosini et al., 2009). Therefore managerial choices in terms of resource picking or capability development decisions (Holcomb & Hitt, 2007; Makadok, 2001, 2002) are made under a regime of rationality that is bounded but intentional (Teece, 2007; Zahra et al., 2006). They are thus “satisficing” (Lavie, 2006; Winter, 2000) and not “optimizing” as equilibrium-based theory would require (Sautet, 2000).

Interestingly, all these still granular perspectives are not so distant from contributions on the nature of dynamic capabilities in small and new firms (e.g. Bessant et al., 2001, Breslin, 2008, Zahra et al., 2006). In this kind of organizations, for example, dynamic capabilities are considered as expression of highly entrepreneurial processes, generally conducted by a single owner-manager or a small team of founders (Breslin, 2008; Zahra et al., 2006). Not surprisingly entrepreneurial and managerial cognition are again a common theme (e.g. Breslin, 2008). Nevertheless, these studies offer some additional insights on the nature of dynamic capabilities. For example, Sapienza et al. (2006)

suggested that, in the internationalization process, prior experience of the entrepreneurial team and the founding resource endowment could act as a substitute of more developed high level organizational processes. This is consistent with the extension to dynamic capabilities of the capability lifecycle model as discussed by Helfat and Peteraf (2003). These scholars, indeed, suggest that the founding resource endowment of a capability strongly shapes its development (Helfat and Peteraf, 2003). Put differently, the underlying idea is the suggestion that dynamic capabilities move from loose, entrepreneurial forms in new firms (Breslin, 2008) to more structured and (to a certain extent) routine-based phenomena in multinational enterprises (Augier & Teece, 2009; O'Connor, 2009). This is also consistent with the case where, in the internationalization of multinational subsidiaries, the local firm may receive an initial resource endowment that can buffer its starting growth against environmental pressures (Sapienza et al. 2006).

In sum on one side dynamic capabilities are moderated by managerial and entrepreneurial cognition (Ambrosini & Bowman, 2009) and on the other they are constrained by the resource endowment and path dependency (Ambrosini & Bowman, 2009; Helfat & Peteraf, 2003; Zollo & Winter, 2002). These two factors help to justify why their outcomes are now commonly considered as variegated. This helps to resolve the tautological link with successful performance that was suggested by the Teece et al.'s (1997) definition.

Therefore there is an increasing consensus that dynamic capabilities can also result in failures or competitive parities (Ambrosini & Bowman, 2009). The role of managers and entrepreneurs in this is fundamental. Contributions based on concepts such as intellectual (Wu et al, 2007⁴²), social (Blyler & Coff, 2003) and embedded capital (Bowman & Swart, 2007) help to understand that managerial agency moderates their

⁴² This paper is part of the empirical (mixed methods) subsample.

outcomes in terms of rent appropriation (Blyler & Coff, 2003; Bowman & Swart, 2007). This means, for example, that the created value could be in part of fully appropriated by the decision makers (Blyler & Coff, 2003; Bowman & Swart, 2007).

In addition, Zott (2001) and Ambrosini et al. (2009) suggest that different timing effect could results in different outcomes, even moving from the same position. Moreover, since developing dynamic capabilities is costly (Zahra et al., 2006; Zott, 2001), their benefits could be lower than necessary investments (Ambrosini & Bowman, 2009; Winter, 2003). However, managers and entrepreneurs need to carefully examine the balance taking into account the latent value of having dynamic capabilities (Winter, 2003). Indeed, they could eventually become fundamental under different circumstances (Teece, 2007) and their benefit could be observed only in the long term (Ambrosini & Bowman, 2009). As Winter (2003: 994) observed, “there is no general rule for riches” in dynamic capabilities.

Reprise

As discussed, the conceptual literature on dynamic capabilities is more complex and variegated than what it was supposed in their core papers. In recent years, scholars have challenged assumptions such as the necessary link with high-velocity environments (Zahra et al., 2006) or with organizational performance (Ambrosini & Bowman, 2009). They have also started to characterize dynamic capabilities from a system perspective (McCarthy, 2004; O’Connor, 2008) and to highlight their role in inter-organizational relationships (Holcomb & Hitt, 2007; Smart et al., 2007). The recognition of the role of top management teams is increasing (Augier & Teece, 2009; Helfat & Peteraf, 2003; Teece, 2007) and so the importance of managerial choices and cognition (Ambrosini et al., 2009; Breslin, 2008; Zahra et al., 2006). Interestingly, some papers focus their

attention on specific types of managerial capabilities (Adner & Helfat, 2003⁴³), such as legal astuteness (Bagley, 2008), strategic political management (Oliver & Holzinger, 2008) or technology management (Cetindamar et al., 2009). Dynamic capabilities are no more conceptually confined in large and mature companies but also important for new and small organizations (Bessant et al., 2001, Breslin, 2008, Zahra et al., 2006). The evolving characteristics of dynamic capabilities from new to mature firms generate opportunities for further discussions.

The discussion on dynamic capabilities creation processes opens instead other potential ways for looking at their nature. As Ambrosini and Bowman suggest (2009), it could be the case that dynamic capabilities present commonalities at the ostensive level (Feldman & Pentland, 2003) but idiosyncrasies in practice. That is, dynamic capabilities creation processes may be expression of the same organizational processes that takes different structural forms when performed. This means, for example, that any dynamic capability could be seen as a mix of different basic and measurable components (Wang & Ahmed, 2007). Some scholars present contributions where a similar logic is explored although in terms of foundations of growth (Ng, 2007) or competitive advantage (Sambamurthy et al., 2003). This systematic review identifies them as equivalent to concepts such as ambidexterity, agility and absorptive capacity. Indeed, the content of these meta-concepts is not so distant to what Teece (2007) calls microfoundations, in terms of sensing, seizing and reconfiguring. This calls for further investigation.

Finally, there is an interesting and common understanding that dynamic capabilities are ultimately driven by the organization's strategy (Bessant et al., 2001; Bowman & Ambrosini, 2003; Cetindamar et al., 2009; Lillis et al., 2007; Wiltbank et al., 2006). This means for example that if the strategy is ineffective, dynamic capabilities are of low

⁴³ This paper is part of the quantitative subsample.

usefulness. At the same time it also opens new questions about the complementarities between the dynamic capabilities framework and the Porterian one (Porter, 1980). Although this theme was suggested by Teece et al. (1997), it is not widely explored. However, recently scholars have started to investigate the role of dynamic capabilities from a positioning point of view. For example Lee et al. (2002) discuss dynamic capabilities as potential sources of mobility barriers between and inside strategic groups. Moreover, the idea that dynamic capabilities are related to specific organizational architectures and governed by strategy is at the core of other recent contributions (Augier & Teece, 2008⁴⁴; Jacobides, 2006). Further research should investigate the way dynamic capabilities are developed as an expression of strategic implementation.

In sum, the thematic analysis on conceptual papers in the sample shows how the discussion on dynamic capabilities is at the same time intense and in its infancy. Several of the seminal characteristics have just started to be dropped. This is the case, for example, of the tautological link with performance or the too narrow idea of their value only in “rapidly changing environments” (Teece et al., 1997; Zahra et al., 2006). At the same time scholars have offered several fruitful insights that are not yet incorporated in a coherent body of knowledge. As already observed, this could confirm Arend and Bromiley’s (2009) concerns. However, it seems to call for further research more than for an abandon of the dynamic capabilities framework.

⁴⁴ This is the last exception that is included in the final sample. In this contribution Augier and Teece (2008) specifically discuss the relationship between strategy, managers and dynamic capabilities. In particular strategy is conceptualized as composed of a tension between evolutionary components and more structured (designed) ones. For these reasons, the paper is mentioned here as a reference.

4.3.2 Empirical papers

This sample contains 55 empirical articles that cover a really large group of topics. Overall, this group's focus is on the test of several prior ideas and contributions. In particular, scholars have focused their attention on four concepts: a) Entrepreneurial foundations of dynamic capabilities; b) Dynamic managerial capabilities; c) Managerial systems and organizational structures; d) Strategic Networks. On one side these themes overlap some of those discussed in the previous section. On the other, instead, the empirical literature presents quite fruitful insights on the characteristics of dynamic capabilities although mutual references are limited. However, more recent papers have started to incorporate contributions from theory building with particular importance given to the mindful role of managers in shaping dynamic capabilities (Salvato, 2009). I now discuss these concepts in turn.

a) Entrepreneurial foundations of dynamic capabilities

Although entrepreneurship has always been important in Penrosean and Schumpeterian contributions (Newbert et al., 2008), it is only recently that scholars has started to investigate dynamic capabilities from an entrepreneurial logic (Newey & Zahra, 2009). Interestingly, concepts such as entrepreneurial capacity and resources (Newbert et al., 2008) have been tested as fundamental building blocks for any recombination of organizational resources (e.g. Newey and Zahra, 2009). Furthermore, Katzy and Crowston (2008) discuss agility as the result of entrepreneurial activities and analyse the creation of collaborative networks for competency rallying, an entrepreneurial dynamic capability for marshalling competences. Similarly, Lee and Kelley (2008) see the deployment and nurturing of entrepreneurial resources as an important managerial task that fosters innovative dynamic capabilities. Finally, MacPherson et al. (2004) highlights

the importance of entrepreneurial networks in creating dynamic capabilities that, in turn, open new entrepreneurial spaces for innovation.

Other studies, instead, focus the attention on entrepreneurship in terms of how founding conditions shape the progressive growth of firms. For example, Buenstorf and Murmann (2005) present a deep account of how the Carl Zeiss Foundation's statute, still based on its founder's legacy, bounds the development of dynamic capabilities but at the same time preserves them from rigidity. McKelvie and Davidsson (2009), instead, offer an exploratory analysis of how changes of founder human capital impact on the evolution of dynamic capabilities in new firms. Both these contributions correlate entrepreneurship with the role of human capital and the importance of balancing different managerial mindsets in order to build different dynamic capabilities. On the same line of reasoning are Wu et al. (2007) who investigate the effect of intellectual capital on innovative performance analysing how structural and relationship capital fully moderate the effects of human capital.

Finally, as Salvato (2009) discusses, dynamic capabilities are created by intentional managerial actions that, incorporating prior and external knowledge, shape current organizational routines and structures. In this view dynamic capabilities are a multilevel phenomenon (Rothaermel & Hess, 2006) where organizational processes and resources set the stage in which individuals generate performance (Salvato, 2009). Interestingly, however, managers only enable and monitor how the capability is performed in practice by 'rank and file' employees (Rothaermel & Hess, 2006).

In sum, in the empirical literature entrepreneurship is given a central role in shaping dynamic capabilities. However the incorporation of new theoretical insights, as discussed in the previous section, is still at the beginning.

b) *Dynamic managerial capabilities*

One of the first papers to point a direct attention on the relationship between dynamic capabilities and managerial dimensions is the one by Adner and Helfat (2003). These scholars extend Teece et al. (1997) ideas building the sub-concept of dynamic managerial capabilities (Adner & Helfat, 2003). Dynamic managerial capabilities are composed of managerial human capital, social capital and cognition (Adner & Helfat, 2003). In their view, these high level capabilities represent the key explanation in performance heterogeneity because top management may differ along these components (Adner & Helfat, 2003).

Scholars directly or indirectly have built on Adner and Helfat's (2003) several kinds of contributions. For example, Bruni and Verona (2009) investigate firm's performance differences in respect of their dynamic marketing capabilities whilst Salvato (2009: 403) suggests that "such capabilities may emerge from gradual refinement of lower-level organizational capabilities". Other research, instead, analyses different effects of managerial cognition, human and social capital. Managerial cognition is seen to affect CEOs' attention (Eggers & Kaplan, 2009) while be influenced by managers' prior experience and personality (Adner & Helfat, 2003). Moreover, managers' cognitive frameworks shape the selection of learning paths and thus the process of capability building (Keil, 2004; Narayanan et al., 2009) as well as the way managers deal with interest group pressures (Julian et al, 2008). With respect to managerial human capital, types of education and training are seen as strongly correlated to its quality (Azadegan et al., 2008; Newbert et al., 2008) while managerial social capital is fostered by the strength of social ties (Adner & Helfat, 2003). However, these last two dimensions have received less attention in the literature, at least in the sample.

Dynamic managerial capabilities may also be influenced by the competence profile of top management teams (Buenstorf & Murmann, 2005). For example, George (2005) discusses the cost of capability development depending on levels of managerial experiential learning. Thus managers need to continuously refresh their individual competencies to maintain high the efficacy of their dynamic capabilities (Buenstorf & Murmann, 2005). This could help them, for example, to better manage leadership based strategic communities, an organizational configuration found useful in managing innovative activities (Kodama, 2007). In doing so, managers can increase their ability in identifying, enabling and managing the mix of different dynamic capabilities that an organization, even public, may have (Pablo et al., 2007).

In sum, managerial-based dynamic capabilities, shaped by organizational resources and complementary (internal and external) assets (Griffith & Harvey, 2001; Helfat, 1997), represent an explanation for competitive heterogeneity (Adner & Helfat, 2003). In particular, for example, the quality of management could offer a solution to the Bowman's paradox of negative risk-return correlation under certain conditions (Andersen et al., 2007). Moreover, it could justify why dynamic capabilities present commonalities but they are idiosyncratic when performed (Bruni & Verona, 2009; Eisenhardt & Martin, 2000). Another explanation, instead, is offered by Garcia-Muina and Navas-Lopez (2007) who discuss heterogeneous performance as caused by differences in the strength of technological capabilities. The literature therefore presents concurrent organizational causes for competitive heterogeneity. However, it is worth noting that, since managers can also be mistaken, dynamic managerial capabilities may be affected sometimes by managerial myopia (Eggers & Kaplan, 2009). Finally, the overall level of strategic responsiveness (Andersen et al., 2007) as well as the organizational

strategic intent and orientation (Chen et al., 2004) are strongly moderated by how dynamic managerial capabilities are performed.

c) Managerial systems and organizational structures

A third common theme in dynamic capabilities literature is the importance recognized in empirical works to different forms of organizational (managerial) systems (e.g. Mitchell, 2006, on the role of managerial structures for projects in networked organizations). For example, Petroni (1998) shows how certain organizations integrate their capabilities through centres of excellence. Similarly, Woiceshyn and Daellenbach (2005: 307) investigate the development of dynamic capabilities “through a dynamic interplay of adoption processes and their knowledge systems”. Differences in managerial systems may also account for the scope of related diversification as a basis for the development of alliances and human capital (Doving & Gooderham, 2008). Interesting is also the contribution by O’Connor et al. (2008) on the possibility of creating dynamic capabilities for radical innovation through the development of specific, self similar managerial systems. Mosey (2005), instead, highlights the importance of learning systems in project management that could help the top management team to constantly reflect upon the development of dynamic capabilities. Another good example of this is the case study presented by Witcher et al. (2008) on *hoshin kanri*⁴⁵ at Nissan South Africa as a nested form of dynamic capabilities. Finally, Ma and Loeh (2007) show how the dynamic capabilities framework may help to understand how to better manager ERP implementations programmes.

⁴⁵ *Hoshin kanri* at Nissan South Africa is a systematic way of conducting top management audits on the implementation of strategic initiatives and the development of organizational capabilities.

The importance of management systems is strongly correlated to the development of particular organizational structures (e.g. Madhok, & Osegowitsch, 2000). Since dynamic capabilities are considered as organizational solutions for balancing exploitation and exploration activities (Soosay & Hyland, 2008), they often need to be incorporated in ambidextrous structures (Capron & Mitchell, 2009; Newbert et al., 2008). On the same line, Danneels (2008) discuss five organizational antecedents⁴⁶ to dynamic capabilities for exploitation and exploration in marketing and R&D. He points the attention on the importance of organizational structures and resource slacks that may allow ambidextrous activities (Danneels, 2008). This is also shown by Luo (2002) in its analysis on the role of organizational infrastructures and governance in capability building and exploitation. Even more, Danneels (2002) presents a typology for classifying new product development projects depending on their explorative or exploitative characteristics: this may be a useful tool to map which competences need to be developed or sourced. Finally, a recent case study by Gilbert (2006) introduces the idea that in a regime of discontinuous change capability development is usually a not sequential but nested process: Gilbert (2006) thus highlights how organizations may need to create structures with separated sub units if old capabilities have a degree of residual fit of with the environment. This is also consistent with the importance recognized to resource-based architectural forms of integration between internal and external knowledge (MacCormack & Iansiti, 2009; Mills et al., 2003; Petroni, 1998).

⁴⁶ These antecedents are: willingness to cannibalize, constructive conflict, tolerance for failure, environmental scanning, and resource slack.

d) *Strategic networks*

As some scholars suggest (Buenstorf & Murmann, 2005; Soosay & Hyland, 2008), dynamic capabilities are rooted in organizations' absorptive capacity. Absorptive capacity is indeed even more important to create strategic value networks (Newey & Zahra, 2009), such as in R&D (Blomqvist et al., 2004), that are also influenced by managerial cognition (Adner & Helfat, 2003). This is also consistent with the view of Verona and Ravasi (2003) of dynamic capabilities as composed of knowledge absorption, knowledge integration and knowledge reconfiguration mechanisms.

Strategic networks are “essential organizational entities for building radical innovation capabilities” (O'Connor et al., 2008: 188). They also foster capability development although through the mediation of cultural factors, IT resources and strategic orientation (Montealegre, 2002). In particular, networks may be useful for internal skills, knowledge and competencies that are missing in the firm (MacPherson et al., 2004). Therefore, since antecedents of innovations can be found at the network level too (Rothaermel & Hess, 2007), it is important to research how “such networks are competency enhancing or competency destroying for member firms” (Chen et al., 2004: 519). In this sense, Chen et al. (2004) explain how a strategic approach to purchasing may enhance customer responsiveness and then firm performance. However strategic purchasing is moderated by managerial mindsets and the firm's strategic orientation (Chen et al., 2004). Notwithstanding this contribution, future research may focus on buyer-supplier relationships, an area currently underdeveloped from a dynamic capabilities perspective (Chen et al., 2004).

Other research takes a network perspective for investigating corporate venturing, alliances and acquisitions (Keil, 2004; Williams & Lee, 2009) as well as strategic partnerships (Chen et al., 2004; Griffith & Harvey, 2001) and logistics management

(Hallorsson & Skjott-Larsen, 2004). In general, then, collaborative networks are seen as enablers of synergistic gains for their members based on relational capabilities (Chen et al., 2004), although there could be unbalanced gains in partnerships between small and multinational firms (Sawer et al., 2008). In addition, in project-based organizations, an effective integration of internal and external knowledge improves the rate of timely project completion (Mitchell, 2006). However, dynamic capabilities' effects are at least twofold. Marcus and Anderson (2006) show how in the retail industry dynamic capabilities directly affect supply chain management capabilities only. Vice versa, social competencies such as environmental management are more affected by firm mission and the overall strategy (Marcus & Andersen, 2006). Nevertheless, multinational enterprises interested in creating firm-specific advantages from the issue of climate change should develop dynamic capabilities for maintain their fir with environmental conditions (Kolk & Finske, 2008). Another example of these variegate effects is given by Bierly III and Paul (2007) who discuss the fact that SMEs and large firms learn differently depending on the source of external knowledge. For example, SMEs tend to learn more from customers and the scientific community whilst multinational organizations from partnerships, competitors and consultants (Bierly III and Paul, 2007).

Reprise

Although numerically not extensive yet, the empirical literature on dynamic capabilities presents a quite broad spectrum of topics and contexts (see Appendix 7). In this paragraph I focused the attention on which concepts have already been tested in some way. Surprisingly, the scope of results is in line with the findings from conceptual papers. However, as already noted, the reference basis on which these two groups are built is considerably different. In particular, empirical papers build their

conceptualizations on the core papers mainly, though most recent articles are starting now to incorporate new theoretical insights. This means for example that dynamic capabilities are still seen as pertinent to “rapidly changing environments” (Teece et al., 1997) and affected by tautological problems in terms of sampling selection (e.g.: only successful firms in the sample). In addition it is still common a view of dynamic capabilities as strongly routine-based (e.g. Peng et al., 2008). Current theoretical developments tend to present a softer view.

Nevertheless, there are also similarities between empirical testing and theory building. This could be considered as an additional confirmation that these groups don't share many references but come from the same foundations. In particular, I identified four main themes discussed in empirical analyses of different kinds.

First, there is increasing consensus that dynamic capabilities represent an idea that is not confined in multinational enterprises only. They have more correlations with problems of entrepreneurial nature than with firm size. However, it is worth noting how dynamic capabilities may indeed take different forms depending on size and age (e.g. Newbert et al., 2008). This is an area of research that needs further investigation and that may eventually benefit from insights based on the idea of capability lifecycles (Helfat & Peteraf, 2003).

Second, in their operationalizations scholars have often underlined the role of managers. In particular, (dynamic) managerial capabilities have been reserved a good amount of research, especially in marketing and R&D contexts. One paper (Moliterno & Wiersema, 2007) even explores resource divestment capabilities as a form of managerial action that impact performance. Therefore there is a good opportunity for exploring other kinds of dynamic managerial capabilities. Similarly important, managerial cognition is commonly considered as one of the main determinants of dynamic capabilities

outcomes, since it shapes the way managers perceive uncertainty. However, firm's strategy always bounds managerial activities to a certain extent.

Third, there is a high attention towards 'hard' features of dynamic capabilities. It seems that they may be naturally embedded in complex managerial systems. In particular, empirical research points out how dynamic capabilities can be seen as expression of ambidextrous activities that have to be managed with organizational dual architectures.

Forth, strategic networks are an important theme related to dynamic capabilities. Scholars have focused their attention mainly on two aspects. One side networks may be used to source or outsource competences that cannot be successfully developed or deployed internally. Partnerships, alliances, strategic purchasing, acquisitions, corporate venturing, and logistics management are the main areas that empirical works explored. On the other, absorptive capacity is researched as a general feature of dynamic capabilities. Overall, this theme presents several aspects that further research may investigate, such as different contexts or the relationship buyer-supplier as the unit of analysis.

In sum empirical studies on dynamic capabilities offer several insights that may be coupled with recent conceptual developments. However, as previously discussed, these two fields have been developed with low mutual influence in terms of direct theoretical connection. I hope that this section may offer new insights towards an improvement of the academic conversation on dynamic capabilities. In particular, it seems important to highlight two potential areas for further exploration:

- *Creation processes of dynamic capabilities.* Both theory building and empirical research incorporate views where dynamic capabilities are seen as managerial processes through which organizations coordinate different resources in order to sense and seize entrepreneurial opportunities with a balance of explorative and exploitative

activities. In doing so, they integrate external and internal knowledge on the basis of prior experience and current conditions. These different components may represent ostensive commonalities of dynamic capabilities that take different and structured forms when performed. In the sample these so called ‘creation processes’ (Ambrosini & Bowman, 2009) are identified as coincident with other constructs such as agility, ambidexterity and absorptive capacity. Given the fact that these high-level (abstract) processes present their own literature, it could be useful to explore them. This may potentially open new empirical frontiers where these contributions are integrated as antecedents of dynamic capabilities (Wang & Ahmed, 2007). Interestingly, from a theoretical point of view, they may also be conceptualized as classes of (Kirznerian) entrepreneurial resources. This, in turn, founds competitive advantage through the mediation of dynamic (managerial) capabilities.

- *Strategic inter-organizational relationships.* Given the strong link between empirical works and the Teece et al.’s (1997) seminal definition, it is not completely surprising the amount of papers that mention inter-organizational relationships. However, only four papers directly operationalized dynamic capabilities at the network level. This represents a clear gap in the literature that is worth of further exploitation. In particular, contributions are represented by two quantitative and two qualitative researches with a focus on cross-age SMEs or cross age firms with different sizes. Therefore, it would also be interesting to investigate how large, mature organizations develop dynamic capabilities at the network level. Particularly interesting, as already observed, may be researching the dyad buyer-supplier as the unit of analysis. In doing this, the role of absorptive capacity has certainly to be taken into account. In addition, it could be the case that

contributions on concepts such as strategic purchasing (Chen et al., 2004) and strategic outsourcing (Holcomb & Hitt, 2007) may offer fruitful insights.

5. CONCLUSIONS AND LIMITATIONS

This chapter presented a systematic literature review of dynamic capabilities. The main thesis was that theoretical and empirical articles had developed from the same foundations but with low mutual influence. The main hypothesis was that this conversational misalignment had led to the reification of the concept of dynamic capabilities.

In order to test this hypothesis and to verify the thesis I built a multi-step methodology for defining my sample of papers. This followed closely suggestions from previous, validated approaches such as Lane et al.'s (2006) reification test of absorptive capacity, Newbert's (2007) test on the empirical support of the resource-based view, and Di Stefano et al.'s (forthcoming) bibliographical analysis of the theoretical foundations of dynamic capabilities. In particular, I systematically selected 105 papers from 16 peer-reviewed journals. The starting sample was composed of 642 articles downloaded from the ISI Web of Science database.

Results show how it is highly likely that the dynamic capabilities framework has become reified. This seems true at least for the seminal conceptualization as proposed by Teece et al. (1997). Indeed, findings show that, despite of being one of the most cited contributions in Management studies in the last decade, Teece et al.'s (1997) framework has not been extensively tested in its original formalization. This is even more surprising given the extension of the debate on dynamic capabilities and the number of calls for increasing its empirical support.

Other results may be of interests for further research. First, contrarily to common thinking, dynamic capabilities' theoretical and empirical work has not been constrained neither in 'high-

velocity' environments nor in large and mature organizations. The scope of the debate is indeed quite wide. The discussion includes insights from small and entrepreneurial contexts as well as from traditional sector, particularly manufacturing. Second, in this work I identified three high-level constructs that are commonly considered underlying the development and the deployment of dynamic capabilities. These are: agility, the capacity of an organization to sense and seize entrepreneurial opportunities; ambidexterity, the capacity of balancing exploitation and exploration activities of different types; absorptive capacity, the capacity of incorporating and making a use of external knowledge from different sources. These constructs do exist in Management studies with their own literature. However, scholars are increasingly bridging them with dynamic capabilities. In this work I suggested that further research may obtain fruitful results from conceptualizing them as common antecedents of dynamic capabilities. It may also be explored a view where these creation processes take the theoretical form of entrepreneurial (Kirznerian) resources. Finally, researchers may find useful to know that few studies have properly operationalized dynamic capabilities at the inter-organizational level, although theoretical contributions underline its importance.

Overall, this chapter presented a systematic literature review based on a wide sample of articles. Nevertheless, as any research effort, it is not immune from some limitations. First, in order to closely follow published methodologies, I didn't include in the sample any book. An example of an important missing contribution is Helfat et al.'s (2007) book "Dynamic capabilities: Understanding strategic change in organization", written as a joint effort by several leading scholars in the field. However, at the best of my knowledge of the book, its absence doesn't affect the results of this work in a substantial way. Second, I decided to download my sample from one database only. Although this is a common procedure in published systematic reviews, it may be the case that I didn't include important contributions. Nevertheless, given the preliminary systematic review that I conducted, as explained in the Protocol, I argue that results

represent a good picture of the whole literature. Third, given my limited experience in doing content and thematic analysis and due to time constraints, it may be likely that I overemphasised some aspects and overlooked others. However, I hope to have presented some reasonable insights on dynamic capabilities at the best of my capacity.

Finally it is worth noting how, even taking into account contributions on inter-organizational relationships that don't directly test dynamic capabilities⁴⁷, these tend to focus on strategic alliances, acquisitions, outsourcing and partnerships. This means that the field doesn't include yet any relevant contribution on the creation of dynamic capabilities in the dyadic relationship between a business service provider and its client firms. This, indeed, represents the major finding and research gap of this systematic literature review in relationship to the objectives of the MRes thesis.

⁴⁷ I refer here to papers codified as 4 or 5 on the centrality scale.

Chapter 4

CONCLUSIONS

My research's starting point is that how organizations deal and manage with the phenomenon of strategic change is a fundamental problem in management studies.

Within this broad theme, the topic of my PhD project is quite clear. I am interested in understanding how organizations manage change using programmes, defined as “sets of inter-related projects that have been brought together to achieve an objective that would not be possible through stand-alone projects” (Maylor et al., 2008). In other oversimplified terms, since strategic management is about how organizations deal with strategic change, I am particularly interested in investigating how organizations channel their strategy into action using programmes. Furthermore, since my PhD is rightly requested to deliver practical implications, I am also interested in suggesting how the management of programmes could be improved.

Indeed, the role of Programme Management has been increasingly recognized in literature as a key approach to strategy implementation (Mc Elroy, 1996; Partington et al., 2005) with particular regard to how organizations deal and manage change (Lycett et al., 2004; Pellegrinelli et al., 2007).

As Pellegrinelli et al. (2007) argued, programmes are emergent phenomena and have indeterminate time horizons so that they can be hardly studied using common project concepts. The same authors clearly recognize that successful programmes require a continuous development of capabilities at both the individual and organizational level. In addition, it is worth noting that capability development is in nature a context dependent phenomenon.

How to create and evolve capabilities over time is the core theme of the dynamic capability view of the firm. Dynamic capabilities are also “connected to the knotty problem of change management, which is of great importance to managers and the bread and butter of countless consulting practices” (Easterby-Smith et al., 2009).

Therefore, my PhD project aims to explore how these capabilities are developed in a context of Programme Management building on the dynamic capabilities view of the firm (e.g.: Ambrosini & Bowman, 2009; Easterby-Smith et al., 2009; Teece et al., 1997).

In order to build robust foundations for doing so, in this MRes thesis I presented a formal systematic review of the literature on dynamic capabilities. Specifically, I developed a formal Protocol in Chapter 1 and the systematic analysis in Chapter 2. In the Protocol I outlined the main features of the methodology, the process and the findings of a preliminary systematic review. In details, I developed a scoping study of the literature based on a wide and semi-systematic number of articles and other publications. Then, on these bases I explained how I conceptually look at the relationships between dynamic capabilities and Programme Management. In doing this, I tried to clarify why the latter is not included in the content of the systematic literature review since it is considered the context for my empirical research. Finally, I converted these findings into two Research Questions and a set of Review Questions for the systematic literature review. In Chapter 2, instead, I developed the review in three main areas. First, I reviewed the most important core papers and critiques on dynamic capabilities. Second, I explained in depth the phase of sample selection and its relationship with published methodologies. These first two phases were used to test the level of reification of the dynamic capabilities concept and to build robust bases for further developments. Finally, I utilized content and thematic analysis for answering the formal review questions. In doing this, I separately analysed conceptual and empirical papers and I showed how the literature on dynamic capabilities reflects a conversational misalignment between these two types of work.

Given this structure, I investigate a general Review question:

- How are dynamic capabilities conceptualized and operationalized in the literature?

I was specifically interested in understanding creation processes and empirical evidence of dynamic capabilities in the literature. Moreover, I gave particular attention to finding research gaps potentially related to Programme Management contexts. I declined these specific interests into two sub Review questions.

In brief, I found the following main results, divided by area:

- *Dynamic capabilities and theory development*

In the literature there is an intense debate about what dynamic capabilities are and how they may be put into practice. In addition some scholars started to suggest that the field doesn't offer much more research potentiality. However, given the result of the preliminary review, I suggested that dynamic capabilities might be a reified concept. If so, it would be important to understand the content of the literature before to proceed for further research. Results of the systematic review confirmed the hypothesis. This has important consequences for any future theoretical and empirical research. Furthermore, the systematic review identified three common themes that may be considered as creation processes of dynamic capabilities. Since they exist in their own literature streams, I named them accordingly: agility, the capacity of an organization to sense and seize entrepreneurial opportunities; ambidexterity, the capacity of balancing exploitation and exploration activities of different types; absorptive capacity, the capacity of incorporating and making a use of external knowledge from different sources. Further research incorporating these parallel streams may be fruitful.

- *Empirical support of dynamic capabilities*

Important was also to clarify what it was already known about dynamic capabilities from an empirical point of view. Although results from the reification test showed that only 3 papers directly tested the original dynamic capabilities' framework, other papers added interesting insights to the discussion. In particular it seems that empirical research attributes to dynamic capabilities strong functional and structural dimensions. Further investigation from an entrepreneurial and a management systems perspective may offer new potential for understanding the nature of this complex concept.

- *Additional research gaps*

This systematic literature review highlighted some other research gaps that could be useful for an operationalization in Programme Management. I point the attention towards two of them.

First it is worth noting how, surprisingly, one of the three papers that properly operationalized the original dynamic capabilities framework did it analysing the implementation of IT programmes. This clearly suggests that the perspective may offer an interesting theoretical lens to analyse how organizations channel their different strategies through programmes. In addition, the very fact that the dynamic capabilities framework has not been widely tested represents a research gap in itself.

Second, the review showed that there is a lot of theoretical interest on inter-organizational relationships from a dynamic capabilities perspective. However, empirical work is limited and tends to focus on alliances, acquisitions, outsourcing

and partnerships in terms of relational capabilities. I didn't find any paper⁴⁸ discussing how dynamic capabilities may be created in client firms through the integration of external capabilities supplied by business services providers⁴⁹. Even more, only one paper used the dyadic collaboration between a service provider and a client firm as the unit of analysis. Further research on this may be quite interesting for understanding the creation and implementation of dynamic programme management capabilities.

In sum, this thesis introduced, composed and discussed a systematic literature review of the dynamic capabilities view of the firm. The underlying objective was to build the foundations for an empirical research project in a programme management context using this particular theoretical lens.

In order to do this, I investigate a general Review Question and two sub Review Questions. Findings showed how the literature on dynamic capabilities is still at its infancy and in need of further theoretical and empirical research. In particular, although the concept is quite diffuse, the analysis suggested that it is reified. Thus future developments should pay a great degree of attention in specifying their theoretical foundations and overcome the risk of perpetuating this problem.

In addition, I found few studies that directly tested the dynamic capability framework. Therefore definitive conclusions on the level of its empirical support are not possible. Consequently, this analysis could not define in details how dynamic capabilities are deployed in practice. However, some common themes are

⁴⁸ Nor in the preliminary systematic review.

⁴⁹ Even papers that focus on business service providers or, more generally, on partnerships develop the discussion in terms of the impact of relational capabilities on the success of the relationship.

shared across different approaches. In this sense dynamic capabilities are generally seen as high level processes through which managers integrate internal and external capabilities to purposefully modify an organization's operational base of resource and capabilities. These managerial processes are rooted in the ability of absorbing new knowledge, the ability of sensing and seizing entrepreneurial opportunities and the abilities of balancing explorative and exploitative activities.

Finally, this thesis identified a clear research gap in the development of dynamic capabilities at the inter-organizational level within the relationship between business service providers and their client firms. This gap may be further narrowed looking at how these dynamic capabilities are integrate, built and reconfigured in a Programme Management context.

This indeed is the main research question identified before than the analysis. Theoretical and empirical evidence from the systematic literature review seem to confirm its validity.

I hope that the depth and the richness of this analysis may be found useful for proceeding with further research.

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146. Zahra, S. & George, G. (2002). Absorptive capacity: A review, reconceptualization and extension. *Academy of Management Review*, 27(2): 213-240.
147. Zahra, S. A., Sapienza, H. J., & Davidsson, P. (2006). Entrepreneurship and dynamic capabilities: A review, model and research agenda. *Journal of Management Studies*, 43(4), 917-955.
148. Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science*, 13(3), 339-351.
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APPENDIXES

Appendix 1: Main aspects of the texts that have informed my thinking

N	WHO is researching...	What aspects of the topic...	based on which THEORIES...
	...the dynamic capability view of the firm		
1	Teece, D. J., Pisano, G., & Shuen, A. (1997)	It's the seminal paper in the field. It presents the most famous definition and conceptualization.	Mainly on RBV, Competitive Forces, and Strategic Conflict. In addition it clearly builds on Evolutionary Theory.
2	Eisenhardt, K. M., & Martin, J. A. (2000)	Second most famous paper of the field. It deals mainly with the nature of DCs	RBV and DCs. In part Organizational Learning and Evolutionary Theory too.
3	Zollo, M., & Winter, S. G. (2002)	This article presents the most relevant effort of linking together dynamic capabilities and organizational learning/knowledge management. It deals with the nature of DCs.	DCs, Organizational Learning, Knowledge Management, Evolutionary Theory.
4	Winter, S. G. (2003)	This article deals with the nature of DCs, presenting some interesting conceptual gaps and developments.	RBV, DCs, Evolutionary Theory.
5	Zahra, S. A., Sapienza, H. J. and Davidsson, P. (2006)	This article develops the relationship between different types of capabilities and between these and organizational learning, with a particular focus on differences between new and established companies.	Entrepreneurship, Organizational Learning and Dynamic Capabilities.
6	Helfat, C.E., Finkelstein, S., Mitchell, W., Peteraf, M., Singh, H., Teece, D. & Winter, S. (2007)	It is a book and it includes several different papers both empirical and conceptual. It deals with the nature of DCs as well as with their deployment.	Several, but mainly DCs.
7	Teece, D.J. (2007)	This article tries to bring the DC view of the firm to the next level, discussing its linkages with Entrepreneurship and Social and Behavioral Sciences. It mainly focuses on DCs' microfoundation in terms of skills, processes, procedures, etc. that compose them.	Mainly DCs and Entrepreneurship.
8	Wang, C. L. and Ahmed, P. K. (2007)	This article aims to clarify the concept of DCs, focusing mainly on their commonalities, that are identified in the literature.	DCs.
9	Ambrosini, V. & Bowman, C. (2009)	This article mainly focuses on the creation of a new model about the role of DCs in the "value creation process". It discusses antecedents, moderators and outcomes, highlighting at the same time the main areas of confusion and contradiction in the DC literature.	Mainly DCs.
10	Easterby-Smith, M., Lyles, M.A., & Peteraf, M.A. (2009)	This is an introductory article to a special issue of the BMJ on DCs. However, it presents a synthetic but clear review of the field, highlighting the main debates and theoretical challenges.	DCs.

N	WHO is researching...	...using which METHODS?	...and what did they CONTRIBUTE to the conversation?
	...the dynamic capability view of the firm		
1	Teece, D. J., Pisano, G., & Shuen, A. (1997)	It is a purely conceptual paper.	It presented a clear, deep conceptualization of a new concept in strategic management literature. It actually opened the discussion and established a clear theoretical milestone in the literature.
2	Eisenhardt, K. M., & Martin, J. A. (2000)	It is a purely conceptual paper.	It firstly highlights how the nature of DCs is composed of common features and idiosyncratic details. It also discusses their potential equifinality and the problem of their dynamization.
3	Zollo, M., & Winter, S. G. (2002)	It is a comprehensive literature review that develops several hypotheses.	It investigates the nature of DCs in terms of their founding learning mechanisms. In particular it highlights the effect of deliberate learning investments on their development and deployment.
4	Winter, S. G. (2003)	It is a purely conceptual paper that uses some examples in order to develop a deep theoretical critique to the DC view of the firm.	It cleverly challenges the main theoretical points in the DC view of the firm, deeply discussing their supposed-to-be hierarchical nature and highlighting some paradoxes. It also discusses their development as in alternative with other forms change tools.
5	Zahra, S. A., Sapienza, H. J. and Davidsson, P. (2006)	It is a comprehensive literature review that develops several propositions.	It highlights the link between DCs and Entrepreneurship and the role of strategic decision makers inside the DC view of the firm.
6	Helfat, C.E., Finkelstein, S., Mitchell, W., Peteraf, M., Singh, H., Teece, D. & Winter, S. (2007)	Several, depending on the chapter.	The main contribution is in the first chapter, that is a purely conceptual paper, where these leading scholars present a new definition of DCs and advance two theoretical new concept, such as evolutionary and technical fitness, as potential yardstick to evaluate DCs. Unfortunately they don't explain how in detail.
7	Teece, D.J. (2007)	It is a purely conceptual paper.	This paper presents a clear understanding of the field as well as a lot of point not deeply discussed. However, it clearly recognises the role of managers in the DC view of the firm. In sum, it is a temptative to take the field to the next steps positioning it at the centre of the strategic management agenda. However, as observed by others (Easterby-Smith et al, 2009) it opens at least as many questions as it answers.
8	Wang, C. L. and Ahmed, P. K. (2007)	It is a comprehensive literature review that focuses its attention on the analysis of the commonalities of DCs as already presented in lateral streams of literature.	It clearly defines DCs as composed by common features and idiosyncratic details and analyses these commonalities in the literature, discussing at the same time conceptual and empirical problems in the DC view of the firm.
9	Ambrosini, V. & Bowman, C. (2009)	It is a comprehensive literature review that proposes a complex model of DCs.	It clearly positions DCs inside the value creation process, discussing also their nature and deployment and several conceptual and empirical problems in the literature.
10	Easterby-Smith, M., Lyles, M.A., & Peteraf, M.A. (2009)	It is a brief but clear literature review.	The main contribution is about a clear presentation of the main debates and challenges in the field.

N	WHO is researching...	What aspects of the topic...	based on which THEORIES...
	...Programme Management		
11	McElroy, W. (1996)	This article looks at the way programmes and projects could be successfully used to deliver strategic change.	Project Management, Programme Management.
12	Lycett, M., Rassau, A. & Danson, J. (2004)	This articles presents a good review of the literature on programme management and its links with that on project management. It also discusses several conceptual and practical problems presenting an agenda for furthe research.	Project Management, Programme Management.
13	Partington, D., Pellegrinelli, S. & Young, M. (2005)	This article researched the key attributes of programme management work studying 15 strategic programmes over seven industry sectors.	Competence-based Theories, Programme Management.
14	Pellegrinelli, S., Partington, D., Hemingway, C., Mohdzain, Z. & Shab, M. (2007)	This article highlights the importance of context, in terms of dynamic cultural, political and business environment on Programme Management.	Project Management, Programme Management.

N	WHO is researching...	...using which METHODS?	...and what did they CONTRIBUTE to the conversation?
	...Programme Management		
11	McElroy, W. (1996)	It is a paper part of the literature on Operations and it seems written mostly for praticioners. It is purely conceptual.	Its main contribution is that it offers a clear picture of
12	Lycett, M., Rassau, A. & Danson, J. (2004)	It is a good, traditional literature review.	This paper offers three main contributions: a) it clearly presents the field as different from Project Management and discusses the reasons behind this positioning; b) it clearly recognizes how Programme Management is relationship-based and enables organizational adaptability in the context of changing business environments; c) it observes how programmes' outcomes are also moderated by power dynamics.
13	Partington, D., Pellegrinelli, S. & Young, M. (2005)	Phenomenography.	The main contribution of this paper lies in the core result that programme management competences can be analysed on four different levels and 17 attributes. The key point is that the matching between different levels of competences hold by different programme managers in a specific environment matters in respect of the outcome of a specific programme.
14	Pellegrinelli, S., Partington, D., Hemingway, C., Mohdzain, Z. & Shab, M. (2007)	It is a paper part of the literature on Operations. It uses mainly in-depth interviews in order to test the actual practices used in some commercial and UK public sector organizations, against a specific template. This specific template was the most widely used programme management framework in the UK, that is "Managing Successful Programmes", published by the Office of Government Commerce.	The main contribution of this paper is double: On one side it showed how the official framework is not perfectly applied; on the other, it raised the importance of programme context, processes and purposes on the outcomes of programme management initiatives in dynamic organizational environments.

Appendix 2: Selected papers for the preliminary literature review

Year	Reference
2008	Biedenbach, T. and Söderholm, A., 2008. The Challenge of Organizing Change in Hypercompetitive Industries: A Literature Review. <i>Journal of Change Management</i> , 8(2): 123.
2008	Florice, S. and Ibanescu, M., 2008. Using R&D portfolio management to deal with dynamic risk. <i>R&D Management</i> , 38(5): 452-467.
2008	Govind Menon, A., 2008. Revisiting Dynamic Capability. <i>IIMB Management Review</i> , 20(1): 22-33.
2008	Hong, J., Kianto, A. and Kyläheiko, K., 2008. Moving cultures and the creation of new knowledge and dynamic capabilities in emerging markets. <i>Knowledge and Process Management</i> , 15(3): 196.
2008	Magnusson, M. and Martini, A., 2008. Dual organisational capabilities: From theory to practice - The next challenge for continuous innovation. <i>International Journal of Technology Management</i> , 42(1-2): 1-19.
2008	Moustaghfir, K., 2008. The dynamics of knowledge assets and their link with firm performance. <i>Measuring Business Excellence</i> , 12(2): 10-24.
2008	O'Connor, G. C., 2008. Major innovation as a dynamic capability: A systems approach. <i>Journal of Production Innovation Management</i> , 25(4): 313-330.
2008	O'Reilly III, C. A. and Tushman, M. L., 2008. Ambidexterity as a dynamic capability: Resolving the innovator's dilemma. <i>Research on Organizational Behavior</i> , 28: 185-206.
2007	Cavusgil, E., Seggie, S. H. and Talay, M. B., 2007. Dynamic capabilities view: Foundations and research agenda. <i>Journal of Marketing Theory and Practice</i> , 15(2): 159-166.
2007	Cillo, P., Verona, G. and Vecari, S., 2007. The interlink between resources and capabilities: Towards a theoretical frame for the development of dynamic capabilities. <i>International Journal of Learning and Intellectual Capital</i> , 4(1-2): 111-131.
2007	Lillis, B. and Lane, R., 2007. Auditing the strategic role of operations. <i>International Journal of Management Review</i> , 9(3): 191-210.
2007	Ljungquist, U., 2007. Core competency beyond identification: presentation of a model. <i>Management Decision</i> , 45(3): 393-402.
2007	Wang, C. L. and Ahmed, P. K., 2007. Dynamic capabilities: A review and research agenda. <i>International Journal of Management Review</i> , 9(1): 31-51.
2007	Williams, S. D. and Whittier, N. C., 2007. Competitive balance implications for hospitals of innovations in networked electronic health records. <i>Competitiveness Review: An International Business Journal incorporating Journal of Global Competitiveness</i> , 17(1/2): 26-36.
2006	Lavie, D., 2006. Capability reconfiguration: An analysis of incumbent responses to technological change. <i>Academy of Management Review</i> , 31(1): 153-174.
2006	Nielsen, A. P., 2006. Understanding dynamic capabilities through knowledge management. <i>Journal of Knowledge Management</i> , 10(4): 59-71.
2006	Zahra, S. A., Sapienza, H. J. and Davidsson, P., 2006. Entrepreneurship and Dynamic Capabilities: A Review, Model and Research Agenda. <i>Journal of Management Studies</i> , 43(4): 917-955.
2005	Barnett, M. L., 2005. Paying attention to real options. <i>R&D Management</i> , 35(1): 61-72.
2002	Zahra, S. A. and George, G., 2002. Absorptive capacity: A review, reconceptualization, and extension. <i>Academy of Management Review</i> , 27(2): 185.

Appendix 3: Cross Reference Analysis (min 5 citations)

Reference (in bold/red, articles directly part of the dynamic capability literature)	N° Citations
Teece, D. J., Pisano, G., & Shuen, A. 1997. Dynamic capabilities and strategic management. Strategic Management Journal, 18: 509-533.	18
Eisenhardt, K. M., & Martin, J. A. 2000. Dynamic capabilities: What are they? Strategic Management Journal, 21: 1105- 1121.	17
Nelson, R. R., & Winter, S. G. (1982). An evolutionary theory of economic change. Cambridge, MA: Belknap Press.	15
Barney, J. 1991. Firm resources and sustained competitive advantage. Journal of Management, 17(1): 99-120.	12
Winter, S. G. (2003). Understanding dynamic capabilities. Strategic Management Journal, 24(10): 991-995.	12
Zollo, M., & Winter, S. G. 2002. Deliberate learning and the evolution of dynamic capabilities. Organization Science, 13: 339-351.	12
Leonard-Barton, D. (1992), "Core capabilities and core rigidities: a paradox in managing new product development", Strategic Management Journal, Vol. 13, p. 111.	10
Penrose, E. (1959). The theory of the growth of the firm. Oxford: Oxford University Press.	10
Cohen, W. M., & Levinthal, D. A. 1990. Absorptive capacity: A new perspective on learning and innovation. Administrative Science Quarterly, 35: 128-152.	9
Wernerfelt, B. 1984. A resource-based view of the firm. Strategic Management Journal, 5: 171-180.	9
Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. Organization Science, 3(3): 383-397.	8
Porter, M.E. (1980) Competitive Strategy. New York: The Free Press.	8
Prahalad, C.K. and Hamel, G. (1990), "The core competence of the corporation", Harvard Business Review, Vol. 68 No. 3, pp. 79-91.	8
Zott, C. (2003). Dynamic capabilities and the emergence of intraindustry differential firm performance: insights from a simulation study. Strategic Management Journal, 24(2): 97-112.	8
Amit, R. and Schoemaker, P.J.H. (1993), "Strategic assets and organizational rent", Strategic Management Journal, Vol. 14 No. 1, p. 33.	7
Collis, D.J. (1994), "Research note: how valuable are organizational capabilities?", Strategic Management Journal, Vol. 15 No. 8, pp. 143-53.	7
Dierickx, I., & Cool, K. 1989. Asset stock accumulation and sustainability of competitive advantage. Management Science, 35: 1504-1513.	7
Grant, R.M. (1996a), "Prospering in dynamically-competitive environments: organizational capability as knowledge integration", Organization Science, Vol. 7 No. 4, pp. 375-87.	7
Helfat, C. E. 1997. Know-how and asset complementarity and dynamic capability accumulation: The case of R&D. Strategic Management Journal, 18: 339-360.	7
Helfat, C. E., & Raubitschek, R. S. 2000. Product sequencing: Co-evolution of knowledge, capabilities and products. Strategic Management Journal, 21: 961-979.	7
Verona, G., & Ravasi, D. (2003). Unbundling dynamic capabilities: An exploratory study of continuous product innovation. Industrial & Corporate change, 12(3): 577-6007.	7
Winter, S. G. 2000. The satisficing principle in capability learning. Strategic Management Journal, 21: 981-996.	7
Zahra, S. A., & George, G. 2002. Absorptive capacity: A review, reconceptualization, and extension. Academy of Management Review, 27: 185-203.	7
Cyert, R.M., & March, J. (1963). A behavioral theory of the firm. Englewood Cliffs, NJ: Prentice Hall.	6
Priem, R.L. and Butler, J.E. (2001), "Is the resource-based view a useful perspective for strategic management research?", Academy of Management Review, Vol. 26 No. 1, p. 22.	6
Teece, D. and Pisano, G. (1994), "The dynamic capabilities of firms: an introduction", Industrial and Corporate Change, Vol. 3 No. 3, pp. 537-56.	6
Brown, S. L. & Eisenhardt, K. M. (1997). The art of continuous change: linking complexity theory and time-paced evolution in relentlessly shifting organizations. Administrative Science Quarterly, 42(1): 1-34.	5
D'Aveni, R.A. (1994) Hypercompetition: Managing the Dynamics of Strategic Maneuvering. New York: The Free Press.	5
Danneels, E. (2002), "The dynamics of product innovation and firm competences", Strategic Management Journal, Vol. 23 No. 12, pp. 1095-121.	5
Helfat, C. E. & Peteraf, M. A. (2003). The dynamic resource-based view: capability lifecycles. Strategic Management Journal, 24(10): 997-1010.	5
Henderson, R., & Cockburn, I. 1994. Measuring competence? Exploring firm effects in pharmaceutical research. Strategic Management Journal, 15(Special Issue): 63-84.	5
Leonard-Barton, D. (1995). Wellsprings of Knowledge: Building and Sustaining the Sources of Innovation, Harvard Business School Press, Boston, MA.	5
Mahoney, J.T. and Pandian, J.R. (1992). The resource-based view within the conversation of strategic management. Strategic Management Journal, 13, 363-380.	5
March, J.G. (1991). Exploration and exploitation in organizational learning. Organization Science, 2: 71-78.	5
Nonaka, I. and Takeuchi, H. (1995), The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation, Oxford University Press, New York, NY.	5
Rindova, V. P. & Kotha, S. (2001). Continuous 'morphing': competing through dynamic capabilities, form, and function. Academy of Management, 44(6):1263-1280.	5
Rumelt, R. P. 1984. Towards a strategic theory of the firm. In B. R. Lamb (Ed.), Competitive strategic management, vol. 26: 556-570. Englewood Cliffs, NJ: Prentice-Hall.	5
Tripsas, M., & Gavetti, G. 2000. Capabilities, cognition, and inertia: Evidence from digital imaging. Strategic Management Journal, 21: 1147-1161.	5

Appendix 4: Selection criteria for full text papers

Element	Level			
	0 - Absence	1 - Low	2 - Medium	
	N/A		3 - High	
Literature	This criteria is not applicable for this paper.	Poor literature with a lack of major contributions. Inconsistent use of references. No clear linkages with propositions/hypotheses.	Reasonably comprehensive literature, not necessarily well discussed. No lack of major contributions and no clear inconsistencies in the reference used. Clear and direct linkages with proposition/hypotheses.	Comprehensive literature review, sufficiently critically discussed. All major contributions included and no clear inconsistencies in the references. Highlights of clear gaps in the existing knowledge and/or argumentation for new knowledge gaps or paradoxes not previously observed. Clear and direct linkages with propositions/hypotheses.
Methodology	This criteria is not applicable for this paper.	Insufficient research design. Few or no description given. Logical inconsistency. Methodology already proven as weak.	Research design acceptably explained, but with some major gaps. Accepted methodology but not well justified in respect of propositions/hypotheses.	Deeply explained and justified research design. Widely accepted methodology fully aligned with propositions/hypotheses.
Empirical results	This criteria is not applicable for this paper.	Too many limitations strongly reducing the generalizability. Anecdotal evidence.	Limitations are present but reasonable and well discussed. Generalizability at least in similar organizations or industries. Data support propositions/hypotheses at a reasonable extent.	Limitations are present but fully discussed in a reasonable way. High generalizability in several areas. Data strongly support propositions/hypotheses.
Contribution to knowledge	This criteria is not applicable for this paper.	No discussion of contributions to knowledge or weak discussion. Unclear alignment between theory, discussion and conclusion.	Sufficient and reasonably discussed advances in theoretical and/or empirical knowledge. Sufficient alignment between theory, discussion and conclusion.	Clear and strong advances in theoretical and/or empirical knowledge. Potential new light on the research problems, not previously discovered or sufficiently proved.
Knowledge into action	This criteria is not applicable for this paper.	No relevance neither for real-life nor for theoretical development towards practical implications. No discussion of practical implications.	Reasonably inclusion and discussion of practical implications, either related to the paper or to clear future research. Real potential relevance for real life implication.	Clear benefits for practice. Clear discussion of the implication built on strong linkages with theoretical and/or empirical results and contributions to knowledge.

Appendix 5: Data extraction framework

Type of coding	Field	Multiple choices
General information	Review Questions	N/A
	Full Reference	
	Author(s)	
	Year	
	Title	
	Journal	
Specific information	Type	Conceptual/Empirical
	Context	N/A
	Level	Individual/Organization/Network/Mixed
	Methodology	Qualitative/Quantitative
		Sample Size
		Method of data collection
		Method of data analysis
Additional notes		
Quality assessment	Centrality	0-3
	Literature	
	Methodology	
	Empirical results	
	Contribution to knowledge	
	Knowledge into action	

Appendix 6: Example of data extraction

Type of coding	Field	Multiple choices	Tecce, D. J., Pisano, G., & Shuen, A. (1997)	Partington, D., Pellegrinelli, S., & Young, M. (2005)	
General information	Review Questions		All	D	
	Full Reference		Tecce, D. J., Pisano, G., & Shuen, A. 1997. Dynamic capabilities and strategic management. <i>Strategic Management Journal</i> , 18: 509–533.	Partington, D., Pellegrinelli, S. & Young, M. (2005). "Attributes and levels of programme management competence: an interpretive study". <i>International Journal of Project Management</i> . 23: 87–95.	
	Author(s)	N/A	Tecce, D. J., Pisano, G., & Shuen, A.	Partington, D., Pellegrinelli, S. & Young, M.	
	Year		1997	2005	
	Title		Dynamic capabilities and strategic management	Attributes and levels of programme management competence: an interpretive study	
Specific information	Journal		Strategic Management Journal	International Journal of Project Management	
	Type	Conceptual/Empirical	Conceptual	Empirical	
	Context	N/A	Conceptual	Programmes	
	Level	Individual/Organization/Network/Mixed	Organizational	Mixed (Individual/Organizational)	
	Methodology		Qualitative/Quantitative	N/A	Qualitative
			Sample Size	N/A	15 programmes
			Method of data collection	N/A	Phenomenography
		Method of data analysis	N/A	Phenomenography	
	Additional notes	N/A	N/A		
Quality assessment	Centrality		3	N/A	
	Literature		3	2	
	Methodology		N/A	2	
	Empirical results		N/A	2	
	Contribution to knowledge	0-3	3	2	
Knowledge into action		2	2		

Appendix 7: Final sample of the systematic literature review

Note: C=Conceptual; M=Mix methods; QL=Qualitative; QT=Quantitative; R=Review; S=Simulation.

Reference	Type	Size	Age	Sector	Context	Level	Sample Size	Method of data collection	Method of data analysis
Adler, P. S., Benner, M., Brunner, D. J., MacDuffie, J. P., Osonno, E., Staats, B. R., et al. (2009). Perspectives on the productivity dilemma. <i>Journal of Operations Management</i> , 27 (2), 99-113.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Adner, R., & Helfat, C. E. (2003). Corporate effects and dynamic managerial capabilities. <i>Strategic Management Journal</i> , 24 (10), 1011-1025.	QT	Medium/Large	Mature	Oil, Gas and Chemicals	US Petroleum industry	Industry	30	Panel data	ANOVA with hierarchical OLS regression with dummy variables
Ambrosini, V., & Bowman, C. (2009). What are dynamic capabilities and are they a useful construct in strategic management? <i>International Journal of Management Reviews</i> , 11 (1), 29-49.	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Ambrosini, V., Bowman, C., & Collier, N. (2009). Dynamic capabilities: An exploration of how firms renew their resource base. <i>British Journal of Management</i> , 20, S9-S24.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Andersen, T. J., Denrell, J., & Bettis, R. A. (2007). Strategic responsiveness and bowman's risk-return paradox. <i>Strategic Management Journal</i> , 28 (4), 407-429.	QT	N/A	N/A	Cross sector	Cross industry	Industry	45 industries	Panel data	Simulation
Augier, M., & Teece, D. J. (2009). Dynamic capabilities and the role of managers in business strategy and economic performance. <i>Organization Science</i> , 20 (2), 410-421.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Azadegan, A., Bush, D., & Dooley, K. J. (2008). Design creativity: Static or dynamic capability? <i>International Journal of Operations & Production Management</i> , 28 (7-8), 636-662.	QT	Medium/Large	Cross age	Cross sector	US Mid Size/Large Organizations	Multilevel	74	Exploratory controlled experiment	Structural equation modeling
Bagley, C. E. (2008). Winning legally: The value of legal astuteness. <i>Academy of Management Review</i> , 33 (2), 378-390.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Benner, M. J., & Tushman, M. L. (2003). Exploitation, exploration, and process management: The productivity dilemma revisited. <i>Academy of Management Review</i> , 28 (2), 238-256.	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Reference	Type	Size	Age	Sector	Context	Level	Sample Size	Method of data collection	Method of data analysis
Bessant, J., Francis, D., Meredith, S., Kaplinsky, R., & Brown, S. (2001). Developing manufacturing agility in SMEs. <i>International Journal of Technology Management</i> , 22 (1-3), 28-54.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Bierly-Paul E., III, & Daly, P. S. (2007). Sources of external organisational learning in small manufacturing firms. <i>International Journal of Technology Management</i> , 38 (1-2), 45-68.	QT	SME's	Cross age	Manufacturing	US Cross industry Small/Medium sized manufacturing firms	Organizational	98	Multiple respondent survey (294 individual surveys)	Regression
Blomqvist, K., Hara, V., Korvunemi, J., & Aijo, T. (2004). Towards networked R&D management: The R&D approach of sonera corporation as an example. <i>R & D Management</i> , 34 (5), 591-603.	QL	Medium/Large	Mature	ITC and High Tech	ITC Sector	Organizational	1	Participation action research	Narrative analysis
Byler, M., & Cofi, R. W. (2003). Dynamic capabilities, social capital, and rent appropriation: Ties that split pies. <i>Strategic Management Journal</i> , 24 (7), 677-686.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Bowman, C., & Ambrosini, V. (2003). How the resource-based and the dynamic capability views of the firm inform corporate-level strategy. <i>British Journal of Management</i> , 14 (4), 289-303.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Bowman, C., & Swart, J. (2007). Whose human capital? the challenge of value capture when capital is embedded. <i>Journal of Management Studies</i> , 44 (4), 488-505.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Breslin, D. (2008). A review of the evolutionary approach to the study of entrepreneurship. <i>International Journal of Management Reviews</i> , 10 (4), 399-423.	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bruni, D. S., & Verona, G. (2009). Dynamic marketing capabilities in science-based firms: An exploratory investigation of the pharmaceutical industry. <i>British Journal of Management</i> , 20 , S101-S117.	QL	Medium/Large	Cross age	Pharma and Biotech	Pharmaceutical	Organizational	7	In depth semi structured interviews	Extended Case Study

Reference	Type	Size	Age	Sector	Context	Level	Sample Size	Method of data collection	Method of data analysis
Buenstorf, G., & Murmann, J. P. (2005). Ernst abbe's scientific management: Theoretical insights from a nineteenth-century dynamic capabilities approach. <i>Industrial and Corporate Change</i> , 14 (4), 543-578.	QL	Medium/Large	Mature	Others	German Foundation	Organizational	1	Historical data	Narrative analysis
Chen, J. J., Paulraj, A., & Lado, A. A. (2004). Strategic purchasing, supply management, and firm performance. <i>Journal of Operations Management</i> , 22 (5), 505-523.	QT	Medium/Large	Cross age	Manufacturing	US Manufacturing firms	Organizational	221	Survey	Exploratory/Confirmatory Factor Analysis
Capron, J., & Mitchell, W. (2009). Selection capability: How capability gaps and internal social frictions affect internal and external strategic renewal. <i>Organization Science</i> , 20 (2), 294-312.	M	Cross size	Cross age	ITC and High Tech	International Telecommunication Industry	Organizational	162	26 Interviews + Survey	Structural equation modeling
Ccindamar, D., Phaal, R., & Probert, D. (2009). Understanding technology management as a dynamic capability: A framework for technology management activities. <i>Technovation</i> , 29 (4), 237-246.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Chadwick, C., & Dabu, A. (2009). Human resources, human resource management, and the competitive advantage of firms: Toward a more comprehensive model of causal linkages. <i>Organization Science</i> , 20 (1), 253-272.	C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Danneels, E. (2008). Organizational antecedents of second-order competences. <i>Strategic Management Journal</i> , 29 (5), 519-543.	QT	Medium/Large	Mature	Manufacturing	U.S. public manufacturing firms	Organizational	145	Survey	Exploratory/Confirmatory Factor Analysis
Chi, T., & Seth, A. (2009). A dynamic model of the choice of mode for exploiting complementary capabilities. <i>Journal of International Business Studies</i> , 40 (3), 365-387.	S	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Danneels, E. (2002). The dynamics of product innovation and firm competences. <i>Strategic Management Journal</i> , 23 (12), 1095-1121.	QL	Cross size	Cross age	Cross sector	High Tech Firms	Organizational	5	60 interview + 20 observation + company data	Extended case study

Reference	Type	Size	Age	Sector	Context	Level	Sample Size	Method of data collection	Method of data analysis
Doving, E., & Gooderham, P. N. (2008). Dynamic capabilities as antecedents of the scope of related diversification: The case of small firm accountability practices. <i>Strategic Management Journal</i> , 29 (8), 841-857.	QT	SMEs	Cross age	Others	Norwegian Accountancy SMEs	Organizational	254	Survey	Linear Regression Analysis
Figgers, J. P., & Kaplan, S. (2009). Cognition and renewal: Comparing CEO and organizational effects on incumbent adaptation to technical change. <i>Organization Science</i> , 20 (2), 461-477.	QT	Cross size	Cross age	ITC and High Tech	Fiber optic market	Organizational	29	Survey	Cox proportional hazard model / Efron method
Easterby-Smith, M., & Prieto, I. M. (2008). Dynamic capabilities and knowledge management: An integrative role for learning? <i>British Journal of Management</i> , 19 (3), 235-249.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Easterby-Smith, M., Lyles, M. A., & Peteraf, M. A. (2009). Dynamic capabilities: Current debates and future directions. <i>British Journal of Management</i> , 20, S1-S8.	R	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Garcia-Muina, F. E., & Navas-Lopez, J. E. (2007). Explaining and measuring success in new business: The effect of technological capabilities on firm results. <i>Technovation</i> , 27 (1-2), 30-46.	QT	SMEs	Cross age	Pharma and Biotech	Spanish biotech SMEs	Organizational	34	Survey	Wilcoxon Test
Eisenhardt, K. M., & Martin, J. A. 2000. Dynamic capabilities: What are they? <i>Strategic Management Journal</i> , 21: 1105- 1121.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Griffith, D. A., & Harvey, M. G. (2001). A resource perspective of global dynamic capabilities. <i>Journal of International Business Studies</i> , 32 (3), 597-606.	QT	SMEs	Cross age	Manufacturing	US Manufacturing firms and foreign distributors	Network	130	Survey	Regression analysis
George, G. (2005). Learning to be capable: Patenting and licensing at the wisconsin alumni research foundation 1925-2002. <i>Industrial and Corporate Change</i> , 14(1), 119-151.	M	N/A	N/A	Others	University patenting	Organizational	1 organization	Interviews and Historical data	Tobit regression and Negative Binomial regression

Reference	Type	Size	Age	Sector	Context	Level	Sample Size	Method of data collection	Method of data analysis
Gilbert, C. G. (2006). Change in the presence of residual fit: Can competing frames coexist? <i>Organization Science</i> , 17 (1), 150-167.	QL	Medium/Large	Cross age	Others	Media	Organizational	1	21 open ended interviews + archival materials + direct observation in meetings + public documents	Multilevel longitudinal case study
Graczyk, F., & Smith, A. C. T. (2008). The role of dualities in arbitrating continuity and change in forms of organizing. <i>International Journal of Management Reviews</i> , 10 (3), 265-280.	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Helfat, C. E. (1997). Know-how and asset complementarity and dynamic capability accumulation: The case of R&D. <i>Strategic Management Journal</i> , 18 (5), 339-360.	QT	Medium/Large	Mature	Oil, Gas and Chemicals	US Petroleum industry	Industry	26	Panel data	Tobit regression
Hahn, E. D., & Doh, J. P. (2006). Using bayesian methods in strategy research: An extension of hansen et al. <i>Strategic Management Journal</i> , 27 (8), 783-798.	QT	Cross size	Cross age	Pharma and Biotech	US Pharmaceutical Industry	Organizational	34	secondary data	Bayesian simulation
Hallorsson, A., & Sjøtt-Larsen, T. (2004). Developing logistics competencies through third party logistics relationships. <i>International Journal of Operations & Production Management</i> , 24 (1-2), 192-206.	QL	Cross size	Cross age	Manufacturing	Supply Chain	Network	2	N/A	Pattern Matching case study
Julian, S. D., Ofori-Dankwa, J. C., & Justis, R. T. (2008). Understanding strategic responses to interest group pressures. <i>Strategic Management Journal</i> , 29 (9), 963-984.	QT	Medium/Large	Mature	Others	US Restaurant Industry	Organizational	59	Survey	Regression and Structural Equation Model
Helfat, C. E., & Peteraf, M. A. (2003). The dynamic resource-based view: Capability lifecycles. <i>Strategic Management Journal</i> , 24 (10), 997-1010.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Holcomb, T. R., & Hitt, M. A. (2007). Toward a model of strategic outsourcing. <i>Journal of Operations Management</i> , 25 (2), 464-481.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Hoopes, D. G., & Madsen, T. L. (2008). A capability-based view of competitive heterogeneity. <i>Industrial and Corporate Change</i> , 17 (3), 393-426.	R	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A

Reference	Type	Size	Age	Sector	Context	Level	Sample Size	Method of data collection	Method of data analysis
Jacobides, M. G. (2006). The architecture and design of organizational capabilities. <i>Industrial and Corporate Change</i> , 15 (1), 151-171.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Luo, Y. D. (2002). Capability exploitation and building in a foreign market: Implications for multinational enterprises. <i>Organization Science</i> , 13 (1), 48-63.	QT	Medium/Large	Mature	Manufacturing	MNE subunits in China	Organizational	167	Survey	Global Factor Analysis
Malik, O. R., & Kotabe, M. (2009). Dynamic capabilities, government policies, and performance in firms from emerging economies: Evidence from india and pakistan. <i>Journal of Management Studies</i> , 46 (3), 421-450.	QT	Gross size	Gross age	Manufacturing	Emerging Market Manufacturing Firms	Organizational	93	Survey	Ordinary Least Square Regression
Katzy, B. R., & Crowston, K. (2008). Competency rallying for technical innovation - the case of the virtuelle fabrik. <i>Technovation</i> , 28 (10), 679-692.	QL	Gross size	Gross age	Manufacturing	Swiss manufacturing sector	Network	N/A	100 semi structured interviews + secondary data	Grounded theory approach
Keil, T. (2004). Building external corporate venturing capability. <i>Journal of Management Studies</i> , 41 (5), 799-825.	QL	Medium/Large	Mature	ITC and High Tech	European ITC industry	Organizational	2	49 semi structured interviews + primary and secondary data	Longitudinal case study
Kodama, M. (2007). Innovation and knowledge creation through leadership-based strategic community: Case study on high-tech company in japan. <i>Technovation</i> , 27 (3), 115-132.	QL	Medium/Large	Mature	ITC and High Tech	Japanese mobile communications company	Organizational	2	Participant observation	Grounded theory approach
Kolk, A., & Pinkse, J. (2008). A perspective on multinational enterprises and climate change: Learning from "an inconvenient truth"? <i>Journal of International Business Studies</i> , 39 (8), 1359-1378.	QL	Medium/Large	Mature	Cross sector	Global 500 Firms	Organizational	N/A	secondary data	Narrative analysis
Lavie, D. (2006). "Capability reconfiguration: An analysis of incumbent responses to technological change", <i>Academy of Management Review</i> , 31 (1), 153-174.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A

Reference	Type	Size	Age	Sector	Context	Level	Sample Size	Method of data collection	Method of data analysis
Lee, H., & Kelley, D. (2008). Building dynamic capabilities for innovation: An exploratory study of key management practices. <i>R & D Management</i> , 38(2), 155-168.	QL	Medium/Large	Mature	Others	Large Korean firms	Organizational	2 firms	12 interviews	Comparative Case Study Analysis.
Lee, J., Lee, K., & Rho, S. (2002). An evolutionary perspective on strategic group emergence: A genetic algorithm-based model. <i>Strategic Management Journal</i> , 23(8), 727-746.	S	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Li, E. Y., Chen, J., & Huang, Y. (2006). A framework for investigating the impact of IT capability and organisational capability on firm performance in the late industrialising context. <i>International Journal of Technology Management</i> , 36(1-3), 209-229.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Lillis, B., & Lane, R. (2007). Auditing the strategic role of operations. <i>International Journal of Management Reviews</i> , 9(3), 191-210.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Marcus, A. A., & Anderson, M. H. (2006). A general dynamic capability: Does it propagate business and social competencies in the retail food industry? <i>Journal of Management Studies</i> , 43(1), 19-46.	QT	Cross size	Cross age	Others	US Retail food industry	Organizational	108	Survey	Exploratory/Confirmatory Factor Analysis
Ma, X., & Loch, H. (2007). Closing the gap: How should chinese companies build the capabilities to implement ERP-driven process innovation? <i>International Journal of Technology Management</i> , 39(3-4), 380-395.	QL	Medium/Large	Mature	Manufacturing	Large/Medium sized Chinese state-owned manufacturing firms	Organizational	3	17 semi structured interviews + semi structured demographic questionnaires + company data	Multiple in depth case study
MacCormack, A., & Iansiti, M. (2009). Intellectual technological transitions: Evidence from microsoft corporation. <i>Journal of Product Innovation Management</i> , 26(3), 248-263.	QL	Medium/Large	Mature	ITC and High Tech	ITC Sector	Organizational	1	24 interviews + company data	Exploratory Case Study
Macpherson, A., Jones, O., & Zhang, M. (2004). Evolution or revolution? dynamic capabilities in a knowledge-dependent firm. <i>R & D Management</i> , 34(2), 161-177.	QL	SMEs	Mature	Manufacturing	UK Small technology based firm	Organizational	1	7 Interviews	Narrative analysis

Reference	Type	Size	Age	Sector	Context	Level	Sample Size	Method of data collection	Method of data analysis
Madhok, A., & Osegowitsch, T. (2000). The international biotechnology industry: A dynamic capabilities perspective. <i>Journal of International Business Studies</i> , 31 (2), 325-335.	QL	N/A	N/A	Pharma and Biotech	Biotech	Industry	N/A	Panel data	Descriptive statistics
Makadok, R. (2001). Toward a synthesis of the resource-based and dynamic-capability views of rent creation. <i>Strategic Management Journal</i> , 22 (5), 387-401.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Makadok, R. (2002). A rational-expectations revision of makadok's resource/capability synthesis. <i>Strategic Management Journal</i> , 23 (11), 1051-1057.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
McKeivie, A., & Davidsson, P. (2009). From resource base to dynamic capabilities: An investigation of new firms. <i>British Journal of Management</i> , 20, S63-S80.	QT	SMEs	New	Cross sector	Swedish cross industry new firms	Organizational	238	Survey	Hierarchical regression + Exploratory Factory Analysis
Mitchell, V. L. (2006). Knowledge integration and information technology project performance. <i>Mis Quarterly</i> , 30 (4), 919-939.	QT	Medium/Large	Mature	Healthcare	IT Health networks	Organizational	74	Survey	Principal component analysis
McCarthy, I. P. (2004). Manufacturing strategy: Understanding the fitness landscape. <i>International Journal of Operations & Production Management</i> , 24 (1-2), 124-150.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Molitero, T. P., & Wiersema, M. F. (2007). Firm performance, rent appropriation, and the strategic resource divestment capability. <i>Strategic Management Journal</i> , 28 (11), 1065-1087.	QT	N/A	N/A	Others	US Professional Baseball Franchises	Organizational	26	Panel data	Cross Sectional Time Series Regression
Newbert, S. L., Gopalakrishnan, S., & Kirchhoff, B. A. (2009). Looking beyond resources: Exploring the importance of entrepreneurship to firm-level competitive advantage in technologically intensive industries. <i>Technovation</i> , 28 (1-2), 6-19.	QT	SMEs	New	ITC and High Tech	Micro and Nanotech	Organizational	117/511	Survey	Common Method Variance + Hierarchical Ordinary Least-Squares Regression
Mills, J., Platts, K., & Bourne, M. (2003). Competence and resource architectures. <i>International Journal of Operations & Production Management</i> , 23 (9), 977-994.	QL	Medium/Large	Mature	Manufacturing	Transport Industry	Organizational	1	Interview and secondary data	Case study

Reference	Type	Size	Age	Sector	Context	Level	Sample Size	Method of data collection	Method of data analysis
Peng, D. X., Schroeder, R. G., & Shah, R. (2008). Linking routines to operations capabilities: A new perspective. <i>Journal of Operations Management</i> , 26 (6), 730-748.	QI	Cross size	Cross age	Manufacturing	Cross country manufacturing plants	Organizational	189	Survey	Confirmatory factory analysis
Rothaermel, F. T., & Hess, A. M. (2007). Building dynamic capabilities: Innovation driven by individual-, firm-, and network-level effects. <i>Organization Science</i> , 18 (6), 898-921.	QI	Cross size	Cross age	Pharma and Biotech	Pharmaceutical	Multilevel	93	Panel data	Negative binomial regression
Montelegre, R. (2002). A process model of capability development: Lessons from the electronic commerce strategy at bolsa de valores de guayaquil. <i>Organization Science</i> , 13 (5), 514-531.	QL	N/A	N/A	Others	Ecuadorian Stock Exchange	Organizational	1	60 Interviews and company data	Longitudinal in depth case study
Mosey, S. (2005). Understanding new-to-market product development in SMEs. <i>International Journal of Operations & Production Management</i> , 25 (2), 114-130.	QL	SMEs	Cross age	Cross sector	UK SME	Organizational	5	50 interviews + company records and published financial results	multiple embedded case study
Narayanan, V. K., Colwell, K., & Douglas, F. L. (2009). Building organizational and scientific platforms in the pharmaceutical industry: A process perspective on the development of dynamic capabilities. <i>British Journal of Management</i> , 20, S25-S40.	QL	Medium/Large	Mature	Pharma and Biotech	Pharmaceutical	Organizational	1 firm + 8 case studies > 2 narratives	27 interviews + secondary data	Narrative analysis
Newbert, S. L. (2007). Empirical research on the resource-based view of the firm: An assessment and suggestions for future research. <i>Strategic Management Journal</i> , 28 (2), 121-146.	R	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Sawers, J. L., Pretorius, M. W., & Oerlemans, L. A. G. (2008). Safeguarding SMEs dynamic capabilities in technology innovative SME-large company partnerships in south africa. <i>Technovation</i> , 28 (4), 171-182.	QI	SMEs	Cross age	ITC and High Tech	South African SME-large company partnership	Network	43	Survey	Binary Logistic Regression
Newey, L. R., & Zahra, S. A. (2009). The evolving firm: How dynamic and operating capabilities interact to enable entrepreneurship. <i>British Journal of Management</i> , 20, S81-S100.	QL	Cross size	Cross age	Pharma and Biotech	Biotech	Organizational	2	40 interviews + secondary data	Single comparative longitudinal case study

Reference	Type	Size	Age	Sector	Context	Level	Sample Size	Method of data collection	Method of data analysis
Ng, D. W. (2007). A modern resource based approach to unrelated diversification. <i>Journal of Management Studies</i> , 44 (8), 1481-1502.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Nightingale, P. (2008). Meta-paradigm change and the theory of the firm. <i>Industrial and Corporate Change</i> , 17 (3), 533-583.	C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
O'Connor, G. C. (2008). Major innovation as a dynamic capability: A systems approach. <i>Journal of Product Innovation Management</i> , 25 (4), 313-330.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
O'Connor, G. C., Paulson, A. S., & DeMartino, R. (2008). Organisational approaches to building a radical innovation dynamic capability. <i>International Journal of Technology Management</i> , 44 (1-2), 179-204.	QL	Medium/Large	Mature	Cross sector	US Cross industry MNEs	Organizational	12	246 interviews + company data	Multicase methods analysis
Oliver, C., & Holzinger, I. (2008). The effectiveness of strategic political management: A dynamic capabilities framework. <i>Academy of Management Review</i> , 33 (2), 496-520.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Pablo, A. L., Reay, T., Dewald, J. R., & Casebeer, A. L. (2007). Identifying, enabling and managing dynamic capabilities in the public sector. <i>Journal of Management Studies</i> , 44 (5), 687-708.	QL	N/A	N/A	Healthcare	Public sector (Health)	Organizational	1	75 semi structured interviews + 20 conferences + 45 observations in meeting + secondary data	Content analysis and Grounded Theory
Pandza, K., & Thorpe, R. (2009). Creative search and strategic sense-making: Missing dimensions in the concept of dynamic capabilities. <i>British Journal of Management</i> , 20, S118-S131.	C	N/A	N/A	N/A	N/A	Multilevel	N/A	N/A	N/A
Petroni, A. (1998). The analysis of dynamic capabilities in a competence-oriented organization. <i>Technovation</i> , 18 (3), 179-189.	QL	Medium/Large	Mature	Healthcare	Healthcare Industry	Organizational	1	In depth interviews (structured and unstructured)	Case study

Reference	Type	Size	Age	Sector	Context	Level	Sample Size	Method of data collection	Method of data analysis
Salvato, C. (2009). Capabilities unveiled: The role of ordinary activities in the evolution of product development processes. <i>Organization Science</i> , 20 (2), 384-409.	M	Medium/Large	Manure	Manufacturing	Designer Home Furnishing	Multilevel	90 NPD projects in 1 company	Inductive Case Study	Various
Sambamurthy, V., Bharadwaj, A., & Grover, V. (2003). Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary firms. <i>Mis Quarterly</i> , 27(2), 237-263.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Sapienza, H. J., Autio, E., George, G., & Zahra, S. A. (2006). A capabilities perspective on the effects of early internationalization on firm survival and growth. <i>Academy of Management Review</i> , 31 (4), 914-933.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Schreyoegg, G., & Kiesch-Eberl, M. (2007). How dynamic can organizational capabilities be? towards a dual-process model of capability dynamization. <i>Strategic Management Journal</i> , 28 (9), 913-933.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Smart, P., Bessant, J., & Gupta, A. (2007). Towards technological rules for designing innovation networks: A dynamic capabilities view. <i>International Journal of Operations & Production Management</i> , 27 (9-10), 1069-1092.	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Analytic induction
Soosay, C., & Hyland, P. (2008). Exploration and exploitation: The interplay between knowledge and continuous innovation. <i>International Journal of Technology Management</i> , 42 (1-2), 20-35.	QL	Medium/Large	Manure	Others	Engineering sector	Organizational	1	5 Semi structured interview	Exploratory Case Study
Tecce, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. <i>Strategic Management Journal</i> , 28 (13), 1319-1350.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A

Reference	Type	Size	Age	Sector	Context	Level	Sample Size	Method of data collection	Method of data analysis
Teeco, D. J. (2008). Dosis technological paradigms and trajectories: Insights for economics and management. <i>Industrial and Corporate Change</i> , 17 (3), 507-512.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Teeco, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. <i>Strategic Management Journal</i> , 18 (7), 509-533.	C	N/A	N/A	N/A	Conceptual	Organizational	N/A	N/A	N/A
Verona, G., & Ravasi, D. (2003). Unbundling dynamic capabilities: An exploratory study of continuous product innovation. <i>Industrial and Corporate Change</i> , 12 (3), 577-606.	QL	Medium/Large	Mature	Healthcare	Hearing-Aid Industry	Organizational	1	In depth semi-structured interviews + archival documents	Exploratory case study
Wang, C. L., & Ahmed, P. K. (2007). Dynamic capabilities: A review and research agenda. <i>International Journal of Management Reviews</i> , 9 (1), 31-51.	R	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Williams, C., & Lee, S. H. (2009). Exploring the internal and external venturing of large R&D-intensive firms. <i>R & D Management</i> , 39 (3), 231-246.	QL	Medium/Large	Mature	Pharmaceutical and ITC	Pharmaceutical and IT	Organizational	6	Secondary data	Content Analysis
Wilbank, R., Dew, N., Read, S., & Sarasvathy, S. D. (2006). What to do next? the case for non-predictive strategy. <i>Strategic Management Journal</i> , 27 (10), 981-998.	R	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Winter, S. G. (2003). Understanding dynamic capabilities. <i>Strategic Management Journal</i> , 24 (10), 991-995.	C	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Witcher, B. J., Chau, V. S., & Harding, P. (2008). Dynamic capabilities: Top executive audits and hoshin kanri at nissan south africa. <i>International Journal of Operations & Production Management</i> , 28 (5-6), 540-561.	QL	Medium/Large	Mature	Manufacturing	Automotive (South Africa)	Organizational	1	Non participant observation + secondary data	Exploratory Case Study/ Semi retrospective ethnographic study
Wooleshy, J., & Daellenbach, U. (2005). Integrative capability and technology adoption: Evidence from oil firms. <i>Industrial and Corporate Change</i> , 14 (2), 307-342.	QL	Medium/Large	Mature	Oil, Gas and Chemicals	Oil firms	Organizational	4	19 interviews + secondary data	Two matched retrospective case studies

Reference	Type	Size	Age	Sector	Context	Level	Sample Size	Method of data collection	Method of data analysis
Wu, S., Lin, L., & Hsu, M. (2007). Intellectual capital, dynamic capabilities and innovative performance of organisations. <i>International Journal of Technology Management</i> , 39 (3-4), 279-296.	M	Cross size	Cross age	ITC and High Tech	Taiwanese Electronic and IT related industry	Organizational	100	100 Interviews + survey	Three-part and Hierarchical Regression
Zahra, S. A., Sapienza, H. J., & Davidsson, P. (2006). Entrepreneurship and dynamic capabilities: A review, model and research agenda. <i>Journal of Management Studies</i> , 43 (4), 917-955.	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. <i>Organization Science</i> , 13 (3), 339-351.	C	N/A	N/A	N/A	Conceptual	Organizational	N/A	N/A	N/A
Zott, C. (2003). Dynamic capabilities and the emergence of intraindustry differential firm performance: Insights from a simulation study. <i>Strategic Management Journal</i> , 24 (2), 97-125.	S	N/A	N/A	N/A	N/A	Organizational	N/A	N/A	N/A
Arend, R. J. and Bromiley, P. (2009). Assessing the dynamic capabilities view: spare change, everyone? <i>Strategic Organization</i> , 7(1), 75-90.	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Di Stefano, G., Peteraf, M.A., Verona, G. (forthcoming). Dynamic capabilities deconstructed: A bibliographical investigation into the origin, development, and future directions of the research domain. <i>Industrial and Corporate Change</i> .	R	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Appendix 8: Number of articles in the starting sample, by year

