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**Absorptive Capacity and Organizational Performance:
A Study of Banks in Turkey**

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Declaration on Inclusion of Material from a Prior Thesis

This thesis is the personal work of Abderaouf Bouguerra. The thesis is submitted in partial fulfilment of the degree of PhD at the University of Warwick. The thesis has not been submitted for a degree at any other university.

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Abstract

The main aim of this thesis is to investigate the relationship between absorptive capacity (ACAP) and organizational performance. The thesis addresses the following research questions: 1) why are some firms better at managing their potential and realized absorptive capacity than others? 2) what is the link between ACAP and organizational performance? The empirical analysis using multi-level modelling technique is drawn on data obtained from 200 managers of the banking sector in Turkey.

The thesis contributes to the progress of ACAP research in three ways. First, it provides a systematic review of the fragmented literature concerning the relationship between ACAP and organizational outcomes. It identifies and analyses 214 papers on ACAP and performance published between 1990 and 2015 in high impact business and management journals. The aim is to review, organize and synthesise the relationship between ACAP and organizational performance according to research approaches used and theories applied to understand the ACAP-organizational performance link. The review moves the literature review forward by highlighting the causes of inconsistencies, providing remedies and suggesting an agenda for future research.

Second, the thesis examines the antecedents of a firm's absorptive capacity. The two components of potential absorptive capacity (PACAP) and realized absorptive capacity (RACAP), are treated separately, in order to assess the moderating effects of market-sensing and responsiveness capabilities. The findings from multi-level analyses, show that while coordination facilitates the development of potential absorptive capacity, systems and socialization enhance the firm's realized absorptive capacity. Further, market sensing capability moderates the relationship between coordination and PACAP, and market responsiveness capability moderates the relationship between socialization and RACAP. Also, market responsiveness capability moderates the relationship between systems and RACAP. Drawing on these findings, this study contributes to ACAP research by elucidating that market sensing and responsiveness are prerequisite capabilities for effective acquisition and exploitation of knowledge.

Third, this research assesses how ACAP's two components, PACAP and RACAP, separately and jointly affect organizational performance. The findings indicate that the combined effect of potential and realized absorptive capacities on organizational performance is greater than the separate effect of the two components. Further, this study reports that the combined effect becomes stronger when organizations operate at a low level of environmental dynamism, and possess a high level of network size. Drawing on these results, the study stresses that potential and realized absorptive capacities are complementary in enhancing superior performance, and indeed this relationship is context dependent.

List of Abbreviations

ACAP	Absorptive capacity
CFA	Confirmatory factor analysis
CFI	Comparative fit index
CMB	Common method bias
df	Degrees of freedom
MCMAM	Monte Carlo Method for Assessing Mediation
PACAP	Potential absorptive capacity
RACAP	Realized absorptive capacity
RMSEA	Root mean square error of approximation
SD	Standard deviation
SRMR	Standardised root mean square residual
TLI	Tucker-Lewis index
OP	Organizational performance

CHAPTER ONE – INTRODUCTION

1.0 Introduction

This chapter introduces the research and provides a roadmap of the thesis. It starts by providing the aim and research objectives, and also the research questions to be addressed. The chapter then explains the motivations behind the research followed by highlighting the main contributions of the research. Finally, it discusses the importance of the context of Turkey as an appropriate context in which to conduct the research.

1.1 Aim and Research Objectives

The thesis investigates the relationship between absorptive capacity (ACAP) and organizational performance of banks in Turkey.

This thesis aims to achieve two main objectives:

1. To examine the organizational antecedents of ACAP, especially the underlying roles of market sensing and responsiveness capabilities.
2. To assess the individual and combined effects of potential absorptive capacity and realized absorptive capacity on organizational performance, moderated by environmental dynamism and network size.

1.2 Research Questions

The thesis seeks to answer the following key research questions:

1. Why are some firms better at managing their potential and realized absorptive capacity than others?
2. What is the link between ACAP and organizational performance?

1.3 Rationale for the Research

In today's dynamic and competitive environment, organizations are required to constantly and actively engage in the assimilation and use of external knowledge (Volberda, Foss and Lyles 2010; Walter, Lechner and Kellermanns 2016). This capability refers to absorptive capacity which is described as a set of dynamic organizational routines and processes by which firms acquire, assimilate, transform

and exploit new knowledge (Zahra and George 2002:28). Extant research unpacks the construct into two sub-dimensions: potential and realized absorptive capacity. Potential absorptive capacity (PACAP) refers to the capacity to acquire and assimilate new knowledge. Realized absorptive capacity (RACAP) refers to the capacity to transform and exploit new knowledge. The assumption, as discussed in detail in chapter three, is that although PACAP and RACAP are complementary, they are conceptually different and also driven by different mechanisms (Zahra and George 2002; Jansen, Van den Bosch and Volberda 2005).

Although a significant body of literature exists on the antecedents of ACAP (Van den Bosch *et al.* 1999; Jansen *et al.* 2005; Ebers and Maurers 2014), the extent to which some firms are better at managing their potential and realized absorptive capacity is still under-researched (Volberda *et al.* 2010). To address this, the study examines the effect of different contextual variables on the distinct antecedents (e.g. coordination, systems, and socialization) for each sub-dimension of ACAP. In so doing, the study focuses on the contextual dimensions such as the ability to read and react to environmental stimuli. Firms need not only the ability to acquire, assimilate, transform and exploit knowledge, but also the capacity to understand and respond to market changes. The core argument here is that while organizations focus on acquiring and assimilating knowledge, they might ignore or misperceive the changing market conditions, which results in not recognizing and apprehending the right resources (Yusuf *et al.* 2004). In a similar vein, organizations that put exclusive focus on transformation and exploitation of knowledge may not respond quickly to market stimuli, which hamper effective implementation of new knowledge (Ahuja and Lampert 2001).

Furthermore, extant literature has shown that the relationship between ACAP and performance is predominantly positive (Cohen and Levinthal 1990; Dyer and Singh 1998; Dyer and Hatch 2006; Lavie, Lechner and Singh 2007). The underlying rationale to explain this positive relationship is that organizations are required to develop their ability to assimilate and exploit knowledge if they seek to thrive and remain competitive in the market. Despite this evidence, some studies find that ACAP might be subject to diminishing financial returns or have an ambiguous

impact on firm performance (Martinez-Noya, Garcia-Canal and Guillen 2013; Wales, Parida and Patel 2013; Kotabe, Jiang and Murray 2014). This line of research highlights that the effect of absorptive capacity can be positive or negative according to a plethora of contextual factors. While the benefits of ACAP have traditionally been extolled, our understanding of how absorptive capacity contributes to performance outcomes remains limited. Variations in the manner of measuring ACAP (e.g. the use of proxies such as R&D, strategic alliances, and organizational forms) have explained, to some extent, differences in organizational outcomes; yet scholars have largely ignored a set of components, processes and routines that constitute a firm's ACAP. That is, there has been little empirical research (for an exception see Ebers and Maurers 2014) examining how the different components of absorptive capacity independently and jointly affect organizational outcomes. This study addresses this gap in the literature.

In addition, extant research shows that ACAP is context dependent resulting in different organizational outcomes (Jansen *et al.* 2005; Wang *et al.* 2014). Previous studies have examined the role of environmental circumstances in influencing the ACAP-performance link and produced inconsistent results. For example, Park and Gallagher (2002) find that the relationship between ACAP and performance is positive in a stable market but tends to be negative in a volatile market. In contrast, Wales *et al.* (2013) highlight that the ACAP-performance link is positive in dynamic environmental conditions whereas this positive effect is limited and short lived in a stable environment. Despite this evidence, research to date has not systematically focused on the effect of the two components of absorptive capacity on organizational performance under different environmental conditions. This has further hampered the progress of research on ACAP.

The aim of this thesis is to address the above-mentioned limitations by firstly examining organizational antecedents of ACAP. In so doing, the study examines the effect of organizational mechanisms including coordination, systems, and socialization on potential and realized absorptive capacity, moderated by market-sensing and responsiveness capabilities. This study advocates that firms that better manage their potential and realized absorptive capacity interact and respond better

to market changes than their counterparts. Secondly, the study extends our understanding of the ACAP-performance link by assessing the distinct and combined effect of potential and realized absorptive capacities on organizational performance, and suggests that this association is moderated by levels of environmental dynamism and network size. Focusing on the sub-dimensions of ACAP and different environmental conditions provide better understanding of why organizations vary in their organizational performance, and further explain how firms can realize the full potential and their ACAP (Lane, Koka and Pathak 2006; Volberda *et al.* 2010).

1.4 Contributions

This thesis makes three main contributions to ACAP research. First, the study provides a systematic review of the fragmented literature concerning the relationship between ACAP and organizational outcomes. The aim is to review, organize and synthesise the relationship between absorptive capacity and organizational performance, according to theories adopted and research approaches applied, in order to understand the ACAP-organizational performance link. This systematic review contributes to the development of ACAP literature by identifying the causes of inconsistencies, providing remedies and suggesting an agenda for future research.

The second contribution builds on and extends Jansen *et al.*'s (2005) seminal work. While Jansen *et al.* (2005) focus on the role of organizational antecedents (e.g. coordination, systems and socialization) in managing potential and realized absorptive capacity, this study goes beyond their argument, by both asserting and demonstrating that ACAP to be effective should be combined with other organizational learning capabilities, such as the ability to understand and react to environmental changes. The core argument here is that organizations need not only coordination, systems and socialization to acquire, assimilate, transform and exploit knowledge, but also the ability to comprehend and respond to environmental changes. Using multilevel analyses of 200 managers of the banking sector in Turkey, the study finds that organizations that better manage their potential and realized absorptive capacity actively sense and respond to environmental stimuli.

The third contribution extends the ACAP-performance link literature. The study assesses how potential and realized absorptive capacities, independently and jointly affect organizational performance. Zahra and George's (2002) model is used to frame the study and tests the hypotheses. The study contributes to the progress of ACAP research by empirically demonstrating that although PACAP and RACAP differ in their drivers and outcomes, potential and realized absorptive capacities are complementary in enhancing superior performance, and that this relationship depends on different conditions (e.g. environmental dynamism and network size).

1.5 Importance of the Context: Turkey

Turkey is one of the MINT (Malaysia, Indonesia, Nigeria and Turkey) emerging countries, and is considered as the leading emerging economy after the BRICS (Brazil, Russia, India, China and Singapore) countries. Emerging economies are characterised by an open economy and big potential for economic growth. For instance, China, Brazil, Russia, India, Mexico, Indonesia, and Turkey are considered the seven largest emerging economies measured either by high nominal GDP (PPP) or GDP growth (World Economic Forum 2016).

Over more than two decades, Turkey has experienced significant economic transformation, following reforms in the regulatory, political, economic and financial environments (e.g. neoliberalism restructuring and opening the market to foreign investment and trade). As a result, per capita income tripled and the gross domestic product (GDP) increased by 9% in 2010 and 2011, and 5% in 2014, making Turkey among the fastest growing economies worldwide (The World Bank in Turkey 2016). Turkey is currently ranked the 18th largest economy in the world with \$788 billion GDP, and it will continue to grow on average by 3.5% per annum, in line with other emerging markets and comparable with the BRICS countries (Bocchi and Yildiz 2015). As the government has eliminated restrictions and offered legal and financial incentives to foreign firms, Turkey has become a focus for investors. For instance, foreign direct investment (FDI) inflow has significantly increased, accounting for \$12.1 billion in 2014, making the country the 22nd most popular for foreign investment globally (World Investment Report 2016).

The banking sector is especially suitable as a site for the study for several reasons. Firstly, there is evidence that the banking sector became more efficient in the wake of market liberalisation (Demirbag *et al.* 2016). By early 2000, Turkey was hit by an economic crisis, and the government liberalised the financial sector and re-launched a new economic development strategy (e.g. Turkish banking restructuring program-2001). Also, due to government regulatory and financial reforms in 2010, the sector has strengthened its resilience against future economic shocks. The reforms were based on the following strategic objectives: a) improve market competition; b) promote corporate governance and management standards; and c) address the causes of a stagnating or dysfunctional banking sector (European Bank for Reconstruction and Development 2016). As a result, the banking sector has been successful in hedging against external shocks during the recent financial crisis, through which the sector became more attractive nationally and internationally. For instance, the presence of foreign banks has increased, attracted by high returns on capital and good growth prospects. Accordingly, foreign banks' assets have increased steadily since 2009 and account for 40% of total assets (Erdem 2014).

Secondly, the change in the Turkish business climate, where foreign-owned banks are increasing their presence in the market while local banks are attempting to increase their international presence, means that the competitive landscape is increasingly challenging. In response to this, banks have been pursuing two main avenues (Erdem 2014). One avenue is that foreign banks seek to promote their corporate governance, learning processes and viability of their business models in order to strengthen their competitive position in the context of the financial sector. The other avenue involves achieving greater diversification and better integration of domestic banks into the global financial market. As such, domestic banks have embraced diversity and more effective operation of financial markets (e.g. in insurance, asset management, and leasing.) for better integration into the global financial system. As a result, banking firms are in the process of renewing and upgrading their organizational capabilities and processes in order to thrive and survive in a changing environment. All of which renders a suitable context to investigate the link between organizational learning processes and organization performance.

1.6 Chapter Synopsis

The dissertation is structured in six chapters, as follows.

Literature Review

Chapter 2 provides a systematic review of the state of the field relating to the relationship between ACAP and organizational performance. In so doing, the chapter reviews, organizes and synthesises the relationship between absorptive capacity and organizational performance.

Theory and Hypotheses

Chapter 3 discusses the theoretical foundation of the research as well as developing a conceptual framework to be tested. The research comprises two empirical studies. The first study examines organizational antecedents of ACAP, highlighting the role of market-sensing and responsiveness capabilities. The second study explores the effect of potential and realized absorptive capacity on organizational performance, in the context of the moderating role of environmental dynamism and network size.

Research Methods

Chapter 4 sets out the research methods. The chapter starts by discussing the philosophical underpinning of the research (e.g. epistemology and ontology). This is followed by an examination of different research methods, while paying particular attention to quantitative research (i.e., survey) as the best approach to addressing the study's research questions and objectives. Finally, an explanation is given of the analytical tools used in the quantitative research, focusing on multilevel modelling as the best statistical technique to test the study's hypotheses.

Results and Discussion

Chapter 5 reports the results and discusses the findings of the two empirical studies.

Conclusions and Implications

Chapter 6 summarises the aim, rationale, and the objectives of this thesis. The chapter presents conclusions, and provides theoretical and managerial contributions of each study. Finally, it identifies limitations, and proposes avenues for future research.

CHAPTER TWO – LITERATURE REVIEW

2.0 Introduction

It is over 25 years since Cohen and Levinthal (1990) published their seminal work on absorptive capacity (hereafter ACAP) defining it as the firm's "ability to recognize the value of new information, assimilate it, and apply it to commercial ends" (p.128). Since then, there has been considerable interest in the antecedents, processes and performance consequences of firms' ACAP. Citation counts suggest that ACAP literature is flourishing with Cohen and Levinthal's paper receiving over 7800 citations in the ISI Web of Knowledge as of December 2015. Lane, Koka and Pathak (2006:833) noted that ACAP "is one of the most important constructs to emerge in organizational research over the past decades".

The vast literature on ACAP is beyond the scope of this review (for examples of previous reviews see Zahra and George 2002; Lane *et al.* 2006; Zahra, Sapienza and Davidsson 2006; Todorova and Durisin 2007; Sun and Anderson 2010; Schleimer and Pedersen 2013; Marabelli and Newell 2014). While previous reviews on absorptive capacity have focused, to a large extent, on extending the ACAP construct, this review focuses on the relationship between ACAP and organizational performance. Volberda *et al.* (2010:27) stressed that 'the scientific and managerial implications of ACAP are somewhat unclear'. That is, despite the proliferation and broad use of the ACAP construct in management and business research, its implications on organizational performance remains obscure. Building on this analysis, this review focuses a subset of the literature that deals with the ACAP-performance link. This review aims to take stock of what is known so far about the association between ACAP and organizational outcomes by categorizing and organizing the literature according to theoretical perspectives and empirical findings, and to provide an agenda for future research.

This review is timely since after 25 years of extensive research, there is not a consensus about how and whether ACAP enhances organizational outcomes. The predominant view of the ACAP-performance literature stipulates that to enhance their innovative capabilities and achieve and sustain success, firms should possess,

develop and enhance their ACAP. However, the stock of knowledge accumulated over the last 25 years exhibits significant variation in both conceptualization and empirical findings regarding the association between ACAP and organizational outcomes. This has raised concerns with the current state of the ACAP-organizational outcome literature. The first issue concerns the nature and role of ACAP. ACAP is conceptualized as both an outcome of, as well as an antecedent to, innovative capabilities and organizational success. For example, ACAP is conceptualized as an outcome to measure the firm's capability (Cohen and Levinthal 1990), a dynamic capability (Mowery and Oxley 1995) as well as an antecedent of – a means to improve - dynamic capabilities (Zahra and George 2002). While these three ways of positioning ACAP share a common assumption that ACAP has a strong influence on the firm's success, they emphasize different implications of those assumptions raising confusion over whether ACAP is an input capability, a process to develop capabilities such as organizational learning and innovation, or an output of the accumulation and management of the stock of knowledge the firm possesses. For the purpose of this review, given the use of ACAP as a measure of organizational performance, studies that explicitly consider ACAP as an organizational outcome are included in this review.

The second issue concerns the inconsistent findings regarding the impact of ACAP on organizational outcomes. Although there is a near consensus that ACAP positively affects organizational performance (Cohen and Levinthal 1990; Dyer and Singh 1998; Ahuja and Katila 2001; Jansen *et al.* 2005; Lavie *et al.* 2007), a number of recent studies have reported a negative (Bierly, Damanpour and Santoro 2009; Weigelt 2009; Kotabe *et al.* 2014) or an ambiguous impact (Schildt, Keil and Maula 2012; Martinez-Noya *et al.* 2013). Also, because of the different conceptualizations of ACAP, scholars have adopted different measures of performance, generating further confusion and disagreement over the relationship between ACAP and organizational outcome.

This chapter is the first to provide a systematic review of the fragmented literature concerning the relationship between ACAP and organizational outcomes. The aim of the chapter is to review, organize and synthesise the relationship between ACAP

and organizational performance according to research approaches used and theories applied to understand the ACAP-organizational performance link. In so doing, it aims to move the literature forward by highlighting the causes of inconsistencies, provide remedies, and suggest an agenda for future research.

The remainder of the chapter is structured as follows. It first discusses the scope and method of the literature review. Next, the chapter critically reviews how the ACAP construct has been conceptualized in prior research. This is followed by an examination of the relationship between ACAP and organizational performance. The final section discusses research challenges in the study of ACAP and organizational performance and proposes ways of addressing them.

2.1 Scope and Method of the Literature Review

The chapter reviews empirical and conceptual papers published between 1990 and 2015 (including papers in press) in high impact general business and management journals, namely *Academy of Management Journal*, *Academy of Management Review*, *Administration Science Quarterly*, *Journal of Management*, *Journal of Management Studies*, *Organization Science*, and *Strategic Management Journal*. The review focuses on high impact journals because preliminary search of the literature revealed that nearly all of the highly-cited papers on the ACAP and organizational performance link are published in the seven selected journals. This shows that papers published in these journals are shaping the research agenda.

Similar to prior systematic reviews, this review followed a formalised codebook that included the following information: author(s) name, journal, year, and citation (WoK), type of paper (conceptual/empirical), research method, sample and measures, theories used, ACAP category and main findings.

Only papers that explicitly examine the impact of ACAP on organizational outcome were selected for this review. This review first searched the keyword ‘absorptive capacity’ in the full text of academic articles of business and management journals. Then used terms such as ‘absorptive capacity impact’, ‘absorptive capacity effect’, and ‘absorptive capacity and performance’ in the search process of the EBSCO database. A total of 1626 papers were retrieved. The inclusion procedure of papers

where the search terms appear in the title, abstract, or full text. Initially, each paper's abstract, introduction, methodology and conclusion were read. A review of the full text helped to exclude articles that were not pertinent to the topic, either because the relationship between absorptive capacity and performance was not the core focus of the analysis or because the scope of the relationship was not well defined and discussed. For instance, papers that examined the effect of strategic alliances on performance without putting exclusive emphasis on absorptive capacity were excluded. This procedure led to 917 papers being excluded.

In addition, highly cited papers, i.e., those with 100 or more citations in Web of Knowledge (WoK) and not published in the selected journals, were identified and included in the analysis. Eight papers published in *Journal of Business Venturing* (one paper), *Journal of International Business Studies* (one paper), *Journal of World Business* (one paper), *Management Science* (one paper), *Research Policy* (three papers), and *Technovation* (one paper) were added. The final database consists of 214 papers.

As Table 1 shows the *Academy of Management Journal*, *Journal of Management Studies* and *Strategic Management Journal*, published the highest number of papers: 45, 39 and 37 papers respectively. *Administrative Science Quarterly* published the least number of papers – eight papers.

Table 1. ACAP and Organizational Performance Articles (1990-2015)

Journal Publisher	Identified Articles	Excluded Articles	Included Articles
Academy of Management Journal	138	93	45
Academy of Management Review	84	64	20
Administrative Science Quarterly	118	110	8
Journal of Management	135	108	27
Journal of Management Studies	149	110	39
Organization Science	182	152	30
Strategic Management Journal	317	280	37
Journal of Business Venturing +	-	-	1
Journal of International Business Studies +	-	-	1
Journal of World Business +	-	-	1
Management Science +	-	-	1
Research Policy +	-	-	3
Technovation +	-	-	1
Total	-	-	214

+ indicates highly cited papers (> 100 citations in WoS)

2.2 Analysis of the Literature

Of the 214 sample papers, 170 (79.5%) are empirical papers and 44 (20.5%) conceptual papers. Interestingly, of the 170 empirical papers, 163 (95.8%) are quantitative, five qualitative (2.9%) and two (1.2%) use a mixed method approach. The lack of qualitative research on the association between ACAP and organizational performance in the seven flagship journals of business and management research is not surprising, as it reflects the limited amount of qualitative empirical research published in these journals.

The analysis of the 170 empirical studies reveals that ACAP has been assessed from three different perspectives: 132 papers (77.6%) adopt an input perspective, 13 papers (7.6%) a process perspective and 11 papers (6.5%) an output perspective. The input perspective refers to ACAP as R&D expenses, technological capabilities, organizational form, human resources (HR) practices, strategic alliances and learning activities (Cohen and Levinthal 1990; Ahuja and Katila 2001; Tsai 2001; Matusik and Heeley 2005; Collins and Smith 2006). The process perspective refers to the ACAP process of acquisition, assimilation, transformation and exploitation of knowledge (Kim 1998; Van den Bosch, Volberda and Boer 1999; Jansen *et al.* 2005). The output perspective captures ACAP by proxies such as patents and publications (Mowery, Oxley and Silverman 1996). In addition to the studies examining the direct link between ACAP and performance, 11 papers (6.5%) used ACAP as a moderator while three papers (1.8%) used it as a mediator.

The review identified 81 conceptual and empirical articles (37.8%) focusing on the underlying theories that seek to explain the link between ACAP and performance. The analysis of the papers indicates that scholars have drawn on five primary theories to explore the link between ACAP and organizational performance. The resource based view (RBV) is the dominant theory used in 39 papers (18.2%). Organizational learning theory is the second central theoretical lens in ACAP-performance link studies with 25 papers (11.7%), followed by dynamic capabilities with 10 papers (4.7%), and co-evolution theory with four papers (1.8%). Other theories include, social network with two papers (0.9%), social capital and transaction cost economics with one paper each (0.5%). Interestingly, there are only

two papers that combined multiple theories. One study (Martin and Salomon 2003) considers jointly the resource based view, internationalisation and evolution theories, and the other (Kotabe *et al.* 2014) considers jointly dynamic capabilities and institutional theories. The remaining papers (130 out of 214, 60.7%) have not cited explicitly the underlying theories that explain the ACAP-performance relationship.

In terms of the impact of ACAP and organizational performance, 194 papers (150 empirical (77.3%) and 44 conceptual (20.5%)) reported, or argued for, a positive association between ACAP and organizational outcomes. A small number of empirical studies (four, 1.8%), reported that ACAP has a negative impact on innovation and knowledge production. For instance, ACAP is negatively correlated with explorative innovation and knowledge production in the long term (Bierly *et al.* 2009; Huang and Murray 2009). The 16 (7.5%) remaining empirical papers found an ambiguous impact. The ambiguous effect of ACAP can be positive or negative depending on the context within which, or the mechanism through which, ACAP is applied (Schildt *et al.* 2012; Martinez-Noya *et al.* 2013). For example, Park and Gallagher (2002) report a negative link between alliance formation and growth, but the link turns positive in a stable market. They argue that environmental dynamism determines the nature of the relationship between ACAP and performance.

2.3 Overcoming Conceptual Hurdles in Reviewing the Absorptive Capacity Literature

During the analysis of the ACAP-performance link literature, the review encountered a major conceptual hurdle. Scholars use several proxies to capture ACAP and to further muddy the waters, these proxies were used as antecedents as well as outcomes of organizational performance. This sub-section provides a brief discussion of the definitions of ACAP, their key features, and the various proxies used to capture ACAP.

While ACAP has been defined from several perspectives, many of the definitions share several key features. Most definitions indicate that ACAP is the firm's ability to recognize, assimilate, transform and apply knowledge for performance purposes

(Cohen and Levinthal 1990; Mowery and Oxley 1995; Zahra and George 2002). As Table 2 shows¹, the definition of ACAP evolved overtime. As highlighted in the opening sentence, ACAP was initially defined as the firm's ability to recognize the value of new information, assimilate it, and apply it to commercial ends (Cohen and Levinthal 1990:128). Cohen and Levinthal (1990) argue that a firm's ACAP rests on three factors: prior investment in its employees' individual ACAP; ACAP is path dependent therefore develops cumulatively over time; and ACAP is influenced by the extent of knowledge sharing and internal communication structure within the firm. Mowery and Oxley (1995) focus on the firm's skills and competences to *modify* the absorbed knowledge base for domestic application. More specifically, Mowery and Oxley (1995) conceptualize ACAP as a dynamic capability that enables the firm to constantly modify the absorbed knowledge to fit the evolving business environment. Kim (1998) emphasizes the firm's learning capability to assimilate existing knowledge and capacity to *create* new knowledge². Zahra and George (2002) unpacked the construct of ACAP into four components, namely, acquisition, assimilation, transformation and exploitation of knowledge. The assumption is that managing the four components effectively produces a dynamic capability that helps firms sustain their competitive advantage. That is, the ACAP construct does not rest only on the ability to learn from the external environment, but also on the firm's ability to respond to environmental changes by continuously adapting and adjusting its resources, processes, and routines (Cohen and Levinthal 1990; Zahra and George 2002; Lewin, Massini and Peeters 2011).

¹ Table 2 lists the four most cited definitions of ACAP.

² The creation of new knowledge was actually first highlighted by Cohen and Levinthal in their 1989 article: "absorptive capacity represents an important part of a firm's ability to create new knowledge" (1989: 570).

Table 2. ACAP Key Definitions and Focus

Author(s)	Definition	Focus of ACAP
Cohen and Levinthal (1990)	‘The ability to recognise the value of external knowledge, assimilate it and apply it to commercial ends’	Recognise; Assimilate; Apply
Mowery and Oxley (1995)	‘A broad array of skills, reflecting the need to deal with the tacit components of transferred technology, as well as the frequent need to modify a foreign-sourced technology for domestic applications’	Transfer; Modify; Transform; Apply
Kim (1998)	‘A set of combination efforts and skills to transfer and transform knowledge as a dynamic capability’ ‘Absorptive capacity requires learning capability and develops problem-solving skills; learning capability is the capacity to assimilate knowledge-for imitation- and problem-solving skills to create new knowledge- for innovation’	Assimilate; Create
Zahra and George (2002)	‘A set of organizational routines and processes by which firms acquire, assimilate, transform and exploit knowledge to produce a dynamic organizational capability’	Acquire; Assimilate; Transform; Exploit

These definitions, while providing a start, left open the question about the nature of the relationship between ACAP and organizational performance. Terms such as ‘commercial ends’, ‘domestic applications’, ‘create new knowledge’, and ‘produce a dynamic capability’ have been conceptually used as an outcome of ACAP but are vague and obscure. Interestingly, as noted by Lane *et al.* (2006), the extant literature tends to side step the issue of ACAP definition and or explains what they mean by it, or clarify the ACAP dimensions that their study focuses on. As such, the concept of ACAP has been a victim of its own success. ACAP has been so widely accepted as a common concept of business management parlance that scholars do not feel the need to provide any clarification. It is not about the lack of willingness by scholars, but rather the vagueness, broadness and tautological difficulties that defy the definitions.

The multitude of definitions and empirical measures triggered the need to organize and categorize the extant literature. Although prior research (Volberda *et al.* 2010) has proposed an integrative framework that highlights the main organizational antecedents, theories and outcomes of ACAP, there is still a need for further work to classify the ACAP antecedents (i.e., how these antecedents have been employed to capture a firm’s ability to acquire and use knowledge). While Volberda *et al.* (2010) reviewed organizational antecedents/measures related to ACAP (i.e., prior related knowledge, strategic alliances, R&D, organizational mechanisms, and HR

practices), this review goes beyond their review and attempts to categorize how these measures have been used/employed in previous research. The analysis reveals that ACAP measures can be classified into an input, a process, and an output perspective (Table 3). This categorization will help ACAP scholars differentiate between the three categories that are often left unclear in prior studies. The following sub-section discusses the input, process and output perspectives.

Input perspective: Studies that categorize ACAP as an input focus on examining how various management practices and initiatives affect the firm's ACAP (Cohen and Levinthal 1990; Lane and Lubatkin 1998). Specifically, this group of studies captures ACAP by management practices that result in knowledge absorption, modification and use such as the use of strategic alliances, organizational forms that facilitate knowledge absorption, investment in technological capability and R&D and HR practices. 46 papers (27%) in the sample captured ACAP by firms' engagement in strategic alliances. This line of research advocates, often implicitly, that strategic alliances are strongly linked to ACAP because they often result in sharing resources between the various partners to develop new processes and expand into a new market (Dyer and Singh 1998; Koza and Lewin 1998; Lane and Lubatkin 1998). For instance, joint ventures between multinational enterprises (MNEs) and local firms can facilitate the transfer of knowledge, particularly to local firms where they are able to acquire and assimilate new knowledge from the foreign partner (Barkema *et al.* 1997; Hoang and Rothaermel 2005; Lavie *et al.* 2007; Phelps 2010; Yu, Gilbert and Oviatt 2011).

A total of 28 papers (16.5%) conceptualize ACAP as an organizational form. This line of research is underpinned by the assumption that organizational processes and structures, such as socialization, connectedness, reconfiguration (Van den Bosch *et al.* 1999; Jansen *et al.* 2005) as well as organizational orientations and strategies, such as marketing orientation, design, and internationalisation (Foss, Lyngsie and Zahra 2013; Garriga, von Krogh and Spaeth 2013) determine the ability of firms to assimilate and exploit knowledge (Sarkar, Aulakh and Madhok 2009; Van den Bosch *et al.* 1999). Another line of research captured ACAP by the firm's technological capabilities (19 papers, 11.17%). This literature advocates that

technological capabilities that include technology assimilation and usage can enhance the firm's ACAP by increasing the knowledge base and developing internal learning processes (Szulanski 1996; Ahuja and Katila 2001; Lee and Kim 1999). For instance, frequent use of advanced machines and devices increases employees' technological experience and enables them to develop the capacity to absorb new knowledge (Nicholls-Nixon and Woo 2003). Also, firms with a high technological base have a tendency to assimilate and exploit more knowledge (Salomon and Jin 2010).

Building on Cohen and Levinthal's (1990) argument on the role of R&D activities in establishing ACAP, 15 papers (8.8%) used R&D expenditure and intensity and the number of laboratories the firm has to capture the firm's ACAP. The underlying assumption here is that investment in R&D helps a firm learn about new knowledge, and over time it learns how to share and commercialise this knowledge (Lane *et al.* 2006; Feinberg and Gupta 2004; Laursen, Masciarelli and Prencipe 2012). Lastly, a relatively small number of studies (nine papers, 5.3%) conceptualized ACAP as HR practices. Overall, this literature suggests that the level of the firm's human capital in terms of educated workforce and trained staff reflects how the firm absorbs new knowledge (Hitt *et al.* 2001; Subramaniam and Youndt 2005; Chang *et al.* 2013).

Process perspective: In addition to the various input proxies of ACAP discussed above, a relatively small but still significant number of papers (13 studies, 7.6%) conceptualized ACAP as organizational processes that facilitate the firm's assimilation, creation, and exploitation of new knowledge. They include coordination capabilities which facilitate cross functional interfaces, job rotation and systems capabilities in the form of formalisation and routineness of processes (Van den Bosch *et al.* 1999) as well as learning activities (Yli Renko, Autio and Sapienza 2001). Schulz (2001) advocates that learning processes through collecting, codifying and combining knowledge influence the likelihood of absorbing and utilising new knowledge.

Output perspective: The output perspective considers ACAP as a performance variable. 11 studies (6.5%) used output proxies such as patents and publications to capture ACAP (Yang, Phelps and Steensma 2010; Wang *et al.* 2014). As noted by Dyer and Singh (1998) scientific research and publications are not only a good indicator of knowledge creation, but are also regarded as the building blocks of knowledge absorption. Patents for instance can be used to evaluate a firm's ability to apply and exploit knowledge (Mowery *et al.* 1996). Yayavaram and Ahuja (2008) argued that patent citations demonstrate the organizational knowledge base, and represent a prerequisite element to develop knowledge and foster organizational innovation capabilities.

Reflections and suggestions: While it is understandable that multidimensional concepts such as ACAP are expected to be captured by various proxies, scholars need to state clearly their perspective and the dimension(s) they are using to capture ACAP. Examining the link between ACAP and organizational outcomes using R&D as a proxy for ACAP is not the same as using other input, process and output proxies. For instance, the portrayal of R&D and other innovation input as a direct driver of ACAP, a pre-condition for ACAP, a moderator driver for ACAP, or a combination thereof is not only confusing but does not help in addressing the question of the link between ACAP and organizational outcomes. Plus, and more importantly, my analysis of the literature reveals that scholars are giving the ACAP label to very different constructs, from input constructs such as R&D and strategic alliances, to processes such as decision making, to output constructs such as patents and publications. These constructs differ significantly in their drivers as well as their outcomes. While using different ACAP proxies/constructs is not very problematic, the clutter of such proxies and measures has obscured the relationship between ACAP and performance.

The vagueness in the use of terms such as capabilities and dynamic capabilities adds to the confusion. Again, scholars are urged to be specific about the use of such terms. As noted by Helfat and Winter (2011), often scholars use the term dynamic capabilities to “connote a generic capacity to undertake change, we worry that this risk making the concept so broad as to have little meaning”. In my opinion,

conceptualizing ACAP as a dynamic capability as well as a determinant/input of a dynamic capability is not the problem. ACAP is both. Not only are there different types of capabilities (Day 1994), but the concept means different things in different contexts. Overall, the argument is that because of the nature of ACAP, as a determinant and moderator of organizational success/innovativeness as well as a measure of it, scholars will continue to use it as both an input and an output of various organizational outcomes. In order to avoid conceptual confusion scholars should clearly state how the concept/term is used. This is common practice in adjacent fields such as innovation where studies are categorized into innovation input or innovation output streams.

Table 3. ACAP Assessment Perspectives

Proxies Year	<u>Input perspective</u>							<u>Process perspective</u>					<u>Output perspective</u>	<u>Moderator</u>	<u>Mediator</u>
	R&D	Alliance	Learning activities	HR	Technological capabilities	Prior related knowledge	Organizational Form	Organizational form	Alliances	Learning activities	HR	Other	Publication and Patent		
1990-1994	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0
1995-1999	1	2	0	0	0	1	1	1*	0	1*	0	0	1	0	0
2000-2004	1	15	2	0	4	1	5	0	0	1# 1^	0	1*	1	1	0
2005-2009	5	15	4	2	5	2	10	2#	1*	1#	1* 1^	0	5	4	1
2010-2015	6	14	2	7	12	2	11	0	1	1*	0	0	4	5	2
Total %	8.8%	27%	5.3%	5.3%	11.17%	3.5%	16.5%	1.8%	1.2%	2.9%	1.2%	0.6%	6.5%	6.5%	1.8%
Total				132	(77.6%)					13	(7.6%)		11 (6.5%)	11 (6.5%)	3 (1.8%)

N= 170 papers; # indicates a quantitative approach, * indicates a qualitative approach, ^ indicates a mixed method

2.4 Absorptive Capacity and Organizational Performance

This section is divided into two parts. The first part discusses the underlying theories that scholars draw on to explain the link between ACAP and organizational outcomes. The second part reviews the literature on the impact of ACAP on organizational performance.

2.4.1 The Underlying Theories Linking Absorptive Capacity to Organizational Performance

The analysis of the literature shows that scholars draw on insights from four theories to understand and explain how and why ACAP impacts organizational outcomes³. These theories are: the resource-based view (RBV) (e.g. Dyer and Singh 1998; Hitt *et al.* 2001; Tsai 2001; Arend, Patel and Park 2014), organizational learning (e.g. Cohen and Levinthal 1990; Kim 1998; Lane and Lubatkin 1998; Reagans and McEvily 2003; Benson and Ziedonis 2009; Rothaermel and Alexandre 2009), dynamic capabilities (e.g. Zahra and George 2002; Jansen *et al.* 2005), and co-evolution theory (e.g. Van den Bosch *et al.* 1999; Volbelda and Lewin 2003). In addition, a small proportion of the literature is underpinned by other theories (e.g. social capital, transaction cost economics, and network analysis) and even a smaller proportion draws on multiple theories. The following sub-sections review each of these theoretical perspectives.

2.4.1.1 ACAP and resource-based view

The RBV represents the dominant theoretical perspective in the study of the ACAP-organizational outcomes link. As Table 4 shows, 39 papers (18.2%; 31 empirical papers and eight conceptual papers) used RBV as a theoretical lens to explain the relationship between ACAP and organizational performance. Of 31 empirical papers, 29 reported positive relationship between ACAP and performance while two papers found mixed findings (De Carolis 2003; Walter *et al.* 2016).

³ Other theories were included in six papers: social network theory (two studies), social capital theory (one paper), transaction cost economics (one study), one study combined RBV and evolution theories, and one study combined dynamic capabilities and institutional theories.

A core focus of the RBV perspective is the link between the firm's capacity to develop and deploy unique, valuable, inimitable, non-substitutable resources and performance (Barney 1991). Given the centrality of knowledge as a unique resource to ACAP and firm performance, RBV has been used from an input perspective with a small number of studies adopting an output perspective. Lavie (2006) argues that knowledge, because of its inimitability and imperfect mobility, leads to sustained competitive advantage. The key assumption here is that the value of knowledge, as a strategic resource of a firm, depends on the firm's ability to acquire it, modify it and deploy it effectively (Dyer and Singh 1998; Hitt *et al.* 2001; Reagans and McEvily 2003; Fang *et al.* 2010; Foss *et al.* 2013; Weigelt 2013).

The analysis of the empirical literature that drew on the RBV perspective reveals that 28 papers used quantitative methods while only two papers used qualitative methods (Ranft and Lord 2002; Shipilov 2009), and only one paper (Wang *et al.* 2014) employed a mixed methods approach. Understandably, studies employing the RBV lens tend to capture ACAP by input proxies such as strategic alliances (nine papers) and organizational forms (eight papers). Several studies examined how the firm's ability to acquire, develop and deploy various resources impacts its performance. Dyer and Hatch (2006) draw on RBV to explain how a resource network leads to competitive advantage and superior performance. They highlight the tension and complementarities between internal resources, housed within the firm, and absorption of network knowledge from outside the firm. Shipilov (2009) undertook qualitative research to explore the relationship between network collaborative ties and organizational performance. He argued that RBV offers insights into understanding this relationship as the theory focuses on the link between network resources, the ability of firms to draw on these resources, and performance. Similarly, using the global semiconductor industry over a period of ten years, Yayavaram and Ahuja (2008) examine the association between the structure of the organizational knowledge base and its usefulness for inventions malleability, i.e. capacity for invention change. Their findings reveal that the link is contingent of the extent to which the knowledge base structure is decomposable into separate and distinct knowledge elements. Besides the focus on knowledge,

Teng (2007) draws on RBV to explain how strategic alliances, as a firm resource, facilitate strategic renewal and enhance competitive advantage.

Although scholars using RBV posit and demonstrate the positive relationship between ACAP and organizational performance, De Carolis (2003), using technological capabilities and competitor imitability, reported mixed results. De Carolis (2003) reported that while imitability has a negative and significant impact on accounting and market-based performance, technological competence is inversely related to market-based performance measures and positively related to accounting measures. Similarly, Walter *et al.* (2016) undertook 96 strategic initiatives and used RBV to explain the relationship between organizational learning activities (searching, processing, codifying and practicing) and performance of strategic initiatives and found no significant association between searching, processing, codifying, or practicing capabilities and initiative performance.

Reflections and suggestions: The literature drawing on the RBV perspective has generated rich insights into how strategic knowledge creates a differentiated level of performance. Particularly, it has moved the debate from whether the availability of knowledge leads to higher performance to the emphasis on the ability of firms to identify, absorb, assimilate and deploy knowledge. Another contribution of the RBV perspective in ACAP is the identification of key features of knowledge that facilitate innovativeness and enhance organizational performance. Given that RBV scholars have typically focused on internal resources, ACAP studies drawing on RBV highlights one of the key limitations of the RBV perspective by examining the importance of knowledge residing outside the firm (Grant 1996). The latter line of inquiry brought into focus the role of the firm's ACAP in the study of the link between knowledge and organizational performance.

Papers drawing on RBV suggest that a significant proportion of papers tends to refer to the theory simply to underscore the importance of resources in establishing competitive advantage which is well established in the literature without using the theory as a platform to enrich the ACAP construct.

2.4.1.2 ACAP and organizational learning theory

Organizational learning is the second leading theory used to explain the association between ACAP and organizational performance (e.g. Cohen and Levinthal 1990; Hoang and Rothaermel 2005; Barkema and Vermeulen 1998; Lane and Lubatkin 1998; Schulz 2001; Kotha, Zheng and George 2008). This line of research focuses on the exploration and exploitation of newly absorbed and exiting knowledge. Exploration refers to the firm's ability to search for and acquire new knowledge while exploitation refers to the ability to use existing knowledge. Scholars adopting a learning perspective argue that learning is the building block of ACAP in terms of the firm's capacity to assimilate new knowledge and use it, with existing knowledge, to enhance organizational performance (Cohen and Levinthal 1990).

As Table 4 shows, there are 25 papers (11.7%), 20 empirical and five conceptual, drawing on organizational learning theory. Similar to the RBV, studies drawing on the learning perspective rely predominantly on quantitative methods. Amongst the empirical papers, 18 papers used quantitative methods, one used qualitative methods and one used a mixed methods approach. Again, similar to studies drawing on the RBV perspective, strategic alliances (six papers), particularly learning from strategic alliances, is the leading theme in the study of ACAP and organizational performance for studies drawing on learning theory. This literature rests on the assumption that the relationship between ACAP and organizational performance is determined by the firm's ability to learn and innovate. The argument is that the capacity to assimilate and apply knowledge enhances learning expertise and knowledge search and subsequently performance (Barkema *et al.* 1997; Kim 1998; Lane and Lubatkin 1998; Schulz 2001; Vasudeva and Anaud 2011). Schulz (2001) focuses on the role of learning processes in enhancing the firm's knowledge base. Similarly, Hoang and Rothaermel (2005) apply the organizational learning lens to examine the effect on business performance of alliance experience accumulation obtained from allying across a diverse set of partners.

Conceptual studies drawing on the learning perspective focus on the importance of ACAP in fostering learning processes within a firm (Miller, Zhao and Calantone 2006; Bingham and Davis 2012). For instance, March (1991) posits that exploration

and exploitation of knowledge enhances learning, and thereby improves performance. Similarly, Inkpen (2002) uses organizational learning theory to explain how knowledge acquisition by joint venture partners enhances learning. Miller *et al.* (2006) focus on the importance of tacit knowledge and interpersonal learning, as key elements of organizational learning, to enhance learning over time.

Reflections and suggestions: Overall, the learning perspective has contributed to my understanding of the process of how knowledge, particularly external knowledge, is identified, captured, assimilated and deployed by firms to enhance their performance. In particular, the literature reveals that a firm's ability to learn from other external organizations, such as strategic partners, is not constant as previously assumed, but depends on a host of variables. That is a firm's ACAP is relative depending on the (di)similarity between partner firms in factors such as prior knowledge base, similarity of organizational structures, and HR practices (Lane and Lubatkin 1998). Lane, Salk and Lyles (2001) examined how three absorptive capacity components, namely, trust between IJV partners, similarities in learning structures, and strategy and training competence facilitate the learning in IJV partnerships. They reported that the three ACAP components have a differentiated impact on knowledge understanding and application on the one hand and knowledge assimilation on the other. This learning perspective challenges and complements the RBV perspective. While the latter emphasises how unique resources should be absorbed, the learning perspective focuses on the firm's capability and characteristics that facilitates or hinders learning from such resources.

Similar to RBV theory, it is noted that a significant proportion of the literature using organizational learning theory rests only on explaining how the firm's ability to learn is important for organizational performance, without fruitfully discussing the role of the theory in enriching the ACAP construct, particularly ACAP processes. Studies drawing on organizational learning have not engaged in discussing theoretically the relationship between learning processes and the ACAP process. The process of organizational learning encompasses a number of practices, namely intuiting and interpreting (individual level learning through for example

experiences), integrating (group level learning through shared understanding and interactive systems) and institutionalizing (organizational level learning through institutionalization of routines, rules and procedures) (Crossan, Lane and White 1999).

Papers drawing on the learning literature highlights lack of engagement between these learning practices and processes and the ability of firms to acquire, assimilate, transform and exploit knowledge (Zahra and George 2002). For instance, how do intuiting and interpreting practices influence the ability of firms to acquire and assimilate knowledge? Similarly, to what extent do integrating and institutionalizing abilities affect the exploitation of knowledge? These questions highlight the need for multi-level studies that are sorely needed in the study of ACAP and organizational performance.

2.4.1.3 ACAP and dynamic capabilities perspective

A number of studies (e.g. Zahra and George 2002; De Carmen Haro-Dominguez *et al.* 2007; Todorova and Durisin 2007) drew on the dynamic capability perspective to examine the interactions between ACAP and performance. Dynamic capabilities refer to the firm's ability to integrate, build and reconfigure internal and external resources to address the rapidly changing environment (Teece, Pisano and Shuen 1997:516). The core argument underpinning this line of research is that the firm's dynamic processes facilitate the integration and reconfiguration of key resources and capabilities, mainly critical knowledge, to match changing market demands (Collis 1994; Zollo and Winter 2002).

The analysis identified 10 studies (4.7%) that drew on dynamic capabilities theory. Interestingly, as shown in Table 4, the number of conceptual papers (seven) exceeds that of empirical papers (three). All the empirical studies are quantitative. The three empirical studies reported a positive link between ACAP and performance (de Carmen Haro-Dominguez *et al.* 2007). This literature advocates that the firm's capacity to modify and adapt resources to market changes is a prerequisite to maintain business performance (Zollo and Winter 2002). Similar to the empirical literature, the conceptual literature advocates a positive link between ACAP, as a dynamic capability, and performance. Zahra and George (2002) stress that the

capacity to acquire, assimilate, transform and exploit knowledge leads to a competitive edge. Lavie (2006) reported that ACAP as a dynamic capability helps firms reconfigure resources and processes while changing the technological base to match changing market demands. Zollo and Winter (2002), conceiving ACAP as a dynamic capability, found that knowledge structure in terms of its codification and articulation, enhances the development of dynamic capabilities. As noted above, the different conceptualization of ACAP may create confusion over whether ACAP is a dynamic capability (Zollo and Winter 2002) or produces a dynamic capability (Zahra and George 2002).

Reflections and suggestions: A key observation from the review of the literature adopting a dynamic capability perspective is the relative lack of empirical studies. For instance, one of Zahra and George's (2002:186) objectives of conceptualizing ACAP as a dynamic capability was to make "(it) amenable to change through managerial actions that effectively redefine and deploy the firm's knowledge-based assets". Such propositions are not yet empirically tested. Notwithstanding the lack of empirical research, the dynamic perspective complements the RBV perspective literature by focusing on the sustaining of competitive advantage over time and how ACAP as a dynamic capability contributes to this (Zahra and George 2002).

2.4.1.4 ACAP and co-evolution theory

Co-evolution refers to the simultaneous evolution of entities and their environments, whether these entities are organisms or organizations (Baum and Singh 1994). The term was adapted from biology to business. In the business management literature, co-evolution theory explains how organizations evolve with their environments as an outcome of the interplay between internal and external environmental forces (Van den Bosch *et al.* 1999). Four studies (1.8%) used co-evolution theory to discuss the link between ACAP and performance (Koza and Lewin 1998; Lewin, Long and Carroll 1999; Van den Bosch *et al.* 1999; Lewin *et al.* 2011). As shown in Table 4, three of the papers are conceptual papers. I identified only one empirical paper employing a qualitative approach.

Reflections and suggestions: The core thesis of the co-evolution literature is that high ACAP helps the firm exploit opportunities and neutralise threats in its business

environment. The co-evolution lens was applied to examine to what extent organizational mechanisms influence ACAP and lead to adaptation capability, and then to performance. The literature argues that organizational mechanisms influence ACAP and develop a firm's capacity to co-evolve in a knowledge environment. Van den Bosch *et al.* (1999) advocated that ACAP enables firms to evolve and adapt in their environments through a number of organizational mechanisms, namely combinative capabilities. These combinative capabilities include coordination (job rotation, participation, and cross function interfaces), systems (routines and formalisation) and socialization capabilities (connectedness and socialization tactics). Lewin *et al.* (1999) explain how firms adapt their resources and competencies, and co-evolve in a changing environment.

Table 4. Underlying Theories that Link ACAP to Organizational Performance

	Resource Based View		Organizational Learning		Dynamic Capabilities		Co-Evolution		Others	Papers with no theories
	Conceptual	Empirical	Conceptual	Empirical	Conceptual	Empirical	Conceptual	Empirical	Empirical	
1990-1994	0	0	1	2	0	0	0	0	0	1
1995-1999	2	0	0	4	1	0	2	1	0	8
2000-2004	1	12	1	3	2	0	0	0	2	19
2005-2009	3	11	2	5	3	2	0	0	2	46
2010-2015	2	8	1	6	1	1	1	0	2	56
Total	8	31	5	20	7	3	3	1	6	130
%	3.7%	14.5%	2.3%	9.3%	3.2%	1.4%	1.4%	0.5%	2.8%	60.7%
Total	39	(18.2%)	25	(11.7%)	10	(4.7%)	4	(1.8%)	6 (2.8%)	130 (60.7%)

2.4.2 The Impact of Absorptive Capacity on Organizational Performance

This section focuses on the findings related to the nature of the link between ACAP and organizational performance. The analysis of the literature reveals that 194 out of 214 papers (90.6%) find that ACAP has a positive impact on firm performance, and four out of 214 studies (1.8%) reported a negative impact. The key explanation for the negative impact is that ACAP may limit firms' ability to come up with radically new innovations. A small but still significant body of literature, 16 studies out of 214 (7.5%), reported that the link between ACAP and performance is contingent on various moderators and mediators. The following section discusses in detail the impact of ACAP on organizational outcomes.

2.4.2.1 Positive impact: measures and determinants

As Table 5a shows, an overwhelming number of studies reported that ACAP has a positive impact on organizational performance. Organizational performance is measured in terms of direct measures of performance such as organizational growth, sales volume, survival, and profitability, as well as indirect measures including innovation, and learning capability.

ACAP and direct measures of performance

77 empirical studies (36%) and 26 conceptual studies (12.1%) reported a positive association between ACAP and firm growth, sales volume, financial performance, competitive advantage, and survival. This line of research examines how ACAP captured by strategic alliances (27 papers), organizational mechanisms (18 papers) and technological capabilities (nine papers) (c.f. Hitt, Uhlenbruck and Shimizu 2006; Lavie *et al.* 2007; Li, Wei and Liu 2010) contributes to organizational performance. Collins and Smith (2006) examined 136 information technology firms and advocate that HR practices, such cooperation between teams and individuals and performance management systems that encourage knowledge sharing, enhance knowledge flow within and between organizational departments leading to higher performance. Similarly, firms can internationalize through an effective use of human capital to recognize and absorb new knowledge and enhance performance (Hitt *et al.* 2006). Kapoor and Lim (2007) reported that the acquisition of technology enhances learning capabilities resulting in higher product development.

Mayer, Stadler and Hautz (2014) discussed the impact of different organizational forms such as diversity and experience, on performance and found that it is relatively affected by the diversity and experience of stakeholders.

Fewer studies examined the link between ACAP and competitive advantage; three empirical studies (1.4%), and nine conceptual studies (4.2%) (Dyer and Singh 1998; Nahapiet and Ghoshal 1998; Zahra and George 2002; Tallman *et al.* 2004; Lavie 2006). Dyer and Singh (1998) argue that ACAP enhances the firm's know-how and thereby establishes competitive advantage. Similarly, Zahra and George (2002) advocate that firms can sustain their competitive advantage by managing effectively the four ACAP dimensions, namely acquisition, assimilation, transformation and exploitation of knowledge. Interestingly, the relationship between ACAP and competitive advantage has been mainly examined at a conceptual level (Matusik and Hill 1998; Volberda *et al.* 2010). This may be due to the complexity of operationalizing and measuring competitive advantage.

ACAP and indirect measures of performance

Three key indirect measures of performance have been used in past studies; innovativeness, learning, and dynamic capabilities. 53 empirical studies (24.7%) and six conceptual studies (2.8%) examined the link between ACAP and innovation. The results are consistent, reporting that ACAP improves innovation. It was Cohen and Levinthal (1990) who first linked absorptive capacity to innovative performance. They argued that the capacity of firms to recognize and assimilate knowledge enhances their innovation capabilities. Empirically, the analysis of the literature shows that ACAP influences organizational innovation through alliances (12 studies), R&D (nine studies), technological capabilities (eight studies) and organizational forms (seven studies) (e.g. Reagans and McEvily 2003; Sampson 2007; Salomon and Jin 2010). Ahuja (2000) studied 97 firms and found that innovation performance is influenced by network collaboration between firms. The argument is that business networks increase the likelihood of knowledge absorption, which in turn develops innovation capabilities.

In total 17 empirical studies (7.9%) and eight conceptual studies (3.7%) examined the link between ACAP and organizational learning capability. All the studies in

the database argued for, and/or demonstrated, a positive association between ACAP and learning. The analysis of the literature shows that alliances (five papers) tend to enhance firms' ACAP and subsequently their ability to learn (Lane and Lubatkin 1998; Lane *et al.* 2001). For instance, Inkpen and Crossan (1995) reviewed previous studies on ACAP and concluded that joint ventures enhance ACAP and foster knowledge transfer and organizational learning. Kim's (1998) study of Hyundai explains the role of the prior stock of knowledge and the firm's ACAP in developing internal learning processes. In addition to alliances and prior stock of knowledge, Schulz (2001) examined 570 subsidiaries in Denmark and the USA, and found that the recognition and assimilation of knowledge intensifies knowledge expertise and learning.

Relatively few studies have examined the link between ACAP and dynamic capabilities: two empirical studies, and one conceptual study (Mowery and Oxley 1995; Zollo and Winter 2002; Danneels 2008). These studies reported that ACAP generates dynamic capabilities that subsequently enhance performance. Empirically, patents and R&D activities have been used as outcomes of ACAP, to assess their impact on producing dynamic capabilities (Danneels 2008). The ability of firms to internalise knowledge from the external environment and modify it leads to new dynamic processes, routines and capabilities. Zahra and George (2002) noted that the ability of a firm to acquire, assimilate, transform and exploit knowledge is a basis to develop dynamic capabilities.

2.4.2.2 ACAP and organizational outcomes: negative impact

The review identified only four out of 214 studies (1.8%) (see Table 5c) that found a negative association between ACAP and organizational performance (Bierly *et al.* 2009; Huang and Murray 2009; Weigelt 2009; Kotabe *et al.* 2014). In a study of 438 firms, ACAP, through the application of knowledge, is found to be negatively linked to explorative innovation (Bierly *et al.* 2009). The underlying argument here is that technological relatedness, as a determinant of ACAP, hinders the application of external knowledge, thereby negatively effecting explorative innovation. Huang and Murray (2009) assessed 42701 U.S. patents and noted that patents decrease the long run production of public knowledge. They argued that this is because patents

are often developed and commercially exploited by private sector firms, which in turn has a negative effect on public sector production of knowledge. Also, Weigelt (2009) posits that technology outsourcing alleviates learning investment and negatively affects business performance.

Several studies reported a negative association between ACAP, conceived as a dynamic capability, and performance. This can be due to two main reasons. First, developing ACAP as a dynamic capability can be costly and time consuming. For instance, Zollo and Winter (2002) advocate that a development of dynamic capability requires a high level of effort, time and energy in the process of modifying and adapting resources to market changes. As such, the cost involved in adjusting, reconfiguring and adapting resources, and competencies may outweigh the benefits. Also, managers might misinterpret environmental dynamics which may result in acquiring and exploiting the wrong knowledge. For example, without a full understanding of the competitive landscape, managers might (mis)configure new knowledge and technology resulting in lower organizational performance (Zahra *et al.* 2006).

2.4.2.3 ACAP and organizational outcomes: moderated impact

As Table 5b shows, 16 out 214 studies (7.5%) have reported mixed findings in assessing the relationship between ACAP and performance. These studies suggest that the impact of ACAP can be positive or negative depending on a plethora of contextual factors (Park and Gallagher 2002; Hoang and Rothaermel 2005; Kotha *et al.* 2008; Lavie and Miller 2008; Schildt *et al.* 2012; Martinez-Noya *et al.* 2013; Walter *et al.* 2016). For instance, a study of 110 U.S. public corporations demonstrated that technological capabilities and R&D activities, used as a proxy of ACAP, have a negative effect on learning in the short term, but have a positive effect on learning practices in alliances in the long term (Schildt *et al.* 2012). Martinez-Noya *et al.* (2013) found that while ACAP, captured as R&D outsourcing, develops internal learning processes it also generates inadequate knowledge for domestic application.

Park and Gallagher (2002) stressed the importance of environmental conditions in determining the relationship between ACAP, proxied by strategic alliances, and

growth. Their study revealed that the link between growth and strategic alliances is positive in a stable market but tends to be negative in a volatile market. Similarly, Wales *et al.* (2013) found that ACAP-organizational performance is positive in dynamic environmental conditions whereas this positive effect is limited and short lived in a stable environment.

Table 5. The Impact of ACAP on Organizational Performance

Table 5a: The Impact of ACAP on Organizational Performance: Positive impact

	ACAP Proxies		Organizational Performance
	Conceptual	Empirical	(Direct measures of performance)
1990-1994	0	1 R&D; 1 organizational form	1 performance; 1 growth
1995-1999	4 organizational form; 1 prior knowledge	1 organizational form; 1 technological capabilities; 1 prior knowledge	4 competitive advantage; 3 performance; 1 growth
2000-2004	2 prior knowledge; 2 learning activities; 1 alliances	9 alliances; 3 technological capabilities; 3 learning activities; 1 organizational form; 1 HR; 1 prior knowledge	15 performance; 4 competitive advantage; 2 growth; 1 survival; 1 value
2005-2009	5 organizational form; 3 learning activities; 2 alliances	12 alliances; 5 organizational form; 3 HR; 3 technological capabilities; 2 learning activities; 1 prior knowledge; 1 patent	29 performance; 3 competitive advantage; 2 growth; 2 value; 2 financial; 1 sales
2010-2015	2 learning activities; 1 technological capabilities; 2 HR; 1 organizational form	10 organizational form; 6 alliances; 2 learning activities; 2 technological capabilities; 2 HR; 4 R&D; 1 prior knowledge	17 performance; 4 growth; 4 value; 3 financial; 2 survival; 1 sales; 1 competitive advantage
Total	10 organizational form; 7 learning activities; 3 alliances; 3 prior knowledge; 2 HR; 1 technological capabilities	27 alliances; 18 organizational form; 9 technological capabilities; 7 learning activities; 6 HR; 5 R&D; 4 prior knowledge; 1 patent	65 performance; 12 competitive advantage; 10 growth; 7 value; 5 financial; 3 survival; 2 sales
%	26 12.1%	77 36%	104 48.6%
	Conceptual	Empirical	(Indirect measures of performance)
1990-1994	1 learning activities	1 R&D	1 innovation; 1 learning
1995-1999	2 organizational form; 3 alliances;	2 alliances; 1 prior knowledge; 1 organizational form; 1 patent; 1 R&D	6 learning; 2 co- evolution; 1 dynamic capability
2000-2004	1 alliances; 1 learning activities; 1 organizational form	4 alliances; 2 organizational form; 1 prior knowledge; 2 technological capabilities; 1 R&D; 1 learning activities	7 innovation; 6 learning; 1 dynamic capability
2005-2009	1 alliances; 2 learning activities; 2 organizational form	6 alliances; 4 R&D; 3 patent; 3 organizational form; 2 learning activities; 2 HR; 2 prior knowledge	23 innovation; 5 learning; 1 dynamic capability
2010-2015	3 organizational form; 3 alliances; 1 prior knowledge	9 technological capabilities; 6 organizational form; 5 alliances; 5 R&D; 4 patent; 3 HR; 1 prior knowledge; 1 learning activities	28 innovation; 7 learning; 1 co-evolution
Total	7 organizational form; 8 alliances; 4 learning activities; 1 prior knowledge	17 alliances; 12 organizational form; 11 R&D; 11 technological capabilities; 8 patent; 5 prior knowledge; 5 learning activities; 5 HR	60 innovation; 25 learning; 3 dynamic capability; 3 co-evolution
%	20 9.3%	73 34.1%	90 42%
Total	44 (20.5%)	150 (77.3%)	194 (90.6%)

Table 5b: The Impact of ACAP on Organizational Performance: Moderated impact

	ACAP Proxies		Organizational Performance
	Conceptual	Empirical	(Direct measures of performance)
1990-1994	0	0	0
1995-1999	0	0	0
2000-2004	0	1 alliances; 2 organizational form	1 growth; 1 performance; 1 survival
2005-2009	0	1 alliances	1 financial
2010-2015	0	2 alliances; 2 learning activities; 1 technological capabilities; 1 HR; 1 organizational form	5 performance; 2 growth;
Total	0	4 alliances; 3 organizational form; 2 learning activities; 1 technological capabilities; 1 HR; 1 R&D	7 performance; 3 growth; 1 financial; 1 survival
	0	11	11
%	0%	5.1%	5.1%
	Conceptual	Empirical	(Indirect measures of performance)
1990-1994	0	0	0
1995-1999	0	0	0
2000-2004	0	1 alliances; 1 organizational form	2 innovation
2005-2009	0	2 organizational form; 1 technological capabilities	3 innovation
2010-2015	0	(technological capabilities and R&D)*	1 innovation; 1 learning; 1 R&D
Total	0	1 alliances; 2 organizational form; 1 patent; 1 technological capabilities	5 innovation
	0	5	5
%	0%	(2.3%)	(2.3%)
Total	0 (0%)	16 (7.5%)	16 (7.5%)

* Indicates the study that uses two proxies to capture ACAP

Table 5c: The Impact of ACAP on Organizational Performance: Negative impact

	ACAP Proxies		Organizational Performance
	Conceptual	Empirical	(Direct measures of performance)
1990-1994	0	0	0
1995-1999	0	0	0
2000-2004	0	0	0
2005-2009	0	1 technological capabilities	1 performance
2010-2015	0	0	0
Total	0	1 technological capabilities	1 performance
%	0 0%	1 (0.4%)	1 (0.4%)
	Conceptual	Empirical	(Indirect measures of performance)
1990-1994	0	0	0
1995-1999	0	0	0
2000-2004	0	0	0
2005-2009	0	1 organizational form; 1 patent	1 innovation; 1 learning
2010-2015	0	1 alliances	1 innovation
Total	0		2 innovation; 1 learning
%	0 0%	3 (1.4%)	3 (1.4%)
Total	0 (0%)	4 (1.8%)	4 (1.8%)

2.5 Discussion

This review presented reflections and future research needs and suggestions. Rather than repeating them, this section focuses on the challenges facing scholars examining the link between ACAP and performance and proposes ways of addressing them.

In spite of the increasing interest in ACAP, or perhaps as a result of it, the literature on the ACAP-performance link has become fragmented and is at the risk of growing fragmentation. As definitions and conceptualization of ACAP proliferate, scholars are examining the impact of conceptually different proxies of ACAP on a variety of organizational outcomes, often without explicitly addressing the differences in the various ways ACAP is captured. The concept needs to be delineated rigorously into something more measurable, comparable and replicable.

The review suggests that the challenges facing ACAP scholars are many and multifaceted. The first key challenge is the comparability of the measures used to access the link between ACAP and organizational outcomes. The analysis of the literature revealed that the use of multiple antecedents/measures of ACAP is classified into input, output and process perspectives. While this in itself is not a major problem, the clutter of ACAP measures has obscured the link between ACAP and performance. More importantly, the incomparability of measures makes it difficult to draw firm conclusions about the impact of ACAP on performance. This study stresses that it does not advocate a single perspective as that would risk suffocating much of the richness of ACAP research. Rather, it maintains that it is appropriate for ACAP to be captured by various measures. To address this challenge this review puts forward a three-fold categorization to help scholars group the literature into coherent strands. It proposed that the literature is categorized according to the type of measures used to capture ACAP, namely input, output and process. ACAP is an input in the practise of generating the firm's output, such as, new product development and patents, it is an output measure of the firm's ability to identify, acquire, assimilate and absorb knowledge and thereby contribute to the firm's overall success, and a process in terms of how it encapsulates knowledge absorption, assimilation and use of knowledge. While the study endorses the

multiplicity of perspectives, it encourages scholars to deal with the disparate variance in the conceptualization of ACAP more explicitly by being cognizant of these differences. Scholars should clearly and explicitly state how ACAP is used in their studies, not least so that the literature can be classified according to the three perspectives proposed in this paper.

Overall, the pluralism in the conceptualization of ACAP creates a challenge for scholars who must pay attention to the various ACAP perspectives subsumed under this concept. The review underscores the centrality of the conceptualization of ACAP to the study of its impact on organizational performance. Future research is required in order to disentangle the three conceptual strands that have been used to capture ACAP. The accumulation of knowledge on the ACAP-performance link hinges on this.

The second key challenge is integration of theoretical perspectives. This study identified and discussed the four prominent theories used to explain the relationship between ACAP and organizational outcomes. Various theories and their distinct contribution to the ACAP-performance literature were reviewed. The analysis reveals that while perhaps understandably the RBV, learning, dynamic capabilities, and to a lesser extent co-evolutionary perspectives are widely employed, the use of multiple theories is rarely used. With few notable exceptions, ACAP scholars have not sought to draw upon insights from multiple theories. This is surprising given the multi-dimensionality of ACAP. For instance, scholars drawing on RBV and dynamic capability perspectives highlight the importance of firms' absorptive capacity of resources and competitive advantage, but do not explain how these resources are used to create competitive advantage. The latter is best explained by learning process drawing on learning theory. Therefore, the integration of input - RBV- and process -learning- perspectives would perhaps be better captured by the use of RBV and or dynamic capabilities together with learning perspectives. RBV explains where and what types of resources create value but does not focus on the process of transforming these resources into value. The latter is best explained by learning theory. Therefore, linking RBV and dynamic capabilities and learning perspectives together would allow us to explain how absorbed firm-specific

resources are leveraged within the firm through a learning process to deliver higher organizational performance.

The third challenge is moving beyond the direct link between ACAP and organizational performance. The review of the literature highlights that until recently empirical studies focused exclusively on the direct link between ACAP and organizational outcomes. While such studies continue to explore this direct link, scholars have become increasingly interested in the moderating and mediating factors that influence this relationship. This line of research is set to continue. Studies examining the interaction between enablers, such as, trust in strategic alliances, are going to refine our understanding of the relationship between ACAP and performance. Research questions such as how does trust, or lack thereof, between partners in strategic alliances influence the association between ACAP and performance? These studies will specify the conditions under which ACAP influence organizational performance. Furthermore, research so far has been focused at the organizational level and has somewhat neglected micro-level variables. Future research could fruitfully explore how micro-level variables, such as the individual's motivation to learn (and unlearn) and to share or withhold knowledge, may moderate the link between ACAP and organizational outcomes. Also, given that expert and tacit knowledge resides with individuals, future studies that examine the link between employee mobility, ACAP and organizational outcomes is highly warranted. Such studies could examine the vulnerability and resilience of the firm's ACAP to departure of individual experts who act as explorers, coordinators and exploiters of knowledge within the firm. New research that accounts for micro variables will add a valuable dimension to the ACAP-performance literature. Scholars may build on the vast human resource, organizational behaviour and emerging talent management literature that shows how micro-individual level factors exert a strong influence on the firm's ability to learn and apply new knowledge. Such work should address some of the important outstanding issues on the interaction between organizational, team and individual level factors in ACAP research. In this context, given the importance of strategic alliances in ACAP research, further research on the acquisition and dissemination

of knowledge by individuals who span the boundary of firms involved in alliances appears crucial.

The fourth challenge is shedding light into the black box of the ACAP performance link. The analysis of the literature revealed that little attention has been paid to the processes through which, and the mechanisms by which, ACAP influences performance. In particular, new qualitative research is needed to explore these processes and mechanisms. As my review reveals, ACAP studies have only infrequently employed qualitative research methods. Given the recent stress on the role of context in influencing the nature of the relationship between ACAP and organizational performance, a new emphasis on data rich qualitative research would appear to hold great promise for bringing to the surface contextual dimensions, such as how firms and individuals explore and exploit new knowledge over time and/or under different competitive dynamics.

2.6 Summary

Clearly, more research is needed in order to develop a full understanding of the relationship between ACAP and organization performance. This requires that further attention be paid to empirical measures of ACAP and organizational outcomes. The review of the literature revealed that a wide range of measures are used in the study of the ACAP-performance link. As noted above, the issue of measurement should not be disconnected from the conceptualization of ACAP. While such measures are appropriate, this review encourages scholars to be cognizant of the various measures when building on previous literature and not to presume that one form of performance outcome can be positively associated with another. Also, variations in the manner of measuring ACAP to some extent have explained differences in performance outcomes, but extant literature has largely ignored a set of components, processes and routines that constitute a firm's ACAP.

The next chapter aims to develop a conceptual framework and ground the hypotheses for the research. This research develops hypotheses on the relationship between organizational antecedents and potential and realized absorptive capacity, and also on the ACAP-performance link.

CHAPTER THREE – THEORY AND HYPOTHESES

3.0 Introduction

This chapter discusses the theoretical background of the research as well as grounds hypotheses of the developed conceptual framework. The chapter is divided into two studies. The first study examines organizational antecedents of ACAP, underlying the moderating effect of market sensing and responsiveness capabilities. The second study investigates the relationship between potential and realized absorptive capacity and organizational performance moderated by environmental dynamism and network size. The following sections explain the rationale of each study, and also build an argument for the developed hypotheses.

3.1 Study 1

3.1.1 Rationale

Uncertainty and dynamism in an ever-changing competitive landscape require organizations to continuously and proactively engage in the acquisition and exploitation of external knowledge (Van den Bosch *et al.*, 1999; Lenox and King 2004; Volberda *et al.* 2010). Indeed, absorptive capacity (ACAP) is considered a key determinant of organizational performance (Cohen and Levinthal 1990). ACAP refers to the set of dynamic organizational routines and processes, by which organizations acquire, assimilate, transform and exploit new knowledge. Previous research unpacks ACAP into two sub-dimensions: potential and realized absorptive capacity (Zahra and George 2002). Potential absorptive capacity (PACAP) refers to the capacity to acquire and assimilate new knowledge. Realized absorptive capacity (RACAP) refers to the capacity to transform and exploit new knowledge. The assumption is that PACAP and RACAP are not only conceptually different, they are driven by different mechanisms (Zahra and George 2002; Jansen *et al.* 2005). Although a significant body of literature exists on the antecedents of ACAP, the question of why some firms are better in managing their potential and realized absorptive capacity remains unanswered. Unpacking the ACAP construct and examining the effect of different contextual variables on the distinct antecedents for each sub-dimension is important. Volberda *et al.* (2010) commented that

investigating combined or moderating effects of various organizational capabilities is an essential prerequisite to stimulate organizational learning and develop the ACAP process.

Given the recent emphasis on the role of contextual factors such as environmental dynamism and conditions in influencing the ACAP process (Volberda *et al.* 2010; Wales *et al.* 2013), this research focuses on organizational capabilities that aim to interact and respond to environmental changes. As such, firms need not only the ability to acquire, assimilate, transform and exploit knowledge, but also the capacity to sense, accurately understand and respond to market changes. This is because managers might ignore or misperceive the change in the business environment, which result in missing opportunities (Yusuf *et al.* 2004). Similarly, firms that put exclusive emphasis on transformation and exploitation of knowledge might be unable to respond rapidly to environmental changes, which disrupt the implementation of new knowledge (Ahuja and Lampert 2001). Hence, examining the effects of market sensing and responsiveness capabilities on the relationship between organizational antecedents and absorptive capacity would explain how firms manage their ACAP process successfully.

While extant research (see e.g. Jansen *et al.* 2005) focuses on organizational coordination, systems and socialization, it ignored firms' capabilities to sense and respond to the external environment. This study brings in important moderating factors that have been overlooked in previous studies. A contribution is made to the ACAP literature by elucidating how market sensing and responsiveness capabilities lead to effective acquisition and usage of new knowledge. The core argument here is that market oriented firms via sensing and responding to market changes tend to spot opportunities and recognise valuable resources, which put them at an advantage to ascertain and anticipate what knowledge should be absorbed and how it can be used successfully.

3.1.2 Theoretical Background and Hypotheses

An extensive body of literature examines the organizational antecedents of a firm absorptive capacity (Van den Bosch *et al.* 1999; Volberda *et al.* 2010). This body of literature demonstrates that firms seeking to absorb and apply knowledge are

required to coordinate activities; and also, to use systems in order to integrate and apply newly acquired knowledge. For instance, Jansen *et al.* (2005) find that coordination facilitates the acquisition and assimilation of new knowledge (potential absorptive capacity), while systems and socialization facilitate the transformation and exploitation of new knowledge (realized absorptive capacity). This body of literature however, does not pay attention to the interaction between organizational mechanisms and ability to sense and respond to environmental changes. This explains why the question of why some firms are better at developing their potential and realized absorptive capacity remains under-researched. To answer this question, it is argued that coordination, systems and socialization are prerequisite organizational antecedents to manage PACAP and RACAP, but the right knowledge has to be identified, captured, and used in the first place by sensing and responding to the external environment within which the firm operates. Thus, firms need to combine other learning capabilities such as market sensing and responsiveness to yield effective acquisition and exploitation of external knowledge.

This study firstly examines the direct relationship between the three organizational antecedents: coordination, systems and socialization, and potential and realized absorptive capacity. Then, it assesses the moderating effect of market sensing and responsiveness capabilities on the proposed associations. Specifically, this study argues that the relationship between coordination and PACAP is moderated by market sensing capability, while the relationship between systems and socialization and RACAP is moderated by market responsiveness capability.

3.1.2.1 Coordination and potential absorptive capacity

Coordination refers to linking and integrating different parts of an organization (Van den Ven, Delbecq and Koenig 1976). Common features of coordination include cross functional interfaces, participation in decision making, and job rotation.

Cross functional interfaces enable firms to increase interaction among employees from different functional backgrounds (Egelhoff 1991). This practice also strengthens linkages between employees, teams and different functional

departments to enhance information flow and exchange (Pearson and Duffy 1999). By inducing people from different functions to work together, firms establish a platform of communication and knowledge sharing (Pagell 2004), and thereby increases a firm's ability to acquire new knowledge (Cohen and Levinthal 1990). Moreover, enhancing information processing, knowledge transfer and mutual understanding (Egelhoff 1991), result in recognizing the usefulness of new knowledge and assimilating it.

Participation in decision making is also expected to enhance the firm's ability to acquire and assimilate new knowledge. Participation refers to joint decisions through which information is shared amongst superiors and subordinates (Lam, Yik and Schaubroeck 2002). Participatory management practices engage managers and subordinates to process information, make decisions, and solve problems (Wagner 1994). This practice exposes employees to a high level of information processing and sharing, which enable firms to acquire and assimilate knowledge successfully.

Job rotation via regular transfer between jobs exposes employees to, and provides them with the opportunity to, acquire multiple skills and competencies (Campion, *et al.* 1994). The shift from one job to another increases individual experience gained from performing different tasks (Gomez *et al.* 2004). Rotated employees are exposed to a wide range of knowledge and develop the experience to understand what is required to promote organizational learning processes. For instance, job rotation enables employees to recognize the usefulness of knowledge and depict what kind of new knowledge is needed and how it can be obtained (Allwood and Lee 2004). Accordingly, exposure to diversity of knowledge and skills increases the likelihood of absorbing new knowledge (McGrath 2001; Bennett 2003).

Overall, the above discussion suggests coordination that exhibits cross functional interfaces, participation in decision making and job rotation, facilitates the acquisition and assimilation of new knowledge (potential absorptive capacity). This discussion leads to the following hypothesis.

Hypothesis 1: There is a positive relationship between coordination and potential absorptive capacity.

3.1.2.2 Moderating effect of market sensing capability

Prior research has demonstrated that one of the challenges facing firms is the ability to read and understand the external environment (Lin and Germain 2003; Volberda *et al.* 2010). The shift in the external environment makes it difficult for firms to spot opportunities and recognize valuable resources (Prahalad and Hamel 1990). Furthermore, firms seeking to learn from the external environment need not only internal learning mechanisms (e.g. prior knowledge, past experience etc), but also the capacity to sense and respond to the shift in the external environment (Day 1994). The core argument here is that learning organizations need to be effectively oriented to market through sensing capability, in order to generate valuable resources and develop external learning processes. The following discussion provides an argument for how and why market sensing capability leads to effective acquisition and assimilation of new knowledge underlying potential absorptive capacity.

As argued previously, coordination positively affects potential absorptive capacity. To further expand the argument, it is assumed that market sensing moderates this relationship. Yusuf *et al.* (2004) maintain that firms that focus on acquiring and assimilating knowledge might misperceive the change in the business climate, which results in not apprehending adequate knowledge. As such, firms that invest in combining various organizational learning mechanisms (i.e., coordination) and capabilities (i.e. sensing capability) tend to activate a state of mind that detects environmental changes and quickly captures opportunities compared to their counterparts (Ambrosini and Bowman 2009; Cho, Park and Michel 2011). Such opportunities include generating vital resources such as knowledge and technology (Day 1992). For instance, firms that are able to apprehend opportunities from the external environment can ascertain what kind of knowledge should be absorbed and how it can be used effectively. Indeed, firms that have this capability are likely to receive, interpret and communicate information about new technologies and knowledge, and anticipate environmental changes better than their counterparts (Teece *et al.* 1997).

Market sensing capability is an important part of organizational learning process about competitors, consumers and other parties in the business climate (Olavarrieta and Friedmann 2008). For instance, firms can capture useful information about new technologies and knowledge from a broad range of sources such as partners, suppliers, customers, and government bodies (Eisenhardt and Martin 2000). To do so, they acquire, interpret and disseminate information about consumers and competitors, and use this market information to foster organizational learning and anticipate how to acquire and assimilate new external knowledge (McDaniel and Kolari 1987; Huber 1991). Further, while coordination provides linkages and networks to facilitate the acquisition and assimilation of new knowledge, market-sensing capability focuses on understanding environmental forces and generating information about market changes in order to recognize and absorb adequate knowledge. Thus, market sensing creates a synergy effect, amplifying the impact of coordination on PACAP.

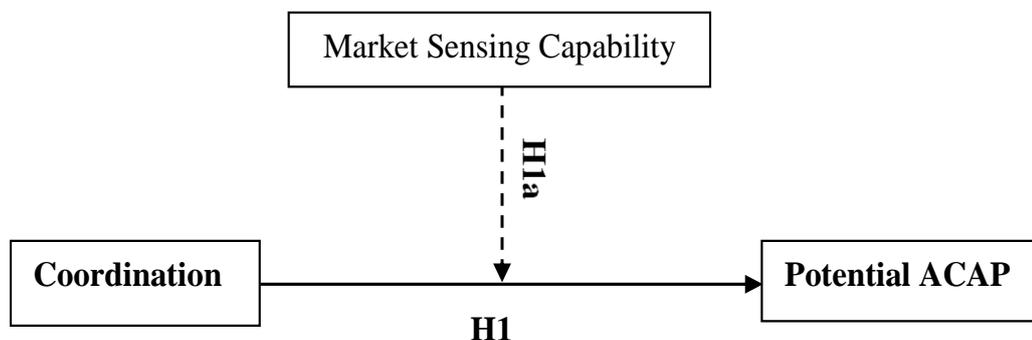
From these arguments, market sensing capability strengthens the relationship between coordination and potential absorptive capacity.

This discussion leads to the following hypothesis.

Hypothesis 1a: The positive relationship between coordination and potential absorptive capacity is greater when market-sensing capability is high.

The conceptual model along with hypothesized relationships is delineated in Figure 1.

Figure 1. Conceptual Model (Potential Absorptive Capacity)



3.1.2.3 Systems and realized absorptive capacity

Systems program behaviours to organize and systematize resources and processes within a firm (Crossan *et al.* 1999). In other words, systems seek to apply processes, transform activities and execute actions (Van Den Bosch *et al.* 1999). They also provide the appropriate system to organize and institutionalise new knowledge. Systems exhibit common features including formalization and routines.

Formalization, which is the extent to which work activities are defined formally by administrative rules, policies and procedures (Ford and Slocum 1977:30), is important to structure activities and processes. Formal rules, standards and procedures are means for organizations to transfer experience and enhance common understanding (Levinthal and March 1993; Michaels, Dubinsky and Kotabe 1996). By recording previous solutions of organizational issues, it serves as the best practice to enhance learning processes via organizing, systematising, and applying past experiences. As such, a formalized system within a firm is necessary to integrate activities, processes and resources in a systematic way (Schminke, Ambrose and Cropanzano 2000). Because this practice programs collective behaviours and establishes patterns of organizational action (i.e., how systems are performed), firms increase the likelihood of integrating and applying new knowledge (March 1991). Combining the key features of formalization practice, it is argued that formalization supports the transformation and exploitation of new knowledge (realized absorptive capacity).

Routines are another important form that facilitate the transformation and exploitation of knowledge. Routines which refer to a set of invariable and repetitious activities, can establish automatic patterns to ensure that inputs are transformed to outputs (Cohen *et al.* 1996). Through repeated tasks and behaviours, employees are able to work toward a common goal, and understand how to perform complex tasks (Argote 1999). Further, repetitive activities provide ways for collective learning and mutual understanding (Cohen and Bacdayan 1994). For instance, via repetitive actions and common behaviours, employees can learn how to accumulate knowledge, store it, and apply it successfully (Huber 1991; Crossan *et al.* 1999). In this vein, routines provide patterns on understanding internal

learning mechanisms and expertise how processes are executed, which help to institutionalise external knowledge without interruptions and conflicts (Volberda 1996). Indeed, this practice establishes patterns of organizational learning, and also enables knowledge accumulation and application, through which firms are likely to integrate and apply new knowledge successfully. From this argument, routines facilitate the transformation and exploitation of new knowledge (realized absorptive capacity).

The above discussion leads to the following hypothesis:

Hypothesis 2: There is a positive relationship between systems and realized absorptive capacity.

3.1.2.4 Socialization and realized absorptive capacity

Socialization is also crucial to institutionalise and apply new knowledge. Socialization refers to the organizational mechanisms that contribute to a set of communication codes and values for appropriate action (Verona 1999). This practice emerges from inter-organizational exchange relationships, while it creates a social relational system within a firm to execute action. Socialization enables employees to generate flexible applications (e.g. shared social experiences, and social tactics) on how to apply new knowledge to existing knowledge. Moreover, it establishes links to reduce the likelihood of conflict and implementation of resources and processes (Cropanzano and Mitchell 2005). Socialization exhibits common features including connectedness and socialization tactics.

Connectedness through dense interpersonal linkages enables firms to execute actions (Rowley, Behrens and Krackhardt 2000). The density of linkages serves as a governance mechanism to facilitate knowledge exchange and implementation. For instance, via communication, cooperation and networks, employees can put in place their experiences and knowledge to improve efficiency of knowledge exchange (Sethi, Smith and Park 2001). Moreover, this practice offers some tactics to enhance organizational learning. Through informal/formal meetings, dinner with

employees/suppliers and business events, employees gain better understanding on how learning processes are executed (Cousins and Lawson 2007). As such, connectedness reduces the likelihood of conflict regarding firm goals and implementation, and also facilitates collaboration to tackle complex problems in transforming inputs into outputs (Reidfleisch and Moorman 2001). From these arguments, connectedness supports the transformation and exploitation of new knowledge (realized absorptive capacity).

Socialization tactics establish interpersonal relationships and lead to congruence of values, norms and beliefs among employees within firms (Ashforth and Saks 1996). These relationships emerge when individuals engage in an interactive learning process between newcomers and their organizations (Mignerey, Rubin and Gorden 1995). Socialization tactics help newcomers to learn specific language that facilitates the comprehension and communication with others (Jones 1986). By providing information about how individuals interpret and respond to actions or events, organizations can encourage newcomers to interpret and respond to situations in a predictable manner, which contribute to developing a desired attitudes and behaviours (Van Maneen and Schein 1979; Alder and Borys 1996). In this way, socialization tactics facilitate the combination and application of new knowledge to existing knowledge (Zahra and George 2002). In addition, this practice enhances commitment and compliance with processes of exploitation of knowledge (Alder and Kwon 2002). Because these tactics provide systematic and institutionalized practices, organizations can increase newcomers' commitment, and adjust and transform newly acquired knowledge successfully (Bauer *et al.* 2007). From these arguments, socialization tactics facilitate the transformation and exploitation of knowledge (realized absorptive capacity).

The above discussion leads to the following hypothesis:

Hypothesis 3: There is a positive relationship between socialization and realized absorptive capacity.

3.1.2.5 Moderating effect of market responsiveness capability

Previous evidence has shown that organizational learning processes are dependent on the way firms respond to environmental changes (Nonaka 1994; Slater and Narver 1995; Athuaene-Gima, Slater and Olson 2005). As such, market responsiveness enhances organizational learning processes and stimulates a use of external knowledge (Bell, Whitwell and Lukas 2002). Through responding to market changes, organizations develop ways to respond to risks in applying the newly acquired knowledge (Kohli and Jaworski 1990). The following discussion provides an argument for how market responsiveness capability leads to effective transformation and exploitation of new knowledge underlying realized absorptive capacity.

As argued previously, systems and socialization positively affect realized absorptive capacity. To further expand the argument, this study contends that market responsiveness capability moderates this relationship. As noted in the opening sentence, to be effective, ACAP should be combined with other organizational learning capabilities. Learning firms tend to perform different processes and practices might be exposed to the challenge of the fit or misfit of these capabilities and processes with the external environment (Chang *et al.* 2013). For instance, firms putting exclusive emphasise on the transformation and exploitation of knowledge, might ignore or misperceive the changes in the external business climate (Ahuja and Lampert 2001). So, firms intending to develop their learning processes from the external environment need the ability to respond quickly to change (Holweg 2005). With increasing competition and changing market conditions, responsiveness has become an essential capability because it interacts proactively with the opportunities and threats in the environment (White, Varadarajan and Dacin 2003).

Responsiveness capability provides rapid and balanced adjustments to the predictable and unpredictable changes in the environment (Gindy *et al.* 1999). It also enables organizations to adapt and reconfigure resources and processes. For instance, Zhou and Li (2010) argue that responsiveness leads to adapting resources and processes to environmental changes. Based on this view, responsiveness

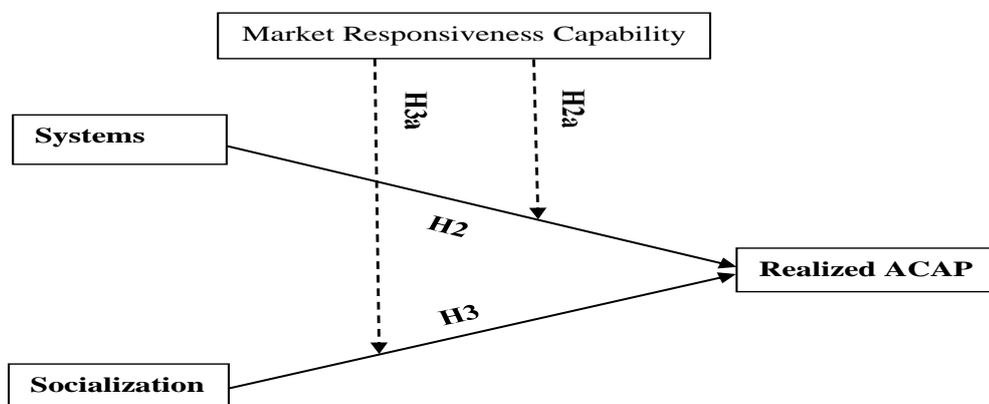
capability provides both systematic and flexible mechanisms in response to environmental stimuli enabling firms to reconfigure their resources and adapt their learning processes to market changes, which is an essential prerequisite to transform and implement new knowledge successfully (DeLeeuw and Volberda 1996; Wei and Wang 2011). Further, while systems and socialization provide mechanisms to execute actions and transform inputs into outputs, , market-responsiveness capability provides flexible and dynamic practices to yield effective application of newly acquired knowledge (Yahaya, Sarhadi and Gunasekaran 1999). Therefore, market responsiveness creates a synergy effect, amplifying the impact of systems and socialization on RACAP. From these arguments, market-responsiveness capability strengthens the relationship between systems and socialization, and realized absorptive capacity. This leads to the following two moderation hypotheses:

Hypothesis 2a: The positive relationship between systems and realized absorptive capacity is greater when market-responsiveness capability is high.

Hypothesis 3a: The positive relationship between socialization and realized absorptive capacity is greater when market-responsiveness capability is high.

The conceptual model along with hypothesized relationships is delineated in Figure 2.

Figure 2. Conceptual Model (Realized Absorptive Capacity)



3.2 Study 2

3.2.1 Rationale

Over the past two decades, research in strategic management literature highlights the important role of ACAP in improving organizational performance. Prior research has suggested a positive linear relationship between ACAP and firm performance (Cohen and Levinthal 1990; Dyer and Singh 1998; Lavie *et al.* 2007). The rationale offered to explain this positive direct relationship is that firms must continuously develop their ability to acquire and use knowledge if they seek to prosper and sustain their competitiveness. Despite this overwhelming evidence, some studies highlight that ACAP might be subject to diminishing financial return or have a nuanced/ambiguous impact on firm performance (Martinez-Noya *et al.* 2013; Wales *et al.* 2013; Kotabe *et al.* 2014). This line of research is underpinned by the assumption that the impact of ACAP can be positive or negative depending on a plethora of contextual factors. While the benefits of ACAP have traditionally been exalted, the literature has almost universally ignored the boundary conditions related to internal and external exogenous factors (Volberda *et al.* 2010; Foss *et al.* 2013).

As highlighted previously, ACAP encompasses two dimensions: PACAP and RACAP (the former aims to acquire and assimilate knowledge, while the latter aims to transform and exploit knowledge) (Zahra and George 2002). The core assumption is that the two dimensions conceptually play different roles in developing a firm absorptive capacity but coexist in enhancing firm performance (Zahra and George 2002; Volberda *et al.* 2010). However, as mentioned in chapter two, this complementarity between the two distinct aspects of ACAP has gained little attention in empirical research (Ebers and Mauraur 2014). In other words, scant attention has been paid to how the processes underlying the two ACAP dimensions overlap in enhancing organizational outcomes. Based on this analysis, this study assesses whether there is a relationship between the two ACAP dimensions. This question can be addressed by examining the mediating effect of RACAP on the relationship between PACAP and firm performance.

Extant research that examines the ACAP-performance link under environmental conditions (e.g. environmental dynamism) shows inconsistent effects. Some empirical studies find that the relationship between ACAP and performance is positive in a stable market but tends to be negative in a volatile market (Park and Gallagher 2002). In contrast, other studies posit that the ACAP-organizational performance link is positive in dynamic environmental conditions whereas this positive effect is limited and short lived in a stable environment (Wales *et al.* 2013). Further, failure to consider the potentially distinct effect of ACAP dimensions on financial performance under different boundary conditions of environmental factors have hampered the progress of research on absorptive capacity. To address these shortcomings, this study assesses the indirect relationship between PACAP and performance via RACAP, while taking into account the following environmental boundary conditions: high and low levels of environmental dynamism and network size.

There are several important reasons for investigating the mechanisms and boundary conditions (environmental dynamism and network size) that strengthen the relationship between ACAP and organizational performance. Firstly, the ability to acquire, assimilate, transform and exploit knowledge is subject to environmental change and turbulence. Changes in the business climate make it difficult to acquire and use knowledge effectively. Volberda *et al.* (2010) note that examining combined or moderating effects of various environmental factors is vital to clarify further how environmental dynamics shape the ACAP-performance link. Secondly, while prior research has put exclusive emphasis on the role of environmental dynamism, it somewhat ignored the extent of network size (i.e., numbers of branches/united). Cruz-Gonzalez, Lopez-Saez and Navas-Lopez (2015) claim that the ACAP-performance link is context dependent. They call for a contingency approach and propose that assessing different contextual characteristics may determine and clarify the nature of the relationship. Building on this view, the study examines the role environmental dynamism and network size in explaining the nature of the link between ACAP and performance.

This study contributes to the literature on the ACAP-performance link in two ways. Firstly, it confirms Zahra and George's (2002) conceptual contribution which pertains that potential absorptive capacity and realized absorptive capacity are complementary and co-exist in enhancing organizational performance. In so doing, it empirically examines the indirect effect of RACAP on the relationship between PACAP and performance. Secondly, this study builds on previous research by explaining that the relationship between ACAP and firm performance can and should be viewed as subject to diminishing financial returns. As such, the ACAP-performance link depends primarily on a plethora of contextual factors. In integrating different environmental conditions (environmental dynamism and network size), this study stresses that the effects of ACAP is determined not only by the shift in the environment, but also by the degree of firm exposure to the external environment.

3.2.2 Theoretical Background and Hypotheses

A firm's absorptive capacity has been defined from several perspectives, but many of the definitions share several key features. Most definitions highlight that ACAP is the firm's ability to recognize, assimilate, transform and apply knowledge to enhance business performance (Cohen and Levinthal 1990, Mowery and Oxley 1995; Zahra and George 2002). ACAP was initially defined as the firm's ability to recognize the value of new information, assimilate it, and apply it to commercial ends (Cohen and Levinthal 1990:128). Cohen and Levinthal (1990) advocate that a firm's absorptive capacity lies on three practices: investment in its employees' prior related knowledge; absorptive capacity is path dependent therefore develops cumulatively over time; the construct is influenced by the extent of knowledge exchange and internal communication mechanism within the firm. Mowery and Oxley (1995) emphasise on the firm's skills and competences to modify the assimilated knowledge for domestic application. More precisely, the authors conceptualize ACAP as a capability that enables the firm to continuously modify and adapt the absorbed knowledge to fit the changing environment. Zahra and George (2002) unfolded the construct of ACAP into four components: acquisition, assimilation, transformation and exploitation of knowledge. The four components come under two phases that include potential and realized absorptive capacity.

PACAP involves acquisition and assimilation of knowledge from the external environment. This step is necessary to establish absorptive capacity. Firms can acquire and assimilate knowledge from the environment to build absorptive capacity, which can be via external sources of knowledge, i.e. foreign direct investment (FDI) knowledge spill over and internal sources through the firm's past experience. RACAP includes transformation and exploitation of knowledge to produce competitive advantage. The assumption is that managing the four components effectively sustains a firm's competitive advantage.

Based on Zahra and George's (2002) model, this study, firstly, explores empirically the extent of complementarity among potential and realized absorptive capacity (how the two dimensions co-exist) by assessing the moderating effect of RACAP on the relationship between PACAP and firm performance. Secondly, the study integrates different environmental factors (i.e., environmental dynamism and network size) to explain when this complementarity can be effective. It argues that firms operating in low (high) levels of environmental dynamism, the mediating relationship will be stronger. Also, firms possessing high levels of network size (i.e., high number of branches) the complementarity between the two distinct ACAP is stronger. To structure the arguments, the following sub-section discusses the relationship between absorptive capacity and organizational performance, paying particular attention to potential absorptive capacity, realized absorptive capacity, and firm performance (e.g. the mediating effect of RACAP on the relationship between PACAP and performance). This is followed by an explanation of the role of environmental dynamism and network size in shaping and strengthening the proposed associations.

3.2.2.1 Absorptive capacity and organizational performance

The literature on the relationship between absorptive capacity and organizational performance suggests that ACAP has, to a large extent, a positive impact on performance. Organizational performance is measured by direct measures of performance such as organizational growth, sales volume, survival, and profitability, as well as indirect measures including competitive advantage,

innovation and learning capability (Cohen and Levinthal 1990; Dyer and Singh 1998; Ahuja and Katila 2001; Jansen *et al.* 2005; Lavie *et al.* 2007).

In terms of direct measures, prior research has reported a positive relationship between ACAP and firm growth, sales volume, financial performance, competitive advantage, and firm survival. This line of research examines how ACAP captured by strategic alliances, organizational mechanisms and technological capabilities (c.f. Hitt *et al.* 2006; Lavie *et al.* 2007; Uotila 2009; Li *et al.* 2010) leads to superior organizational performance. For instance, Mayer *et al.* (2014) examined the impact of different organizational forms such as diversity and experience on performance and found that it is relatively affected by the diversity and experience of stakeholders. In a study of 136 information technology firms, it is demonstrated that HR practices, such as cooperation among teams and individuals, enhance knowledge sharing and knowledge flow within and between organizational departments, and contribute to high performance (Collins and Smith 2006).

In terms of indirect measures, previous research has examined the link between ACAP and competitive advantage, innovation, and learning (Dyer and Singh 1998; Nahapiet and Ghoshal 1998; Zahra and George 2002; Tallman *et al.* 2004; Lavie 2006). For instance, Dyer and Singh (1998) argue that ACAP enhances the firm's know-how and thereby establishes competitive advantage. Cohen and Levinthal (1990) linked absorptive capacity to innovative performance. The authors argued that the capacity of firms to recognize and assimilate knowledge enhances a firm's innovation. In addition, in a study of 97 firms, it is found that network collaboration between firms improves innovation performance (Ahuja 2000). The argument is that networks increase the likelihood of knowledge assimilation, which result in developing innovation capabilities.

Despite this overwhelming evidence, some empirical studies found a negative and ambiguous association between ACAP and performance (Bierly *et al.* 2009; Huang and Murray 2009; Weigelt 2009; Kotabe *et al.* 2014). Bierly *et al.* (2009) studied 438 firms and found that ACAP, through the application of knowledge, is negatively linked to explorative innovation. It is argued that technological relatedness, as a determinant of ACAP, reduces the application of external

knowledge, hence negatively affects innovation capabilities of a firm. Huang and Murray (2009) examined 42701 U.S. patents and noted that patents decrease the long run production of public knowledge. The authors argue that as patents are often developed and commercially exploited by private sector firms, which in turn hinder the production of public knowledge.

In addition, other studies have reported ambiguous findings in assessing the relationship between ACAP and performance. These studies reveal that the impact of ACAP can be positive or negative depending on a plethora of contextual factors (Park and Gallagher 2002; George, Kotha and Zheng 2008; Hoang and Rothaermel 2010; Schildt *et al.* 2012; Walter *et al.* 2013). For instance, Schildt *et al.* (2012) studied 110 U.S. public corporations, and found that technological capabilities and R&D activities, as ACAP proxies, have a negative effect on learning in the short term, but have a positive effect on learning in alliances in the long term. Martinez-Noya *et al.* (2013) demonstrated that while ACAP, captured as R&D outsourcing, develops internal learning processes it also generates inadequate knowledge for internal use. Further, Park and Gallagher (2002) focused on environmental conditions in assessing the relationship between ACAP, measured by strategic alliances, and sales growth. The study explained that the relationship between growth and strategic alliances is positive in a stable market but tends to be negative in a volatile market. However, Wales *et al.* (2013) reported that the ACAP-performance link is positive in dynamic environmental conditions whereas this positive effect is limited and short lived in a stable environment.

Although there has been considerable interest in the link between absorptive capacity and organizational performance (using direct and indirect measures of performance), the relationship between potential and realized absorptive capacity have been largely ignored in the ACAP literature (Lane *et al.* 2006). Even when potential and realized absorptive capacity have been considered (see Jansen *et al.* 2005; Ebaur and Maurers 2014), the separate and joint impact of the two ACAP dimensions on organizational performance has been largely omitted.

3.2.2.2 Potential and realized absorptive capacity, and performance

While there is an overwhelming use of proxies such as R&D, HR practices, strategic alliances, and organizational forms, to measure ACAP, little attention has been paid to the processes and components that constitute a firm absorptive capacity. The few studies (e.g. see Jansen *et al.* 2005; Ebers and Maurers 2014) that examined the ACAP processes, highlight that the effect of PACAP and RACAP on organizational performance remains unclear. For instance, Jansen *et al.* (2003) reported that the level of realized to potential absorptive capacity decreases the relationship with organizational performance. Developing processes underlying RACAP through transforming and exploiting knowledge, as opposed to processes underlying PACAP, decrease financial performance (Jansen *et al.* 2003). In a similar vein, Jansen *et al.* (2005) found that PACAP improves organizational performance while RACAP does not necessarily increase performance in dynamic markets. The key argument here is that firms operating in a dynamic environment improve their financial performance by increasing the level of potential absorptive capacity. It is highlighted that potential absorptive capacity provides greater strategic flexibility in reconfiguring resources and effective deployment of knowledge at lower cost, which is necessary in sustaining competitive advantage (Zahra and George 2002).

This study aims to firstly treat separately the two distinct dimensions of ACAP (potential absorptive capacity and realized absorptive capacity) to assess their influence on organizational performance.

This leads to the following hypotheses:

Hypothesis 4: Potential absorptive capacity is positively associated with organizational performance

Hypothesis 5: Realized absorptive capacity is positively associated with organizational performance

3.2.2.2.1 Mediating role of realized absorptive capacity

Prior research on absorptive capacity (Zahra and George 2002) stressed that the underlying processes of both PACAP and RACAP ‘co-exist’, but surprisingly, research to date has been limited to examining the effect of this complementarity on organizational performance.

As noted previously, PACAP and RACAP varies in their performance effects. For instance, Jansen *et al.* (2005) argue that while the processes underlying PACAP tend to improve organizational performance, the processes underlying RACAP do not necessarily contribute to high performance. Volberda *et al.* (2010) explained this finding by assuming that a high level of PACAP may imply a low level of RACAP. The core argument here is that firms putting exclusive focus on acquisition and assimilation of knowledge, may find it difficult to develop realized absorptive capacity (transformation and exploitation of knowledge). From this analysis, the benefits of ACAP rests on the interactions and complementarity of the learning processes. It is argued that the complementarity of learning processes provides a unique value to a firm (Harrison *et al.* 2001). As such, the simultaneous interaction of processes underlying PACAP and RACAP lead to developing a firm absorptive capacity, and contribute to high performance (Tanriverdi and Venkatraman 2005). Further, the synergies from the two ACAP dimensions lead to benefits that exceed the positive effects of the distinct processes. In examining the performance effects of complementary ACAP processes, the effect of individual process has to be compared with the overall effect of absorptive capacity to define the conditionality on one another and to ensure that the overall effect outweighs the distinct effect. Thus, examining the role of the processes of PACAP in increasing business performance through the processes of RACAP is necessary to explain the interaction and complementarity of ACAP processes in improving performance.

From the above discussion, it is argued that RACAP can mediate the relationship between PACAP and organizational performance. The discussion leads to the following hypothesis:

Hypothesis 6: Potential absorptive capacity is positively associated with organizational performance through realized absorptive capacity

3.2.2.2.2 Moderating effect of environmental dynamism and network size

So far, it has been argued that potential absorptive capacity, mediated by realized absorptive capacity, is positively associated with organizational performance. To expand the argument, this study posits that environmental dynamism and network size are boundary conditions that strengthen the proposed association.

A firm learning processes are embedded in an environment context (Levinthal and March 1993). Accordingly, the environment is important to analysing the effects of absorptive capacity because different dynamics in a firm's environment imply different organizational outcomes. Firms are affected by increased dynamism in their environments, which might result from various changes in suppliers, buyers and the overall competitive landscape. As a result, firms face various challenges as to how they source external knowledge and use it to sustain superior performance (Tallon 2008). For instance, managing a firm's resources is predominantly affected by the level of market dynamism in terms of what/how it is acquired and used (Drnevich and Kriauciunas 2011). Ensley, Pearce and Hmieleski (2006) find that environmental dynamism has an impact on leadership capabilities and subsequently on performance; and this impact varies according to the level of market dynamism (i.e., positive in a stable market and negative in a relatively volatile market). Park and Gallagher (2002) argue that in a volatile market, resource-rich organizations have the ability to access external resources through alliances while resource-poor organizations are less likely to do so. Conversely, in relatively stable markets, resource-poor organizations actively engage in alliance formation. Hung and Chou's (2013) findings indicate that technological market turbulence positively moderates the relationship between external technology acquisition and firm innovation. This finding underscores the important role of environmental characteristics on improving innovation capabilities within a firm. In addition, Jansen *et al.* (2005) examined the moderating effect of environmental dynamism on the relationship between potential and realized absorptive capacity and organizational performance. They found that PACAP improves organizational performance, while RACAP does not necessarily increase performance in dynamic markets. The current study goes beyond Jansen *et al.* (2005) argument and integrates market dynamism to strengthen the indirect relationship between

potential absorptive capacity and organizational performance via realized absorptive capacity. In so doing, it clarifies and brings a nuanced picture of the extent of the effect of high and low levels of market dynamism in strengthening the complementarity between PACAP and RACAP in enhancing performance.

Furthermore, firms that continuously interact with the external environment may be affected not only by environmental dynamism, but also by the level of their network size (e.g. number of branches/units). Firms seeking to internalize new resources obtained from the external environment need considerable technical expertise and exposure to the environment, which can assist them to understand, interpret, and apply knowledge more quickly than their counterparts. (Mowery *et al.* 1996). Network size, which reflects the extent to which firms expose their activities and expand their branches/units can promote speed, frequency and magnitude to generate and institutionalise new knowledge (Kim and Kogut 1996; Roberts 2015). For instance, organizations possessing a large scope of their network size (i.e., high number of branches) know where and how to find key resources and skills required to absorb and use knowledge (Gnywali and Park 2009). Also, it allows them to develop core processes and capabilities and address environmental risks and uncertainties.

In addition, when dealing with uncertainty from rivalry and intense competitive pressures, increasing business presence via creating different units/branches and generating diverse resources is an essential prerequisite to develop organizational learning, which can be leveraged in response to changes (Simon, Hitt and Ireland 2007). For example, firms with high network size tend to develop better capabilities in recognizing and assimilating valuable knowledge. These firms are likely to engage in sensing the external environment and possess strategic flexibility, which provides a basis to implement the absorbed knowledge effectively. Indeed, increasing the network size of an organization fosters a variety of learning and external sources which is a prerequisite to develop the ACAP process and subsequently improve performance. From the above, it is argued that a high level of network size positively affects how firms absorb and exploit knowledge, consequently, the indirect relationship between PACAP and organizational performance via RACAP is stronger where network size is high.

The above discussion leads to the following hypotheses:

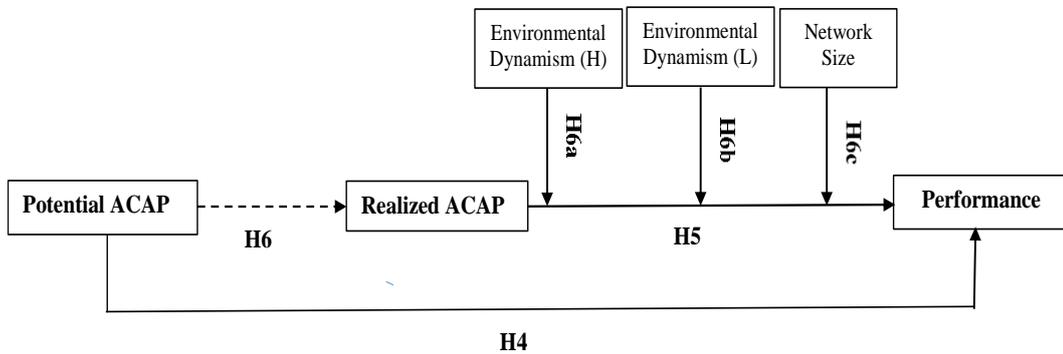
Hypothesis 6a: Potential absorptive capacity has a stronger association with organizational performance through realized absorptive capacity where environmental dynamism is high

Hypothesis 6b: Potential absorptive capacity has a stronger association with organizational performance through realized absorptive capacity where environmental dynamism is low

Hypothesis 6c: Potential absorptive capacity has a stronger association with organizational performance through realized absorptive capacity where network size is high

The conceptual model along with the hypothesized relationships is in Figure 3.

Figure 3. Conceptual Model (ACAP and Organizational Performance)



3.3 Summary

This chapter develops hypotheses based on two conceptual frameworks to be tested. The chapter, firstly, examines organizational antecedents of absorptive capacity, and argues that firms that are better at managing their potential and realized absorptive capacity have the ability to read and react quickly to environmental changes. Secondly, it argues that PACAP and RACAP are complementary, by assessing the mediating effect between the two ACAP dimensions, in enhancing superior performance and this relationship is context dependent. The next chapter sets out the research methods used for this study, paying particular attention to the appropriate method and methodology to test the two developed frameworks.

CHAPTER FOUR – RESEARCH METHODS

4.0 Introduction

This chapter aims to answer the following questions:

- What kind of knowledge will be produced through the research?
- Which theoretical lens underpins the research?
- Which methodology and method are used in the research?

To answer these questions, the chapter firstly discusses the ontology and epistemology of the research. Secondly, it explains the theoretical underpinning of the research, focusing on positivism as the best philosophy to produce knowledge. Finally, this chapter examines different research methods necessary to access knowledge.

4.1 Philosophical Underpinning

4.1.1 Ontology and Epistemology

Ontology and epistemology are interrelated as they represent the facets of reality and can affect which knowledge to produce (Hatch and Canliffe 2006). Ontology refers to the philosophical study of being that determines what it is, what exists and what is real (Blaikie 1993). Ontology incorporates the view and nature of reality including claims or assumptions. There are two philosophical traditions that depict the nature of reality that include objective (reality exists) and subjective (reality is the product of the human mind). In other words, the description and explanation of reality can be through personal experiences (subjectivism) or reality exists independently (objectivism) from how individuals determine this reality (Denzin and Lincoln 2003). As such, ontological assumptions can affect the view of the researcher who might be conditioned to certain aspects under some assumptions. Further, different views and perceptions of reality lead to the question of how to gain knowledge of the world for the purpose of explaining the nature of reality. This can be achieved through exploring epistemology, which aims to explain and interpret knowledge from the social world. Epistemology is the theory or science of the method or grounds of knowledge, through which it explains how knowledge can be produced and presented (Blaike 1993:6).

Epistemological positions can affect knowledge production and how to access knowledge. These can also affect the research design and conclusion. For instance, the researcher's view of reality is likely to be exposed to objective and subjective epistemological views which alters the understanding of the phenomenon as well as explaining the research orientation. Objective epistemology presumes that a world exists independently and is neutral, while the subjective epistemology view is based on individual or group observations and interpretations. Also, information collected objectively about a phenomenon is regarded as less biased, as it does not involve the researcher's interpretation, and can be presented in a statistical form rather than narrative analysis (Eriksson and Kovalainen 2008).

After discussing ontological and epistemological approaches, and how these approaches can influence the research, the next area for consideration is the underlying research philosophies.

4.1.2 Research Philosophies

There are a number of research philosophies classified as classical or contemporary, namely positivism, interpretivism, constructivism and realism (Denzin and Lincoln 2003). The two dominant philosophies are positivism and interpretivism. Positivism aims to create an objective knowledge through observable facts, to which the researcher is seen as a scientist (cause and effect), who explains a social problem in an objective way. This theory uses quantitative research (i.e., experimental or survey research) to measure and test observations and events (Crotty 1998). Interpretivism is more about understanding how things happen through the quest of subjective knowledge. In this approach, the researcher uses his or her interpretation, values and meanings. Qualitative research underlines a number of methodologies to produce subjective knowledge such as ethnography, grounded theory and phenomenological research. For instance, the methods used in subjective knowledge include observation, interview, focus groups, case study, life history and visual approach (Crotty 1998).

This thesis focuses on positivism as the best philosophical approach to answer the key research questions and objectives.

4.1.2.1 Rationale for adopting positivism philosophy

The positivism doctrine has a number of benefits related to the view of reality, and how knowledge is produced and accessed. Positivism aims to produce objective knowledge through testing facts and observations. This tenet argues that true knowledge is based on experience of senses and can be obtained through observation and experiment (Bhaskar 1978). At the ontological level, positivists advocate that reality is objectively given and measurable, and which is independent from the researcher. For instance, this philosophy offers scientific methods to generate knowledge and then enhance precision in the description of variables and their associations (Henning, Van Rensburg and Smith 2004).

The current research seeks to develop hypotheses to be tested. The hypotheses lead to the gathering of data that provide the basis for subsequent hypothesis testing. Such facts are consistent with the notion of ‘observable social reality’ similar to that employed by the physical and natural sciences. Drawing on the positivism approach, this research will test the hypotheses through measuring variables and testing correlations. As such, this approach facilitates a highly-structured methodology and statistical rigour and validity. Due to the nature of the research aim and objectives, which encompass investigation and examination of different correlations, a quantitative research methodology (i.e., survey questionnaire) will be used as the best method to access objective knowledge. The following sections discuss the methodology, focusing on quantitative research methodology and a survey questionnaire method to operationalize this research.

4.2 Methodology

4.2.1 Secondary Research and Primary Research

Secondary research is information that already exists, and collected by other researchers (Van Maneen 1983). In other words, secondary research is a set of information that was already collected and analysed by other researchers (Kumar 2005). For instance, reports, academic journal articles, published statistics, government publications, electronic databases and books constitute secondary data. One of the advantages of secondary data is its accessibility and availability via, for example, Google Scholar, EBSCO, and Web of Knowledge.

This thesis uses secondary research for two reasons. Firstly, an extensive review of the literature is conducted aiming to review, organize and synthesise the relationship between absorptive capacity and organizational performance according to research approaches used, theories applied, measures of performance and type of the relationship. Secondly, secondary research enables the building of a theoretical foundation for the research as well as developing a conceptual framework to be tested empirically (Becker 1998).

Primary research is described as information gathered by observing phenomena or surveying respondents (Dibb et al. 2006:177). This approach gathers information through interactions with other people, which is different from secondary research. There are a number of techniques to generate primary data that include quantitative and qualitative research methods. It is argued that quantitative research is explanatory while qualitative research is exploratory (Creswell 2008). While qualitative research analyse data mainly in non-numeric ways (e.g. interpretation, coding techniques), quantitative research is the collection and analysis of data using statistical techniques (Saunders, Lewis and Thornhill 2009). The difference between the two methods lies in how the data is collected and analysed. For instance, quantitative research predominantly uses a survey questionnaire to collect data and statistical techniques to analyse data (e.g. multilevel modelling technique). In contrast, qualitative research employs mainly interviews to collect data and various techniques to interpret and analyse data (e.g. categorizing, coding) which generates non-numerical data (Saunders *et al.* 2009:145). Indeed, quantitative research and qualitative research represent different methods in data collection, leading to different analysis techniques, interpretation and conclusions.

The use of quantitative research enables the researcher to experiment, test, and validate observations and hypotheses, which subsequently lead to generating objective data (Creswell and Clark 2011). Due to the nature of this research (i.e., developing hypotheses) and as well as the nature of objectives and questions (i.e., they incorporate investigation and examination of organizational mechanisms and processes), quantitative research, and in particular a survey questionnaire, are the most appropriate methodology and method for the study.

4.2.1.1 A quantitative approach

Quantitative research is a research methodology that aims to use statistical techniques via methods such as survey research (Dawson 2002). Survey research is used to answer questions that have been raised, to solve problems that have been posed or observed, to assess needs and set goals, to determine whether or not specific objectives have been met, to establish baselines against which future comparisons can be made, to analyse trends across time, and generally, to describe what exists, in what amount, and in what context (Isaac and Michael 1997). There are three characteristics of survey research. First, survey research is used to quantitatively describe specific aspects of a given population. These aspects may involve testing the relationships among variables. Second, the data required for survey research are collected from people. Finally, survey research uses a selected portion of the population from which the findings can later be generalized back to the population (Kraemer 1993). Further, survey research encompasses structured techniques and statistical data analysis, for example, General Linear Model, Structural Equation Modelling (SEM) and Multi-Level Modelling (Rasbash *et al.* 2009). The choice of the statistical technique lies in the nature of the data and also the aims and objectives of the research.

In this thesis, survey research (questionnaire) is undertaken to test the developed conceptual framework from the literature. For instance, survey research enables the investigation of the associations between absorptive capacity and organizational performance (Bryman and Bell 2011). In doing so, first, an empirical study of the development of the ACAP process is undertaken in order to answer the following research question: why are some firms better at developing their potential and realised absorptive capacity than others? Secondly, investigation of the relationship between absorptive capacity and organizational performance is undertaken by addressing the following research question: how can firms realize the full potential of their absorptive capacity.

4.2.1.2 Rationale for using survey research

Survey research is used to test the hypotheses developed from the literature. The survey is based on a random sampling technique which is representative of the particular population and produces results which can be generalized to the wider population (Dawson 2002). It also enables the gathering of demographic data that describes the composition of the sample (McIntyre 1999). In addition, surveys can also elicit information about attitudes that are otherwise difficult to measure using observational techniques (Bell 1996). Indeed, due to the nature of the aims and objectives of this research, a survey represents the best method to test the hypotheses and increase the rigor of the analysis.

There are two main reasons for using a mail survey. First, the costs of completion are lower compared to online and telephone surveys. Second, procedures for a mail survey are frequently simpler and generate higher response rates than other techniques. For instance, De Vaus (1991) argues that mail surveys are widely used for large-scale populations for research conducted in government, schools, and businesses due to their simplicity to follow-up and relevant response rate.

4.3 Research Design

4.3.1 Survey Setting

A structured questionnaire was used to collect primary data from executives employed in bank branches operating in Turkey. Turkey was selected as the research site as it constitutes an appropriate setting for the research – as set out in Chapter One. Turkey is relatively under-researched, but becomes an important player in outward/inward FDI (Demirbag, Tatoglu and Glaister 2009), and shares a number of key features with other notable emerging economies (e.g. India, Brazil, Mexico and South Korea) including the industrial and organizational structures (Fainshmidt *et al.* 2016). Bank branches were chosen because they are geographically diverse and exposed to global competitive dynamics, which renders a suitable context for investigating organizational mechanisms and processes, and performance. The banking sector is especially suitable for our study because banking firms are in the process of renewing and upgrading their organizational capabilities and processes in order to survive and succeed in the changing

environment (Erdem 2014). The change in the Turkish business climate, where foreign-owned banks are increasing their presence in the Turkish market while local banks are attempting to increase their international presence, means that the competitive landscape is increasingly challenging. Consequently, banks need to promote their learning processes from the external environment, and also upgrade their resources and capabilities in order to sustain their competitive advantage.

The research participants are middle and top-level managers and executives, who possess a high level of knowledge and expertise on internal and external organizational activities. Each variable is analysed via managerial perceptual evaluations. Using perceptual measures is a suitable way to explore and understand the focal phenomenon (Glick 1985) because managers have core knowledge about the functions and organizational mechanisms within the boundaries of the firm. Participants are qualified based on their responsibilities, holistic understanding of core organizational processes and performance, and expertise, following the criteria proposed by Dillman (2007).

The survey questionnaire was originally written in English, and then translated into Turkish, using the back-translation procedure recommended by Brislin (1986). This process of back translation was useful to identify misinterpretations and misunderstandings prior to running the survey. To ensure the veracity of the translation, two Turkish bilingual researchers independently translated the survey instrument from English into Turkish. Following this, the wording of the items was discussed with colleagues from related fields. To ensure face validity, two other bilingual researchers translated the Turkish questionnaire back to English and checked whether the Turkish version was accurately transcribed from a literal English language translation.

4.3.2 Pilot Test

A pilot study was undertaken in three stages. In the first stage, an initial list of questions was produced drawn from previous studies, and given to five academic members of staff at Warwick Business School. The academics were selected from five different disciplines: international business, strategy, human resource management, marketing and finance. These academics provided feedback about the

wording and grammar, and also proposed some ways to adapt the items for bank branches, the site of the research. In the second stage, the questionnaire was distributed to 20 top level managers working in banks in the UAE. Managers completed the questionnaire and provided feedback about the clarity of items and also proposed a number of amendments (e.g. they suggested the items related to organizational performance be adjusted for bank branches). Following this procedure, some items were modified to meet the sample criteria. In the third stage, a Turkish version of the questionnaire was sent to a business school professor located in Turkey, who used his professional network in the banking sector to verify the quality and clarity of the translated version and also administer a final check prior to distribution. The professor made several suggestions to improve the questionnaire, especially on the translated version, and also to the cover page in order to comply with the cultural setting of the research.

4.3.3 Data Collection

A range of bank branches located in Turkey were sampled in order to reach a satisfactory level of external validity (Cook and Campbell 1979). The sampling frame of the research was based on the website of BAT (the Banks Association of Turkey). BAT provides a database of all banks (47 banks) and bank branches (10000 branches) operating in Turkey including state-owned banks, privately-owned banks, and foreign banks. The contact information of these bank branches is available at the BAT website (<https://www.tbb.org.tr/en/home>). A total of 1000 questionnaires were randomly mailed (i.e., 4 surveys to each branch) with a cover letter introducing the research project and requesting that respondents at different managerial levels (middle, senior and executive managers) with relevant knowledge should complete it. Using multiple respondents for each bank fosters the accuracy of the data and increases the validity of responses. The questionnaires were returned in sealed envelopes and with attached business cards. This procedure was essential to increase the validity and reliability of responses.

After two waves of data collection and two reminders, a total of 215 questionnaires were returned, of which 200 questionnaires were usable (from a total of 84 branches) representing an effective response rate of 20%, which was deemed

satisfactory given the confidential nature of the questionnaire (Mellahi and Harris 2015). Of the responding managers in the sample, 63% are top level managers, 30% were middle level managers and 7% were low level managers. On average, the managers had worked in the bank for 10.6 years and had been in their current job for 5.7 years. Of the managers in the sample, 67.5% hold a bachelor's degree while 27.2% hold a master's degree.

To evaluate non-response bias, two steps were followed. First, responses from early and late respondents were compared. No statistically significant differences were found. Secondly, Mann-Whitney U tests were conducted on three key demographic variables: number of employees, firm size, and firm sales volume. The results indicated no significant differences. It may be concluded that non-response bias does not pose a significant issue in this study.

4.3.4 Measurement of Variables

All items were measured on a 7-point Likert scale (1= 'strongly disagree', 7= 'strongly agree') (a copy of the questionnaire is provided in Appendix 1).

Potential absorptive capacity. Potential absorptive capacity (PACAP), was measured using nine items developed by Jansen *et al.* (2005). Potential ACAP includes acquisition and assimilation of knowledge. Managers were asked to assess the ability to acquire knowledge using six items and the ability to assimilate knowledge using three items. Acquisition and assimilation abilities were combined to provide an aggregate score for PACAP ($\alpha=0.75$).

Realized absorptive capacity. Realized absorptive capacity (RACAP), was measured using twelve items developed by Jansen *et al.* (2005). Realized ACAP includes transformation and exploitation of external knowledge. Six items were used to assess transformation and six items to assess exploitation (Szulanski 1996; Jansen *et al.* 2005). Acquisition and assimilation abilities were combined to provide an aggregate score for RACAP ($\alpha=0.78$).

Market-sensing capability. Market sensing capability (MASEN) aims to read and analyse the external environment and is composed of five items. Managers were

asked to evaluate the ability of their firms to sense and read the market dynamics (Danneels 2008) ($\alpha=0.83$).

Market-responsiveness capability. Market responsiveness (MARES) measures the capacity of managers to respond to environmental changes. MARES is composed of five items that assess the extent to which managers quickly and efficiently respond to any change (industry, customer, global) in the business climate (Kolhi, Jaworski, and Kumar 1993) ($\alpha=0.90$).

Coordination. Coordination (COOR) is composed of nine items ($\alpha=0.76$) which are subsumed under three subdimensions: cross functional interfaces, participation in decision making and job rotation (Jansen *et al.* 2005). Each dimension includes three items. Cross functional interfaces are assessed by asking managers about the extent of liaison personnel, temporary task forces, and permanent teams to coordinate activities (Galbraith 1973; Gupta and Govindaraj 2000). Participation is assessed by the extent to which employees participate in decision making within a firm (Hage and Aiken 1967; Dewar, Whetten and Boje 1980). Job rotation is measured through employees' rotation between different jobs and functions.

Systems. Systems (SYST) includes a total of six items ($\alpha=0.81$), which are subsumed under two sub-dimensions: formalization and routineness. Each dimension includes three items. Formalization measures the degree of formalization of procedures and instructions within a firm (Deshpande and Zaltman 1982). Routineness, measures the extent to which tasks are uniform and invariable (Whitney, Daft and Cooper 1983).

Socialization. Socialization (SOCI) is assessed using six items ($\alpha=0.85$). These capabilities consist of two sub-dimensions: connectedness and socialization tactics. Three items measure each sub-dimension. Connectedness is assessed by the extent to which individuals in a unit are connected to various levels of hierarchy in other departments/divisions (Jansen *et al.* 2005). Socialization tactics are based on Van Maneen and Schein's Model (1979). Connectedness and socialization tactics were aggregated to a composite scale of socialization practice.

Environmental dynamism. Environmental dynamism (ENV) examines the degree of change and shift in the local environment. Managers were asked to evaluate the pace and shift in the environment where they operate (Volberda and Van Bruggen 1997). Four items were included ($\alpha=0.82$).

Network size. Network size (NET) is the number of branches distributed within the site of the study. This variable was operationalized by taking the number of branches within the respective location. Following Hirtle's (2007) categorization, a high level of network size represents banks with more than 100 branches, while a low level of network size represents banks with less than 100.

Organizational performance. Organizational performance (OP) was measured by six items based on Zou and Cavusgil (2002) and Jansen *et al.* (2005). Managers were asked to evaluate and compare several aspects of their organizational performance (e.g. return on assets, return on equity, and cost efficiency) with corresponding business units in reference to branches and their direct competitors. The resulting scale for financial performance was reliable ($\alpha=0.94$). Such subjective measures of organizational performance are commonly used on business units of large organizations (Jansen *et al.* 2005). Previous research has found a strong correlation between subjective and objective measures. Singh, Darwish and Potocnik (2016) note that using subjective measures of organizational performance is reliable and provides statistical rigor to test hypotheses.

Control variables. Several control variables were identified: firm size (SIZE), firm ownership (OWN), manager's experience in a bank (EXP) and respondent's educational level (EDU). SIZE was measured by an ordinal variable of five categories consisting of the number of employees ranging from 0 to 5000 employees. EXP was captured in five categories measuring managerial experience in the same bank from less than 5 years to more than 40 years. EDU by was measured by five categories identified by the university qualifications obtained by respondents.

4.4 Statistical Analysis: Multilevel Modelling

Multilevel modelling is a statistical technique that has been used in social, medical, and recently business research (Rasbash *et al.* 2009). Organizational behaviour research increasingly involves what are often referred to as multilevel data. Generally, multilevel data sets are referred to as ‘nested’ or ‘hierarchically nested’ because observations (also referred to as units of analysis) at one level of analysis are nested within observations at another level (Nezlek 2008). For example, organizational learning provides a clear case of a system in which individuals are nested within organizations. Employees can learn through a number of practices namely HR and or organizational mechanisms, and these mechanisms exist and are embedded within organizations (Chen *et al.* 2005). This thesis requires analyses of data that take into account the nesting effect of employees working for firms.

Multilevel analyses are appropriate when data have been collected at multiple levels simultaneously. As such, ‘levels’ refer to how the data is organized, and more importantly, to how observations statistically are dependent or independent. The common way to refer to these levels is by numbers (i.e., Level 1, Level 2, etc.), where high numbers indicate levels that are higher in hierarchy. For instance, a study in which individuals work for firms, would constitute firm data representing level 1, and individual data representing level 2 (Nezlek 2008).

One important characteristic of multilevel data is that the level 1 observations are not independent (Rasbash *et al.* 2009). Individuals nested in organizations share whatever characteristics an organization has, which provide a common understanding and behaviour of organizational practices. This lack of independence means that traditional ordinary least-square (OLS) techniques, such as multiple regression, in which level 1 observations are treated as independent observations cannot be used because such analyses violate a fundamental assumption – the independence of observations (Kim *et al.* 2015). For example, in a study of employees clustered in firms, it is fundamentally not relevant to conduct a single level regression analysis by which firm level measures are assigned to the individual and are then used in the analysis as if they were individual level measures.

4.4.1 Rationale for using multi-level modelling

Multilevel analysis is used to test the hypotheses in this thesis. Due to the nature of the data (200 managers clustered in 84 branches), possible nesting effects of bank-level and employee-level factors on the relationships tested are controlled for, as recommended by Rasbash *et al.* (2009), and Kim *et al.* (2015). The recommendations of Klein, Tosi and Cannella (2000) were followed to test whether multilevel analysis was the adequate statistical technique for the study. First, a model of one structure (individual level) was compared to a model at two levels (individuals nested in bank branches). The results show that the difference in log likelihood ($474.72 - 495.31 = 20.59$; $p < .01$) is significant. Secondly, the percentage of variance at level 2 to overall variance was compared, i.e., the division of level 2 variance (0.107) by the total variance (0.644), which equals 0.166. Any value above 0.1 justifies the use of the multilevel statistical technique (Klein *et al.* 2000). Hence, there is a valid justification to use multilevel analysis for the research.

4.5 Summary

This chapter describes how knowledge is produced and accessed. Positivism philosophy underpins the current research. This involves accessing objective data and testing the developed hypotheses from the literature. A survey questionnaire was administered in order to obtain data to answer the key research questions and objectives. Due to the nature of the data (200 managers clustered in 84 branches), multilevel modelling technique was identified as the most appropriate statistical tool to analyse the data. In the next chapter, the results from the fieldwork investigation are reported, followed by a discussion of the findings.

CHAPTER FIVE – RESULTS AND DISCUSSION

5.0 Introduction

This chapter reports and discusses the findings from the hypotheses testing following two studies. The data analysis procedure is undertaken in three stages in each study. First, confirmatory factor analysis (CFA) was conducted to determine if the study's constructs provide a good fit. Secondly, to address the possibility of common method bias (CMB) and avoid contamination of measures, the marker variable technique was used following the recommendations of Podsakoff *et al.* (2011). Thirdly, the hypotheses are tested using multilevel analysis.

5.1 Study 1: Results and Discussion

The first empirical study of the thesis examines organizational antecedents of absorptive capacity, underlying the moderating role of market sensing and responsiveness capabilities. This study aims to answer the following question: why are some firms better at managing their absorptive capacity better than others?

5.1.1 Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) was conducted to explore the factorial structures of the measures and assess the validity of the variables using AMOS software (Byrne 2001). This study followed a procedure suggested by Klein *et al.* (2000), and Schumacker and Lomax (2004). The model includes seven constructs (i.e. coordination, systems, socialization, market-sensing capability, market-responsiveness capability, potential absorptive capacity, and realized absorptive capacity) indicating a relatively good fit with the data [$\chi^2=2007.5$; $df=909$; $\chi^2/df=2.21$, $p<0.01$; comparative fit index (CFI)=0.76; incremental fit index (IFI)=0.77; Tucker-Lewis index (TFI)=0.73; root-mean-square error of approximation (RMSEA)=0.077].

5.1.2 Common Method Bias

Following the recommendations of Podsakoff *et al.* (2011) and Lindell and Whitney (2001), the marker variable technique was employed to check whether CMB has an effect on the model. To undertake this test, the smallest correlation between the

marker variable and the substantive variables was taken as an estimate of the effects of CMB. In doing so, the lowest positive correlation between self-report variables was subtracted from each correlation value. The results of the variables tested were relatively small ranging between 0.01 and 0.005. Therefore, CMB is not an issue in this study.

5.1.3 Hypotheses Testing

The descriptive statistics, reliability estimates and correlations of all measures are reported in Table 6.

Table 6. Mean, Standard Deviations, and Correlations (study 1)

Variables	Variable	Mean	S.D.	α	1	2	3	4	5	6	7	8	9	10
1. SIZE	Firm size	4.649	0.709		1									
2. EXP	Work experience	3.678	1.130		0.146*	1								
3. EDU	Educational level	2.151	0.561		-0.063	-0.101	1							
4. COOR	Coordination	4.781	0.818	0.76	-0.038	0.023	0.127	1						
5. SYST	Systems	5.547	0.592	0.81	0.094	0.113	0.015	0.309**	1					
6. SOCI	Socialization	5.490	0.806	0.85	0.053	0.188**	-0.002	0.346**	0.500**	1				
7. MASEN	Market sensing capability	5.595	0.818	0.83	0.223**	0.002	0.075	0.324**	0.491**	0.560**	1			
8. MARES	Market responsiveness capability	5.594	0.810	0.90	0.289**	0.168*	-0.028	0.260**	0.459**	0.632**	0.690**	1		
9. PACAP	Potential absorptive capacity	5.563	0.811	0.75	0.237**	0.121	0.108	0.362**	0.467**	0.628**	0.621**	0.648**	1	
10. RACAP	Realized absorptive capacity	5.990	0.942	0.78	0.247**	0.041	0.006	0.318**	0.498**	0.510	0.598**	0.622**	0.685**	1

Notes:

N= 200 employees nested in 84 branches.

*p<0.05; **p<0.01.

Table 7 presents regression results predicting the direct and interaction effects of coordination on PACAP through market-sensing capability; and system and socialization on RACAP through market-responsiveness capability. There are three models for assessing the relationship between coordination and PACAP moderated by market-sensing capability (Models 1 to 3), and also six models for examining the associations between system and socialization, and RACAP moderated by market-responsiveness capability (Models 4 to 9). Models 1, 4 and 7 consist of dependent variables and independent variables only while Models 2, 5, 8 contain independent and control variables. Models 3, 6, 9 represent the full model containing all the independent and control variables and interaction terms. Findings in Table 7 show that there is no effect of control variables (firm size, work experience and educational level) on the hypotheses tested.

Table 7. Regression Results (study 1)

Variable	Dependent variable: potential absorptive capacity									Dependent variable: realized absorptive capacity																			
	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6			Model 7			Model 8			Model 9				
	β	SE	t	β	SE	T	β	SE	t	β	SE	t	B	SE	t	β	SE	t	β	SE	t	β	SE	t	β	SE	t		
Intercept	5.20	0.05	104.00**	6.03	0.06	100.50**	4.27	0.39	10.95**	5.98	0.12	49.83**	6.00	0.49	12.24**	5.92	0.48	12.33**	5.98	0.13	46.00*	6.03	0.13	46.38*	6.03	0.51	11.87*		
SIZE				0.25	0.07	3.57*	0.14	0.06	2.33*				0.14	0.08	1.75*	0.04	0.07	0.50				0.13	0.08	1.62*	0.03	0.07	0.37		
EXP				0.05	0.04	1.25*	0.08	0.04	2.00*				-0.02	0.05	-0.40	-0.07	0.04	-1.80				-0.04	0.05	-0.80	-0.08	0.04	-1.81		
EDU				0.10	0.09	1.11*	0.08	0.07	0.87				0.01	0.09	0.11	0.02	0.07	0.03				0.03	0.09	0.33	0.02	0.08	0.30		
COOR	0.34	0.05	6.80**	0.31	0.06	5.16**	0.32	0.06	5.33**																				
SYST										0.71	0.06	11.83**	0.75	0.08	9.25**	0.75	0.09	8.22**											
SOCI																			0.52	0.06	8.66**	0.57	0.07	8.14**	0.58	0.07	8.28**		
MASEN	0.49	0.04	12.25**	0.54	0.05	10.80**	0.53	0.06	8.83**																				
MASEN × COOR							0.04	0.06	0.66																				
MARES										0.52	0.06	8.25**	0.50	0.06	8.06**	0.51	0.06	8.17**	0.49	0.07	6.44**	0.45	0.07	5.92**	0.46	0.08	5.90**		
MARES × SYST																-0.26	0.08	-3.02*											
MARES × SOCI																											-0.17	0.06	-2.61*
Level intercept variance (SE)	1	0.02	0.02	0.02	0.01		0.04	0.04		0.22	0.08		0.23	0.09		0.24	0.09	0.02	0.10		0.02	0.10		0.03	0.10		0.02		
Level intercept variance (SE)	2	0.38	0.03	0.36	0.04		0.00	0.00		0.31	0.03		0.33	0.03		0.33	0.03	0.39	0.04		0.38	0.04		0.36	0.04		0.39		

Notes:

SIZE: firm size, EXP: work experience, EDU: educational level, COOR: coordination, SYST: systems, SOCI: socialization, MASEN: market sensing capability, MARES: market responsiveness capability.

N= 200 employees nested in 84 branches.

*p<0.05; **p<0.01.

Model 3 indicates that there is strong support for Hypothesis 1, in that coordination practice is positively and significantly related to potential absorptive capacity ($\beta=.32, p<.01$).

Model 6 shows that there is a strong support for Hypothesis 2, in that systems practice is positively and significantly associated with realized absorptive capacity ($\beta=.75, p<.01$).

Model 9, shows strong support for Hypothesis 3, in that socialization practice is positively and significantly associated with realized absorptive capacity ($\beta=.58, p<.01$). It may be noted that system practice has a greater positive impact than socialization practice on realized absorptive capacity.

While Jansen *et al.* (2005) examined the influence of the subdimensions of coordination, systems and socialization on potential and realized absorptive capacity (e.g. the effect of cross functional interfaces, job rotation, and participation on the acquisition and assimilation of new knowledge), this study took the aggregate of these subdimensions and investigated the influence of these organizational antecedents on potential and realized absorptive capacity. This study has responded to the call by Volberda *et al.* (2010) who stressed that to manage a firm's ability to assimilate and exploit new knowledge efficiently, ACAP should be combined with other organizational learning mechanisms. In so doing, this study has examined the role of market sensing and responsiveness capabilities on the relationship between coordination, systems and socialization and PACAP and RACAP.

The study finds strong support for the three moderation Hypotheses 1a, 2a and 3a. As Model 3 shows, the moderation effect of market sensing capability on the link between coordination and PACAP was supported, and has strengthened the relationship tested ($\beta=0.04, p<0.05$). However, the interaction at high and low levels of market responsiveness was not significant. To interpret this finding, firms in the sample tend to have solid coordination activities, but yet they need to read quickly the shift in the environment. Also, market sensing capability helps firms to interact with customers, which puts them at an advantage to generate and

disseminate useful information about changing consumer behaviours and new emerging market trends (Workman, Homburg and Jensen 2003). Further, this study highlights that to manage PACAP effectively, firms need to undertake activities requiring sensing the external environment. Indeed, through integrating market sensing to the process of potential absorptive capacity, firms can stimulate learning and further adapt resources and reconfigure knowledge successfully.

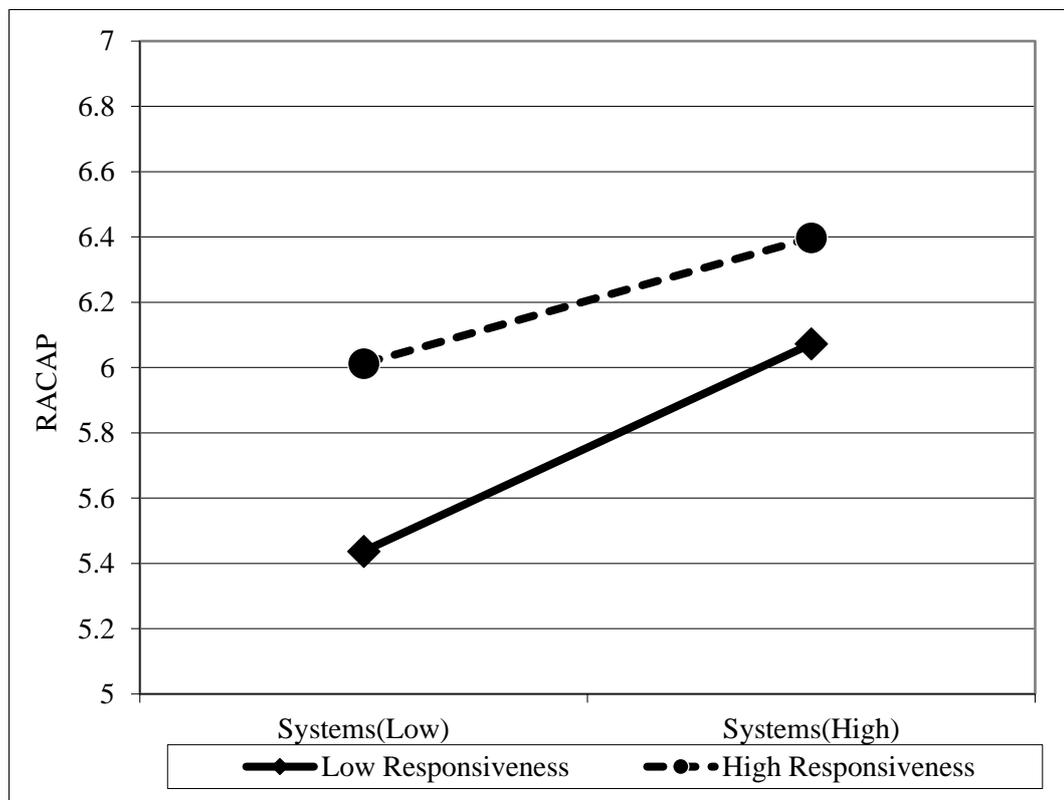
Model 6 shows the coefficient on the interaction term ($y = -0.26$, $p < 0.01$) is negative and significant, indicating support for Hypothesis 2a. In order to interpret the interaction term, the recommendations of Bauer, Preacher and Gil (2006) were followed. Simple slopes at 1 standard deviation below and above the mean of the moderator were plotted (as also proposed by Aiken and West 1991). These simple slope analyses of the moderating effects of market responsiveness capability on the relationship between systems and realized absorptive capacity are plotted in Figure 4. The slope estimates for Level 2 (firm-level) and Level 1 (employee level) were regressed to test this interaction. The positive relationship between systems and RACAP was statistically significant when market responsiveness capability was at high levels (simple slope = 0.03, $p < 0.05$); and to a lesser extent, the relationship was positive and significant when market responsiveness capability was at low levels (simple slope = 0.06; $p > 0.05$). That is, despite the different results in both high and low levels, the moderator had a relatively strong and positive effect on the relationship between systems and RACAP.

The interpretation of the results of the interaction of market responsiveness capability with systems on RACAP is based on the nature of the selected antecedent of ACAP. For instance, systems are characterised by high formalization and routineness, through which firms in the sample do need both high and low levels of market responsiveness to yield effective transformation and exploitation of new knowledge. That is, to develop RACAP, firms need not only the ability to transform and exploit knowledge, but the capacity to respond to the external environment.

Model 9 shows that the coefficient on the interaction term is negative and significant ($y = -0.17$, $p < 0.01$), indicating significant support for Hypothesis 3a. Following the same procedure as noted above, the interaction at 1 standard

deviation above and below the mean of the moderator was plotted (Aiken and West 1991). The slope estimates for Level 2 (firm-level) and Level 1 (employee level) were regressed to test this interaction. As Figure 4 indicates, the tests of simple slopes showed that the positive relationship between socialization and realized absorptive capacity was statistically significant when market responsiveness capability was at low levels (simple slope=0.13, $p<0.01$) but became insignificant at high levels (simple slope=0.08, $p>0.1$).

Figure 4. Interaction of Market Responsiveness Capability with Systems on RACAP

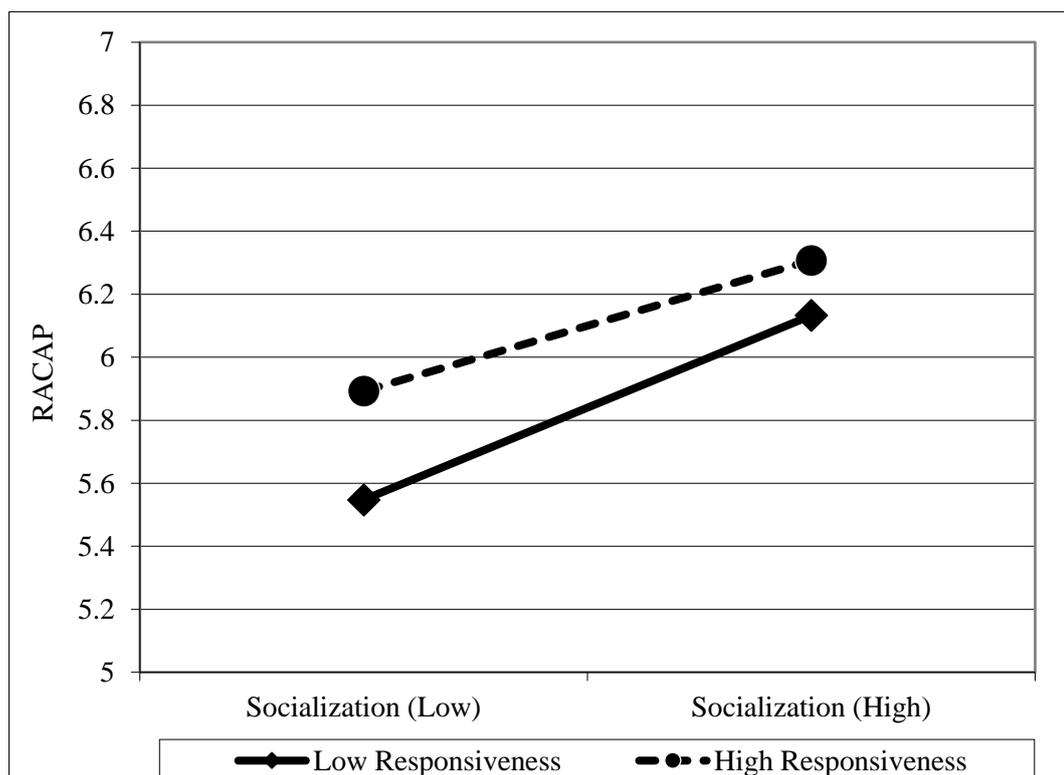


Model 9 shows that the coefficient on the interaction term is negative and significant ($\gamma=-0.17$, $p<0.01$), indicating support for Hypothesis 3a. Following the same procedure as mentioned above, the interaction at 1 standard deviation above and below the mean of the moderator was plotted (Aiken and West 1991). The slope estimates for Level 2 (firm-level) and Level 1 (employee level) were regressed to test this interaction. As Figure 5 indicates, the tests of simple slopes showed that the positive relationship between socialization and RACAP was statistically

significant when responsiveness capability was at low levels (simple slope=0.129, $p<0.01$) but became insignificant at high levels (simple slope=0.08, $p>0.1$).

The interaction of market responsiveness with socialization capabilities on realized absorptive capacity, indicates that to manage RACAP effectively, firms in the sample do need a low level of responsiveness. As socialization capabilities are characterised by a high level of interaction, communication and shared experiences among employees, firms tend to have more exposure and understanding of the external environment, enabling them to read and react quickly to market changes compared to their counterparts. It is then understandable that firms which use socialization to capture RACAP need a low level of market responsiveness for effective transformation and exploitation of knowledge.

Figure 5. Interaction of Market Responsiveness Capability with Socialization on RACAP



5.2 Study 2: Results and Discussion

The second empirical study of the thesis examines the effect of potential and realized absorptive capacity on organizational performance, underlying the moderating role of environmental dynamism and network size. The study aims to answer the following question: what is the link between ACAP and organizational performance?

5.2.1 Confirmatory Factor Analysis

Similar to the first study, the discriminant validity of the measures is assessed using AMOS software (Byrne 2001), where the proposed procedure by Klein *et al.* (2000) and Schumacker and Lomax (2004) is followed to report the findings. The model of the second study includes five study variables (i.e., potential absorptive capacity; realized absorptive capacity; environmental dynamism; network size; and organizational performance). The CFA results supported the discriminant validity of the measures and report a good fit with the data: $X^2= 1237.6$; $df= 512$; $X^2/df= 2.42$, $p < .01$; comparative fit index (CFI) = 0.82; incremental fit index (IFI) = 0.82; Tucker-Lewis index (TFI) = 0.79; root-mean-square error of approximation (RMSEA) = 0.083.

5.2.2 Common Method Bias

Again, similar to the first study, to check whether common method bias is an issue in the second study, the suggested marker variable technique of Lindell and Whitney (2001) was adopted. In so doing, this method takes the smallest correlation between the marker variable and the substantive variables as an estimate of the method bias effects. Then, the lowest positive correlation between self-report variables is subtracted from each correlation value. Consistent with the previous CMB results, the absolute differences were relatively small, ranging between 0.01 and 0.005. Hence, common method bias is not a problem in this study.

5.2.3 Hypotheses Testing

The descriptive statistics, reliability estimates and correlations of all measures are reported in Table 8.

Table 8. Means, Standard Deviations, and Correlations (study 2)

Variable names	Variable	Mean	S.D.	α	1	2	3	4	5	6	7	8
1. SIZE	Firm size	4.649	0.709		1							
2. EXP	Work experience	3.678	1.130		0.146*	1						
3. EDU	Educational level	2.151	0.561		-0.063	-0.101	1					
4. PACAP	Potential absorptive capacity	5.563	0.811	0.75	0.237**	0.121	0.108	1				
5. RACAP	Realized absorptive capacity	5.999	0.942	0.78	0.247**	0.041	0.006	0.685**	1			
6. ENV	Environmental dynamism	1.800	0.401	0.83	0.476**	0.1149*	-0.061	0.210**	0.262**	1		
7. NET	Network size	5.047	1.308		-0.049	-0.106	0.122	0.083	0.072	0.093	1	
8. OP	Organizational performance	5.506	1.129	0.94	0.284**	0.097	-0.045	0.470**	0.416**	0.344**	0.180**	1

Notes:

N= 200 employees nested in 84 branches.

*p<0.05; **p<0.01.

To test the indirect relationship between transformation and exploitation, and performance via acquisition and assimilation, a procedure recommended by Muller, Judd and Yzerbyt (2005) and Bauer *et al.* (2006) is followed. Monte Carlo Markov Chain (MCMC) stimulations with 20,000 iterations is applied in order to produce confidence intervals for the proposed indirect effects (Selig and Preacher 2008). In doing so, an online tool to develop R^2 value is used to test the indirect effect (mediation) (Selig and Preacher 2008). If confidence intervals do not contain zero value, it means that the indirect effect is significant. Furthermore, to test the moderated mediation effect (e.g. testing whether high/low environmental dynamism and exposure moderate the indirect relationship of PACAP with organizational performance via RACAP), this study followed Edwards and Lambert's (2007) procedure.

Table 9 presents regression results predicting the relationship between potential and realized absorptive capacity and organizational performance. The table also reports the results of the mediation and interaction effects of potential absorptive capacity with organizational performance through realized absorptive capacity; and the interaction with high and low levels of environmental dynamism and exposure. There are two models for assessing the relationship between potential and realized absorptive capacity and organizational performance (Model 1 and Model 2). Two models to test the mediation effect of realized absorptive capacity on the association among potential absorptive capacity and performance (Model 3 and Model 4). Four models for examining the moderated mediation effect of environmental dynamism on the proposed associations (Models, 5, 6, 7, and 8). Findings in Table 4 show that there is no effect of control variables (firm size, work experience and educational level) on the hypotheses tested.

Table 9. Regression Results (study 2)

Variable	Dependent variable: organizational performance																								
	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6			Model 7			Model 8			
	β	SE	t	β	SE	t	β	SE	t	β	SE	t	β	SE	t	β	SE	t	β	SE	t	β	SE	t	
Intercept	5.28	0.14	37.71**	6.03	0.06	100.50**	4.55	0.40	11.37**	5.78	0.69	8.37**	6.14	1.00	6.14**	4.87	0.71	6.86**	7.11	0.67	10.61**				
SIZE				0.06	0.11	0.54	0.08	0.06	1.33	0.05	0.10	0.50	0.04	0.17	0.23	0.19	0.10	1.90	-0.23	0.12	-1.91				
EXP				-0.02	0.06	-0.33	0.06	0.04	1.50	-0.01	0.06	-0.16	-0.09	0.08	-1.12	0.07	0.07	1.00	-0.01	0.06	-0.16				
EDU				-0.14	0.11	-1.27	0.14	0.07	2.00	-0.12	0.11	-1.09	-0.26	0.16	-1.62	-0.17	0.14	1.21	-0.17	0.11	1.54				
<i>Direct effects</i>																									
PACAP	0.48	0.08	6.00**	0.50	0.08	6.25**																			
RACAP	0.38	0.07	5.43**	0.38	0.07	5.43**																			
<i>Mediation</i>																									
PACAP * RACAP							0.55	0.04	13.75**																
PACAP via RACAP										0.40	0.11	3.45**													
<i>Moderated mediation</i>																									
ENV (H) × PACAP via RACAP													0.11	0.15	0.73	0.56	0.07	8.00**							
ENV (L) × PACAP via RACAP													0.12	0.15	0.80	0.75	0.14	5.36**							
NET × PACAP via RACAP																			0.15	0.11	1.36	0.28	0.35	0.80	
Level 1 intercept variance (SE)	0.33	0.14		0.4	0.16		0.03	0.02		0.25	0.11		0.73	0.31		0.00	0.03		0.30	0.14		0.00	0.00		
Level 2 intercept variance (SE)	0.76	0.08		0.78	0.08		0.31	0.03		0.75	0.08		0.54	0.09		0.66	0.09		0.63	0.07		0.00	0.00		

Notes:

SIZE: firm size, EXP: work experience, EDU: educational level, PACAP: potential absorptive capacity, RACAP: realized absorptive capacity, ENV (H): high level of environmental dynamism, ENV (L): low level of environmental dynamism, NET: network size.

N= 200 employees nested in 84 branches.

*p<0.05; **p<0.01.

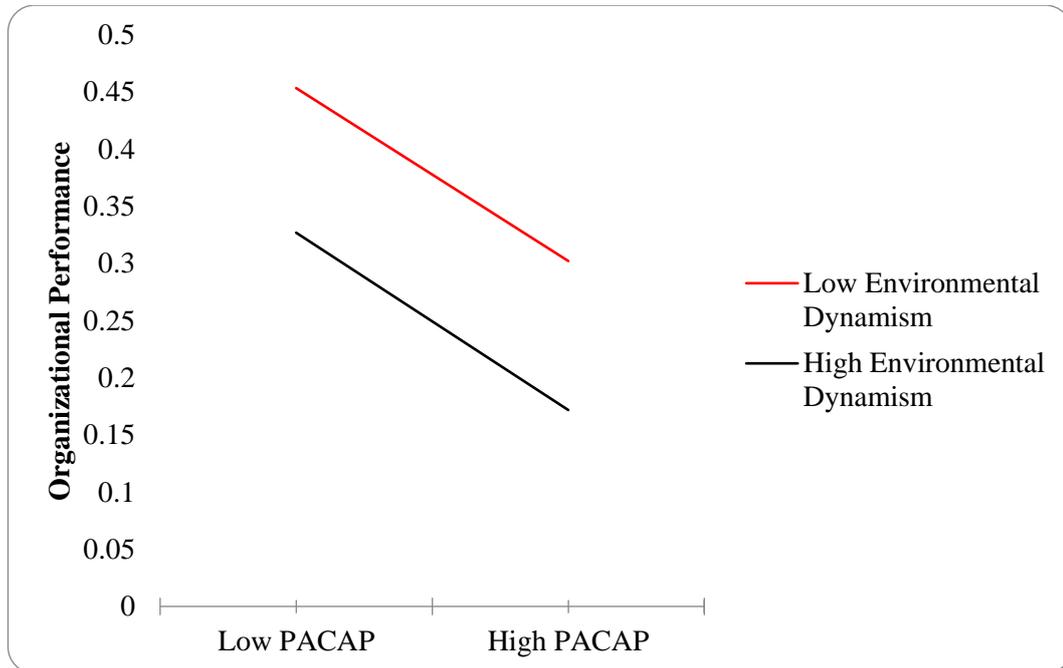
Model 2 shows that there is a strong support for Hypothesis 4, in that potential absorptive capacity has a positive and significant effect on organizational performance ($\beta = .5, p < .01$).

Similarly, Hypothesis 5 is supported. Model 2 reports that RACAP is positively and significantly related to organizational performance ($\beta = .38, p < .01$).

To test Hypothesis 6, which predicts that PACAP has an indirect and positive relationship with organizational performance via realized absorptive capacity, this study followed the recommendations by Bauer *et al.* (2006). The results in Table 9 (Model 3) shows that PACAP is positively and significantly associated with RACAP ($\beta = .55, p < .01$). Also, Model 4 shows that PACAP is positively and significantly associated with organizational performance after taking RACAP into account ($\beta = .40, p < .01$). Monte Carlo Markov Chain (MCMC) stimulations are used to obtain confidence intervals for the proposed indirect effects (Selig and Preacher 2008). The use of an online tool helped to develop R^2 value and test the mediation as suggested by Selig and Preacher (2008). The bootstrapping test reported that the indirect effect of potential absorptive capacity on organizational performance via realized absorptive capacity was significant (i.e., indirect effect = .08, $p < .01$). Also, the 95 percent confidence interval (CI: 0.09-0.33) of the indirect effect did not contain zero. Thus, there is strong support for Hypothesis 6.

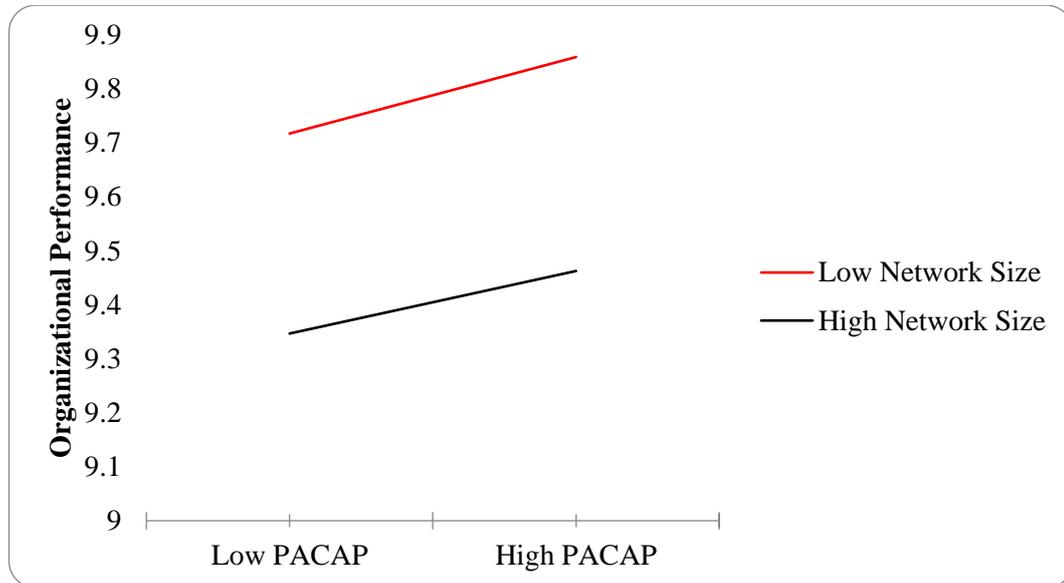
This study finds strong support for the two moderated mediation hypotheses (Hypotheses 6a and 6b). To test hypothesis 6a, the procedure recommended by MacKinnon and Fairchild (2009) was used. This procedure is also suggested in recent research concerning moderated mediation analyses (Muller *et al.* 2005). As Model 6 indicates, the moderated path analytic procedure reveals that the indirect effect was significant ($\beta = .75, p > .5$) at a low condition of environmental dynamism (95 % CI: 0.26 - 0.6). However, the indirect effect, as shown in Model 5, was non-significant ($\beta = .12, p > .5$) at a high condition of environmental dynamism (95% CI: -0.08 - 0.22). Thus, there is support for Hypothesis 6a. The results suggest that the indirect effect of RACAP on organizational performance via PACAP varies by environmental dynamism. The moderated indirect relationships are plotted in Figure 6.

Figure 6. Indirect Effect of PACAP on Organizational Performance via RACAP at Levels of Environmental Dynamism



Similarly, to test hypothesis 6b, the procedure recommended by MacKinnon and Fairchild (2009) and Muller *et al.* (2005) was followed. As Model 7 shows, the moderated path analytic procedure reveals that the indirect effect was significant ($y = .15$, $p > .5$) at a high condition of network size (95% CI: 0.02 - 0.13). Conversely, the indirect effect was non-significant ($y = .28$, $p > .5$), as reported in Model 8, at a low condition of network size (95% CI: -0.2 - 0.4). Hence, Hypothesis 6b is supported. The findings reveal that the indirect effect of RACAP on organizational performance via PACAP varies by not only environmental dynamism, but also by the size of an organization network. The moderated indirect relationships are plotted in Figure 7.

Figure 7. Indirect Effect of PACAP on Organizational Performance via RACAP at Levels of Network Size



5.3 Summary

From the findings of the fieldwork investigation, all of the hypotheses have been relatively supported. The first study found that market sensing and responsiveness capabilities significantly moderate organizational antecedents of absorptive capacity. This means that, as argued previously, firms do not only need the ability to acquire, assimilate, transform and exploit external knowledge, but a great deal relies on their capacity to read and react to environmental changes. This study builds on prior research by stressing that firms that manage better their potential and realized absorptive capacity interact and respond continuously to changing market conditions. The second study reported that potential and realized absorptive capacity are complementary (i.e., assessing the mediating effect of RACAP on the relationship between PACAP and performance) in enhancing superior performance, and this complementarity becomes stronger when organizations operate in a low level of environmental dynamism, and possess a high level of network size. Indeed, PACAP and RACAP co-exist in a manner that organizations can realize the full potential of their ACAP.

The following chapter draws a general conclusion of the thesis, demonstrates the theoretical contributions and practical implications of each study, sets out the limitations of the study and identifies avenues for future research.

CHAPTER SIX – CONCLUSIONS AND IMPLICATIONS

6.0 Introduction

The aim of this thesis is to answer two key research questions: 1) why are some firms better at managing potential and realized absorptive capacity than others? And 2) what is the link between ACAP and organizational performance?

The thesis firstly provides a systematic review of the fragmented literature on the relationship between ACAP and organizational performance. In reviewing 214 papers published in high impact business and management journals between 1990 and 2015, the literature review organizes and synthesises the ACAP-performance link according to theoretical perspectives and research approaches applied. In so doing, the review moves the ACAP literature forward by highlighting the causes of inconsistencies, providing remedies and suggesting an agenda for future research, one of which is the focus of this study.

Secondly, the thesis examines organizational antecedents of absorptive capacity, and focuses on the association between coordination, systems and socialization, and potential and realized absorptive capacity, moderated by market sensing and responsiveness capabilities. The findings expand our understanding that coordination, systems and socialization are key antecedents to manage potential and realized absorptive capacity, but are not sufficient if firms do not actively sense and respond to environmental changes.

Thirdly, the thesis investigates the relationship between ACAP and organizational performance and reports that potential and realized absorptive capacity are complementary in enhancing superior performance, and this complementarity is influenced by different environmental conditions. The study extends the literature on the ACAP-performance link by elucidating that firms can realize the full potential of their absorptive capacity if they operate in low environmental uncertainty and possess a high network size.

A summary of the study's hypotheses and the findings of the empirical analyses are set out in Table 10.

Table 10. Summary of Hypotheses and Findings

Hypothesis	Findings	Supported/ Not Supported
Study 1		
H1. There is a positive relationship between coordination and potential absorptive capacity.	($y=.32, p<.01$)	Supported
H2. There is a positive relationship between systems and realized absorptive capacity.	($y=.75, p<.01$)	Supported
H3. There is a positive relationship between socialization and realized absorptive capacity.	($y=.58, p<.01$)	Supported
H1a. The positive relationship between coordination and potential absorptive capacity is greater when market-sensing capability is high.	($y=.04, p<.05$)	Supported
H2a. The positive relationship between systems and realized absorptive capacity is greater when market-responsiveness capability is high.	($y=-.26, p<.01$)	Supported at high levels (simple slope= .03, $p<.05$)
H3a. The positive relationship between socialization and realized absorptive capacity is greater when market-responsiveness capability is high.	($y=-.17, p<.01$)	Supported at low levels (simple slope= .13, $p<.05$)
Study 2		
H4. Potential absorptive capacity is positively associated with organizational performance.	($y=.5, p<.01$)	Supported
H5. Realized absorptive capacity is positively associated with organizational performance.	($y=.38, p<.01$)	Supported
H6. Potential absorptive capacity is positively associated with organizational performance through realized absorptive capacity.	($y=.40, p<.01$) (indirect effect= 0.08, $p<.01$)	Supported (95% CI: 0.09-0.33)
H6a. Potential absorptive capacity has a stronger association with organizational performance through realized absorptive capacity where environmental dynamism is low.	($y=.75, p>.05$)	Supported at low levels (95% CI: 0.26-0.6)
H6b. Potential absorptive capacity has a stronger association with organizational performance through realized absorptive capacity where environmental dynamism is high.	($y= .56, p> .05$)	Not supported at high levels (CI: -0.04-0.17)
H6c. Potential absorptive capacity has a stronger association with organizational performance through realized absorptive capacity where network size is high.	($y=.15, p<.05$)	Supported at high levels (95% CI: 0.02-0.12)

The two empirical studies make several contributions and have managerial implications, which are discussed in the following sections.

6.1 Study 1: Conclusions and Implications

The first empirical study builds on Jansen *et al.*'s (2005) research and examines organizational antecedents of ACAP. This study focuses on one core question: why are some firms better at managing potential and realized absorptive capacity than others? To answer this question, the study scrutinized the role of coordination, systems, and socialization in the ACAP process, with the moderating effect of market sensing and responsiveness on these relationships. Drawing on multilevel data from 200 managers, the findings indicate that coordination is positively

associated with potential absorptive capacity while system and socialization are positively associated with realized absorptive capacity. Also, market responsiveness strengthens the relationship between coordination and PACAP. Further, market responsiveness strengthens the relationship between socialization and systems and RACAP (the effect is significant at lower levels of market responsiveness), and the relationship between systems and RACAP (the effect is significant at both high and low levels of market responsiveness). The findings offer several contributions which are discussed below.

6.1.1 Contributions of the study

The study contributes to the extant literature in two ways. Firstly, this study builds on Jansen *et al.*'s (2005) seminal work and stresses that organizational antecedents such as coordination, systems and socialization are important to manage potential and realized absorptive capacity, but are not sufficient for firms operating in dynamic markets. Organizations that manage better their potential and realized absorptive capacity actively sense and respond to environmental stimuli. As such, market sensing is a key activity to develop the acquisition and assimilation of knowledge. The practice of perusing, sensing, and understanding the environment is vital to yield effective acquisition and assimilation of knowledge underlying potential absorptive capacity. Also, market responsiveness is an essential capability to develop transformation and exploitation of knowledge. Through market responsiveness, organizations can avoid any disruptive changes that may occur in the process of transformation and exploitation of newly acquired knowledge, resulting in a better management of their RACAP. This study extends our understanding that firms using coordination, systems, and socialization to acquire, assimilate, transform and exploit knowledge in itself is not sufficient if firms do not also possess other learning processes, such as sensing and responsiveness capabilities. These learning processes are essential prerequisites to manage potential and realized absorptive capacity effectively.

Secondly, the study builds on the organizational learning literature. Prior research highlights that a greater responsiveness to the environment is determined primarily by the coordination capabilities of a firm (i.e., effective generation and

dissemination of information). Day (1994) argues that responsiveness to the external environment is expected to increase where information is generated and disseminated adequately, however, this study goes beyond this argument and shows that the increase of responsiveness is determined by the nature of mechanisms, processes, and capabilities within an organization. In other words, this study stresses that the increase/decrease of market responsiveness is based on the flexibility or rigidity of organizational mechanisms, processes and capabilities. For instance, socialization, which embodies more flexible processes, can be combined with a low level of market responsiveness capability to generate effective results, while systems which are based on rigid and formalized processes can be combined with a high level of market responsiveness capability to produce effective outcomes. Hence, when bank branches use system capabilities to transform and exploit knowledge, they need both low and high levels of market responsiveness. Given that systems are characterized by a high level of rigidity, repetitive actions and formalized procedures, it makes it difficult for firms to understand changes in the environment and respond quickly (Schminke *et al.* 2000). On the other hand, firms that capture realized absorptive capacity via socialization can effectively transform and exploit knowledge with a minimum/low level of market responsiveness capability. Socialization, which incorporates connectedness and socialization tactics, tends to provide more flexibility to react to the external environment (Saks and Ashforth 1996).’

This study advances organizational learning research by demonstrating that market oriented firms are not only driven by their level of coordination capability but also by the level of flexibility/rigidity of their internal mechanisms and processes.

To sum up, this finding reveals that a firm’s absorptive capacity in itself is not sufficient to achieve higher organizational learning, unless it is also combined with other learning capabilities (i.e., market sensing and responsiveness capabilities). As noted previously, prior research has not examined learning capabilities that aim to read and react to changes in market conditions. Organizations that seek to learn from the external environment are more exposed to different dynamics, and are more likely to address challenges and recognize opportunities. The ability to learn faster than competitors requires them proactively to read and respond to different

market conditions when they assimilate and exploit external knowledge. This study stresses that the greater capacity to read and react to market changes assists organizations in obtaining information about current and latent market needs, which leads to higher learning orientation, and therefore anticipates what knowledge should be acquired, and how it can be exploited efficiently. Indeed, with long-term orientation, organizations can further develop disciplined learning from the external environment to sustain effective acquisition and application of knowledge, which contributes to the accumulation of resources and increased value from ACAP.

6.1.2 Practical Implications

To help ensure the effectiveness of the firm's ability to absorb and exploit underlying knowledge, it is vital that firms encourage their employees to engage in activities requiring sensing and responding to the external environment. For instance, as Turkey is one of the major emerging economies and characterized by a dynamic environment (e.g. developing infrastructure and introducing economic and financial reforms), managers should sense, interact and respond continuously to changing market conditions. In particular, due to the shift in the competitive landscape of the banking sector, where foreign presence is on the rise and local banks are attempting to expand their local and international activities, organizations are under pressure to develop, renew and upgrade, and are thus required to understand and respond adequately to changing conditions.

In addition, from the research findings, for effective transformation and exploitation of knowledge, firms are required to use systems (e.g. routines) socialization tactics (e.g. connectedness) and also interact continuously and proactively with the external environment. This would activate a state of mind to avoid and respond to any disruptive changes that may affect the transformation and exploitation of knowledge. While systems and socialization provide systematic practices to execute actions, organizations need to respond to environmental changes to yield effective transformation and exploitation of knowledge. Managers may draw on this by interacting continuously with the environment in order to develop the firm's ability to absorb and use knowledge.

6.2 Study 2: Conclusions and Implications

The second empirical study builds on Zahra and George's (2002) seminal work to answer the following question: what is the link between ACAP and organizational performance? The study extends understanding of the ACAP-performance link by explaining that potential and realized absorptive capacity are complementary in improving financial returns and that this complementarity is determined by different environmental conditions. The study finds that there is an indirect effect of PACAP on organizational performance via RACAP, suggesting that this association is moderated by environmental dynamism and network size. The study also reports that increases and decreases in performance are determined by boundary conditions, i.e., high and low levels of environmental dynamism and network size. For instance, to realize the full potential of their absorptive capacity, firms should operate in a stable environment and possess a high network size. The findings provide several contributions which are set out below.

6.2.1 Contributions of the study

The first contribution of this study is to identify that, of the two distinct ACAP dimensions, potential absorptive capacity is the basis of creating and sustaining a firm's competitive advantage. The findings indicate that the processes underlying potential absorptive capacity (acquisition and assimilation) improve firm performance more than processes underlying realized absorptive capacity (transformation and exploitation). This might be due to two causes. Firstly, firms tend to find it difficult to manage the two ACAP dimensions successfully. For instance, where firms put emphasis on acquisition and assimilation of knowledge underlying potential absorptive capacity, they might not manage effectively the ability to transform and exploit knowledge underlying realized absorptive capacity. Accordingly, Volberda et al. (2010) posit that some underlying tensions may occur between the dimensions of ACAP, through which high levels of potential absorptive capacity might be detrimental to develop realized absorptive capacity. Secondly, prior research (e.g. see Jansen *et al.* 2005; Volberda *et al.* 2010; Ebers and Maurer 2014) advocates that in dynamic environments, firms manage better their PACAP to increase performance. It is argued by these authors that potential absorptive capacity provides greater strategic flexibility in reconfiguring resources

and effective deployment of knowledge at lower cost, which is a prerequisite to promoting business performance. Despite this evidence, emphasizing the two distinct components of ACAP is necessary, but not sufficient, for firms to realize the full potential of their absorptive capacity and sustain superior performance.

The second contribution of this study rests on confirming empirically the framework of Zahra and George (2002), which maintains that potential absorptive capacity and realized absorptive capacity are complementary and co-exist in enhancing organizational performance. In so doing, the study empirically examined the mediated effect of RACAP on the relationship between PACAP and performance, and found a positive and significant effect. Moreover, from the analysis, it may be noted that the indirect relationship has a greater effect than the direct relationship of the ACAP-performance link. In other words, the relationship between potential absorptive capacity and firm performance is greater through the condition of realized absorptive capacity. Drawing on this finding, the study stresses that there is an overlap of the processes underlying the two ACAP dimensions in improving financial returns.

A third contribution is to highlight that, against a generally favourable view of absorptive capacity, the relationship between ACAP and firm performance is not always positive and can and should be viewed as subject to diminishing financial returns. Recent research has reported mixed findings in assessing the relationship between ACAP and performance. These studies suggest that the impact of ACAP can be either positive or negative depending on a plethora of contextual factors (Martinez-Noya *et al.* 2013; Walter *et al.* 2016). This study contributes to the research on context dependency of ACAP by elaborating and testing different environmental factors (e.g. environmental dynamism and network size).

The results reveal that the ACAP-performance link is influenced by both high and low levels of environmental dynamism and network size. Depending on environmental conditions, the impact of organizational performance will vary. For instance, when firms operate under low levels of environmental dynamism, they are better at managing potential and realized absorptive capacity and so will increase financial returns. That is, at a low level of environmental dynamism, firms can

develop their potential absorptive capacity and are more likely to engage in effective transformation and exploitation of knowledge to improve organizational performance. Conversely, firms operating at a high level of environmental dynamism experience difficulty in developing their ability to acquire and exploit knowledge, which leads to decreased financial performance. The findings imply that, rather than absorptive capacity being more beneficial in certain settings, different conditions of the external environment require that firms deploy quite distinct and different capabilities and strategies for improved performance.

In addition, the inclusion of network size illuminates an important contingency in the relationship between the ACAP dimensions and business performance. The study finds that RACAP positively mediates the relationship between PACAP and organizational performance where network size is high, but this effect does not appear at a low network size. These findings advance understanding of how ACAP can be not only affected by changes in the external environment, but also by the size and scope of units and branches distributed and exposed to the environment. The value of absorptive capacity increases with the degree of connectedness (network size). The underlying argument for this finding rests on the fact that high network size enables the firm to create, engage and grasp new opportunities, such as accessing new resources, as well as developing core capabilities, to sense and respond to the environment more quickly than competitors. For instance, a bank with a large number of branches tends to be able to develop strong ties and strategic flexibility in order to absorb and use knowledge effectively. The bank branches are exposed to a variety of technologies and resources, which is an essential prerequisite to manage and develop their absorptive capacity, and subsequently enhance superior performance.

Consequently, this study moves the literature on ACAP forward by explicating that the nature of the relationship between ACAP and performance does not rest only on the ability of firms to acquire and use knowledge, but more on different environmental conditions that either facilitate or hinder the flow of knowledge. Understanding the relationship between an organization and its external environment is critical to comprehending when, how and why ACAP can be either

positive, negative or insignificant on performance. This study also builds on Ebers and Maurers (2014) argument which highlights that the complementarity between PACAP and RACAP exists when the underlying processes of the two components have a positive association and/or reinforce each other. Moreover, this complementarity is strengthened and sustained when organizations are more connected via large network size and operate in stable environments. Indeed, for organizations aiming to realize the full potential of their absorptive capacity, they are advised to conduct their learning activities in stable markets and increase their network size.

6.2.2 Practical Implications

The findings provide a number of direct implications for banks. Those branches hoping to increase financial gains from absorptive capacity need to invest in opening new branches in different geographical locations. Such investment would be beneficial for banks to capture new opportunities and help them to absorb valuable knowledge from the external environment. For example, by opening more branches, banks tend to increase customer engagement opportunities, which allows them to generate and disseminate richer information about market trends and to respond more quickly to opportunities and threats compared to their competitors. Moreover, a large number of bank branches develops the ability to acquire and exploit knowledge effectively, which is an essential prerequisite to achieve a sustained competitive advantage.

6.3 Limitations and Future Research

As with all studies, this thesis has some limitations, which provide opportunities for future research. One limitation is that the study does not shed light on how/when firms respond to unexpected events while they transform and exploit knowledge. Future research could fruitfully explore the extent to which firms react to an external shock (how they behave towards environmental stimuli). Given that research on ACAP is predominantly conducted quantitatively, future research could adopt qualitative research methods to explore and explain how firms react to various exogenous factors in the process of knowledge assimilation and usage.

A second limitation is related to the use of organizational mechanisms (coordination, systems and socialization) in capturing the richness of the ACAP construct. Given the multidimensional nature of the concept of absorptive capacity scholars are calling for more micro-foundation research on ACAP. Research to date has been focused at the organizational level and has somewhat neglected micro-level variables. Future research could fruitfully explore how micro-level variables, for instance, emotional intelligence, language codes, communication systems and the individual's motivation to learn (and unlearn) and to share or withhold knowledge, may affect the ability of firms to acquire, assimilate, transform and exploit knowledge.

The third limitation of the study rests on the cultural and business context. In particular, this study was undertaken with data obtained from Turkey, where the cultural context is characterized by high in-group collectivism (Kabasakal and Bodur 2007). In this cultural setting, individuals have high social network and coordination capabilities. Firms engaging in absorptive capacity via coordination capability are likely to be heavily influenced by the cultural context rather than internal organizational capabilities/mechanisms. However, this study did not depict the nature of these capabilities, which provides an opportunity for future research.

Also, given that the study was conducted with banking sector in Turkey, where the government is involved in stabilizing the market, it is difficult to extrapolate the findings regarding how firms read and respond to environmental dynamics. Therefore, future research is needed in different contexts (cultural and business) to provide a more nuanced picture of how firms sense and respond to a rapidly changing environment, while they engage in assimilating and using knowledge.

A fourth limitation is related to the nature of the complementarity of potential and realized absorptive capacity in developing a firm's absorptive capacity and increasing organizational performance. There is a fundamental research question this study does not address: How and why the four ACAP practices (from acquisition to transformation) co-exist? In future work, scholars should be encouraged to adopt qualitative research methods in order to explore the extent of the overlap of the processes underlying potential and realized absorptive capacity.

Indeed, this approach would help to further explain how the two distinct aspects interact and react to environmental dynamism, which is required to bring a more nuanced understanding of the extent of the flexibility of each dimension.

Fifthly, the research does not shed light on the role ownership structures of banks (e.g. state-owned banks, private-owned banks, foreign-owned banks and joint venture) in affecting a firm's absorptive capacity. In other words, the research does not highlight the potential influence of different bank ownership structures on the acquisition and exploitation of knowledge, and subsequently on performance. Therefore, it would be fruitful, for example, to explore how foreign banks and state banks acquire and assimilate knowledge to enhance their superior performance. This would bring a nuanced picture on why are some firm better at managing their ACAP process than others, and also clarify further the nature of the relationship between ACAP and performance.

Finally, there is a lack of generalizability of the findings due to the narrow focus of sample characteristics. The study targeted upper-level employees, who have senior/executive positions. In this context, the participants possess managerial expertise/knowledge, and are also involved in making decisions. Hence, it would be beneficial in future research to use different samples (e.g., low/high managerial levels). This would further help understanding of the ways the ability to learn, absorb and use knowledge varies between managers at different hierarchical levels.

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Appendices

Appendix 1- Questionnaire

(I) ORGANIZATIONAL PROFILE

1. Which of the following best describes your bank?		
<input type="checkbox"/> 100% local privately owned	<input type="checkbox"/> Publicly owned	
<input type="checkbox"/> Wholly foreign owned	<input type="checkbox"/> Joint venture (% foreign parent owns) ____%	
How long has your bank been in operation?		
<input type="checkbox"/> Less than 5 years	<input type="checkbox"/> 5-10 years	<input type="checkbox"/> 11-20 years
<input type="checkbox"/> 21-40 years	<input type="checkbox"/> More than 40 years	
3. What was the approximate value of your bank's total assets in 2015 (Turkish Lira) ?		
<input type="checkbox"/> >5 billion	<input type="checkbox"/> 5-24.9 billion	<input type="checkbox"/> 25-49.9 billion
<input type="checkbox"/> 50- 99.9 billion	<input type="checkbox"/> 100- 200 billion	<input type="checkbox"/> <200 billion
4. What was the number of employees in your bank in 2015?		
<input type="checkbox"/> >100	<input type="checkbox"/> 100-249	<input type="checkbox"/> 250-999
<input type="checkbox"/> 1000-5000	<input type="checkbox"/> <5000	
5. How long have you worked in your bank?		
<input type="checkbox"/> >1 year	<input type="checkbox"/> 1-3 years	<input type="checkbox"/> 4-9 years
<input type="checkbox"/> 10-15 years	<input type="checkbox"/> <15 years	
6. How long you have you worked in this industry?		
<input type="checkbox"/> >1 year	<input type="checkbox"/> 1-3 years	<input type="checkbox"/> 4-9 years
<input type="checkbox"/> 10-15 years	<input type="checkbox"/> <15 years	
7. Which of the following best describes your position in your bank?		
<input type="checkbox"/> Upper-level management	<input type="checkbox"/> Middle-level management	<input type="checkbox"/> Lower-level management
8. Please identify the department you work in?		
.....		
9. What is your highest qualification?		
<input type="checkbox"/> Associate's Degree	<input type="checkbox"/> Bachelor's Degree	<input type="checkbox"/> Master's Degree
<input type="checkbox"/> Doctorate	<input type="checkbox"/> Other.....	

(II) ABSORPTIVE CAPACITY

To what extent do you agree or disagree with the following statements?

1= Strongly disagree 2= Disagree 3= Somewhat disagree 4= Neutral 5= Somewhat agree 6= Agree 7= Strongly agree	
<i>Potential absorptive capacity</i>	
1	Our bank branches have frequent interactions with corporate headquarters.
2	Employees of our bank regularly visit other branches.
3	Our bank collects industry information through informal means (e.g. lunch with industry friends, talks with trade partners).
4	Other branches of our bank are rarely visited.
5	Our bank periodically organises special meetings with customers or third parties.
6	Employees regularly approach third parties such as accountants, consultants, or tax consultants.
7	Our bank is slow to recognize shifts in our market (e.g. competition).
8	Our bank quickly understands new opportunities to serve our clients.
9	Our bank quickly analyses and interprets changing market demands.
<i>Realized absorptive capacity</i>	
10	Our bank regularly considers the consequences of changing market demands in terms of new products and services.
11	Our employees record and store newly acquired knowledge for future reference.
12	Our bank quickly recognizes the usefulness of new external knowledge to improve on existing knowledge.
13	Our employees frequently share practical experiences.
14	Our employees clearly understand the opportunities from new external knowledge.
15	Our bank periodically meets to discuss consequences of market trends and new product development.
16	Our bank clearly knows how activities should be performed.
17	Our stakeholders' complaints are not taken into consideration in our bank.
18	Our bank clearly outlines roles and responsibilities for each position.
19	Our bank is constantly looking for ways to better exploit new knowledge.
20	Our bank has difficulty introducing new products and services.
21	Our employees have a common language regarding our products and services.

(III) ORGANIZATIONAL ANTECEDENTS

To what extent do you agree or disagree with the following statements?

1= Strongly disagree 2= Disagree 3= Somewhat disagree 4= Neutral 5= Somewhat agree 6= Agree 7= Strongly agree	
Coordination	
1	Our bank uses liaison personnel to coordinate decisions and actions.
2	Our bank uses temporary task forces to coordinate decisions and actions.
3	Our bank uses permanent teams to coordinate decisions and actions.
4	Employees participate in decisions on the adoption of new programs.
5	Employees participate in decisions on the adoption of new policies.
6	Employees participate in decisions to hire new staff.
7	Employees participate in decisions on the promotion of professional staff.
8	Employees are regularly rotated between different positions.
9	Employees are regularly rotated between different subunits.
Systems	
10	To do their work, employees in our bank can rely on established procedure and practices.
11	It is necessary for employees to go through the proper channels in getting jobs done.
12	Employees have to follow strict operational procedures at all times.
13	Work in our bank is routine.
14	Employees do the same job in the same way most of the time.
Socialization	
15	There is ample opportunity for informal discussion among individuals from different departments.
16	In our bank, employees from different departments feel comfortable contacting each other when the need arises.
17	Managers here encourage employees to discuss work related matters with those who are not their immediate superiors or subordinates.
18	Managers in my department can easily schedule meetings with managers in other departments.
19	Experienced employees see advising or training new comers as one of their main job responsibilities.
20	Employees gain a clear understanding of the role from observing senior colleagues.
21	Employees receive little guidance from experienced members as to how they should perform their job.

(IV) LEARNING CAPABILITIES

To what extent do you agree or disagree with the following statements?

1= Strongly disagree 2= Disagree 3= Somewhat disagree 4= Neutral 5= Somewhat agree 6= Agree 7= Strongly agree	
Market-sensing capability	
1	In our bank, people participate in professional business associations' activities.
2	Our employees attend scientific and professional conferences.
3	We connect with our active network of contacts with the scientific and research community.
4	We use established processes to identify target market segments, changing customer needs and customer innovation.
5	A lot of informal discussion in this bank concerns our competitors' tactics or strategies.
Market-responsiveness capability	
6	Several departments get together periodically to plan a response to changes taking place in our business environment.
7	If a major competitor was to launch an intensive campaign targeted at our customers, our bank would implement a response immediately.
8	Our bank is quick to respond to significant changes in our competitors' pricing strategies.
9	When our bank finds out that our customers are unhappy with the quality of our service, it takes corrective action immediately.
10	When our bank finds that customers would like us to modify a product or service, it makes concrete efforts to do so.

(V) ENVIRONMENTAL CONDITIONS

To what extent do you agree or disagree with the following statements?

1= Strongly disagree 2= Disagree 3= Somewhat disagree 4= Neutral 5= Somewhat agree 6= Agree 7= Strongly agree	
Environmental dynamism	
1	Environmental changes in our local market are intense.
2	Our clients regularly ask for new products and services.
3	Changes take place continuously in our local market.
4	Nothing significant has changed in our market in the past year.

(VI) ORGANIZATIONAL PERFORMANCE

To what extent do you agree or disagree with the following statements?

1= Strongly disagree 2= Disagree 3= Somewhat disagree 4= Neutral 5= Somewhat agree 6= Agree 7= Strongly agree	
1	Our bank has entered new markets more quickly than our competitors.
2	Our bank has brought new products/services to the market faster than our competitors.
3	The success rate of our new products and services has been higher than our competitors.
4	Our profit margin has grown considerably compared to our competitors.
5	Our return on equity has grown considerably compared to our competitors.
6	Our return on assets has grown considerably compared to our competitors.
7	The total value of our assets has improved significantly compared to our competitors.
8	Our operational efficiency has grown considerably compared to our competitors.
9	Our overall cost has been reduced considerably compared to our competitors.