

# Enhancing organizational structure performance: the mediating influence of absorptive capacity in response to the external environment

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Mohammad A. Algarni

*Department of HRM, Faculty of Economics and Administration,  
King Abdulaziz University, Jeddah, Saudi Arabia*

Murad Ali

*Newcastle Business School, Northumbria University, Newcastle Upon Tyne, UK*

Saleh Bajaba

*Department of Business Administration, King Abdulaziz University, Jeddah, Saudi Arabia*

Hengky Latan

*Department of Statistics, Economics and Management, HLC Consulting,  
Semarang, Indonesia*

Shakir Ullah

*Department of Accounting, Finance, Healthcare and Information Systems  
Broadwell College of Business and Economics, Fayetteville State University,  
Fayetteville, North Carolina, USA*

Muhammad Saleem Sumbal

*Department of Industrial and Systems Engineering,  
The Hong Kong Polytechnic University, Hong Kong, China, and*

Hersugondo Hersugondo

*Department of Management, Diponegoro University, Semarang, Indonesia*

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## Abstract

**Purpose** – Integrating theories of environmental and organizational design, this purpose of this study to examine the mediating effect of a firm’s absorptive capacity (ACAP) on the relationship between external organizational environment and internal organizational structure.

**Design/methodology/approach** – The authors investigate a data set of 347 multisectoral industrial firms in South Korea. The results from composite-based structural equation modeling (CSEM) analysis support the mediating effect of ACAP in external organizational environment – internal organizational structure link.

**Findings** – The findings underscore the positive impact of both the external environment and ACAP on the internal structural aspects. Furthermore, the authors reveal that ACAP serves as a crucial mediator in the relationship between the external environment and characteristics of the internal organizational structure.



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**Practical implications** – This study offers a unique perspective, focusing on the intricate connection between the external organizational environment and internal organizational structure, while concurrently exploring the mediating role of ACAP in aligning internal structural attributes with external environmental conditions.

**Originality/value** – This paper focuses to build and test an integrated model to examine the association among external organizational environment, internal organizational structure and ACAP. Furthermore, this study simultaneously assesses the mediating role of ACAP on the fit between external environmental conditions and internal organizational structure. This focus is considered as the main theoretical and empirical contribution of this study.

**Keywords** Absorptive capacity, Organizational environment, Organizational structure, South Korea

**Paper type** Research paper

## 1. Introduction

In recent decades, absorptive capacity (ACAP) has emerged as a critical multidimensional construct in organizational and management research, garnering increasing scholarly attention for its strategic significance in fostering organizational learning and competitive advantage (Algarni *et al.*, 2023; Al-Husseini, 2024; Kim *et al.*, 2025; Sang *et al.*, 2024). While many studies have predominantly explored ACAP in a technological context, it is becoming increasingly evident that this concept extends beyond the technological lens and plays a vital role in various non-technological domains (Algarni *et al.*, 2023; Ali *et al.*, 2016 Boroomand and Chan, 2022; Silva *et al.*, 2022). Despite this broadening conceptual scope, empirical investigations into ACAP outcomes have remained disproportionately focused on technical dimensions, inadvertently overlooking the profound influence of organizational dynamics, particularly the structural configurations that shape how people collaborate and the environmental conditions within which they operate (Ali and Park, 2016; Gonzalez, 2024; Rosa *et al.*, 2025; Setiawan *et al.*, 2025; Yunus and Emawati, 2025). This scholarly oversight has resulted in a significant knowledge gap regarding how organizational antecedents and contextual environmental factors shape employees' and organizations' capacities to recognize, assimilate and leverage external knowledge (Ali *et al.*, 2016; Le and Do, 2024). Thus, this study aims to address these research gaps by advocating that in addition to the technical determinants of ACAP, organizational factors encompassing both the external environment and internal organizational structure are essential for comprehensive research in this field (Corchuelo Martínez-Azúa *et al.*, 2025; Ghazinoory *et al.*, 2025; Gonzalez, 2024; Kim *et al.*, 2025). Consequently, this study seeks to advance theoretical understanding by positing that a comprehensive examination of ACAP must extend beyond technical determinants to encompass the organizational factors that fundamentally influence how individuals and teams acquire and apply knowledge. Specifically, we argue that both external environmental context and internal organizational architecture are indispensable elements for developing a holistic understanding of how organizations build and sustain their ACAP (Gonzalez, 2024).

Previous studies have extensively examined the ACAP phenomenon, often adopting either an external environmental perspective (Gonzalez, 2024; Lenart-Gansiniec *et al.*, 2022; Ng and Sánchez-Aragón, 2024) or focusing primarily on the internal structural dimensions (Corchuelo Martínez-Azúa *et al.*, 2025; Kanwal *et al.*, 2022; Teixeira *et al.*, 2023). However, relatively few studies have simultaneously addressed both perspectives in an integrated framework (Gonzalez, 2024; Jansen *et al.*, 2005a; Jansen *et al.*, 2005b), despite growing calls for more holistic approaches. Scholars, such as Lane *et al.* (2006), have emphasized that ACAP is fundamentally relational, evolving through the dynamic interplay between external environmental stimuli and internal organizational routines. In particular, external environmental turbulence, technological dynamism and market volatility have been shown to act as critical triggers for ACAP development

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(Camisón and Forés, 2010), while an organization's capacity to absorb and exploit external knowledge helps to support internal organizational factors such as structural flexibility, decentralization and knowledge integration mechanisms significantly (Flatten *et al.*, 2011). Notably, recent research has begun to shed light on the role of contingent factors and managerial roles in shaping ACAP, while also considering antecedents such as prior related knowledge, knowledge sources, complementarity, past experience and R&D investment (Zahra and George, 2002). Nevertheless, non-technical factors have yet to receive the attention they deserve in ACAP research (Ali *et al.*, 2018). This oversight represents a significant gap given the growing recognition that non-technological organizational factors profoundly influence potential and realized ACAP (Ali and Park, 2016). Furthermore, emerging interdisciplinary research suggests that external and internal organizational factors may either facilitate or hinder the realization of the full potential of ACAP (Foss *et al.*, 2010; Foss *et al.*, 2010). Thus, future research must move beyond rigid paradigms and engage more critically with the technical behavioral domain (Gao *et al.*, 2017) underpinnings of ACAP to fully capture its complexity in dynamic organizational environments.

This study posits that, beyond the conventional technical determinants of ACAP, such as intellectual property or R&D investments (Ng and Sánchez-Aragón, 2024), organizational factors, specifically components of the external environment, should be integrated into this analytical framework. This integration is particularly critical because few studies have investigated the organizational antecedents of ACAP (Jansen *et al.*, 2005a; Lenart-Gansiniec *et al.*, 2022; Ng and Sanchez-Aragon, 2022). Furthermore, although several studies have focused on the technical aspects of ACAP outcomes, the organizational factors associated with organizational structure remain largely unexplored (Ali *et al.*, 2018; Claver-Cortés *et al.*, 2012; Gonzalez, 2024; Pertusa-Ortega *et al.*, 2010; Zhang, and Sun, 2023). To this end, these arguments highlight the mediating effect of ACAP on the relationship between the external environment and organizational structure. In dynamic environments, ACAP enhances a firm's ability to respond flexibly by mitigating the rigidity often associated with centralization and formalization (Ali *et al.*, 2018). Firms with high ACAP transform external knowledge into actionable insights, balancing exploration and exploitation, despite structural constraints (Jansen *et al.*, 2005b). Complexity and integration, while potentially leading to fragmentation, are positively leveraged through strong absorptive processes that facilitate knowledge recombination and innovation. Consequently, ACAP ensures that structural dimensions, whether hierarchical or decentralized or rigid or flexible, support organizational adaptability and strategic renewal rather than impede them (Ali *et al.*, 2018). This dynamic capability enables firms to continuously realign their internal architecture in response to external pressures, thus ensuring a sustainable competitive advantage (Hussain *et al.*, 2022). Thus, this study endeavors to bridge this knowledge gap and provide valuable insights into the intricate dynamics of ACAP in diverse organizational contexts.

This study aims to address the following research questions:

- RQ1. How does the external environment influence internal organizational structure dimensions within a firm?
- RQ2. What is the nature of the relationship between the external environment and firms' ACAP?
- RQ3. To what extent does ACAP mediate the relationship between the external environment and internal organizational structure dimensions and what specific mechanisms are involved in this mediation?

By addressing these questions, this study makes four key contributions to the literature. First, it addresses a significant gap in the existing literature on the relationship between ACAP and the organizational environment (Apriliyanti and Alon, 2017; Gao *et al.*, 2017). While ACAP

has received extensive attention, research that comprehensively explores how various aspects of the organizational environment, including customers, competitors, government, suppliers and technology, influence a firm's ability to acquire, assimilate and exploit external knowledge is limited (Ali *et al.*, 2018). Understanding this intricate interplay is crucial for organizations seeking to adapt and innovate in a constantly evolving business landscape. Bridging this gap provides valuable insights into tailoring environments for effective external knowledge utilization in knowledge-driven economies (Ali *et al.*, 2018; Kanwal *et al.*, 2022).

Second, this study focuses on how different organizational structures either facilitate or hinder a firm's capacity to absorb and leverage external knowledge (Ali *et al.*, 2018; Kanwal *et al.*, 2022; Sang *et al.*, 2024). This is essential for firms aiming to remain competitive and innovative in a rapidly evolving business landscape, particularly in a knowledge-intensive economy (Kanwal *et al.*, 2022; Senivongse *et al.*, 2022). ACAP enables organizations to transform external knowledge into routines that enhance performance, allowing for alignment between the internal structure and external environment. Bridging this gap is crucial for optimizing organizational processes (Moilanen *et al.*, 2014).

Third, this study explores the mediating role of ACAP in the context of the external environment's influence on the internal organizational structure. Understanding this mediation can help organizations align their internal structures with the external environment, especially in the face of increased competition (Cuevas-Vargas *et al.*, 2023; Koçak *et al.*, 2023; Lenart-Gansiniec *et al.*, 2022). This study argues that ACAP serves as a bridge between the antecedents and outcomes of organizational factors, facilitating the acquisition, assimilation, transformation and utilization of external knowledge and ultimately improving organizational performance.

Finally, this study highlights the complex and dynamic interplay between ACAP and the organizational environment (Volberda *et al.*, 2010). Organizational environment significantly influences ACAP, with factors such as environmental dynamism, competitive intensity and the organization's internal knowledge base playing critical roles (Lane *et al.*, 2001; Lane *et al.*, 2006). This study emphasizes the importance of understanding how external and internal factors interact to enhance a firm's ability to innovate and gain competitive advantage (Grandinetti, 2016; Ponce-Espinosa *et al.*, 2022). Overall, this study addresses gaps in the literature and delves into the contingent effects of environmental components and organizational structure, shedding light on the successful use of ACAP for improved organizational innovation and performance.

The remainder of this paper begins with a theoretical background and hypotheses, followed by the research methods. The following sections present the results and empirical findings. The final section provides both the theoretical and practical implications.

## 2. Theoretical background and hypotheses

### 2.1 Absorptive capacity

This study adopts Zahra and George's (2002) definition of ACAP, which refers to a set of organizational routines and processes by which firms acquire, assimilate, transform and exploit knowledge to produce a dynamic organizational capability and distinguishes four dimensions split into two components: potential ACAP (acquisition and assimilation (PACAP) and realized ACAP [transformation and exploitation (RACAP)]. PACAP captures the efforts expended to identify and acquire new external knowledge and assimilate knowledge obtained from external sources (Jansen *et al.*, 2005a). RACAP encompasses deriving new insights and consequences from the combination of existing and newly acquired knowledge, and incorporating transformed knowledge into operations (Jansen *et al.*, 2005a).

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## 2.2 External environment

In a general context, the environment is considered external to the organization's boundaries. However, [Robbins \(1990\)](#) defines an organization's environment as comprising of all those institutions and forces outside the organization that potentially affect organizations' performance. This study adopts the definition of [Duncan \(1972\)](#), which suggests that an organizational environment is the totality of all physical and social factors that are considered directly in the decision-making behavior of individuals in the organization. This study chooses the classification of external environmental components and [Duncan \(1972\)](#) develops it, as this seems to be the most accepted and has been used in the same context by [Kim \(1976\)](#) and [Ali \(2014\)](#). [Duncan \(1972\)](#) divided the external environment into five major components: customers, suppliers, competitors, governments and technology.

## 2.3 Organizational structure

[Mintzberg \(1979\)](#) referred to the structure of an organization as the sum of the ways in which it divides its labor into distinct tasks and then achieves coordination among them. This study adopts the four commonly used dimensions of organizational structure: centralization, formalization, complexity and integration.

Centralization reflects the degree to which the right to make decisions and evaluate activities is concentrated in an organization ([Liao et al., 2011](#)). Formalization refers to the extent to which an organization follows rules, regulations, procedures, instructions and communication in conducting organizational activities to prescribe behavior ([Pertusa-Ortega et al., 2010](#)). Complexity describes the degree to which functions are distinguished with respect to goals, task orientation, time horizon and the degree of autonomy ([Lee and Grover, 2000](#)). Integration describes the degree to which the activities of subunits in an organization are coordinated through formal coordination mechanisms ([Lee and Grover, 2000](#)).

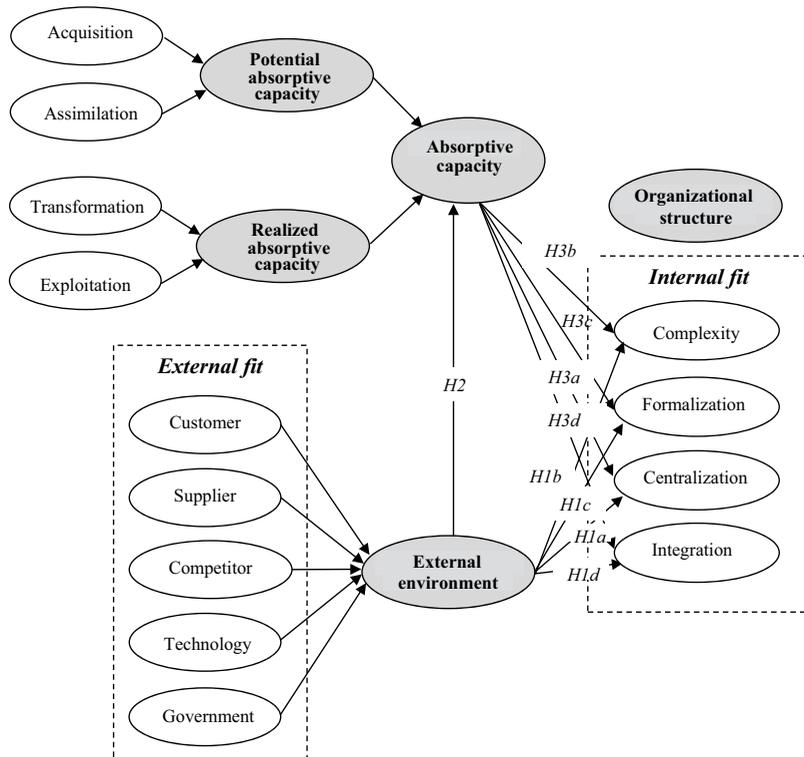
## 2.4 Theories of environmental design, absorptive capacity and organizational design

The external environment of an organization refers to a system outside the organization, which influences the inside of the organization ([Damanpour and Gopalakrishnan, 1998](#)). The theory of environmental design commonly aims to specify the environmental characteristics that influence the behavior and properties of an organization ([Damanpour and Gopalakrishnan, 1998](#)), including organizational knowledge ([Miller, 1991](#)) and structure ([Liao et al., 2011](#)). The theory of ACAP argues that absorptive capacity is highly dependent on the external environment ([Apriliyanti and Alon, 2017](#); [Gao et al., 2017](#)) and influences organizational structure ([De Araújo, 2010](#)). The theory of organizational design refers to the principles, concepts and frameworks that guide how an organization structures itself to achieve its goals and objectives effectively and efficiently. This involves the design of several components within a firm, such as its hierarchy, processes, communication channels, roles and responsibilities, to optimize the utilization of resources and support the organization's strategic direction ([Liao et al., 2011](#)). Theories of organizational design provide insights into how different structures and arrangements can impact an organization's performance, information processing, innovation, communication and overall effectiveness ([Damanpour and Gopalakrishnan, 1998](#)). These theories often consider factors such as the size of an organization ([Damanpour, 1992](#)), the industrial sector ([Pertusa-Ortega et al., 2010](#)), culture ([Ali and Park, 2016](#)), technology ([Damanpour, 1996](#)) and the environment ([Damanpour, 1991](#); [Damanpour and Gopalakrishnan, 1998](#)) to develop models and frameworks for designing or redesigning organizations ([Damanpour and Gopalakrishnan, 1998](#)). Organizational design theory often aims to specify the organizational design characteristics that support the implementation of organizational strategies, structures,

processes or systems that align with an organization's strategic objectives. Thus, the intersection of environmental design, ACAP and organizational design theories lays the theoretical foundation for this study to build and test an integrated model comprising variables related to the environment, ACAP and organizational structure, as shown in Figure 1.

### 2.5 Linking external environment and organizational structure

Prior research on the environment-structure relationship helps us understand why strategic management generally restructured organizations must be lean, fast and flexible. Research on the organizational environment has attempted to identify the environmental factors affecting organizational structure and has studied the components of the environment and their impact on organizational structure (Miller, 1991). The environment is considered a natural result of combining several elements of a structure. Environmental factors are expected to have important implications for the structure of organizations (Gonzalez, 2024; Koçak *et al.*, 2023; Miller, 1991; Pertusa-Ortega *et al.*, 2010; Robbins, 1990). The concept of organizational environment adopted in this research is based on the concept of Liao *et al.* (2011). Accordingly, this study discusses the relationships between the external environment



**Figure 1.** Research model

**Source(s):** Authors' own work

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and each of the four internal organizational structural dimensions: centralization, formalization, complexity and integration.

The first proposition, suggesting a negative relationship between the external environment and centralization, aligns with the general view that a dynamic and uncertain environment necessitates a more decentralized structure (Liao *et al.*, 2011). In stable environments, centralization is typically favored because it promotes efficiency, reduces the complexity of decision making and ensures clear lines of authority. However, in dynamic and rapidly changing environments, a centralized approach is less effective because it hinders flexibility and responsiveness. Firms in such environments require decentralized decision-making to adapt quickly and leverage diverse knowledge sources across the firm (Claver-Cortés *et al.*, 2012). While this argument holds theoretical merit, the relationship between centralization and the external environment may not be linear. Some studies argue that firms retain centralized decision making while implementing adaptive practices, particularly through hybrid structures (Miller, 1991).

The second hypothesis posits that external environmental dynamism is positively related to organizational complexity. A dynamic environment often introduces new challenges, uncertainty and external pressures that compel organizations to adapt their internal structures to handle increasing amounts of information, decision-making processes and the need for specialized roles (Liao *et al.*, 2011). Indeed, a high level of environmental uncertainty leads to greater organizational complexity with increased specialization, differentiation and role interdependence within the organization. However, while this relationship seems intuitively plausible, one must consider that increased complexity may introduce inefficiencies and coordination challenges. The introduction of complexity might not always result in the desired organizational performance if integration mechanisms (e.g. coordination systems and communication channels) are not adequately implemented (Claver-Cortés *et al.*, 2012). Moreover, the positive relationship between environmental dynamism and complexity may vary across industries or organizational contexts, where some organizations remain relatively simple and flexible even in complex environments (Koçak *et al.*, 2023). Thus, this relationship requires a more nuanced exploration.

The third proposition suggests that external environmental changes have a negative relationship with formalization. In stable environments, formalization leads to efficient operations and clear role definitions, thereby ensuring predictability and control. However, in rapidly changing environments, highly formalized structures stifle innovation and flexibility because rigid rules may not allow for the rapid adjustments needed to respond to environmental shifts (Liao *et al.*, 2011). Thus, it is reasonable to expect that as external environments become more dynamic and uncertain, firms would reduce formalization to allow greater flexibility and quicker decision-making. However, it is important to recognize that while formalization may decrease in turbulent environments, it may not disappear altogether. Firms may adopt a hybrid approach in certain industries or situations, maintaining some level of formalization while also fostering flexibility through other mechanisms such as empowered teams or decentralized decision-making (Claver-Cortés *et al.*, 2012).

The fourth proposition, suggesting a positive relationship between external environmental factors and integration, posits that dynamic environments require greater integration within organizations. In dynamic and complex environments, firms must foster greater internal collaboration and communication to effectively respond to external changes. Integration mechanisms such as cross-functional teams, information-sharing systems and interdepartmental coordination enable firms to align their operations with external market demands and enhance organizational agility. Although the positive relationship between a dynamic environment and integration is well supported in the literature (Liao *et al.*, 2011),

the complexity of integration processes requires further exploration. For example, integration may be challenging for large hierarchical firms or firms with deeply entrenched silos.

In summary, based on the theory of organizational design, firms focusing on formalization and centralization are the most effective in a stable environment (Liao *et al.*, 2011). However, to create new knowledge, organizations need a changing and dynamic environment. This means that centralization and formalization may have a negative effect on the changing and dynamic environment, leading to the conclusion that there is a negative association between the external environment and centralization and between the external environment and formalization. On the same note, those firms which focus more on integration and job complexity are best suited to a dynamic and rapidly changing environment. This means that complexity and integration positively contribute to the changing and dynamic environment that is required for creating new knowledge. The above discussion suggests the following hypotheses:

- H1a. A negative relationship exists between *external environment* and *centralization*.
- H1b. A positive relationship exists between *external environment* and *complexity*.
- H1c. A negative relationship exists between *external environment* and *formalization*.
- H1d. A positive relationship exists between *external environment* and *integration*.

#### 2.6 Linking the external environment and absorptive capacity

According to the ACAP theory, the external environment is recognized as one of the most important contextual variables that influence ACAP (Cohen and Levinthal, 1990; Todorova and Durisin, 2007). Knowledge-intensive firms operating in an open environment attach greater importance to knowledge because they constantly interact with and exchange knowledge (Nonaka and Takeuchi, 1995; Van den Bosch *et al.*, 1999). Several studies identify ACAP as the sharing of relevant knowledge among the firm and organizational stakeholders such as customers, suppliers, governments, competitors and partners (Ali, 2015). This relationship works as a joint activity essentially based on information and knowledge sharing. This contributes to the enhancement of knowledge bases, capacities and competitive spirit through the ACAP learning process (Leal-Rodríguez and Roldán, 2013). Firms depend greatly on external knowledge to innovate and enhance their performance (Truong *et al.*, 2023).

This study suggests a positive relationship between the external environment and ACAP, drawing on a well-established body of literature that underscores the critical role of environmental factors in shaping organizational knowledge capabilities (Lenart-Gansiniec *et al.*, 2022; Truong *et al.*, 2023). However, while the literature conceptually supports the link between the external environment and ACAP, research to date has not provided sufficient empirical evidence (Ali, 2015). For instance, Daghfous (2004) argues that firms do not exist in isolation but instead co-evolve with a variety of external agents; thus, the external environment plays a vital role in their ACAP processes. This assertion is further supported by Leal-Rodríguez and Roldán (2013), who emphasize the relational nature of ACAP, where firms interact with a variety of stakeholders to access and share knowledge. However, while these views highlight the relationship between the external environment and ACAP, they tend to overlook their investigation through a deductive approach. The external environment is one of the primary sources of external knowledge, but it is crucial to recognize that external factors are not uniformly beneficial (Van den Bosch *et al.*, 1999). For instance,

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environmental uncertainty may pose significant challenges for firms attempting to navigate knowledge management (Liao *et al.*, 2011). In this context, ACAP is not just about absorbing new information but also involves the organization's capacity to assess and respond quickly to changing conditions. Liao *et al.* (2011) established a positive relationship between environmental uncertainty and knowledge management, but this relationship warrants further investigation. In uncertain environments, firms may struggle to discern which knowledge is truly valuable and how to effectively leverage it. The ability to filter and interpret knowledge is as important as the ability to acquire it. Malhotra (2000) emphasized that increasingly dynamic and discontinuous business environments require firms to develop robust ACAP processes. However, this perspective assumes that firms develop the capabilities necessary to respond to high uncertainty quickly.

In brief, while existing literature supports a positive relationship between the external environment and ACAP, a critical examination of this relationship reveals that it is far more complex than often portrayed. External knowledge is valuable, but its impact depends on the organizational context, quality of the knowledge and the firm's internal processes for managing and applying it. The relationship between the external environment and ACAP is not just about passive absorption, but also requires active engagement, adaptation and sometimes, substantial organizational change. Therefore, future research should explore the specific conditions under which external knowledge leads to improved ACAP, considering both the challenges and opportunities presented by the external environment. Based on these observations and the points mentioned above, this study proposes the following hypotheses:

H2. A positive relationship exists between *external environment* and *ACAP*.

### 2.7 *The mediating role of absorptive capacity*

Based on H1a–d and H2, this study identifies a gap in literature by exploring how ACAP mediates the relationship between an organization's external environment and its internal structure (Cuevas-Vargas *et al.*, 2023; Sang *et al.*, 2024). By doing so, it contributes to resolving the theoretical question of how organizations manage tensions and synergies between these two aspects. This helps bridge the gap between the environmental, organizational design and ACAP theories. Information processing in organizations can facilitate their ability to cope with the external environment (Liao *et al.*, 2011). However, Nonaka *et al.* (1996) emphasized that when organizations face a rapidly changing environment, information processing needs to be adapted accordingly and the role of ACAP must be highlighted. ACAP enables organizations to handle the external environment through acquisition, assimilation, transformation and exploitation; however, information processing is only useful in helping people increase their work efficiency (Ortega-Gutiérrez *et al.*, 2022; Truong *et al.*, 2023). Literature on organizational structure-knowledge management interaction has explored the role of ACAP in four dimensions: acquisition, assimilation, transformation and exploitation (Ali *et al.*, 2018).

This study proposes that ACAP plays a crucial role in mediating organizational structures, such as centralization, in volatile environments. Specifically, ACAP deserves further attention, as it may enable centralized systems to function more effectively in decentralized contexts by facilitating the efficient acquisition, assimilation and application of external knowledge. This suggests that, even in centralized structures, firms with high ACAP, supported by robust knowledge processes, can enhance knowledge flow, adaptability and responsiveness to environmental changes typically associated with decentralized systems (Ali, 2015). The positive relationship between external environment and complexity may vary across industries or organizational contexts, where some firms remain relatively

simple and flexible, even in complex environments (Koçak *et al.*, 2023). Thus, the relationship requires more nuanced exploration, taking into account the mediating effects of ACAP. Similarly, it is important to recognize that, while formalization may decrease in turbulent environments, it may not disappear altogether (Liao *et al.*, 2011). Firms may adopt a hybrid approach in certain industries or situations, maintaining some level of formalization while also fostering flexibility through other mechanisms such as empowered teams or decentralized decision-making (Pertusa-Ortega *et al.*, 2010). Furthermore, the relationship between formalization and the external environment may be dependent on internal organizational factors, such as ACAP, suggesting that these factors need to be incorporated into the analysis (Claver-Cortés *et al.*, 2012). Moreover, the effectiveness of integration depends not only on the external environment, but also on the internal capabilities of the firm, such as ACAP. Therefore, while integration is essential for success in dynamic environments, the process through which it occurs should be considered a key variable that may differ across organizational contexts.

In short, the characteristics of the external organizational environment can influence the development of ACAP (Volberda *et al.*, 2010) and ACAP influences the characteristics of the internal organizational structure (Lenart-Gansiniec *et al.*, 2022). Therefore, any indirect effects of the external environment on an organization's internal structure may be transmitted via a firm's ACAP (Forés and Fernández-Yáñez, 2023; Moilanen *et al.*, 2014; Zhang and Sun, 2023). Changes in an organization's external environment create problems and make it necessary to design an organizational structure that can cope with them (Chen *et al.*, 2010; Claver-Cortés *et al.*, 2012; Gonzalez, 2024; Pertusa-Ortega *et al.*, 2010). However, designing the desired structural responses to the environment is not an easy task without ACAP (Duan *et al.*, 2020; Liao *et al.*, 2011). Organizations' stakeholders (i.e. customers, suppliers, competitors, government and technology) that exist in the external environment are an excellent source for generating new knowledge. Furthermore, ACAP provides a culture that helps cope with the internal fit of the organizational structure. The external environment requires organizations to increase their ACAP, which manifests itself in structural changes (Liao *et al.*, 2011). In this scenario, ACAP mediates the relationship between the external environment and internal structure of the organization. Based on the above observations and discussion, this study proposes the following hypotheses:

- H3a. ACAP negatively mediates the relationship between *external environment* and *centralization*.
- H3b. ACAP positively mediates the relationship between *external environment* and *complexity*.
- H3c. ACAP negatively mediates the relationship between *external environment* and *formalization*.
- H3d. ACAP negatively mediates the relationship between *external environment* and *integration*.

Figure 1 illustrates the theoretical model.

### 3. Research methods

#### 3.1 Data collection and sample

The first step in conducting an empirical study is the selection of the target population. For this study, the sample comprising of 347 multisectoral industrial firms in South Korea. These firms are relatively homogeneous, thereby minimizing the risk of significant structural

differences across divisions. Korean firms were selected as the focal sample because of the growing recognition within these organizations of the strategic advantages associated with knowledge management initiatives, particularly fostering innovation excellence. Furthermore, the sample encompasses firms from a variety of sectors rather than being limited exclusively to knowledge-intensive industries, acknowledging that any organization, irrespective of sector, can potentially attain high levels of knowledge performance (Baskerville and Dulipovici, 2006; Pertusa-Ortega *et al.*, 2010). Efforts were made to ensure that all participating firms exhibited comparable organizational structures and resource configurations, thus mitigating the potential moderating effects of economic and industrial variability.

The sample specifically targeted individuals occupying top and middle management positions who possessed substantial familiarity with their firms' processes, routines, information flows and knowledge management practices. These individuals play a pivotal role in facilitating the transformation and dissemination of knowledge across organizational levels. Middle managers are integral to the knowledge creation process, acting as a bridge between strategic directives from top management and operational practices within line management units (Baskerville and Dulipovici, 2006). This study deliberately sought not only top executives but also middle managers to capture a more comprehensive view of knowledge processes, recognizing that while senior executives are key decision makers, they are not solely responsible for the everyday circulation of information and knowledge across teams. The fieldwork on the final survey was carried out in May 2022–March 2023. By the end of the fieldwork, 359 responses had been received from 195 firms. Of these, 12 were eliminated from the sample because of incompleteness or error. Thus, the final sample, composed of 347 samples, was used for statistical analyses. Demographic information about the firms and respondents is presented in Table A1.

### 3.2 Measures

This study used and adapted existing validated scales for all the constructs involved. Section 2 provides the basis for the questionnaire design. All items and responses appeared on a five-point Likert-type scale, ranging from “strongly disagree” (1) through “neither agree nor disagree” (3) to “strongly agree” (5). As the survey was administered in South Korea, the original questionnaire items were initially developed in English and subsequently translated into Korean (Burns and Bush, 2026). To ensure the validity of the instrument, a rigorous translation process was undertaken to confirm that the items were clearly understood and free from ambiguity (Brislin, 1980). A pre-test was conducted involving one professor and three PhD students, all of whom had professional experience, to assess the face validity and contextual appropriateness of the instruments within the Korean setting (DeVellis, 2016). In addition, ten industry professionals reviewed the questionnaire to identify any potential issues related to design or clarity. Based on the feedback received, minor revisions were made to enhance the consistency of the semantic meaning between the English and Korean versions and to improve the overall readability of the questionnaire (Behr, 2017). To measure the higher-order construct of the ACAP, this study adapted the scale used by Ali and Park (2016), originally developed by Flatten *et al.* (2011). This scale consists of four first-order constructs: acquisition, measured with three items; assimilation, measured with four items; transformation, measured with four items; and exploitation, measured using three items. The internal structural instrument used was adopted from Liao *et al.* (2011), which also reflects four variables: centralization, measured using five items; formalization, measured with three items; complexity, measured with three items; and integration, measured with three items. Finally, Ali (2015) adopted a five-dimension external environment scale, composed of

customers, measured with four items; supplier, measured with five items; competitor, measured with three items; government, measured with four items; and technology, measured with three items. The questionnaire items associated with all constructs of the theoretical model are provided in [Table A2](#).

### 3.3 Data analysis

The research model shown in [Figure 1](#) was analyzed using a composite-based structural equation modeling (CSEM) tool, specifically the WarpPLS package (version 8.0 ([Kock, 2022](#))). WarpPLS was selected based on the fact that it allows for the concurrent utilization of two algorithms, catering to both composite and factor models at the same time. It evaluates the psychometric properties of both construct validity and reliability, while concurrently estimating the parameters of the structural model. The following points summarize why this study considers WarpPLS instead of LISREL or AMOS to be a more appropriate statistical technique. Using CSEM is more suitable when the research objective focuses on predicting and explaining the variance of key target constructs by different explanatory constructs, when the model is more complex and comprises higher-order reflective and formative constructs, when the available data is non-normal and/or when covariance-based SEM provides no or at best questionable results ([Hair et al., 2022](#)). In this study, composite-based techniques were chosen over covariance-based methods because of the presence of both reflective and composite indicators in the proposed research model. In addition, the data collected were based on a Likert or ordinal scale, making it inappropriate to meet the assumptions of data normality required for the covariance structure analysis technique ([Henseler, 2021](#); [Kline, 2023](#); [Mehmetoglu and Venturini, 2021](#)).

## 4. Results

Two steps were involved in analyzing and interpreting the results of our CSEM model: (1) assessment of the measurement model and (2) testing of the structural model.

### 4.1 Measurement model

Using the WarpPLS software, we used a factor-based algorithm to assess the validity and reliability of the measurement model, also known as the outer model. The assessment of the measurement model calculated individual factor loadings, Cronbach's alpha, Dijkstra-Henseler's rho ( $\rho_A$ ), composite reliability, convergent validity (average variance extracted or AVE), inter-construct correlations and latent variable scores. The results provided in [Tables 1–4](#) confirm that the measurement model meets all minimum requirements. First, the model satisfies the prerequisite of construct reliability because all values of Cronbach's alpha, Dijkstra-Henseler's rho ( $\rho_A$ ) and composite reliability range between 0.779 and 0.938, which are greater than 0.70 in all cases, as shown in [Tables 1–3](#). Second, the latent constructs also fulfilled the minimum requirements of convergent validity, with AVE values ranging between 0.508 and 0.717, surpassing the minimum threshold of 0.50, as shown in [Tables 1–3](#). Third, the reflective individual items were shown to be reliable because the standardized factor loading values of all first-order constructs ranged between 0.632 and 0.913, which is above 0.60 in every case, as shown in [Tables 1–3](#).

This study provides support for discriminant validity based on the Fornell-Larcker criterion and the Heterotrait-Monotrait ratio of correlations (HTMT) approach. According to the Fornell-Larcker criterion, the square root of the AVE of all constructs is greater than the corresponding construct correlation, as shown in [Table 3](#) ([Hair et al., 2022](#)). Second, according to the HTMT criterion, the HTMT values are less than 0.85 or 0.90, except in one

**Table 1.** Measurement model assessment of absorptive capacity (ACAP)

Construct	SFL	SE	<i>p</i> -value <sup>a,b</sup>	VIF	$\alpha$	$\rho_A^c$	CR	AVE <sup>d</sup>
<i>First-order reflective construct</i>								
Acquisition					0.825	0.828	0.841	0.638
AC1	0.794	0.051	<0.001	1.872				
AC2	0.840	0.050	<0.001	2.149				
AC3	0.759	0.052	<0.001	1.740				
Assimilation					0.807	0.814	0.810	0.516
AS1	0.701	0.051	<0.001	1.648				
AS2	0.752	0.052	<0.001	1.664				
AS3	0.669	0.052	<0.001	1.568				
AS4	0.749	0.051	<0.001	1.713				
Transformation					0.831	0.833	0.836	0.561
TR1	0.720	0.052	<0.001	1.732				
TR2	0.772	0.051	<0.001	2.006				
TR3	0.767	0.051	<0.001	2.088				
TR4	0.736	0.052	<0.001	1.910				
Exploitation					0.851	0.853	0.861	0.675
EX1	0.772	0.052	<0.001	1.856				
EX2	0.873	0.050	<0.001	2.601				
EX3	0.816	0.051	<0.001	2.185				
<i>Second-order formative construct</i>								
		CW		SE		<i>p</i> -value <sup>a,b</sup>		VIF
<i>Potential ACAP</i>								
Acquisition		0.512		0.050		<0.001		1.127
Assimilation		0.306		0.051		<0.001		1.127
<i>Realized ACAP</i>								
Transformation		0.379		0.051		<0.001		1.420
Exploitation		0.558		0.049		<0.001		1.420
<i>Third-order construct</i>								
ACAP		0.249		0.052		<0.001		1.601
		0.679		0.049		<0.001		1.601

**Note(s):** SFL = standardized factor loadings; SE = standard error; <sup>a</sup>Test-statistics are obtained by 500 Bootstrap runs; <sup>b</sup>Absolute *p*-values < 0.05 are two-tailed significant at 5%;  $\alpha$  = Cronbach's alpha; CR = composite reliability; <sup>c</sup>Dijkstra–Henseler's rho; AVE = average variance extracted; <sup>d</sup>Percentage of variance of item explained by the latent variable; VIF = variance inflation factor; CW = correlational weights of first-order composite on second-order composite

**Source(s):** Authors' own work

case, in which the HTMT value is equal to 0.92. In this case, the HTMT inference was used to check whether the upper confidence interval was less than one. The upper confidence interval was less than one in this case (Henseler, 2021).

Following Henseler's (2021) procedure, this study specifies a composite model of second- and third-order constructs for ACAP (see Table 1) and the external environment (see Table 2), respectively, in CSEM by conceptualizing the hierarchical component models through repeated use of the manifest variables (i.e. indicators/dimensions) of the underlying lower-order reflective constructs (Henseler, 2021). Put simply, higher-order constructs are directly measured by observed variables for all lower-order constructs, whereas lower-order constructs are directly measured by reflective items.

**Table 2.** Measurement model assessment of external environment

Construct	SFL	SE	<i>p</i> -value <sup>a,b</sup>	VIF	$\alpha$	$\rho_A^c$	CR	AVE <sup>d</sup>
<i>First-order reflective construct</i>								
Customer					0.798	0.808	0.819	0.508
CUS1	0.687	0.052	<0.001	2.939				
CUS2	0.726	0.051	<0.001	3.745				
CUS3	0.685	0.052	<0.001	2.919				
CUS4	0.724	0.051	<0.001	3.696				
Competitor					0.779	0.781	0.787	0.554
COM1	0.632	0.052	<0.001	1.363				
COM2	0.773	0.051	<0.001	1.918				
COM3	0.816	0.050	<0.001	2.009				
Government					0.817	0.819	0.821	0.539
GOV1	0.678	0.053	0.004	1.349				
GOV2	0.679	0.052	<0.001	1.663				
GOV3	0.820	0.051	<0.001	2.421				
GOV4	0.830	0.050	<0.001	2.432				
Supplier					0.887	0.887	0.888	0.614
SUP1	0.778	0.052	<0.001	2.413				
SUP2	0.838	0.051	<0.001	3.156				
SUP3	0.834	0.052	<0.001	2.601				
SUP4	0.707	0.053	0.002	1.774				
SUP5	0.753	0.052	<0.001	2.023				
Technology					0.887	0.889	0.889	0.717
TEC1	0.828	0.052	<0.001	2.450				
TEC2	0.899	0.050	<0.001	3.046				
TEC3	0.811	0.052	<0.001	2.428				
<i>Second-order formative construct</i>								
	CW	SE	<i>p</i> -value <sup>a,b</sup>	VIF	$\alpha$	$\rho_A^c$	CR	AVE <sup>d</sup>
External environment					0.884	0.887	0.888	0.614
Customer	0.289	0.050	<0.001	2.939				
Competitor	0.418	0.051	<0.001	1.918				
Government	0.321	0.051	<0.001	2.421				
Supplier	0.307	0.052	<0.001	2.601				
Technology	0.229	0.051	<0.001	2.428				

**Note(s):** SFL = standardized factor loadings; SE = standard error; <sup>a</sup>Test-statistics are obtained by 500 Bootstrap runs; <sup>b</sup>Absolute *p*-values < 0.05 are two-tailed significant at 5%;  $\alpha$  = Cronbach's alpha; CR = composite reliability; <sup>c</sup>Dijkstra-Henseler's rho; AVE = average variance extracted; <sup>d</sup>Percentage of variance of item explained by the latent variable; VIF = variance inflation factor; CW = regression weights of first-order composite on second-order composite

**Source(s):** Authors' own work

#### 4.2 Structural model

After confirming the reliability and validity of the constructs, the next step was to calculate the structural model results to identify patterns in the data relationships, that is, to test the research hypotheses. This study followed the guidelines of Hair *et al.* (2022) to estimate a structural model. This involved the following steps: collinearity assessment among the constructs, coefficient of determination ( $R^2$  value) and hypothesis testing through structural model path coefficients.

First, this study identified various separate ordinary least squares for each part of the research model to assess collinearity, that is, the external environment as a predictor of

**Table 3.** Measurement model assessment of internal structure

Construct	SFL	SE	<i>p</i> -value <sup>a,b</sup>	VIF	$\alpha$	$\rho_A^c$	CR	AVE <sup>d</sup>
<i>Centralization</i>					0.937	0.938	0.938	0.715
CEN1	0.842	0.053	0.002	3.456				
CEN2	0.891	0.052	<0.001	4.166				
CEN3	0.881	0.052	<0.001	4.494				
CEN4	0.872	0.052	<0.001	3.509				
CEN5	0.839	0.052	<0.001	3.134				
CEN5	0.740	0.053	0.043	2.152				
<i>Complexity</i>					0.837	0.844	0.844	0.635
COMX1	0.809	0.052	<0.001	2.509				
COMX2	0.898	0.049	<0.001	2.830				
COMX3	0.666	0.053	0.003	1.617				
<i>Formalization</i>					0.841	0.854	0.854	0.629
FOR1	0.744	0.052	<0.001	2.129				
FOR2	0.913	0.049	<0.001	2.866				
FOR3	0.708	0.053	<0.001	1.837				
<i>Integration</i>					0.883	0.887	0.888	0.707
INT1	0.794	0.050	<0.001	2.285				
INT2	0.890	0.051	<0.001	2.873				
INT3	0.834	0.052	<0.001	2.478				

**Note(s):** SFL = standardized factor loadings; SE = standard error; <sup>a</sup>Test-statistics are obtained by 500 Bootstrap runs; <sup>b</sup>Absolute *p*-values < 0.05 are two-tailed significant at 5%;  $\alpha$  = Cronbach's alpha; CR = composite reliability; <sup>c</sup>Dijkstra–Henseler's rho; AVE = average variance extracted; <sup>d</sup>Percentage of variance of item explained by the latent variable; VIF = variance inflation factor

**Source(s):** Authors' own work

ACAP and the external environment and ACAP as predictors of centralization, complexity, formalization and integration. Collinearity tests were performed by checking the variance inflation factor (VIF) values and correlations among variables. The results from all the sets showed minimal collinearity. All VIF values were below the common cutoff threshold of less than 5, and the inter-variable correlations, as shown in Table 4, were below 0.7. Therefore, collinearity among the predictor constructs was not an issue in the structural model, and we could continue to evaluate the next steps.

The second step involved the analysis of variance explained by endogenous variables in the research model ( $R^2$ ). Although the exact interpretation of the  $R^2$  value level depends on the particular model and research discipline,  $R^2$  values of 0.25, 0.50 and 0.75 for the endogenous constructs can be considered weak, moderate and substantial, respectively. The  $R^2$  values for ACAP (0.393), centralization (0.084), complexity (0.381), formalization (0.309) and integration (0.506) were moderate and acceptable.

Furthermore, we evaluated potential causality issues using Sympson's paradox ratio (SPR) to determine whether any hypothesized path was implausible or reversed. The SPR value of our model exceeded 0.70, indicating that the model was free of causality problems.

The final step involved assessing the structural model path coefficients: the strength of the relationships between the constructs, their path coefficients ( $\beta$ ) and their significance values, which were represented through the derived hypotheses. This study uses a resampling procedure (with stable resampling) to examine the significance of these paths.

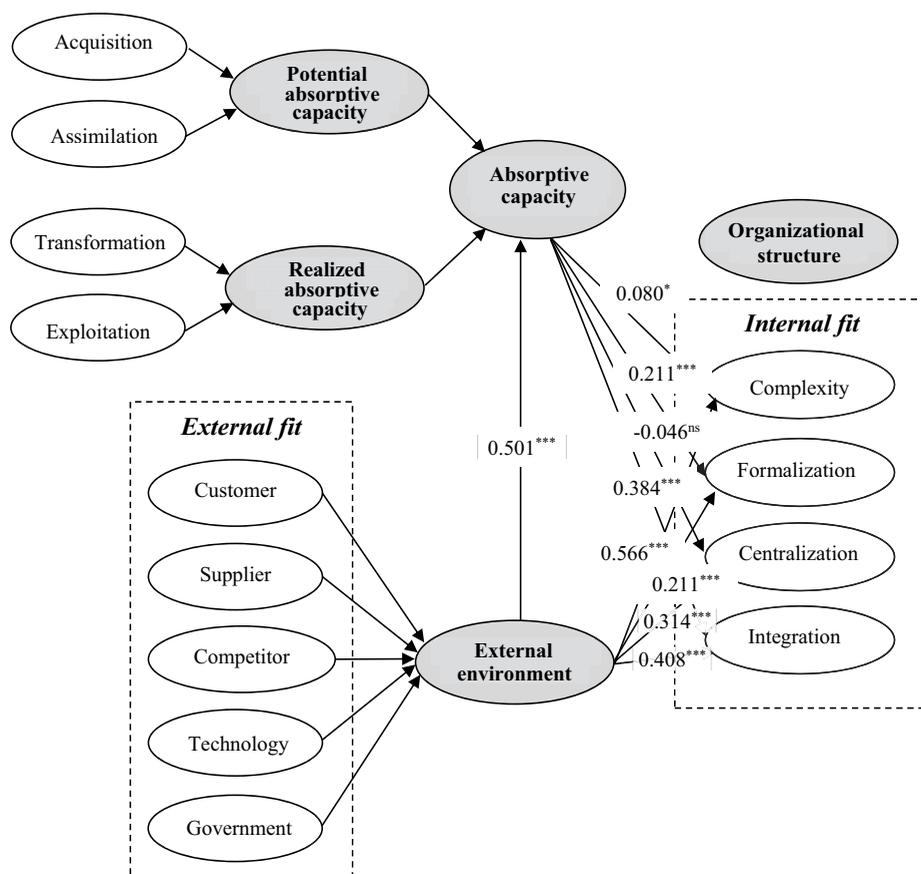
The results of the structural model path coefficients are presented in Figure 2 and Table 5. The results of the empirical analyses show that the external environment has a direct effect on centralization ( $\beta = 0.314$ ;  $p < 0.001$ ;  $CI_{0.95}$ : [0.15, 0.43]) and formalization ( $\beta = 0.211$ ;  $p < 0.001$ ;

**Table 4.** Descriptive statistics, correlations for constructs (convergent validity and discriminant validity)

Construct	1	2	3	4	5	6	7	8	9	10	11	12	13
(1) Acquisition	0.860	0.411	0.445	0.405	0.383	0.416	0.309	0.359	0.394	0.160	0.355	0.314	0.379
(2) Assimilation	0.340**	0.794	0.651	0.653	0.371	0.388	0.428	0.415	0.381	0.146	0.396	0.377	0.576
(3) Transformation	0.369**	0.533**	0.812	0.647	0.375	0.347	0.441	0.351	0.435	0.104	0.370	0.395	0.489
(4) Exploitation	0.339**	0.547**	0.543**	0.877	0.412	0.395	0.401	0.452	0.397	0.082	0.343	0.345	0.496
(5) Customer	0.312**	0.308**	0.306**	0.340**	0.787	0.924	0.687	0.712	0.639	0.218	0.550	0.548	0.597
(6) Competitor	0.335**	0.321**	0.280**	0.320**	0.720**	0.831	0.663	0.777	0.750	0.279	0.495	0.613	0.596
(7) Government	0.257**	0.353**	0.371**	0.339**	0.559**	0.529**	0.806	0.651	0.560	0.299	0.533	0.530	0.611
(8) Supplier	0.306**	0.359**	0.302**	0.396**	0.599**	0.644**	0.564**	0.831	0.644	0.280	0.444	0.626	0.567
(9) Technological	0.337**	0.331**	0.374**	0.347**	0.538**	0.624**	0.476**	0.573**	0.906	0.269	0.448	0.562	0.517
(10) Centralization	0.141**	0.119*	0.082	0.069	0.180**	0.250**	0.260**	0.258**	0.246**	0.872	0.248	0.111	0.145
(11) Complexity	0.296**	0.330**	0.310**	0.290**	0.451**	0.405**	0.441**	0.383**	0.388**	0.220**	0.872	0.441	0.523
(12) Formalization	0.263**	0.316**	0.331**	0.293**	0.448**	0.448**	0.443**	0.541**	0.486**	0.100	0.370**	0.872	0.606
(13) Integration	0.326**	0.501**	0.419**	0.431**	0.502**	0.496**	0.521**	0.503**	0.459**	0.131*	0.450**	0.522**	0.900
Mean	3.593	3.564	3.646	3.318	3.496	3.468	3.383	3.203	3.645	3.500	3.169	3.564	3.288
SD	0.878	0.799	0.731	0.869	0.846	0.898	0.888	0.866	0.910	0.929	0.906	0.886	0.900

**Note(s):** Significance levels:  $p < 0.05^*$ ;  $p < 0.01^{**}$ ; SD = standard deviation; Diagonal and italicized elements are the square roots of the average variance extracted (AVE); the elements appeared in the lower-left half are the correlations between the constructs values; The elements appeared in the upper-right half are the HTMT values; The results marked in italics indicate HTMT > 0.85. The upper confidence intervals are checked which are less than one (HTMT inference is used in these cases)

**Source(s):** Authors' own work



**Figure 2.** Research model with estimates  
**Source(s):** Authors' own work

CI<sub>0.95</sub>: [0.28, 0.52]), but both show a positive sign, which is not consistent with the proposed hypotheses. Therefore, these results do not support *H1a* and *H1c*. The results showed that the external environment had direct and positive effects on complexity ( $\beta = 0.566$ ;  $p < 0.001$ ; CI<sub>0.95</sub>: [0.42, 0.64]), integration ( $\beta = 0.408$ ;  $p < 0.001$ ; CI<sub>0.95</sub>: [0.32, 0.55]) and ACAP ( $\beta = 0.501$ ;  $p < 0.001$ ; CI<sub>0.95</sub>: [0.42, 0.62]). These results support hypotheses *H1b*, *H1d* and *H2*, respectively. In addition, the results show that ACAP has positive and direct effects on complexity ( $\beta = 0.088$ ;  $p = 0.049$ ; CI<sub>0.95</sub>: [0.01, 0.22]), formalization ( $\beta = 0.211$ ;  $p < 0.001$ ; CI<sub>0.95</sub>: [0.06, 0.31]) and integration ( $\beta = 0.384$ ,  $p < 0.001$ ; CI<sub>0.95</sub>: [0.22, 0.43]), while the direct effect of ACAP on centralization ( $\beta = -0.046$ ;  $p = 0.196$ ; CI<sub>0.95</sub>: [-0.16, 0.13]) was not significant.

The significant effects of ACAP on complexity, formalization and integration, coupled with the effects of the external environment, reflect the critical value of exploring the mediating effects of ACAP. A structural model was analyzed to determine whether ACAP mediates the effect of the external environment on the internal structure. Therefore, this study tested the mediating effects by examining the output of the indirect effects with two segments in WarpPLS 8.0, which is calculated

**Table 5.** Hypotheses testing, direct, indirect and total effects

DV	IV				p-value	95% BCa confidence interval	Conclusion	$\beta$	p-value	95% BCa confidence interval
	$\beta$	VAF (%)	External environment	ACAP						
Centralization										
Direct effects	0.314****†	<0.001	[0.150, 0.430]		0.196	ns	-0.046	0.196	[-0.160, 0.130]	
Indirect effects	-0.023 <sup>h,s</sup>	0.153	[-0.090, 0.070]							
Complexity				-0.068						
Direct effects	0.566****	<0.001	[0.420, 0.640]	0.067	0.049	*	0.080	0.049	[0.010, 0.220]	
Indirect effects	0.040*	0.045	[0.010, 0.130]							
Formalization				0.334						
Direct effects	0.211****†	<0.001	[0.280, 0.520]		<0.001	†	0.211	<0.001	[0.060, 0.310]	
Indirect effects	0.106****†	<0.010	[0.030, 0.180]							
Integration				0.316						
Direct effects	0.408****	<0.001	[0.320, 0.550]		<0.001	†	0.384	<0.001	[0.220, 0.430]	
Indirect effects	0.192****	<0.001	[0.100, 0.250]							
ACAP										
Direct effects	0.501****	<0.001	[0.400, 0.620]							
Indirect effects	-									

**Note(s):** Significance levels:  $p < 0.05^*$ ;  $p < 0.01^{**}$ ;  $p < 0.001^{***}$ ;  $p < 0.001^{****}$ ; DV = dependent variable; IV = independent variable;  $\beta$  = standardized beta coefficients; VAF = variance accounted for; † = not supported (+sign)

**Source(s):** Authors' own work

automatically by the program. The only requirement for mediation is that the indirect effect is significant, because if the indirect effect is significant, then the mediator absorbs some of the direct effects (Hair *et al.*, 2022). The results show that ACAP is a strong mediator and significantly mediates the relationship between the external environment and three dimensions of organizational structure (complexity, formalization and integration). The results of the analyses in Table 4 show that the indirect paths from the external environment to complexity ( $\beta = 0.040$ ;  $p = 0.045$ ;  $CI_{0.95}$ : [0.01, 0.13]) and integration ( $\beta = 0.192$ ;  $p < 0.001$ ;  $CI_{0.95}$ : [0.10, 0.25]) are positive and significant. These results support those for H3b and H3d. However, the indirect path from the external environment to formalization ( $\beta = 0.106$ ;  $p < 0.01$ ;  $CI_{0.95}$ : [0.03, 0.18]) was significant but positive; therefore, H3c was not supported. In addition, the indirect path from the external environment to centralization ( $\beta = -0.023$ ;  $p = 0.153$ ;  $CI_{0.95}$ : [-0.09, 0.07]) was not significant. Therefore, H3a is not supported.

Furthermore, the percentage values of the variance accounted for (VAF) were calculated to determine the size of the indirect effect in relation to the total effect (i.e. direct and indirect effects) (Hair *et al.*, 2022). This approach complements the assessment of mediation by using a resampling procedure. A VAF value greater than 80% indicates full mediation,  $20\% \leq VAF < 80\%$  indicates partial mediation and a  $VAF < 20\%$  assumes no mediation. Table 4 presents the results of the VAF in percentage form. Since -6.8% of the external environment's effect on centralization is explained via the ACAP mediator, this shows no mediation. Similarly, 6.7%, 33.4% and 31.6% of the effects of the external environment on complexity, formalization and integration, are explained by the ACAP mediator, which shows partial mediation between them.

## 5. Discussion, conclusion, limitations and future research

Recently, the interest in exploring ACAP has been recognized by many firms. However, many firms have not been able to obtain maximum possible benefits from ACAP. This is because these firms are limited to technical solutions and have failed to consider organizational and environmental factors. Using theories of environmental and organizational design and ACAP, this study links the external and internal fit of organizational factors to ACAP and explores how ACAP mediates the relationship between the external organizational environment and the internal organizational structure. This study constructs and tests an integrated model to investigate the relationships among the external environment, ACAP and internal structure. These relationships are analyzed using a multivariate data analysis technique, that is, the CSEM approach, along with reflective-formative-type hierarchical latent variables, using a data sample from multiple industrial sectors in South Korea. The results suggest that the external environment and ACAP positively influence internal structure. Furthermore, ACAP positively mediates the relationship between the external environment and internal organizational structure characteristics. The organizational environment contributes to ACAP, which in turn embeds itself in structural changes, consistent with previous studies (Ali *et al.*, 2016, 2018; Apriliyanti and Alon, 2017; Gao *et al.*, 2017).

### 5.1 Discussion of results

The key findings of this study are summarized as follows. The results indicate that the external environment is positively associated with complexity and integration, aligning with the findings of Liao *et al.* (2011). Although negative relationships were expected between the external environment and centralization and formalization, a positive association was found between these factors. These results are in line with previous studies exploring the relationship between organizational structure and several other variables, such as ACAP, knowledge management environment, strategy, innovation and performance (Ali, 2015). The relationship between organizational structure and these variables has been found to be both positive (Jansen *et al.*, 2005a; Jansen *et al.*, 2005b, 2006; Claver-Cortés *et al.*, 2012; Mahmoudsalehi *et al.*, 2012;

Pertusa-Ortega *et al.*, 2010) and negative (Mahmoudsalehi *et al.*, 2012; Pertusa-Ortega *et al.*, 2010; Zheng *et al.*, 2010), although some studies have not confirmed (De Araújo, 2010; Liao *et al.*, 2011). These divergent findings highlight the complexity of the link between organizational structure and various internal factors, suggesting that further exploration is necessary to fully understand these dynamics. The role of organizational structure in shaping processes, such as ACAP, is particularly critical, as it can influence the effectiveness of knowledge absorption and innovation within firms (Claver-Cortés *et al.*, 2012; Pertusa-Ortega *et al.*, 2010). This complexity underscores the need for more nuanced studies addressing the variability of structural influences across different organizational contexts.

The second part of our analysis confirms that the external environment is positively associated with ACAP, which is supported by previous studies (Volberda *et al.*, 2010). The external environment typically includes factors, such as market conditions, technological advances and competitive pressures, all of which can influence an organization's capacity to innovate and adapt (Volberda *et al.*, 2010). A dynamic external environment often provides the stimuli necessary for organizations to develop or enhance their ACAP processes, thereby enabling them to recognize, acquire and apply external knowledge more effectively (Van den Bosch *et al.*, 1999). This process is crucial for maintaining a competitive advantage and fostering innovation in an ever-changing business landscape. While the positive relationship between the external environment and ACAP is well supported in the literature, the mechanisms through which this relationship operates remain complex. Organizations may respond differently to environmental changes based on their internal structures, strategies and prior knowledge bases. Consequently, the positive association observed in this study reinforces the notion that ACAP is not a static capability, but one that evolves in response to external stimuli, suggesting that organizations must remain adaptable and responsive to the external environment to fully leverage their ACAP (Zahra and George, 2002).

The final section of the empirical findings examines the mediating role of ACAP in the proposed research model, as depicted in Figure 1 and Table 4. The results provide strong support for the model, indicating that ACAP serves as a partial mediator in the relationship between the external environment and organizational structure. Specifically, the findings suggest that ACAP positively mediates the relationship between the external environment and key structural dimensions such as complexity, formalization and integration. This supports the idea that ACAP plays a crucial role in how organizations adapt to and integrate external environmental stimuli into their internal structures (Ali *et al.*, 2018; Hussain *et al.*, 2022). However, the analysis reveals an interesting divergence: ACAP does not appear to mediate the relationship between the external environment and centralization. The lack of a mediating effect on centralization suggests that the influence of the external environment on this particular aspect of organizational structure may operate through other mechanisms or factors not captured by the ACAP process in this study. Centralization concentrates on decision-making authority within a firm and may be less responsive to changes in the external environment or other factors such as internal power dynamics, managerial preferences or historical organizational practices could be more influential in shaping centralization. These findings highlight the complexity of the relationship between external environmental factors, organizational structure and ACAP (Ali *et al.*, 2018). While ACAP clearly mediates the relationship between the external environment and certain structural elements, its role may vary across structural dimensions (Hussain *et al.*, 2022). This suggests that further research is needed to better understand the conditions under which ACAP effectively mediates these relationships, and to explore other potential mediating factors that could influence centralization.

### 5.2 Theoretical contributions

This section provides several theoretical contributions that this study makes to the current literature. First, it uses an integrated model and broad measures to explore the associations

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between the external environment, ACAP and internal organizational structure. Thus, this study enriches our theoretical insights into how firms navigate the interplay between their internal configurations and external pressures they face (Sang *et al.*, 2024). This contribution is particularly valuable for researchers and practitioners seeking to understand the dynamics of organizational adaptation and develop strategies for optimizing internal structures in response to changing external conditions (Knudsen and Schleimer, 2022; Ponce-Espinosa *et al.*, 2022; Truong *et al.*, 2023). Second, this study confirms that the external environment has a positive influence on the internal organizational structure, measured in terms of complexity and integration. Thus, firms adapt their internal structures and processes to respond effectively to changes and demands in their external environment. Third, this study contributes to literature by demonstrating a positive relationship between external environment and ACAP. This relationship underscores the impact of external environmental forces such as customers, suppliers, competitors, technology and government knowledge processes within firms (Grandinetti, 2016). Finally, this study contributes to the literature by analyzing the likely mediating role of ACAP (Bashir and Pradhan, 2023; Cuevas-Vargas *et al.*, 2023; Sang *et al.*, 2024) in the relationship between the external environment and internal organizational structure. This finding contributes to the understanding of how ACAP facilitates a firm's ability to absorb and use external knowledge, resources and practices to navigate internal organizational structures. This could shed light on how firms leverage their capacity to learn and adapt to achieve a better alignment between external challenges and internal capabilities.

### 5.3 Managerial contributions

This study offers the following managerial implications. First, the findings of this study offer a practical framework for organizational leaders to align their structures with the evolving external environment, ensuring that the organization can better absorb and apply new knowledge. Second, managers should focus on strengthening their organization's absorptive capacity as it plays a key role in mediating how environmental factors influence structural decisions. This alignment is crucial for maintaining flexibility, improving decision making, reducing risks and enhancing organizational performance. By recognizing the importance of ACAP, managers can ensure that their firms are better prepared to handle external uncertainties and make effective, more informed decisions. This could lead to a reduction in knowledge-sharing costs, as the firm is better equipped to manage and disseminate knowledge internally. Moreover, ACAP helps managers recognize the types of organizational structures that work best in specific evolving business environments. For example, in a rapidly changing industry, a more flexible and less hierarchical structure may be needed to allow for faster decision-making and adaptability. In contrast, a more stable environment may support a more traditional hierarchical structure. This study provides valuable insights that can guide managers, researchers and practitioners in designing organizations that are more responsive and adaptable to the changing business landscape.

### 5.4 Limitations and future work

Finally, this study has several limitations. First, since this study was cross-sectional, future studies with longitudinal and experimental designs will help to cautiously consider the causal inferences of the research results. Second, this study relied solely on questionnaire-based perceptions using a single method. Future research should adopt mixed methods by combining surveys with qualitative approaches to enable triangulation and deeper understanding. Third, since the variables used in this study are likely to be culturally oriented, and since this study takes place in a particular geographic context (South Korea), researchers must be careful about generalizing these results and conclusions to different contexts. Future research should test the model in different cultural and national settings to

enhance the generalizability of the results. Finally, a potential issue with model misspecification may exist because we did not consider the four dimensions of ACAP separately (acquisition, assimilation, transformation and exploitation). Rather, we modeled the ACAP as a third-order factor. Future studies should model and test each ACAP dimension independently, compare alternative model specifications and examine the distinct effects of each dimension to improve theoretical precision and model robustness.

### Data availability

Data will be made available on request.

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**Table A1.** Demographic information

Classification	No.	%
<i>Information about sampling firms</i>		
Type of business		
Manufacturing	72	20.7
Consulting and service industry	109	31.4
IT software and telecommunication	26	7.5
Finance, bank and insurance	54	15.6
Electronic equipment and cable	8	2.3
Distribution and logistics	12	3.5
Travel and transportation	11	3.2
Power generating and plants	22	6.3
Chemical and associated products	3	0.9
Construction	19	5.5
Others	12	3.2
<i>Number of employee (firm's size) below 50</i>	127	36.6
51~100	24	6.9
101~200	44	12.7
201~300	24	6.9
Above 300	128	36.8
<i>Annual revenue</i>		
Below KRW 5 billion	124	35.7
KRW 5–10 billion	25	7.2
KRW 10–15 billion	59	17.0
KRW 15–20 billion	12	3.5
Above KRW 20 billion	127	36.6
<i>Firm's age</i>		
Below average mean	192	55.33
Above average mean	155	44.67
<i>Information about respondents</i>		
Gender		
Male	219	63.1
Female	128	36.9
<i>Marital status</i>	180	52.5
Single	181	52.2
Married	166	47.9
<i>Education</i>		
Did not complete high school	–	–
Undergraduate degree	44	12.7
High school graduate	47	13.5
Graduate degree	194	55.9
Certificate or associates degree	62	12.9

(continued)

**Table A1.** Continued

Classification	No.	%
<i>Role</i>		
Management	68	19.6
Professional	103	29.7
Operations	148	42.7
Administration	6	1.7
Others	22	6.3
<i>Experience</i>		
Below 3 years	128	36.9
3~5 years	73	21.0
5~10 years	66	19.0
10~20 years	52	15.0
Below 20 years	28	8.1
<i>Respondent's age</i>		
Below 30 years	85	24.9
30~40 years	144	41.2
40~50 years	60	17.3
Above 50 years	58	16.8

**Source(s):** Authors' own work

**Table A2.** Questionnaire items<sup>a,b</sup>

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Absorptive capacity

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*Acquisition*

- 1 The search for relevant information concerning our industry is every-day business in our company
- 2 Our management motivates the employees to use information sources within our industry
- 3 Our management expects that the employees deal with information beyond our industry

*Assimilation*

- 1 In our company ideas and concepts are communicated cross-departmental
- 2 Our management emphasizes cross-departmental support to solve problems
- 3 In our company there is a quick information flow, e.g. if a business unit obtains important information it communicates this information promptly to all other business units or departments
- 4 Our management demands periodical cross-departmental meetings to interchange new developments, problems and achievements

*Transformation*

- 1 Our employees have the ability to structure and to use collected knowledge
- 2 Our employees are used to absorb new knowledge as well as to prepare it for further purposes and to make it available
- 3 Our employees successfully link existing knowledge with new insights
- 4 Our employees are able to apply new knowledge in their practical work

*Exploitation*

- 1 Our management supports the development of prototypes
- 2 Our company regularly reconsiders technologies and adapts them accordant to new knowledge
- 3 Our company has the ability to work more effective by adopting new technologies

*Organizational structure*

*Centralization:* in our company, there is considerable decision by top management: i.e....

- 1...new product introduction
- 2...capital budgeting
- 3...set of pricing policies
- 4...entrance to new market
- 5...changes in manufacturing process
- 6...personnel policy

*Formalization:* our company stresses ...

- 1...extent of rules/procedures documentation
- 2...reliance on rules and procedures
- 3...tolerance level of rule violation

*Complexity:* in our company, there is considerable...

- 1...number of different product lines
- 2...diversity of production technology
- 3...diversity of marketing strategies

*Integration:* our company stresses...

- 1...frequency of interdepartmental committees
- 2...frequency of interdepartmental task forces
- 3...frequency of liaison personnel

*Organizational environment*

*Customer components:* in our industry, there is considerable attention is paid to:

- 1 Domestic distributor
- 2 Overseas distributor
- 3 Domestic consumer
- 4 Overseas consumer

(continued)

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**Table A2.** Continued

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**Absorptive capacity**

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*Supplier components:* in our industry, there is considerable attention is paid to:

- 1 Raw material supplier
- 2 Equipment supplier
- 3 Technology supplier
- 4 Overseas capital supplier
- 5 Domestic fund supplier

*Competitor components:* in our industry, there is considerable attention is paid to:

- 1 Competitors in overseas market
- 2 Competitors in local market
- 3 Competitors for supplier

*Government components:* in our industry, there is considerable attention is paid to:

- 1 Government's regulatory control over the industry
- 2 Government's tax and other incentive for technological learning
- 3 Government's import and export policy
- 4 Government's control over the foreign capital and technology acquisition

*Technological components:* in our industry, there is considerable attention is paid to:

- 1 Meeting technological requirements of own industry and related industries in production of product/service
- 2 New technological advances in the industry
- 3 Availability of technical expertise at research institutions in Korea

**Note(s):** <sup>a</sup>The Korean version may be asked from the authors upon request; <sup>b</sup>References of the all the scales are given the paper – Sub-section 3.2

**Source(s):** Authors' own work

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**Corresponding author**

Murad Ali can be contacted at: [murad2.ali@northumbria.ac.uk](mailto:murad2.ali@northumbria.ac.uk)