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The Impact of Intertwined Relationships between Organizational Capabilities on Business Performance

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Abstract

The aim of this study was to investigate the intertwined relationship between some dynamic capabilities such as organizational agility, organizational creativity and organizational learning. It also aimed to verify the relationship between these dynamic capabilities and business performance among companies in an emerging context such as Tunisia. Our quantitative approach enabled us to conduct a study on a sample of 180 companies operating in the industrial sector in order to verify the bi-directional and positive relationships between organizational agility, organizational creativity and organizational learning and to measure their contributions to business performance. These positive relationships suggest that, in order to optimize its performance, a company must develop its creative, agile, and learning capabilities. Organizational agility has positive impacts on creativity and learning, making them more agile and thus developing agile creativity and agile learning. When creativity and learning are agile, they are capable of creating more organizational agility. Finally, the results show that business performance is positively affected by dynamic capabilities such as organizational agility, organizational creativity, and organizational learning.

Keywords: Dynamic capabilities; Organizational Creativity; Organizational Agility; Organizational Learning; Business Performance

1. Background of the study

In a hyper-competitive environment, it is always difficult, even complex, to adapt quickly to a changing market, to adopt an appropriate management style, and to ensure the organizational change necessary to achieve performance objectives. Companies are forced to constantly renew their organizational capabilities with their own (scarce and valuable) resources to improve their performance (Helfat and Peteraf, 2003) because the hyper-competitive and fast-paced environmental conditions offer only temporary advantages (D'Aveni and al., 2010).

However, the renewal of organizational capacities is not without its difficulties; it requires Dynamic Capacities (DC) that reconfigure and release resources and competencies to de-rigidify the organization and promote its change (Teece et al. 1997; Baretto, 2010). "Strong DC are necessary for fostering the organizational agility necessary to address deep uncertainty, such as that generated by innovation and the associated dynamic competition" (Teece and al., 2016). To be strong, DC need not be stable or fixed (Teece, 2023). "They can shift as new managers bring fresh insights to mesh with the slower-changing high-level routines and culture of a given organization" (Teece, 2023, p.124).

In this context, it has become necessary for each organization to "be characterized with sensing agility, decision-making, and agility in carrying out work properly" for providing quick response and good compatibility with environment (Nafei, 2016, p.296). This Organizational Agility (OA) has even been recognized as a DC (Teece, 2023; Musa and Enggarsyah, 2025; Teece, 2016; Raschke, 2010; Hassner Nahmias and Perkins, 2012; Baird and Higgins, 2012; Sambamurthy et al., 2003).

Other DC, such as Organizational Creativity (OC) and Organizational Learning (OL), can be combined with OA, offering increased utility in a turbulent environment. It is only when creativity and learning are combined with agility that they acquire the characteristic of "agile" (Li and Chalermvongsavej, 2025; Olszewski, 2023) to improve Business Performance (BP). Therefore, measuring and verifying the bidirectional (or intertwined) relationships between OA, OC, and OL, as well as their contribution to performance, becomes justified.

In this article, we seek to examine the various direct relationships that may exist between OA, OC, and OL, and their impacts on BP. While OA, OC, and OL are the subject of recognized research, few studies link these concepts and measure them in intertwined relationships. This article conducts precisely this empirical analysis of their combined contribution to performance. We pose the following two research questions:

- To what extent can the Intertwined relationships between organizational agility, organizational creativity, and organizational learning be verified?
- To what extent do organizational agility, organizational creativity, and organizational learning influence business performance?

The first section offers a literature review to define our topic. We then present our conceptual and operational frameworks, which we verify in a final phase by presenting the data analyses and the resulting interpretations.

2. Literature Review

We outline our conceptual framework through its theoretical foundations and present a literature review as the basis for our own research proposals.

2.1 Dynamic Capabilities (DC)

Our research is theoretically based on the DC approach that is originates from the seminal article by Teece, Pisano, and Shuen (1997) as updated in 2007 (Teece, 2007) and in 2023 (Teece, 2023). DC are considered as “the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments” (Teece and al., 1997, p.516). The dynamic capabilities differ from ordinary capabilities because they cannot be acquired (Teece, 2023). They must be developed since they involve cognition and learning (Teece, 2023). They can be integrated into organizational routines rooted in the company's culture and history (Teece, 2023).

DC’ Management is integrated into three types of vision: static vision, dynamic vision and transformational vision (Prevot and al., 2010). First, the static vision is related to the integration and coordination of competencies. Second, the dynamic vision is interested on learning through repetition and experimentation. Third, the transformational vision is linked to reconfiguration and transformation, which involve the ability to sense the need for change (Prevot and al., 2010).

The Future of the DC Framework “has the potential to introduce much that is currently absent, including interfirm heterogeneity and a model of how individual firms compete. It is a framework that recognizes complex interactions within a firm, with other firms, and with the business environment in a quest to understand long-run enterprise performance” (Teece, 2023, p.125). This DC framework can serve as a guide to empirical studies (Teece, 2023).

Teece (2016) explores agility at a fundamental level and relates it to DC. Also, he considers creativity and learning as DC (Teece, 2023).

2.2 Organizational Creativity (OC)

Generally, creativity is synonymous with an individual's imagination and ability to produce something new (Mnisri and Nagati, 2012) or “ability to generate novel and useful ideas” (Cui, 2025, p.4). So, to talk about creativity, the ideas generated must be not only new and original, but also useful (Amabile, 1996).

For Revelle (2014, p.31) "creativity is thinking up new things or new combinations of things". Creativity is based on the human capacity to anticipate the future and to mobilize technological, social, and even psychological skills (Durand, 2006). Creativity is a function of personal characteristics (personality, skills, experience, motivation), organizational characteristics (leadership, culture, management style), and the interactions between all these characteristics (Sigala and Chalkiti, 2015). OC thus depends on the individual level, the organizational level, and the transition between the two. In this sense, OC is linked to internal and external transformation processes aimed at changing individual behavior (Durand, 2006). This transformation facilitates the acceptance of novelty within the organization (Durand, 2006). Meaning, motivation, commitment, and action are organized in such a way as to effectively influence members of the organization to engage in creative processes (Drazin et al., 1999).

2.3 Organizational Agility (OA)

Since its appearance in the 1991 report published by the “Lehigh-Iacocca Institute” (Goldman, Nagel, Dove, and Preiss, 1991), the concept of agility has taken on a variety of conceptual bases. In this report, agility is considered the ability of an organization to develop and thrive in a competitive environment that changes in unpredictable ways (Goldman et al., 1995). It's about “ability quickly to recognize opportunities, change direction, and avoid collisions” (McCann2004, p. 47; Duchek 2020)

Some definitions do not stray too far from the initial conceptualization of agility and emphasize the relationship between firm and its environment and the degree to which it adapts to the inherent changes in that environment. Agility is

therefore necessary to detect changes in the environment and respond to them with appropriate capabilities (Sharifi and Zhang, 1999).

Other definitions have emphasized the attributes or dimensions of agility, but there is still no real consensus on the number and nature of these attributes. Thus, agility is considered a broad concept encompassing flexibility, responsiveness, adaptability, speed, learning, innovation, change response, quality, cost, and integration (Yusuf et al., 1999; Sherehiy et al., 2007; Cui, 2025). For Cui (2025, p.4), "OR refers to the ability to rapidly adapt to changes in the external environment, encompassing elements such as flexibility, speed, and responsiveness".

Subsequently, the conceptualization of agility was developed from the perspective of dynamic capabilities. Agility is an important dynamic capability in the contemporary business environment because it explains how the company establishes, strengthens, and reconfigures the capabilities that allow it to adapt to changes in the environment (Roberts and Grover, 2012; Raschke, 2010).

Agility is a capability that can be applied to all business areas, including business practices, organizational structures, information systems or technologies, processes, logistics, personnel, and the enterprise in general (Christopher and Towil, 2001; Narasimhan et al., 2006; Katayama and Bennet, 1999; Charbonnier-Voirin, 2011). Moreover, many studies on agility implicitly or explicitly address enterprise resources, particularly competencies and capabilities.

For this research, the dimensions we associate with the concept of agility are flexibility, speed, responsiveness, and response to change. Strategic flexibility is linked to resource flexibility and flexibility in coordinating the use of these resources across different functional areas (Zhang, 2005). Regarding speed, time appears to be a crucial strategic factor for companies, enabling them to outpace their competitors by developing and manufacturing or delivering their products more quickly (Leroy, 2004). Speed is even important for a company's responsiveness, which shapes its ability "to react to changes in the environment, and if possible, more quickly than its competitors" (Kalika, 2006, p. 221).

2.4 Organizational Learning (OL)

In a broad sense, OL has been defined by Koenig (2006) as a collective phenomenon of acquisition and development of competencies which, more or less profoundly, more or less sustainably, modifies the management of situations and the situations themselves. R-A theory (Hunt, 2000, p. 88), in accordance with Competency-Based View (CBV), defines organizational learning as: « Flows that lead to a change in the stocks of beliefs within the organization ». For Patky (2020), "OL can be defined as the process by which organizational knowledge base and insights are developed via associations between past actions, the effect of those and future operations".

The dimensions that we associate with the OL are learning engagement, shared vision, open-mindness and inter-organizational knowledge sharing. Learning engagement is the degree to which the organization evaluates and encourages learning (Baker and Sinkula, 1999). A shared vision generally reflects the organization's interest in sharing perspectives on organizational goals and priorities (Santos-Vijande and al., 2005). A shared vision is essential because it leads to consistency in beliefs, opinions, and assumptions, and consequently, to internal stability within the firm (Croteau and Raymond, 2004). Open-mindness is the willingness to critically evaluate the organization's operational routines and to accept new ideas (Sinkula and al., 1997). Inter-organizational knowledge sharing is a form of collaboration that promotes the acquisition of new knowledge, thereby enriching the company's resources (skills, information).

2.5 Business Performance (BP)

In general, performance is the ultimate goal of any firm. Whether judged against its own objectives, without reference to other enterprises or against an internal benchmark (e.g., performance levels from previous periods) or an external benchmark (e.g., the performance of competing firms, the industry average), performance is an indicator of a company's success. It is information indicating the degree to which the organization's objectives or plans have been achieved (Silem, 1990). Performance is equivalent to action, the result of action, and success (Bourguignon, 1995). It is an action, that is, a process. It is then the result of the action, hence the evaluation of the results obtained from the action implemented. Finally, performance is synonymous with success, referring to subjective representations of success that vary and depend on the actors involved (Bourguignon, 1995).

2.6 Research Hypotheses

Our empirical analysis focuses on the relationships between OC, OA, OL and BP; it is based on the formulation of nine research hypotheses (cf: Figure 1) intended to clarify and qualify the intertwined relationships (bidirectional relationships) that result from them.

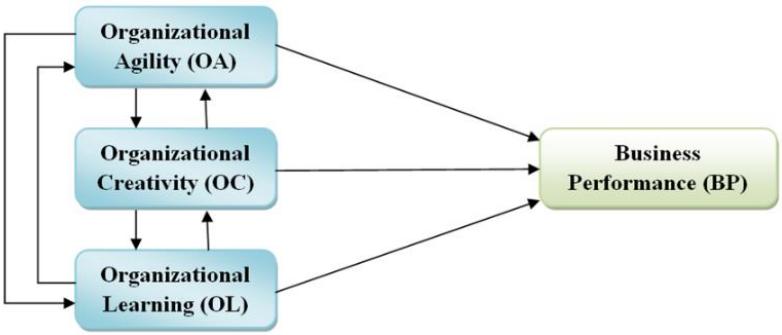

Figure 1: Conceptual model

Intertwined Relationships between OC and OA

OC and OA are often treated as DC that implie constant transformations within the firm (Teece, 2016). Agile companies are constantly looking for a new idea or practice to improve their performance (Barzi, 2007). Agile structures are necessarily flexible, meaning adaptable, able to handle fast-paced environments, and capable of responding to unforeseen events. Such structures can foster a spirit of creativity within the company and thus enhance its focus on innovation. In light of these observations, we propose the following two hypotheses:

H_1: OC has a positive impact on OA.

H_2: OA has a positive impact on OC.

Intertwined Relationships between OC and OL

OL enables the company to develop capabilities that promote creativity and innovation which, in turn, positively influence performance (Baker and Sinkula, 1999; Hurley and Hult, 1998; Jiménez-Jiménez and Sanz-Valle, 2011). Musa and Enggarsyah (2025) show that the company needs to build a learning culture to improve its creativity and thus maintain its competitive advantage. We therefore propose the following two hypotheses.

H_3: OC has a positive impact on OL.

H_4: OL has a positive impact on OC.

Intertwined Relationships between OA and OL

Recent researches have shown a clear relationship between agility, learning and BP. Learning agility is even described as the ability to transfer knowledge and quickly seize opportunities after learning from experience and applying them to new situations. Li and Chalermvongsavej (2025) consider that learning agility is the ability to learn and the willingness to acquire new skills to perform under first-time and tough conditions. We propose the following hypothesis:

H_5: OA has a positive impact on OL.

H_6: OL has a positive impact on OA.

Relationships between OA, OC, OL and BP

OA, as a concept of competitiveness (Zhang, 2011), has emerged as a fundamental determinant of business success in a hyper-competitive environment (Roberts and Grover, 2012). OA is therefore essential for a company's survival, competitiveness, and performance (Sharifi and Zhang, 1999; Schönsleben, 2000). In fact, agility is critical for developing and maintaining a competitive advantage, and even for expanding it and ensuring superior performance (Sanchez and Nagi, 2001). Thus, we propose the following hypothesis:

H_7: OA has a positive impact on BP.

OC is a critical driver of innovation and competitive advantage (Cui, 2025) and therefore of BP. Many of the key managerial decisions depend, in the first instance, on creative insight and intuition and not on technical analysis and decision rules (Teece, 2023). It is generally recognized that creativity and innovation are essential to enhance BP (Anderson et al., 2014). The creativity mobilized in the development of new products and processes is a prerequisite for achieving and maintaining success in global markets (Croteau and Raymond, 2004).

We formulate the following hypothesis:

H_8: OC has a positive impact on OP.

OL is a basis for gaining a competitive advantage and a key variable in the enhancement of BP (Jiménez-Jiménez and Sanz-Valle, 2011). “The long-term viability of a firm requires ... a continuous learning process, periodic pruning, and ongoing orchestration of intangible assets and other resources” (Teece, 2023, p. 115). We formulate the following hypothesis:

H_9: OL has a positive impact on BP.

3 Research Methodology

Here we present the different measurement scales adopted to measure the conceptual model' variables, as well as the data collection and sampling tools.

3.1 Measurement of Variables

We use five-point Likert scales to measure the different variables.

The Zhou and George (2001) scale measures OC with 13 items and a good reliability of 0.96. It is well-validated by previous research. The Tallon and Pinsonneault (2011) scale measures OA with 8 items, assessing response to changes in demand, innovation, and pricing; adaptability; speed; reaction time or response time to competitor product launches; market expansion; changes in product mix; and adoption of new technologies. We also include the organizational flexibility scale developed by Miller et al. (1992), which consists of 4 items and has a fairly good reliability (α=0.761).

For the OL measurement scale, we adopted the scale developed by Calantone et al. (2002), which consists of four items related to "Commitment to Learning", four items related to "Shared Vision", four items measuring "Open-mindedness", and five items measuring "Intraorganizational Knowledge Sharing". The scale's reliability was deemed well, with a Cronback alpha of 0.80. Content validity, construct validity, and discriminant validity were all well-established.

The OP measurement scale developed by Hooley et al. (2005) is perfectly suited to our research. It covers all dimensions associated with the concept. It is a five-point Likert scale ranging from 1 (too weak) to 5 (far better). It has good construct validity and its reliability was judged good (α=0.86).

3.2 Data Collection Tool and Sampling Process

To collect the data, we used a questionnaire. This tool is best suited to our quantitative research, which involves a large sample. All the selected measurement scales were included in the questionnaire. After a pre-test, we administered it primarily through face-to-face interviews and online. Our population consists of firms operating in the industrial sector (food processing, packaging and design, and electronics). Our final sample comprises 180 firms distributed as follows: 44% in food processing, 40% in packaging and design, and 16% in electronics.

4 Results and Discussion

To ensure the quality of the measurement scales adopted, we verify their validity through factor analysis and their reliability through reliability analysis. We then discuss the confirmation or refutation of our research hypotheses.

4.1 Measurement Scales Verification

For OA scale, both the KMO (Kaiser, Meyer et Olkin) score and Bartlett's sphericity test are satisfactory. The KMO score is 0.760 (>0.5), and Bartlett's test is significant (Chi-square=688.45; p=0.000). The analysis reveals three factors representing 73.404% of the total variance. The first factor (34.727% of the variance) relates to response to change, the second factor reflects reactivity (21.989% of the variance), and the third factor represents speed (16.689% of the variance). The average reliability of these three factors was judged to be quite good (Cronbach's Alpha = α = 0.749).

Regarding flexibility, only one factor was identified, with 1.904 as the value and representing 47.611% of the retrieved information. This factor' reliability is 0.629.

For OC scale, factor analysis revealed a KMO value of 0.720 (>0.5) and a significant Bartlett's test (χ^2 = 854.014; p=0.000). This test also demonstrated good item representation. Principal component analysis identified two factors related to "New ideas and Problem-solving" (33.578%) and "New methods and Achievement of objectives" (25.548%). Reliability analysis showed fairly good internal consistency for both factors (α= 0.66).

For OL scale, Factor analysis shows that the original data matrix is factorable. The KMO test yields a value of 0.873 (>0.5). Bartlett's test is significant (χ^2 = 2484.471; p = 0.000). Principal component analysis reveals three factors with values greater than 1: The first factor represents the "Shared vision". Its value is 4.183 and accounts for 27.846% of the information retrieved. The second factor relates to "Engagement in learning". Its value is 1.591 and accounts for 27.218% of the information retrieved. The third factor encompasses both "Open-mindedness and Knowledge sharing". The value factor is 1.245 and accounts for 15.118% of the information retrieved. Reliability analysis shows good reliability (α = 0.852).

For OP scale, the verification reveals two factors accounting for 77.309% of the total variance. The first factor (49.760% of the variance) represents superior financial performance with good reliability (α=0.896). The second factor (27.549%) is linked to superior commercial performance with very good reliability (α=0.916).

4.2 Hypotheses Verification

Multiple linear regressions was conducted to verify the relationships between continuous variables and to ensure the testing of hypotheses linking several multidimensional variables.

H_1: OC & OA. (Creativity on Agility)

The OC explains 11.4% of the OA in terms of responsiveness, 5.3% in terms of response to change, 3.1% in terms of speed and 7.8% in terms of flexibility. These relationships are significant since the Fisher tests show positive values with

error probabilities below the 5% threshold (Responsiveness (F=22.429; p=0.000), Response to change (F=10.811, p=0.000), Speed (F=5.609; p=0.004), Flexibility (F=13.693; p=0.000)). We confirm our first hypothesis with the following regression equations:

Table 1: Results of Creativity on Agility

OA / Response to change	=	0,201 OC/ New ideas and Problem-solving (t= 3,868 ; p= 0,000)
	+	0,134 OC/ New methods and Achievement of objectives (t= 2,580 ; p= 0,010)
OA / Responsiveness	=	0,305 OC/ New ideas and Problem-solving (t= 6,039 ; p= 0,000)
	+	0,146 OC/ New methods and Achievement of objectives (t= 2,897 ; p= 0,004)
OA / Speed	=	0,174 OC/ New methods and Achievement of objectives (t= 4,209 ; p= 0,000)
OA / Flexibility	=	0,230 OC/ New ideas and Problem-solving (t= 2,920 ; p= 0,004)
	+	0,166 OC/ New methods and Achievement of objectives (t= 3,109 ; p= 0,002)

H_2: OA & OC. (Agility on Creativity)

The results of the OA regressions on OC show that:

- OC based on "New ideas and Problem-solving" is explained to a degree of 13.4% by agility (in terms of responsiveness and response to change) and by agility to a degree of 5.1% (in terms of flexibility).
- OC based on "New methods and Achievement of objectives" is explained to a degree of 7% by agility (speed, responsiveness and response to change) and to a degree of 2.6% by agility (flexibility).

The following regression equations confirm our second hypothesis regarding the positive impact of OA on OC.

Table 2: Results of Agility on Creativity

OC / New ideas and Problem-solving	=	0,305 Responsiveness (t= 6,099 ; p= 0,000)
	+	0,201 Response to change (t= 4,028 ; p= 0,000)
OC / New ideas and Problem-solving	=	0,225 Flexibility (t= 4,155 ; p= 0,000)
OC / New methods and Achievement of objectives	=	0,174 Speed (t= 3,368 ; p= 0,001)
	+	0,146 Responsiveness (t= 2,823 ; p= 0,005)
	+	0,134 Response to change (t= 2,592 ; p= 0,000)
OC / New methods and Achievement of objectives	=	0,160 Flexibility (t= 2,920 ; p= 0,004)

H_3: OC & OL. (Creativity on Learning)

The results of the OC regressions on OL show that:

- OL based on "Shared Vision" is explained to a degree of 12.6% by OC (New ideas/ Problem-solving & New methods/Achievement of objectives).
- OL based on "Learning Engagement" is explained to a degree of 10.4% by OC (New ideas/ Problem-solving & New methods/Achievement of objectives).
- OL based on "Open-mindedness & Knowledge Sharing" is explained to a degree of 8.9% by OC (New ideas/ Problem-solving & New methods/Achievement of objectives).

The following regression equations confirm our third hypothesis regarding the positive impact of OC on OL.

Table 3: Results of Creativity on Learning

OL / Shared vision	=	0,311 OC/ New ideas and Problem-solving (t= 3,958 ; p= 0,000)
	+	0,236 OC/ New methods and Achievement of objectives (t= 2,610 ; p= 0,010)
OL / Learning engagement	=	0,301 OC/ New ideas and Problem-solving (t= 6,249 ; p= 0,000)
	+	0,196 OC/ New methods and Achievement of objectives (t= 2,996 ; p= 0,000)
OL / Open-mindedness & Knowledge sharing	=	0,244 OC/ New ideas and Problem-solving (t= 2,911 ; p= 0,001)
	+	0,187 OC/ New methods and Achievement of objectives (t= 3,229 ; p= 0,002)

H_4: OL & OC. (Learning on Creativity)

The results of the OL regressions on OC show that OC based on "New ideas and Problem-solving" is explained to a degree of 20.4% by OL and OC based on "New methods and Achievement of objectives" is explained to a degree of 13,2% by OL. The following regression equations confirm our hypothesis regarding the positive impact of OL on OC.

Table 4: Results of Learning on Creativity

OC / New ideas and Problem-solving	=	0,386 Shared vision (t= 5,899 ; p= 0,000)
	+	0,296 Learning engagement (t= 4,327 ; p= 0,000)
	+	0,199 Open-mindedness & Knowledge sharing (t= 3,76 ; p=0,000)
OC / New methods and Achievement of objectives	=	0,278 Shared vision (t= 3,389 ; p= 0,000)
	+	0,149 Learning engagement (t= 2,823 ; p= 0,001)
	+	0,192 Open-mindedness & Knowledge sharing (t= 2,632 ; p= 0,004)

H_5: OA & OL. (Agility on Learning)

The results of the OA regressions on OL show that:

- OL based on "Shared vision" is explained to a degree of 19.6% by OA (in terms of responsiveness and response to change) and by OA to a degree of 5.1% (flexibility).
- OL based on "Learning engagement" is explained to a degree of 12% by OA (speed, responsiveness and response to change) and to a degree of 4.8% by OA (flexibility).
- OL based on "Open-mindedness & Knowledge sharing" is explained to a degree of 8.2% by OA (speed, responsiveness and response to change) and to a degree of 2.8% by OA (flexibility).

The regression equations confirm our hypothesis regarding the positive impact of OA on OL.

Table 5: Results of Agility on Learning

OL / Shared vision	=	0,329 Responsiveness (t= 6,789 ; p= 0,000)
	+	0,278 Response to change (t= 4,828 ; p= 0,000)
OL / Shared vision	=	0,252 Flexibility (t= 4,155 ; p= 0,000)
OL / Learning engagement	=	0,278 Speed (t= 3,368 ; p= 0,001)
	+	0,189 Responsiveness (t= 2,943 ; p= 0,005)
	+	0,176 Response to change (t= 2,697 ; p= 0,000)
OL / Learning engagement	=	0,243 Flexibility (t= 4,155 ; p= 0,000)
OL / Open-mindedness & Knowledge sharing	=	0,174 Speed (t= 3,498 ; p= 0,001)
	+	0,146 Responsiveness (t= 2,783 ; p= 0,005)
	+	0,134 Response to change (t= 2,642 ; p= 0,000)
OL / Open-mindedness & Knowledge sharing	=	0,168 Flexibility (t= 2,833 ; p= 0,002)

H_6: OL & OA. (Learning on Agility)

The results of the OL regressions on OA show that the OL explains 12.8% of the OA/Responsiveness, 8.3% of the OA/Response to change, 5.1% of the OA/Speed and 7.9% of the OA/Flexibility. These relationships are significant since the Fisher tests show positive values (error probabilities < 5%). We confirm our hypothesis with the following regression equations:

Table 6: Results of Learning on Agility

OA / Responsiveness	=	0,362 Shared vision (t= 5,899 ; p= 0,000) + 0,268 Learning engagement (t= 4,327 ; p= 0,000) + 0,201 Open-mindedness & Knowledge sharing (t= 3,76 ; p=0,000)
OA / Response to change	=	0,288 Shared vision (t= 3,099 ; p= 0,000) + 0,197 Learning engagement (t= 2,869 ; p= 0,000) 0,168 Open-mindedness & Knowledge sharing (t= 2,623 ; p= 0,002)
OA / Speed	=	0,199 Shared vision (t= 3,190 ; p= 0,000) 0,186 Learning engagement (t= 2,521 ; p= 0,001)
OA / Flexibility	=	0,288 Shared vision (t= 3,901 ; p= 0,003)

H_7: OA & OP. (Agility on Performance)

The overall regression model shows that 12.3% of "Financial Performance" is explained by OA (response to change, reactivity and speed) and 3.5% is explained by flexibility.

Table 7: Results of Agility on Financial Performance

OP/ Financial Performance	=	0,314 Responsiveness (t= 5,846 ; p= 0,000) + 0,115 Response to change (t= 2,147 ; p= 0,033) = 0,113 Speed (t= 2,112 ; p= 0,036)
OP/ Financial Performance	=	0,186 Flexibility (t= 3,216 ; p= 0,001)

This regression model corresponds to a significant relationship, as the Fisher tests are satisfactory (F=14.234; p=0.000; F=10.339; p=0.001). The regression results also show that OA (responsiveness to change, responsiveness, and speed) explains 11.1% of the "Commercial Performance", and flexibility explains 1.8%. Both Fisher tests show significant relationships (F=12.503; p=0.000; F=5.329; p=0.022).

Table 8: Results of Agility on Commercial Performance

OP/ Commercial Performance	=	0,148 Responsiveness (t= 2,742 ; p= 0,006) + 0,188 Response to change (t= 3,477 ; p= 0,001) = 0,237 Speed (t= 4,374 ; p= 0,000)
OP/ Commercial Performance	=	0,135 Flexibility (t= 2,308 ; p= 0,022)

All of these results allowed us to confirm our hypothesis that OA has a positive impact on OP.

H_8: OC & OP. (Creativity on Performance)

OC significantly explains 6.4% of "Commercial Performance" (F=10.424; p=0.000) and 4.4% of "Financial Performance" (F=6.959; p=0.001). In verifying the significance of the regression parameters, we eliminated the constants and Betas related to OC based on "New ideas and Problem-solving" due to their lack of significance (probability of error greater than the threshold). OC based on "New methods and Achievement of objectives" has a positive impact on performance. Thus, our hypothesis was confirmed.

Table 9: Results of Creativity on Performance

OP/Commercial Performance	=	0,251 OC/ New methods and Achievement of objectives (t= 4,537 ; p= 0,000)
OP/Financial Performance	=	0,197 OC/ New methods and Achievement of objectives (t= 3,519 ; p= 0,000)

H_9: OL & OP. (Learning on Performance)

The regression results show an R-squared value of 0.128 for "Commercial Performance" and 0.097 for "Financial Performance". Therefore, the OL explains 12.8% of Commercial Performance and 9.7% of Financial Performance. These regression relationships are significant, as the Fisher tests are satisfactory (F=39.261; p=0.000 and F=17.319; p=0.000).

The equations presented below confirm our hypothesis regarding the positive impact of the OL on the OP.

Table 10: Results of Learning on Performance

OP/Commercial Performance	=	0,236 Shared vision (t= 4,399 ; p= 0,000)
	+	0,191 Learning engagement (t= 3,427 ; p= 0,000)
	+	0,165 Open-mindedness & Knowledge sharing (t= 2,86 ; p=0,000)
OP/Financial Performance	=	0,218 Shared vision (t= 3,387 ; p= 0,000)
	+	0,129 Learning engagement (t= 2,626 ; p= 0,001)
	+	0,112 Open-mindedness & Knowledge sharing (t= 2,431 ; p= 0,004)

4.3 Discussion of results

Based on the research results, the nine hypotheses initially formulated were confirmed. The OA, OC and OL positively influence OP. The intertwined relationships between these three dynamic capabilities showing positive impacts have been verified. These results are consistent with theoretical and empirical studies, highlighting the determining nature of DC in general and of agility, creativity, and organizational learning in particular.

Many authors consider OC to be an essential resource for success (Akan, 2023). In creative industries, the growth of firm is particularly influenced by creativity because it relies heavily on creativity to gain initial market success (Gao and al., 2021). For Cui (2025), OC that highlights its role in fostering innovative approaches to digital initiatives and OA that suggests that agile practices enable firms to adapt quickly to changes and uncertainties were found to have a direct and positive impact on OP. Olszewski (2023) demonstrated how agility in project management can foster creativity within work teams and he developed a framework to enhance creativity in agile teams.

According to Azizi (2017, p.164), the results of his study on insurance companies "showed that there is a positive relationship between OL and its four dimensions (management commitment, vision systems, open space, and experimentation, transfer and integration of knowledge) and BP".

5 Conclusion

Our study offers a fresh perspective on the bidirectional or intertwined relationships between OA, OC, and OL on the one hand, and on the relationships between these three dynamic capabilities and OP on the other hand. These findings enrich the approach to organizational agility with two essential and embedded components that broaden its range of outputs and enhance its performance. Our empirical results support the nine initial hypotheses. These results align with previous theoretical and empirical studies by highlighting the crucial role of dynamic capabilities in general and of OA, OC, and OL in particular. Furthermore, we have verified and measured the bidirectional impacts of OA & OC, OA & OL, and OC & OL.

These positive relationships suggest that, to optimize performance, a company must jointly develop its creative, agile, and two-way learning capabilities. More precisely, the more agile the OC and OL, the more agility they generate. OA, in turn, strengthens both the OC and OL. Finally, the results show that company performance is positively affected by dynamic capabilities such as those of the OA, OC and OL. In this respect, our work stands out among the few existing studies that highlight these positive bidirectional relationships, such as dynamic feedback loops.

While the DC perspective posits that a company's success is based on its judicious mobilization and reconfiguration, the agility perspective supports the idea that a company's prosperity in a turbulent and uncertain environment is based on its agility, characterized by an ability to react and respond to changes quickly and flexibly while continuing to satisfy customers and strive to achieve organizational goals. When OA is combined with OC and OL, as dynamic capabilities, intertwined or overlapping positive effects can occur, contributing to superior OP.

Our research has the limitation of not sufficiently considering the moderation and alignment relationships that may exist between all the variables studied. Furthermore, it should be noted that we have excluded other concepts or DC that could establish closer links within the model and, consequently, deepen our understanding of the problem and our analysis. In particular, the concepts of technological and managerial innovation could be introduced into the model to examine the resulting relationships. Future research avenues can be explored in light of these limitations, allowing for a further refinement of double-loop dynamic synergies to highlight the managerial processes that optimize functional, strategic, structural, and technological interfaces.

Declaration of Competing Interests

The authors declare that they are not aware of any competing financial interests or personal relationships that may have influenced the work described in this document.

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Ethical considerations

The article followed all ethical standards appropriate for this kind of research.

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