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# DRIVERS OF SME COMPETITIVENESS WITHIN CLUSTERS: A CONFIRMATORY ANALYSIS OF INNOVATION, PUBLIC INCENTIVES, AND GOVERNANCE PRACTICES

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## ABSTRACT

*In a context marked by the widespread adoption of cluster policies as major instruments of territorial competitiveness, assessing their actual impact on small and medium-sized enterprises (SMEs) remains a debated issue in the literature (Porter, 2003; Ketels & Protsiv, 2023). Prior studies highlight the difficulty of capturing competitiveness through predominantly latent variables, as well as the strong dominance of exploratory approaches, particularly in emerging economies (Audretsch & Belitski, 2022). In response to these limitations, this article investigates the following research question: does cluster membership exert a significant impact on the competitiveness of Moroccan SMEs? The study adopts a mixed-methods methodological framework grounded in critical realism (Bhaskar, 2017). An initial qualitative exploratory phase was conducted to contextualize the conceptual model, validate the latent constructs derived from the literature, and adapt measurement indicators to the empirical setting, following the methodological recommendations of Miles and Huberman (2003). The quantitative phase follows a confirmatory approach aimed at testing the structural relationships among variables using structural equation modeling (SEM), a method widely recognized for analyzing complex constructs (Kline, 2015; Hair et al., 2022). The findings reveal a positive and statistically significant effect of cluster membership on SME competitiveness, measured through economic performance, mediated by three key mechanisms: public incentives, innovation and R&D activities, and governance and integrated managerial practices.*

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**KEYWORDS:** SME Competitiveness, Confirmatory Analysis, Innovation, Public Incentives, Governance Practices.

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## 1. INTRODUCTION

In a rapidly changing environment characterized by an increasing demand for innovation, firms now operate under the constant pressure of globalization. This context requires the simultaneous mobilization of tangible and intangible factors in order to deliver offerings aligned with fast-evolving market dynamics. Consequently, competitiveness can no longer be understood as an individual outcome based solely on firms' internal resources and capabilities. It has become a multidimensional phenomenon grounded in the interaction of multiple actors, institutional mechanisms, and collective dynamics, aimed at building a superior value proposition capable of competing in both local and international markets (Teece, 2018; Audretsch & Belitski, 2021; Delgado, Porter & Stern, 2023).

From this perspective, territory has progressively emerged as a key driver of firms' competitive renewal, contributing to the continuous upgrading of their adaptive capacities in the face of intensified competition and environmental uncertainty. Such challenges cannot generate sustainable outcomes without the presence of a structured territorial ecosystem that fosters knowledge diffusion, actor coordination, and the integration of innovation into firms' competitive offerings (Cooke, 2019 ; Asheim, Grillitsch & Trippel, 2020). This territorial logic is particularly critical for small and medium-sized enterprises (SMEs), whose development trajectories remain highly conditioned by access to collective resources, public support mechanisms, and place-based programs. These territorial instruments constitute sustainable levers enabling SMEs to enhance their resilience, innovation capacity, and competitive positioning relative to their counterparts (OECD, 2023 ; Stam & Van de Ven, 2021 ; Errajaoui & Nokairi, 2025).

In this context, many countries recognized for the effectiveness of their public intervention and industrial policies have, for several decades, oriented their development strategies toward territorially anchored models of competitiveness. Territorial ecosystems have thus become a central pillar of innovation and industrial transformation policies in technologically advanced economies such as Germany, Spain, the United States, Japan, and China (European Commission, 2020; World Bank, 2022; Ketels, 2024). These international experiences rely on the structuring of high-performing territorial networks that promote cooperation among firms, research institutions, and public authorities within highly competitive economic systems integrated into global value chains.

This observation opens new research perspectives aimed at questioning the actual impact of territorial ecosystems also referred to as clusters or networks of actors on SME competitiveness. Recent studies highlight that, despite the proliferation of cluster-based public policies, their observed effects remain heterogeneous and strongly dependent on the degree of territorial structuring, the intensity of inter-organizational interactions, and the quality of ecosystem governance (Spigel & Harrison, 2020 ; Audretsch, Cunningham & Kuratko, 2022). SMEs therefore expect these ecosystems to provide concrete mechanisms enabling not only improved economic performance, but also strengthened innovation capabilities, organizational resilience, and enhanced responsiveness to the growing demands of globalization, which increasingly favors firms able to comply with international standards related to innovation, digitalization, and managerial best practices.

Within this framework, the present paper aims to examine quantitatively and objectively the impact of membership in a structured territorial ecosystem on SME competitiveness. The analysis focuses on three key variables derived from the literature, considered today as structural factors whose effective development remains largely dependent on territorial support. This research is grounded in the Porterian perspective linking firm competitiveness to the quality of the local environment (Aharonson, Baum & Plunket, 2008; Baldwin & Okubo, 2006; Diallo, 2006; Dei Ottati, 2009; Wolff & Pett, 2006; Crampes & Encaoua, 2005; Molina-Morales & Martínez-Fernández, 2010; Feldman & Audretsch, 2004; Baptista & Swann, 1998; Saxenian, 1996; Feldman, 1994; Feldman & Florida, 1994; Porter, 1990). Accordingly, particular attention is devoted to clusters, regarded as the most widespread and institutionalized form of ecosystem worldwide for fostering firm competitiveness (Ketels & Protsiv, 2023).

The research problem is therefore articulated around the following questions : to what extent do territorial ecosystems contribute to structuring SMEs' access to strategic resources that foster innovation, facilitate access to public incentives, and support the integration of managerial best practices ? Furthermore, to what extent do these dynamics translate into measurable and sustained improvements in SME competitiveness ? (Delgado et al., 2023; OECD, 2023).

To address this research problem, the study adopts a confirmatory methodological approach grounded, on the one hand, in the epistemological

stance of critical realism (Bhaskar, 2017), and, on the other hand, in a mixed empirical design combining qualitative and quantitative methods. This approach aims to develop a robust conceptual model whose latent variables and measurement metrics emerge directly from the empirical field, in line with contemporary methodological standards in management research (Creswell & Plano Clark, 2018; Hair et al., 2022).

Accordingly, the article is structured into several complementary sections. The first section presents a comprehensive literature review addressing both the theoretical foundations and the main empirical contributions related to the research problem. The second section introduces the conceptual framework and formulates the research hypotheses. The third section outlines the adopted methodology, including epistemological positioning, data collection procedures, sampling strategy, and analytical techniques. The fourth section reports the empirical results of the study, while the fifth section is devoted to discussion, allowing the findings to be confronted with prior research. Finally, a general conclusion synthesizes the main contributions of the study and outlines directions for future research.

## 2. LITERATURE REVIEW

This literature review aims to examine the theoretical and empirical foundations linking firm competitiveness to its territorial embeddedness. It first mobilizes the main conceptual frameworks explaining how business ecosystems and Porter's Diamond model contribute to the creation of competitive advantage. It then reviews empirical studies analyzing the impact of territorial ecosystems on SME competitiveness. Particular attention is devoted to the effects of these ecosystems on innovation development, access to public incentives and subsidies, and the adoption of integrated governance practices.

### 2.1. Firm Competitiveness From A Territorial Perspective

#### A) The Business Ecosystems Model

The concept of the business ecosystem (BE) has evolved significantly over recent decades and has been widely popularized through the seminal contributions of several scholars (Moore, 1996 ; Iansiti & Levien, 2004; Teece, 2007; Isckia, 2006; Gueguen & Torrès, 2004; Pellegrin-Boucher & Gueguen, 2005; Ronteau, 2009). Rooted in the stream of inter-organizational network theory, the earliest theoretical foundations of the business ecosystem can be traced back to the pioneering work of Marshall

(1890).

Within this framework, Becattini (1989) revisited the Marshallian concept of industrial districts by moving beyond a narrow focus on agglomeration effects toward a broader analytical perspective incorporating social, cultural, and institutional dimensions influencing local economic development and industrial growth. Becattini's socio-economic approach (1978) emphasizes coordination mechanisms among production activities, highlighting how competitiveness increasingly emerges from integrated value chains supported by ecosystem-based mechanisms. The notion of ecosystem originally appeared within the natural sciences under the term *ecological ecosystem*, before being transposed into economic and managerial analysis.

As illustrated in Figure 1, a business ecosystem is composed of a diversity of actors, including core players, partners, suppliers, customers, regulators, competitors, innovators, shared infrastructure, and communities. Recent economic and management literature emphasizes that the structuring of industries into business ecosystems, along with the availability of infrastructure, skilled human capital, and geographic endowments, significantly affects the quality and performance of firms' activities (Eifert, Gelb & Ramachandran, 2005).

Within a business ecosystem, a firm should no longer be viewed as an isolated entity operating within a single industry, but rather as part of an interconnected and interactive system in which members share competencies and know-how to develop new products that respond to evolving customer needs, thereby co-evolving through innovation (Moore, 1993). From this perspective, a favorable business climate constitutes a key driver of economic growth and firm success. Accordingly, the ecosystem can be defined as a system of interactions among multiple actors organizations, competitors, institutions, and regulatory frameworks making it a necessary condition for fostering what Moore (1996) refers to as the *ecology of competition*, which in turn supports firms' capacity to survive and perform within their competitive environment. The business ecosystem is not a closed or self-contained structure (Torres-Blay, 2010). On the contrary, the dynamics of interaction among firms embedded within the same ecosystem stimulate both internal network development and collective expansion through continuous interaction with the external environment. In this regard, Moore (1996) argues that the organizational structure of a business ecosystem is characterized by its ability to explore new market

spaces, manage uncertainty, and mobilize heterogeneous resources. This evolving system of interactions opens new strategic opportunities for firms by blurring traditional boundaries between organizations, markets, and industries. It fosters the emergence of new opportunity spaces in which firms are encouraged to pool resources and competencies while jointly managing shared assets within the network (Prahalad & Ramaswamy, 2004).

### ***B) The Porter Diamond Model***

The growing interest in clusters does not imply that they represent a disruptive or entirely new discovery (Vicente, 2016). The origins of this concept can be traced back to the seminal writings of Marshall (1890). Nevertheless, the Porterian model remains the most widely adopted framework in the design and implementation of cluster development policies (Hamdouch, 2008). Until the 1980s, the industrial district model largely dominated economic geography.

From the 1990s onward, the Porterian cluster model gradually became predominant. The strong fascination with the economic dynamism of the United States directed scholarly and policy attention toward several regions that had successfully implemented cluster-based development models. During this period, multiple conceptual approaches to clusters emerged, notably Porter's Diamond Model (Porter, 1998) and the Cluster Green Book developed by Solvell, Lindqvist, and Ketels (2003). According to Chalaye and Massard (2009, p. 155), clusters may take diverse forms, including "industrial districts, technopoles, innovative milieus, regional innovation systems, local production systems (LPS), competitiveness poles, and economic or scientific clusters." As emphasized by Porter (2004, p. 207), a cluster is defined as "a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities."

Porter's definition suggests that clusters are not necessarily dedicated exclusively to innovation. Rather, they primarily aim to generate complementarities and synergies among actors, regardless of whether cooperation occurs in innovation-related activities or in other domains responding to firms' strategic needs.

According to Porter (1990), firms' competitive advantage depends on four interdependent determinants. First, it relies on the availability of specialized factors of production adapted to specific industrial requirements. Second, demand conditions play a critical role, not merely in terms of market size

but, more importantly, through the qualitative sophistication of domestic demand, which stimulates competition and innovation.

Third, the presence of specialized domestic suppliers and related industries is essential for providing inputs that support process innovation within industries. Finally, the nature of regional or national competitive rivalry significantly influences industrial performance. The more developed and intensive the interactions among these four strategic determinants, the higher the productivity and competitiveness of the firms concerned.

Within this framework, the Porter Diamond creates an environment conducive to the emergence and strengthening of competitive industrial clusters (Porter, 1990). Geographic proximity among firms enhances productivity, stimulates innovation, facilitates knowledge diffusion, and encourages new firm creation. As Porter (1998, p. 83) states, "In addition to enhancing productivity, clusters play a vital role in a company's ongoing ability to innovate. Some of the same characteristics that enhance current productivity have an even more dramatic effect on innovation and productivity growth."

Through his competitive diamond model, Porter emphasizes that the geographical concentration of rivals, customers, and suppliers significantly reinforces innovation dynamics and cluster competitiveness. He highlights the existence of internationally competitive activity hubs across different regions of the world referred to as clusters structured around four strategic determinants forming a mutually reinforcing "diamond" (Porter, 1990).

The Porter Diamond framework has enabled a more refined analysis of the factors influencing firm competitiveness by emphasizing clustering as a strategic mechanism that connects actors, encourages resource pooling, and enhances competitive advantage through agglomeration effects. These interactions often characterized by simultaneous cooperation and competition among a diverse set of actors such as firms, competitors, universities, and research laboratories lie at the core of firm performance, particularly in terms of innovation capacity. Porter's theory has generated extensive academic debate, leading to a wide range of definitions and interpretations of the cluster concept (Marceau, 1999; Peneder, 1999), as well as the emergence of multiple cluster typologies (Roelandt & Den Hertog, 1999).

Porter (1998, p. 78) defines clusters as "a geographic concentration of interconnected companies and institutions in a particular field,

linked by commonalities and complementarities.” His work synthesizes earlier contributions developed by Marshall (1890) on industrial districts and by Perroux (1955) on growth and development poles. In this regard, Retour (2009, p. 94) emphasizes that clusters represent “configurations characterized by diverse partners whose concentration is not necessarily driven by public labeling.” The emergence of a cluster often stems from the collective willingness of multiple actors including competitors to establish and sustain a relational system capable of enhancing firms’ efficiency, performance, and competitiveness.

Similarly, Belleflamme, Picard, and Thisse (2000) define clusters as a partial or total concentration of firms within a specific region that benefit from geographical proximity. Clusters are also viewed as “self-reinforcing systems that generate endogenous wealth” (De La Ville Fromoit & Copeau, 2010, p. 11). In this sense, clusters respond primarily to an economic logic of territorial development, whereas business ecosystems are grounded in a managerial logic oriented toward entrepreneurial development (Oruezabala, 2017).

Since the 1990s, several European countries have implemented public policies aimed at fostering the emergence of regional clusters (Salvador & Chorincas, 2006). While national approaches differ according to institutional and territorial contexts, several common characteristics can be identified. Public authorities generally play a strong incentive-based role, while actor support mechanisms are implemented in a manner that allows strategic objectives to be defined by ecosystem participants rather than imposed by public institutions.

Following this reasoning, Girardot (2004) emphasizes the importance of locally constructed resources derived from territorial specificities such as know-how and productive capabilities in addressing the challenges faced by local economic systems. This perspective moves beyond the traditional view of territory as a neutral space or a simple reservoir of physical resources. In the same vein, Cooke (2001) highlights both vertical and horizontal relationships within clusters, defining them as “geographically proximate firms in vertical and horizontal relationships involving a localized enterprise support infrastructure with a shared development vision for business growth, based on competition and cooperation in a specific market field” (p. 121).

From the perspective of analyzing the positive externalities generated by clusters in relation to SME competitiveness, the present study draws upon the aforementioned theoretical contributions to examine

the various analytical streams addressing the effects of structured territorial ecosystems on the enhancement of firm competitiveness.

## ***2.2. Analysis Of The Impact Of Ecosystems On SME Competitiveness***

The literature review undertaken in this study enabled the identification of a set of variables that may generate positive effects for firms participating in cluster-based ecosystems.

As depicted in Figure 2, the assessment of cluster impacts on firm competitiveness requires particular attention to the positive externalities arising from firms’ integration within clusters. Consequently, this framework is adopted to analyze the explanatory variables shaping firm competitiveness, an investigation situated at the third level of the proposed evaluation structure.

### ***a) Effects Of The Territorial Ecosystem On Innovation Development***

The concepts and practices of innovation management implemented within firms have undergone profound transformations over recent decades (Atour & Barbaroux, 2015). Numerous empirical studies conducted in the United States and Canada (Feldman & Audretsch, 1999; Canina, Enz & Harrison, 2005; Aharonson, Baum & Plunket, 2008; Pe’er & Keil, 2008), as well as in Europe (Baptista & Swann, 1998; Paci & Usai, 1999; Beaudry & Breschi, 2003; Van Beers & Van der Panne, 2006; Hervás-Oliver & Albors-Garrigos, 2009), have focused on analyzing the impact of clustering externalities on firms’ innovation performance. The economic environment has become increasingly dynamic and unpredictable, while competitive and strategic conditions have profoundly changed. This new configuration calls for renewed forms of inter-sectoral economic coordination, including localized groupings of heterogeneous organizations oriented toward a specific market, industry, or technological field.

In response to these constraints, firms are confronted with a major challenge innovation which has become a central driver of competitive advantage (O’Regan, Ghobadian & Sims, 2006). Innovation is widely regarded as the price firms must pay to the market in order to remain competitive (Kline & Rosenberg, 1986). However, this challenge is often constrained by limited financial resources (Levratto, 2009), as well as shortages in human and technological capital (Bianchi, Campodall’Orto, Frattini & Vercesi, 2010). These constraints weigh particularly heavily on SMEs, making the innovation

process difficult to sustain when pursued in isolation.

According to the doctoral research conducted by De Benedittis (2016) on the role of clusters in the diffusion and integration of new knowledge within member firms, clusters play a crucial role in enhancing innovation performance. In the same vein, Buzard, Carlino, Hunt, Carr, and Smit (2020) demonstrate that clusters facilitate the transfer of knowledge and technological spillovers among participating firms. Such dynamics positively affect the innovation output of actors located within cluster environments.

Furthermore, Chaudey and Dessertine (2018) highlight the positive impact of clusters on employment among firms involved in R&D projects within competitiveness clusters. Their findings validate the hypothesis of a positive effect of participation in collaborative R&D projects on employment performance. Nevertheless, the authors emphasize the relevance of extending analytical models to additional explanatory variables in order to avoid reducing cluster externalities solely to innovation and R&D activities. In a complementary quantitative study based on panel data from 2004 to 2010 using a difference-in-differences model, Dessertine (2014) confirms that clusters positively influence firm performance through participation in collaborative projects, which enhance both the quantity and quality of skilled R&D employment.

Other empirical contributions further support these findings. Mokhtari and Ettaibi (2021) demonstrate a positive impact of clusters on firms' innovation capacity. Similarly, Lusso (2017), through an exploratory multiple-case study of French video-game industry clusters, shows that clustering provides member firms with substantial advantages related to R&D activities and innovation projects. In the same line of research, Nassiki and Ahrouch (2020) confirm that clusters significantly contribute to strengthening firms' innovation performance.

Likewise, Bokov (2021) argues that clusters foster SME innovation performance by providing access to complementary resources and knowledge that compensate for firms' structural limitations. However, the author also stresses the importance of moving beyond an overly innovation-centric view of clusters. Indeed, Ducroquet and Chesnel (2017) point out that radical and open innovation strategies are not systematically pursued by small firms. Consequently, cluster effects should not be restricted exclusively to innovation as a central outcome. Rather, clusters must mobilize their mechanisms according to the heterogeneous characteristics and strategic needs of member firms.

Based on this empirical literature review, and in alignment with the theoretical foundations of the Porter Diamond Model and the resource-based view of the firm, this study formulates its first research hypothesis regarding the positive influence of innovation on SME competitiveness. Within a structured territorial ecosystem, innovation becomes more accessible to SMEs, as cluster membership facilitates knowledge sharing, resource pooling, and collaborative learning processes enabled by geographic and organizational agglomeration.

**H1 : The development of innovation resulting from cluster membership has a positive impact on the economic performance of SMEs.**

#### ***b) Effects Of The Territorial Ecosystem On Access To Incentive And Subsidy Schemes***

According to Chaudey and Dessertine (2018), clusters provide firms with a dynamic environment that facilitates access to direct public subsidies, particularly those related to the financing of innovation projects and R&D investments. Their findings confirm that firms belonging to clusters benefit from substantial financial support, enabling them to secure the resources necessary for growth and development.

In this regard, Buzard, Carlino, Hunt, Carr, and Smit (2020) report above-average performance among cluster-affiliated firms. This superior performance is largely attributed to public subsidies allocated to clusters in order to support R&D activities. Similarly, Dessertine (2014) argues that subsidies granted to cluster firms enable them to generate higher levels of employment compared to non-clustered firms.

Along the same lines, Engel, Mitze, Patuelli, and Reinkowski (2011), based on a quantitative empirical study, reveal a positive impact of cluster-related subsidies on beneficiary firms' performance. Their results indicate that clustered firms achieve higher R&D performance levels than firms operating outside such systems. This effect is mainly explained by the targeted public funding allocated to cluster members to enhance their competitiveness through R&D financing. Likewise, Lefevre (2016) identifies a significant positive effect of clusters on firm development, particularly for SMEs and start-ups, which benefit from privileged access to public funding schemes and financial support as a result of their cluster membership.

In the same vein, Czarnitzki, Ebersberger, and Fier (2007), as well as Cooke, Uranga, and Etzebarria (2007), emphasize that clusters provide firms with

substantial financial support derived from government subsidies aimed at concentrating public intervention within dynamic agglomerations. Consequently, cluster participation generates a positive impact on beneficiary firms' performance. Similarly, Montargot and Férérol (2016), based on a qualitative study, highlight the strategic importance of cluster membership due to its capacity to facilitate firms' access to subsidies and support funds, thereby enabling business expansion and improved market performance.

Furthermore, Hobad, Hobad, and Kabbouri (2022) conclude, following a qualitative investigation, that clusters represent systems requiring sustained public support in the form of subsidies in order to enhance their attractiveness and dynamism. Public authorities play a critical role in establishing incentive mechanisms that encourage actors to invest in cluster activities, thereby amplifying positive territorial externalities. However, several studies adopt a more critical stance, arguing that excessive reliance on public funding may generate dependency effects, with returns on public investment remaining below the level of financial support granted (Martin, Mayer & Mayneris, 2011). Moreover, Baldwin and Okubo (2006) observe that the most productive firms are more likely to locate within clusters to benefit from subsidies, which may disproportionately favor large firms.

These empirical findings are consistent with the theoretical implications of Porter's Diamond Model as well as transaction cost theory. Accordingly, they lead to the formulation of a second research hypothesis concerning the role of incentives and subsidies.

**H2 : Cluster membership has a positive impact on the economic performance of SMEs through access to incentive and subsidy schemes.**

**c) *Effects Of Clusters On The Development Of Governance And Integrated Practices***

Clusters constitute a mechanism through which firms can benefit from a wide range of structural advantages that exert a significant impact on their performance and, consequently, on their competitiveness. Governance represents one of the key levers underlying the strength and effectiveness of this form of territorial agglomeration.

Bokov (2021) demonstrates that clusters operate as governance systems combining multiple factors deployed in support of member firms, particularly fostering SME performance. In this regard, Nait-

Lachgar and Benmoussa (2020) confirm the positive impact of cluster governance practices on the performance of Moroccan firms. Similarly, Berthinier-Poncet (2012) shows that governance practices exert a positive influence on firms' innovation performance. From a comparable perspective, Achermann (2019), in his analysis of cluster policy in Russia, argues that clusters promote local governance processes characterized by strong institutional proximity, which facilitates the engagement of territorial actors around dynamic innovation-oriented projects.

In another line of research, Gautier (2015) highlights the role of clusters in supporting firms' adoption of good practices through labeling systems that facilitate market access, enhance visibility, and contribute to sectoral development. However, mistrust and excessive discretion among actors may hinder collective coordination around effective governance and integrated practices, thereby limiting the emergence of tangible performance outcomes. Conversely, Bocquet and Mothe (2015) confirm that cluster membership provides SMEs with a structured transformation roadmap through excellence labeling mechanisms. Such mechanisms foster the acquisition and integration of managerial best practices while reducing technological barriers for less advanced SMEs.

Similarly, Lai, Hsu, Lin, Chen, and Lin (2014), based on a quantitative study of 210 firms across three types of Taiwanese clusters operating in diversified sectors, demonstrate a positive correlation between cluster governance practices and firms' commercial performance. In contrast, Kaoud (2018) observes that public governance structures may negatively affect cluster firms due to bureaucratic rigidities that constrain organizational flexibility. Meanwhile, Cennamo, Marchesi, and Meyer (2020) argue that centralized governance structures help prevent ecosystem fragmentation. Transparent and coordinated governance systems are particularly effective in fostering trust among actors, especially within highly technological ecosystems where coordination increasingly relies on digital and intelligent platforms (Martino, Bellavitis, Vanacker & Filatotchev, 2024).

Based on these empirical findings, and in alignment with the theoretical foundations of Porter's Diamond Model and transaction cost theory, this study formulates a third research hypothesis concerning the role of governance and integrated practices in enhancing SME performance.

**H3 : The integration of best practices resulting from cluster-led actions has a positive impact**

on the economic performance of SMEs.

### 3. CONCEPTUAL MODEL

The literature highlights the difficulty of examining firm competitiveness independently from its external environment. Indeed, the analysis of competitiveness cannot be dissociated from the territorial dynamics within which organizations operate, which justifies the growing interest in studying exogenous drivers originating from cluster-based ecosystems. From this perspective, competitiveness emerges as a multidimensional construct materializing through firm performance and its capacity to sustainably and continuously improve economic indicators (Salabert-Céré, 2001 ; Rabet & Callot, 2006).

In the same vein, Mokhtari and Ettaibi (2021) emphasize the need to develop quantitative studies mobilizing more comprehensive analytical models in order to examine the impact of cluster-generated externalities on firm competitiveness, particularly within the Moroccan context. Similarly, Dana and Granata (2013) stress the relevance of quantitative approaches capable of objectively assessing the effects of cluster membership on the performance of participating firms. Several empirical contributions have also highlighted the potential benefits firms may derive from cluster participation especially SMEs while calling for future research grounded in confirmatory frameworks aimed at rigorously measuring the economic and competitive outcomes of territorial support mechanisms (Loufrani-Fedida & Saint-Germes, 2015; Lusso, 2017).

Moreover, part of the existing research conducted in the Moroccan context has primarily focused on organizational performance, leaving a research gap concerning the analysis of competitiveness through economic performance indicators. This observation opens avenues for the development of research models integrating multiple explanatory variables derived from the territorial ecosystem (Nassiki & Ahrouch, 2020; El Waatmani & Makhtari, 2021; Chahbouni & Eddelani, 2023). In the present study, economic performance is therefore retained as the central metric for assessing the impact of clusters on firm competitiveness. This choice is justified both by theoretical foundations and by the methodological orientations emerging from prior empirical research. Although performance retains conceptual autonomy and may be mobilized across various disciplinary fields, it remains a privileged theoretical and empirical reference for analyzing firm competitiveness.

The figure 3 presents the conceptual architecture

of the research model developed from the literature review. The three exogenous variables are conceptualized as key structuring mechanisms of the territorial ecosystem and are hypothesized to exert a positive effect on the competitiveness of cluster-affiliated firms. The model is based on latent constructs that cannot be directly observed or measured through objective indicators. Their operationalization therefore requires the specification of appropriate measurement items derived from the empirical context. This step ensures the contextual grounding of the theoretical model and the alignment of the selected measurement scales with the characteristics of the study setting, thereby strengthening the conceptual consistency and empirical validity of the analytical framework.

### 4. RESEARCH METHODOLOGY

#### 4.1. Epistemological Positioning

This research adopts an epistemological positioning grounded in critical realism, also referred to as a form of moderate positivism embedded within a moderated hypothetico-deductive logic. This stance assumes that social reality exists independently of the researcher, while its observable manifestations vary according to analytical and contextual conditions (Bhaskar, 2017). Critical realism thus postulates the existence of underlying structures and generative mechanisms whose effects differ across spatial, temporal, and institutional configurations (Collier, 1994 ; Archer et al., 1998).

Several recent studies emphasize the relevance of critical realism for analyzing complex organizational and territorial phenomena, particularly innovation ecosystems and cluster-based systems characterized by non-linear and context-dependent causal relationships (Easton, 2021 ; Ryan et al., 2021; Fletcher, 2022). This framework enables researchers to move beyond the positivism-interpretivism divide by explaining not only observable outcomes, but also the mechanisms through which they emerge.

Critical realism is especially suited to the study of territorial ecosystems, where interactions among firms, institutions, and public policies generate effects that are often latent and unevenly observable (Byrne, 2018; Sayer, 2022). Recent contributions in regional development and cluster policy research explicitly recommend this approach to capture governance mechanisms, institutional proximity, and collective externalities shaping firm competitiveness (Grillitsch & Trippel, 2021; Ketels & Protsiv, 2023).

Accordingly, this epistemological positioning supports the adoption of a mixed-methods design



based on triangulation, which is particularly appropriate for the construction and operationalization of latent variables and for confirmatory analyses using structural equation modeling (Hair et al., 2022; Saunders, Lewis & Thornhill, 2023). Overall, critical realism provides a coherent foundation for integrating theory, empirical evidence, and contextual specificities within the Moroccan territorial setting.

#### **4.2. Sampling Strategy**

The population of this study comprises clusters operating in accordance with the definition established by the Moroccan Ministry of Industry and Trade, while the unit of analysis focuses on SMEs affiliated with these clusters.

To ensure conceptual coherence, the scope of the research was deliberately restricted to a single form of territorial ecosystem, thereby avoiding analytical bias resulting from heterogeneous and non-comparable ecosystem configurations. Nevertheless, in line with prior literature, the sample was constructed from clusters belonging to different sectors in order to enhance the robustness and generalizability of the findings (see Table 1).

Given the heterogeneous structure of the population and the unequal size of clusters in terms of SME membership, a stratified probabilistic sampling design was adopted. This approach is particularly appropriate when significant variations exist across subpopulations, as it improves estimation precision and reduces sampling error compared to simple random sampling (Cochran, 1977 ; Kalton, 1983 ; Lohr, 2010). Each cluster constituted a stratum, and proportional allocation was applied based on the number of SMEs within each cluster.

The required sample size was determined using a standard statistical formula assuming a normal population distribution, with a 95% confidence level ( $z = 1.96$ ), a margin of error of 5%, and an estimated proportion of 50%. The initial sample size of 251 SMEs was increased by 10% to account for potential non-response bias, resulting in a final sample of **276 SMEs** (as shown in Table 2). This sampling strategy ensures adequate representation of all clusters included in the study and strengthens the reliability, validity, and generalizability of the empirical results.

#### **4.3. Data Collection Process**

In line with the epistemological positioning of critical realism and the mixed-method research design adopted in this study, data collection was conducted through a three-phase sequential process,

combining qualitative exploration and quantitative confirmation.

#### **Phase 1 : Exploratory Qualitative Stage**

The first phase relied on a qualitative approach aimed at exploring the empirical field in depth. This stage made it possible to identify and quantify key actors within Moroccan clusters, to establish an accurate mapping of affiliated SMEs, and to validate the relevance of variables derived from the literature. Qualitative inquiry constitutes a particularly suitable strategy for investigating complex and multidimensional phenomena, as it enables a contextualized understanding of social mechanisms through actors' perceptions, interactions, and lived experiences (Miles & Huberman, 2003).

Initial interviews were conducted on-site within cluster premises. However, due to the geographical dispersion of respondents and constraints related to their availability, greater flexibility was introduced by offering multiple interview formats, including face-to-face meetings, videoconferencing, and telephone interviews, depending on respondents' preferences and locations. This flexibility facilitated access to key informants while preserving the depth and consistency of the qualitative data collected.

#### **Phase 2: Contextualization And Validation Of Measurement Indicators**

Following the validation of the conceptual variables identified during the exploratory phase, the second stage focused on the contextualization of measurement indicators prior to launching the confirmatory analysis. A preliminary version of the questionnaire was developed and administered to a pilot sample of twenty SMEs affiliated with selected clusters. This pretest aimed to assess the clarity, relevance, and contextual adequacy of the proposed indicators.

Feedback obtained during this phase led to minor adjustments to the questionnaire, thereby strengthening both the conceptual model and the measurement instrument. This step was particularly important given the ambiguity surrounding the assessment of cluster effects on firms' performance. Previous studies highlight the limitations of purely quantitative indicators when cluster outcomes are not immediately observable (Bocquet & Mothe, 2009). Moreover, in emerging contexts such as Morocco, the absence of standardized measurement frameworks reinforces the necessity of validating indicators through empirical grounding (Bokov, 2021).

Several authors have also emphasized that

traditional innovation indicators such as R&D projects or patent counts are often poorly suited to SMEs' realities and insufficient to capture the actual impact of clusters (Bocquet et al., 2009; El Waatmani & Makhtari, 2018). Consequently, this study adopts a broader perspective by integrating indicators related to economic performance, including productivity, turnover growth, value added, employment creation, and market expansion.

### ***Phase 3: Quantitative Confirmatory Stage***

After incorporating feedback from the exploratory phase, the finalized questionnaire was distributed to a database of 720 SMEs corresponding to the target sample. The use of a structured questionnaire is consistent, first, with the methodological requirements of the adopted epistemological framework, and second, with the research objective of testing and explaining causal relationships between exogenous variables and SMEs' competitiveness.

Furthermore, given the lack of accessible and reliable secondary databases in the Moroccan context particularly longitudinal firm-level data the questionnaire represented the most appropriate instrument for collecting primary quantitative data necessary for the confirmatory analysis.

### ***4.4. Data Processing Techniques***

In this study, a confirmatory quantitative approach was adopted to test theory-driven hypotheses derived from the literature and to assess their empirical validity within the Moroccan context. Confirmatory analysis enables the examination of the degree of consistency between observed data and the hypothesized theoretical structure, while reducing model overfitting biases commonly associated with exploratory procedures (Kline, 2015; Brown, 2015). However, given the complexity of territorial ecosystems and the multidimensional nature of SME competitiveness, the conceptual model required preliminary contextualization prior to empirical testing (see figure 4).

Accordingly, an exploratory qualitative phase was conducted upstream to adapt theoretical constructs to field realities, validate the relevance of the selected variables, and identify the mechanisms effectively activated within clusters. This phase was based on semi-structured interviews conducted with representatives of 17 operational clusters. The qualitative findings supported the operationalization of latent constructs and the contextual refinement of measurement indicators grounded in stakeholders' perceptions (see table 3).

The quantitative phase followed a two-step analytical procedure. First, a confirmatory factor analysis (CFA) was performed to assess the reliability and validity of the measurement model. This step involved examining factor loadings, internal consistency, convergent validity, and discriminant validity of the latent constructs. Only indicators meeting recommended statistical thresholds were retained for subsequent analysis.

Second, a structural equation modeling (SEM) approach was implemented to test the hypothesized causal relationships between exogenous variables and SME competitiveness. SEM was selected due to its ability to simultaneously estimate complex structural relationships among latent variables while accounting for measurement error. This method is particularly suitable when constructs are not directly observable and when objective longitudinal data are unavailable (Berthinier-Poncet, 2012; Lusso, 2017; Mejri, 2017; Chaudey & Dessertine, 2018).

The confirmatory analysis was conducted on a final sample of 110 SMEs, presenting a response rate deemed statistically adequate relative to the initial sample size (see table 4). This sequential CFA-SEM procedure ensured the robustness of the measurement model and the reliability of the structural results, thereby strengthening the internal validity of the empirical findings.

## **5. PRESENTATION OF RESULTS**

### ***5.1. Analysis Of Internal Consistency Of Constructs***

The evaluation of internal consistency represents a fundamental step in ensuring the reliability and construct validity of the measurement scales employed in this study. The analysis was conducted on a final sample of 110 firms, following a preliminary exploratory phase involving 20 companies that enabled the refinement and purification of measurement items. Internal consistency and reliability were assessed using multiple complementary indicators, including Cronbach's alpha and composite reliability (CR). Convergent validity was examined through average variance extracted (AVE) values, while item quality was evaluated based on standardized factor loadings and the proportion of explained variance. The combined use of these indicators ensures a robust assessment of the psychometric properties of the latent constructs prior to structural model estimation.

As presented in table 5, the results indicate a high overall reliability of the measurement scales employed in the study. For the variable *access to incentive and subsidy schemes*, the explained variance

reaches 75.846%, with a Cronbach's alpha of 0.919, reflecting excellent internal consistency. The *innovation and R&D development* dimension exhibits an explained variance of 85.357%, confirming the strong contribution of its items to the measurement of the construct. Regarding the *governance and integrated practices* variable, the findings reveal an explained variance of 82.738% and a Cronbach's alpha of 0.930, attesting to the robustness of the scale. Finally, the dependent variable *firm economic performance* displays particularly high reliability levels, with an explained variance of 92.927% and a Cronbach's alpha of 0.981. Overall, these results confirm the strong psychometric properties of the measurement scales and their ability to consistently capture the theoretical dimensions of the proposed model.

## 5.2. Model Validity

The analysis of model validity, presented in the corresponding table 6, makes it possible to assess the psychometric quality of the constructs employed in this study through several widely recognized indicators. The results related to internal reliability, measured using Composite Reliability (CR), reveal values well above the recommended threshold of 0.70 for all variables. By way of illustration, the *innovation* construct reports a CR of 0.958, while *economic performance* reaches a particularly high level of 0.981, thereby confirming the strong internal consistency of the measurement scales.

Furthermore, the assessment of convergent validity using the Average Variance Extracted (AVE) reveals values consistently exceeding the recommended threshold of 0.50, indicating that each construct explains more than half of the variance of its indicators. The economic performance construct, with an AVE of 0.910, demonstrates a remarkable capacity to capture variance associated with its measurement dimensions. The analysis of inter-construct correlations also highlights positive and statistically significant relationships, with coefficients ranging from 0.514 to 0.903. These findings reflect strong theoretical coherence within the model, particularly the pronounced relationship between incentives and innovation, characterized by a correlation coefficient of 0.730. Similarly, the governance and integrated practices variable exhibits significant correlations with all model dimensions, underscoring its structuring role as an externality influencing the transformation of firms' capabilities, competencies, and performance outcomes. Finally, the economic performance variable displays high correlation levels with the other constructs,

confirming its relevance as the central endogenous variable within the conceptual model.

## 5.3. Estimation Du Modèle

The results derived from the estimation of the structural model allow for a clear assessment of the proposed research hypotheses. Regarding Hypothesis H1, which postulates a positive effect of access to incentive and subsidy schemes on SME competitiveness, the findings confirm this relationship, as the estimated coefficient is positive and statistically significant ( $\beta = 0.228$ ;  $p < 0.001$ ). This empirical validation indicates that public support mechanisms constitute a key lever through which clusters contribute to enhancing the economic performance of member firms (table 7).

Hypothesis H2, relating to the impact of innovation development and research and development activities on SME competitiveness, is also strongly supported. The coefficient associated with this variable ( $\beta = 1.000$ ;  $p < 0.001$ ) reveals that innovation represents the most structuring mechanism through which the cluster environment fosters value creation and strengthens firms' competitive positioning.

Finally, the results validate Hypothesis H3, according to which the development of governance structures and the integration of managerial best practices exert a positive effect on SME competitiveness. The estimated coefficient ( $\beta = 0.438$ ;  $p < 0.001$ ) highlights the central role of coordination, steering, and support mechanisms implemented within clusters in achieving sustainable improvements in economic performance.

Overall, the simultaneous validation of hypotheses H1, H2, and H3 confirms the relevance of the proposed conceptual model and demonstrates that the impact of clusters on SME competitiveness operates through complementary institutional, technological, and organizational levers.

## 5.4. Qualité D'ajustement Du Modèle

The following table summarizes the validity indicators of the estimated model. First, the coefficient of determination ( $R^2$ ) exhibits a very high value of 0.874, indicating that the model explains 87.4% of the variance in SMEs' economic performance. This result is highly satisfactory and demonstrates that the model's explanatory variables constitute major determinants of the phenomenon under investigation (see table 8).

With regard to the absolute fit indices, the results appear more mixed. The Goodness of Fit Index (GFI) reaches a value of 0.70, which remains close to the

recommended threshold of 0.90. However, the Standardized Root Mean Square Residual (SRMR) of 0.07 is below the accepted cutoff value of 0.08, indicating a satisfactory model fit. In contrast, the Root Mean Square Error of Approximation (RMSEA) of 0.110 exceeds the recommended threshold of 0.08, suggesting a relatively weak fit of the model to the observed data. Concerning the incremental fit indices, the results are more satisfactory. The Normed Fit Index (NFI) reaches 0.80, which is close to the recommended threshold of 0.90 and indicates an acceptable fit. Moreover, both the Tucker-Lewis Index (TLI) and the Comparative Fit Index (CFI) attain the recommended cutoff value of 0.90, providing evidence of a good incremental fit of the model.

Finally, the parsimony fit indices yield conclusive results. The normed chi-square ratio ( $\chi^2/\text{df} = 2.312$ ) is below the threshold of 3, confirming an acceptable overall model fit. In addition, the Akaike Information Criterion (AIC = 1677.709) and the Consistent Akaike Information Criterion (CAIC = 2095.863) present relatively low values, indicating a satisfactory parsimonious fit. Overall, the assessment of model validity indices reveals mixed results. While the coefficient of determination ( $R^2$ ) is exceptionally high, some absolute and incremental fit indices point to a moderate model fit. Nevertheless, the satisfactory parsimony indices support the relevance of the proposed conceptual model for analyzing the impact of cluster-generated externalities on SMEs' economic performance.

## 6. DISCUSSIONS

The results derived from the confirmatory quantitative analysis provide a structured empirical insight into the mechanisms through which clusters influence SME competitiveness, as measured by their economic performance. The estimation of the structural model confirms that the impact of clusters does not operate automatically, but rather results from the activation of specific levers related to institutional, technological, and organizational dimensions. This interpretation aligns with recent territorial ecosystem approaches, which conceptualize clusters as intermediary devices transforming collective resources into competitive advantages for firms (Audretsch & Belitski, 2022; Stam & Van de Ven, 2024).

First, the findings confirm a positive and significant effect of access to incentive and subsidy schemes on SMEs' economic performance. This relationship converges with recent studies by Chiappini (2022) and Cirera, Maloney, and Manresa

(2023), which demonstrate that public support instruments play a critical role in alleviating financial constraints faced by SMEs and in strengthening their investment capacity. However, several studies emphasize that the effectiveness of subsidies remains contingent upon institutional quality. In this regard, Mazzucato and Collington (2023) show that incentive-based policies generate differentiated economic outcomes depending on the precision of their targeting and their alignment with firms' actual needs. This observation helps explain the moderate magnitude of the estimated coefficient in our model, suggesting that incentives represent a necessary but not sufficient lever of competitiveness.

With respect to innovation and research and development activities, the results indicate that this dimension exerts the strongest explanatory effect on economic performance. This finding strongly supports recent empirical evidence identifying innovation as the primary driver of competitiveness for SMEs embedded in collaborative ecosystems (Almansoori et al., 2024; OECD, 2023). Several studies using similar confirmatory approaches report that clusters enhance innovation through intensified interactions, shared infrastructures, and knowledge diffusion mechanisms (Delgado, Porter & Stern, 2023). Nevertheless, recent literature nuances this relationship by highlighting that the impact of innovation on performance depends heavily on the nature of R&D investments and firms' absorptive capacity, which explains performance disparities between mature and emerging territorial contexts (Hausman, 2022).

Moreover, the positive and significant effect of governance and integrated practices on economic performance confirms the central role of organizational mechanisms in cluster success. These results are consistent with the conclusions of Bouncken, Kraus, and Martínez-Pérez (2022), who demonstrate that governance quality conditions a cluster's ability to transform collective resources into tangible economic outcomes. Similarly, Ketels and Protsiv (2023) emphasize that clusters supported by professional management structures and clearly defined steering mechanisms exhibit superior performance compared to those relying on informal coordination. The present confirmatory analysis therefore reinforces the view that governance constitutes a major organizational externality, acting as a catalyst for the effectiveness of other cluster levers.

The findings further highlight the complementarity among the three explanatory variables. Public incentives facilitate investment,

innovation drives value creation, and governance ensures coordination and sustainability of the process. This systemic logic is consistent with recent research on entrepreneurial ecosystems, which emphasizes interdependence among factors rather than isolated effects (Stam & Van de Ven, 2024; Autio et al., 2023). Accordingly, competitiveness measured through economic performance emerges as the outcome of interconnected mechanisms rather than the result of a single dominant variable.

Nevertheless, certain divergences appear when compared with studies conducted in more advanced contexts. Recent research in Germany and the United States reports stronger effects of public incentives and innovation on financial performance, largely due to the availability of longitudinal datasets and more stable institutional frameworks (Fritsch & Wyrwich, 2022; Buzard et al., 2023). Conversely, in emerging economies, the literature highlights how institutional instability and limited territorial maturity constrain the conversion of cluster externalities into immediate economic gains (World Bank, 2024). These structural differences help explain the gaps observed between international findings and the results obtained in the present study.

Overall, the confirmatory quantitative analysis validates the hypothesis that cluster membership exerts a positive and significant impact on SME competitiveness, provided that incentive-related, innovation-based, and governance-driven externalities are effectively mobilized. The findings corroborate recent theoretical and empirical contributions while emphasizing the necessity of a contextualized interpretation of cluster effects. They demonstrate that SMEs' economic performance depends not merely on the existence of a cluster, but on its capacity to sustainably activate institutional, technological, and organizational levers aligned with contemporary competitiveness requirements.

## 7. CONCLUSION

This research aimed to address the following central question: *Does cluster membership have a significant impact on the competitiveness of Moroccan SMEs?* To provide a scientifically grounded answer, the study adopted a mixed-method research design anchored in critical realism. This epistemological positioning made it possible to transcend the traditional divide between positivist and interpretivist approaches by acknowledging the existence of underlying real mechanisms whose effects depend on the contextual conditions of their activation (Bhaskar, 2017).

The use of a mixed-method approach based on

transduction enabled continuous iterative movements between theory and empirical evidence, thereby facilitating the contextualization of the conceptual model and the operationalization of latent variables that are inherently difficult to observe. This methodological stance responds directly to limitations identified in prior research, often criticized for being either strictly exploratory or excessively deductive with limited contextual grounding (Audretsch & Belitski, 2022; Stam & Van de Ven, 2024).

The findings of the confirmatory quantitative analysis clearly demonstrate that cluster membership exerts a positive and significant effect on the competitiveness of Moroccan SMEs, measured through their economic performance. This impact operates primarily through three complementary levers: access to incentives and subsidies, innovation and research and development activities, and governance along with the integration of managerial best practices. These results are consistent with recent evidence suggesting that clusters function as intermediary mechanisms capable of transforming territorial resources into firm-level competitive advantages (OECD, 2023; World Bank, 2024).

From a methodological perspective, this research offers an important contribution by proposing an alternative to radical quantitative methods widely applied in European and North American contexts such as difference-in-differences or matching models which are often impractical in emerging economies due to the lack of reliable longitudinal data (Fritsch & Wyrwich, 2022; Delgado, Porter & Stern, 2023). The use of structural equation modeling thus provides an appropriate framework for estimating causal relationships among latent constructs while accounting for the complexity of the phenomenon under investigation.

Empirically, the study fills a significant gap in Moroccan and North African literature, which remains largely dominated by descriptive or qualitative research (Mokhtari & Ettaibi, 2021; Boustane, 2023). The validated model represents one of the first confirmatory attempts to simultaneously assess multiple cluster externalities and their combined effect on SMEs' economic performance, thereby moving beyond fragmented approaches focused exclusively on innovation.

At the theoretical level, the research contributes to enhancing conceptual clarity surrounding clusters by embedding them within an integrated ecosystem perspective. In particular, it operationalizes Porter's Diamond Model frequently criticized for its lack of empirically measurable indicators (Ketels & Protsiv,

2023) through a testable factorial structure adapted to the Moroccan context. This contribution helps clarify the interrelationships between territory, firms, and competitiveness.

The managerial implications of the study are equally significant. The findings highlight the need for public policymakers and cluster governance bodies to strengthen coherence between incentive policies, innovation-support mechanisms, and governance frameworks. They demonstrate that SME competitiveness does not arise mechanically from cluster membership itself, but rather from the cluster's capacity to activate these levers in a coordinated and sustainable manner, as emphasized in recent analyses of cluster policy performance (Mazzucato & Collington, 2023).

Despite these contributions, certain limitations should be acknowledged. The cross-sectional nature of the data does not allow for an assessment of the temporal dynamics of competitiveness, a limitation frequently emphasized in recent literature (Audretsch et al., 2024). In addition, although grounded in a robust confirmatory approach, the study relies on self-reported data, which remains a

common constraint in territorial ecosystem research (Ketels & Protsiv, 2023).

These limitations open promising avenues for future research, including the use of longitudinal analyses, interregional comparisons, or quasi-experimental designs aimed at strengthening causal inference. They also invite extensions of the proposed model through complementary studies focused on additional strategic variables, within a cumulative scientific research logic.

In conclusion, this study provides a clear empirical answer to the initial research question: cluster membership has a significant impact on the competitiveness of Moroccan SMEs, provided that public incentives, innovation activities, and governance mechanisms are effectively mobilized. By combining methodological rigor, empirical contextualization, and a critical engagement with the literature, this research contributes to advancing the understanding of territorial competitiveness mechanisms in emerging economies and paves the way for more effective and better-targeted cluster policies.

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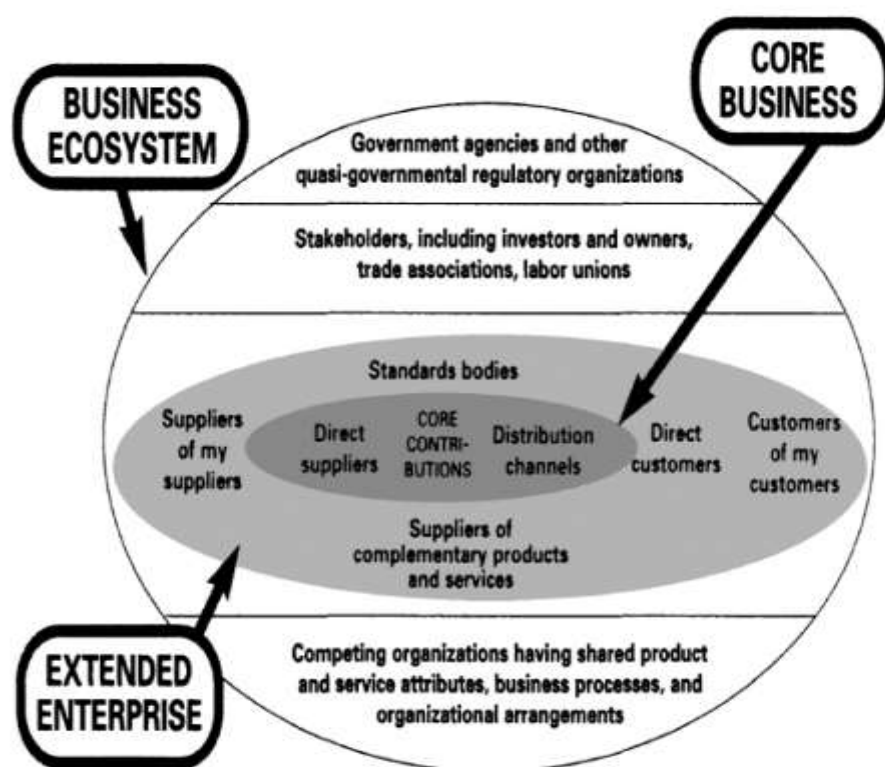


Figure 1 : Illustration Of The Business Ecosystem According To Moore (1996).

Source : Moore (1996, P.20).

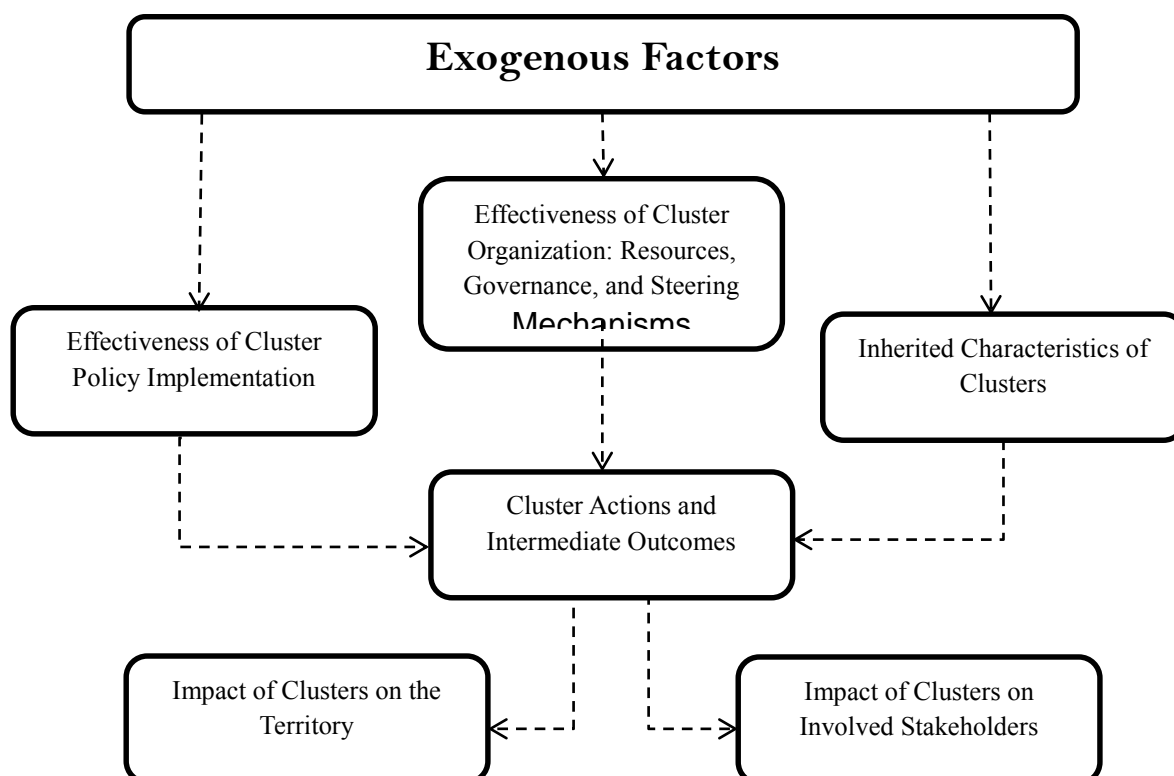
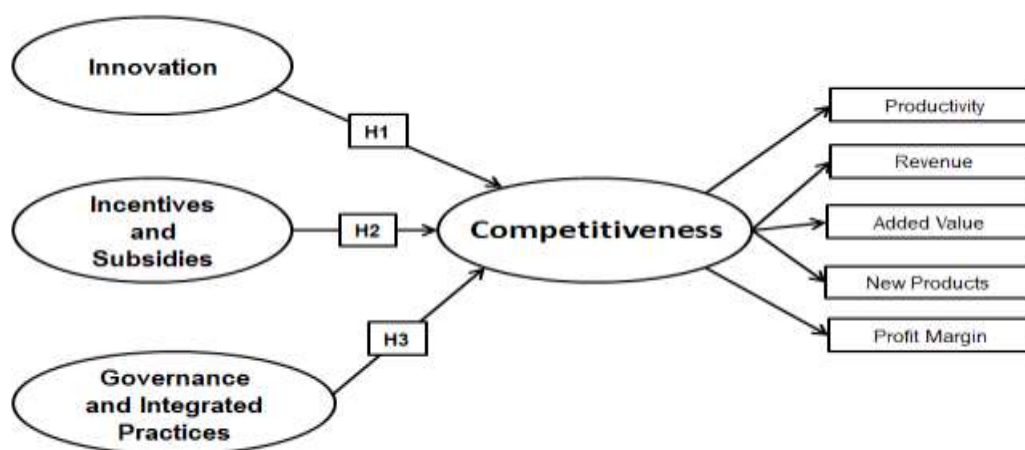


Figure 2 : Framework Of The Three Levels For Evaluating Cluster Effects

Source : Gallié, Glaser & Pallez (2014, P. 8).





**Figure 3: Conceptual Framework.**

Source : Elaborated By The Authors.

**Table 1: Key Figures Of Operational Clusters In Morocco.**

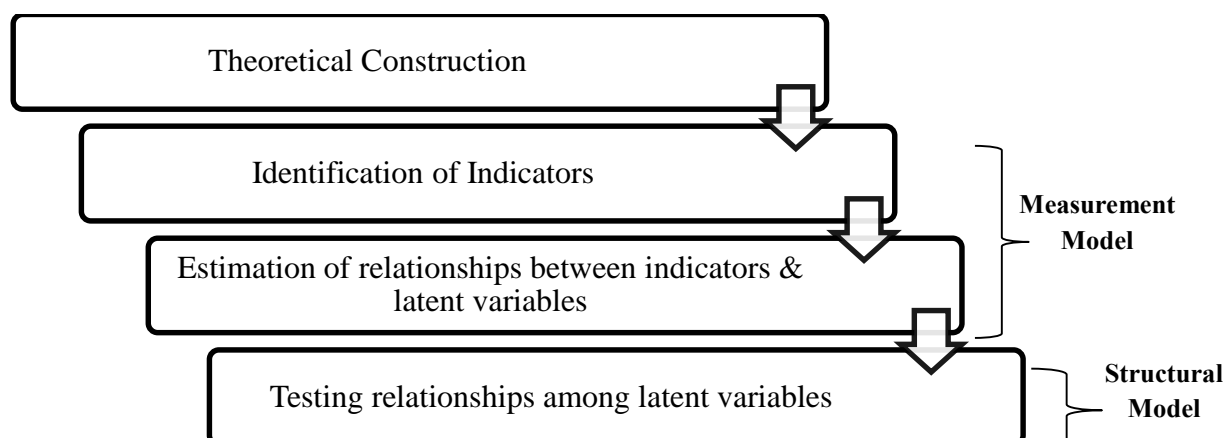
| None            | Year of Establishment | Number of Member Companies | Share of SMEs | Share of Large Enterprises |
|-----------------|-----------------------|----------------------------|---------------|----------------------------|
| CE3M            | 2010                  | 100                        | 90%           | 10%                        |
| MDFC            | 2013                  | 60                         | 90%           | 10%                        |
| AHP             | 2010                  | 80                         | 70%           | 30%                        |
| C2TM            | 2013                  | 36                         | 30%           | 70%                        |
| Maintenance 4.0 | 2021                  | 35                         | 60%           | 20%                        |
| MMI             | 2020                  | 30                         | 80%           | 20%                        |
| Valbiom         | 2017                  | 85                         | 40%           | 20%                        |
| EMC             | 2013                  | 40                         | 70%           | 30%                        |
| CISE Maroc      | 2014                  | 100                        | 95%           | 5%                         |
| Menara Cluster  | 2012                  | 70                         | 70%           | 30%                        |
| AMC             | 2017                  | 150                        | 60%           | 30%                        |
| Green H2 Maroc  | 2021                  | 50                         | 40%           | 50%                        |
| Agrinova        | 2015                  | 20                         | 80%           | 20%                        |
| ENR             | 2014                  | 210                        | 80%           | 15%                        |
| MNC             | 2010                  | 40                         | -             | -                          |
| Logipole        | 2013                  | 50                         | 60%           | 40%                        |
| Digipole        | 2022                  | -                          | -             | -                          |

Source : Elaborated By The Authors.

**Table 2: Sample Composition Table.**

| Cluster        | Year of Establishment | City         | Nbr of SMEs | %           | Sample     |
|----------------|-----------------------|--------------|-------------|-------------|------------|
| CE3M           | 2010                  | Casablanca   | 90          | 12%         | 35         |
| MDFC           | 2013                  | Casablanca   | 54          | 7%          | 21         |
| AHP            | 2010                  | Agadir       | 56          | 8%          | 21         |
| C2TM           | 2013                  | Casablanca   | 11          | 2%          | 4          |
| Valbiom        | 2017                  | Oujda        | 34          | 5%          | 13         |
| EMC            | 2013                  | Settat       | 28          | 4%          | 11         |
| CISE Maroc     | 2014                  | Casablanca   | 95          | 13%         | 36         |
| Menara Cluster | 2012                  | Marrakech    | 49          | 7%          | 19         |
| AMC            | 2017                  | Casablanca   | 90          | 12%         | 35         |
| AGRINOVA       | 2015                  | Fès & Meknès | 16          | 2%          | 6          |
| ENR            | 2014                  | Casablanca   | 168         | 23%         | 64         |
| Logipole       | 2013                  | Agadir       | 30          | 4%          | 11         |
| <b>Total</b>   |                       |              | <b>721</b>  | <b>100%</b> | <b>276</b> |

Source : Elaborated By The Authors.



**Figure 4 : Stages In The Development Of The Structural Equation Modeling (SEM).**

Source : Elaborated By The Authors (Adapted From Meschi & Livolsi, 2003).

**Table 3: List Of Interviews Conducted By Profile.**

| Clusters        | Profil  | Sexe | Date       | Duration |
|-----------------|---|------|------------|----------|
| CE3M            | Chief Executive Officer (CEO)   | M    | 21/06/2023 | 1h30     |
| MDFC            | Chief Executive Officer (CEO)   | F    | 23/06/2023 | 1h       |
| AHP             | Project Officer   | F    | -          | -        |
| C2TM            | Project Officer   | M    | 12/07/2023 | 1h30     |
| Maintenance 4.0 | President   | M    | 21/07/2023 | 45Min    |
| MMI             | Chief Executive Officer (CEO)   | M    | 03/08/2023 | 1h       |
| Valbiom         | Chief Executive Officer (CEO)   | M    | 08/08/2023 | 1h       |
| EMC             | Vice President  | M    | 08/08/2023 | 1h       |
| CISE Maroc      | Chief Executive Officer (CEO)   | F    | 07/09/2023 | 40Min    |
| Menara Cluster  | Chief Executive Officer (CEO)   | F    | 08/09/2023 | 1h       |
| AMC             | Innovation and R&D Manager  | F    | 06/10/2023 | 45Min    |
| Green H2 Maroc  | Coordinator   | F    | -          | -        |
| AGRINOVA        | Coordination Manager and Director of the Innovation Regulatory Center | M    | 20/10/2023 | 40Min    |
| ENR             | Development Manager   | F    | 24/11/2023 | 40Min    |
| MNC             | Chief Executive Officer (CEO)   | M    | 01/12/2023 | 30Min    |
| Logipole        | Chief Executive Officer (CEO)   | F    | -          | -        |
| Digipole        | Chief Executive Officer (CEO)   | M    | -          | -        |

Source : Elaborated By The Authors.

**Table 4: Presentation of Collected Responses.**

| Characteristics of the Analyzed Firms             |                           |    |       |
|---|---------------------------|----|-------|
|   |                           | N  | %     |
| Legal Status of the Company                       | Autre                     | 9  | 8,2   |
|   | SA                        | 26 | 23,6  |
|   | SARL                      | 75 | 68,2  |
| Firm Age  | ≤ 5 ans                   | 18 | 16,4  |
|   | ≤ 10 ans                  | 34 | 30,9  |
|   | ≥ 15 ans                  | 58 | 52,7  |
| Sector  | Commerce                  | 2  | 1,8   |
|   | Industrie                 | 77 | 70,0  |
|   | Services                  | 31 | 28,2  |
| Size  | Entre 10 et 20 personnes  | 48 | 43,60 |
|   | Entre 30 et 50 personnes  | 19 | 17,30 |
|   | Entre 60 et 100 personnes | 19 | 17,30 |
|   | Supérieur à 100 personnes | 24 | 21,80 |
| Market  | Les deux                  | 61 | 55,5  |
|   | Marché export seulement   | 13 | 11,8  |
|   | Marché local seulement    | 36 | 32,7  |
| Company Revenue Level over the Last Three Years   | Entre 10 et 50 MDH        | 74 | 67,20 |
|   | Entre 60 et 80 MDH        | 10 | 9     |
|   | Entre 100 et 175 MDH      | 26 | 24    |
| Share of Innovation and Research & Development in | Entre 1% et 10%           | 41 | 37,3  |

|                                       |                  |     |       |
|---------------------------------------|------------------|-----|-------|
| Company Revenue                       | Entre 20% et 30% | 27  | 24,5  |
|                                       | Entre 40% et 50% | 11  | 10,0  |
|                                       | Mois de 1%       | 18  | 16,4  |
|                                       | Supérieur à 50%  | 13  | 11,8  |
|                                       | Total            | 110 | 100,0 |
| Cluster                               | AHP              | 15  | 13,6  |
|                                       | AMC              | 15  | 13,6  |
|                                       | C2TM             | 13  | 11,8  |
|                                       | CE3M             | 7   | 6,4   |
|                                       | EMC              | 10  | 9,1   |
|                                       | ENR              | 12  | 10,9  |
|                                       | Logipole         | 10  | 9,1   |
|                                       | Menara           | 8   | 7,3   |
|                                       | Valbiom          | 20  | 18,2  |
| Number of Years of Cluster Membership | ≤ 5 ans          | 41  | 37,3  |
|                                       | ≤ 2 ans          | 19  | 17,3  |
|                                       | ≥ 10 ans         | 36  | 32,7  |
|                                       | Autre            | 14  | 12,7  |
| Total                                 |                  | 110 | 100,0 |

Source : Elaborated By The Authors.

**Table 5: Analysis Of Internal Consistency Of Constructs.**

| Internal Consistency of Constructs                              |               |                           |                         |                |                  |
|---|---------------|---------------------------|-------------------------|----------------|------------------|
| Variable (Code)   | Items         | Quality of Representation | % of Explained Variance | Factor Loading | Cronbach's Alpha |
| Access to Incentive and Subsidy Schemes (Incentives)            | Incentives_1  | 0,600                     | 75,846                  | 0,775          | 0,919            |
|   | Incentives_2  | 0,826                     |                         | 0,909          |                  |
|   | Incentives_3  | 0,775                     |                         | 0,880          |                  |
|   | Incentives_4  | 0,826                     |                         | 0,909          |                  |
|   | Incentives_5  | 0,765                     |                         | 0,874          |                  |
| Innovation and R&D Development (Innovation)                     | Innovation_1  | 0,831                     | 85,357                  | 0,912          | 0,957            |
|   | Innovation_2  | 0,779                     |                         | 0,882          |                  |
|   | Innovation_3  | 0,933                     |                         | 0,966          |                  |
|   | Innovation_4  | 0,889                     |                         | 0,943          |                  |
|   | Innovation_5  | 0,836                     |                         | 0,915          |                  |
| Development of Governance and Integrated Practices (Governance) | Governance_1  | 0,788                     | 82,738                  | 0,887          | 0,930            |
|   | Governance_2  | 0,849                     |                         | 0,922          |                  |
|   | Governance_4  | 0,851                     |                         | 0,922          |                  |
|   | Governance_5  | 0,822                     |                         | 0,907          |                  |
| Firm Economic Performance (Performance)                         | Performance_1 | 0,909                     | 92,927                  | 0,953          | 0,981            |
|   | Performance_2 | 0,908                     |                         | 0,953          |                  |
|   | Performance_3 | 0,958                     |                         | 0,979          |                  |
|   | Performance_4 | 0,954                     |                         | 0,977          |                  |
|   | Performance_5 | 0,918                     |                         | 0,958          |                  |

Source : Elaborated By The Authors Sur AMOS.

**Table 6: Analysis Of Model Validity.**

|                 | CR    | AVE   | MSV   | MaxR(H) | 1            | 2            | 3            | 4            |
|-----------------|-------|-------|-------|---------|--------------|--------------|--------------|--------------|
| Incentives (1)  | 0,918 | 0,692 | 0,608 | 0,937   | <b>0,832</b> |              |              |              |
| Innovation (2)  | 0,958 | 0,821 | 0,816 | 0,969   | 0,730***     | <b>0,906</b> |              |              |
| Governance(3)   | 0,931 | 0,771 | 0,883 | 0,932   | 0,656***     | 0,757***     | <b>0,878</b> |              |
| Performance (4) | 0,981 | 0,91  | 0,816 | 0,987   | 0,780***     | 0,903***     | 0,814***     | <b>0,954</b> |

Source : Elaborated By The Authors Sur AMOS.

**Table 7: Results Of The Model Estimation.**

| Résultats de l'estimation du modèle |      |                      |          |       |        |         |
|-------------------------------------|------|----------------------|----------|-------|--------|---------|
| Dependent Variable                  |      | Explanatory Variable | Estimate | S.E.  | C.R.   | p-value |
| Economic Performance                | <--- | Incitations          | 0,228    | 0,067 | 3,391  | ***     |
|                                     | <--- | Innovation           | 1,000    | 0,066 | 15,052 | ***     |
|                                     | <--- | Governance           | 0,438    | 0,093 | 4,724  | ***     |

(\*\*\*)=p-value<0,001 : Highly significant relationship

Source : Elaborated By The Authors Sur AMOS.

**Table 8: Analysis Of Model Fit Indices**

| Model Validity Indicator               |                      |               |
|--|----------------------|---------------|
| Coefficient of Determination ( $R^2$ ) | 0,874                |               |
| Absolute Fit Indices                   | GFI                  | 0,7           |
|  | SRMR                 | 0,07          |
|  | RMSEA                | 0,110         |
| Incremental Fit Indices                | NFI                  | 0,8           |
|  | TLI                  | 0,9           |
|  | CFI                  | 0,9           |
| Parsimony Fit Indices                  | $\chi^2(\text{ddl})$ | 1451,709(628) |
|  | $\chi^2/\text{ddl}$  | 2,312         |
|  | AIC                  | 1677,709      |
|  | CAIC                 | 2095,863      |

Source : Elaborated By The Authors Sur AMOS.