



DIGITAL TRANSFORMATION AND INNOVATION IN MOROCCAN SMALL, MEDIUM-SIZED, AND VERY SMALL ENTERPRISES: EFFECTS ON FINANCIAL PERFORMANCE

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ABSTRACT

In a context shaped by accelerating digitalization, this study examines the effects of digital transformation on the financial performance of Moroccan small and very small enterprises, while emphasizing the mediating role of innovation. Based on a sample of 223 companies across various regions and sectors, the analysis was conducted using partial least squares structural equation modeling to assess the structural relationships between the variables. The results show, first, that digital transformation directly enhances firms' innovation capacity, confirming its role as a strategic lever for organizational renewal. Second, the study demonstrates that digital transformation has only a marginal direct impact on financial performance, but exerts a strong indirect effect through innovation, which acts as a partial mediator. Furthermore, different forms of innovation process and product affect financial outcomes in distinct ways. These findings highlight the necessity for small and very small enterprises to develop coherent digital strategies that integrate innovation as a driver of competitiveness. The study provides both theoretical and practical recommendations for policymakers, business leaders, and support institutions to strengthen the resilience and performance of Moroccan enterprises in the digital age.

Keywords: *Digital transformation, Strategy, Business innovation, Financial performance*

1. INTRODUCTION

In an era of rapid technological change, digital transformation has emerged as a key strategic lever for enhancing organizational innovation and performance. This is particularly evident with the rise of emerging technologies such as artificial intelligence, cloud computing, the Internet of Things, and data analytics (Vial, 2019; Hanelt et al., 2021). These innovations are compelling firms to rethink their business models and management practices to remain competitive in an increasingly globalized and fast-paced environment (Sebastian et al., 2017; Korachi & Bounabat, 2020).

Although numerous international studies have confirmed the positive effects of digitalization on innovation and performance in large firms (Matt et al., 2015; Wessel et al., 2021), the literature continues to suffer from conceptual ambiguities regarding its key dimensions (Ziyadin et al., 2020). Moreover, its financial impact on smaller businesses remains both underexplored and inconclusive (Susanti et al., 2023; Torres & Augusto, 2021). Research in this domain continues to

concentrate mainly on large corporations, often neglecting small and very small enterprises despite their critical role in the global economy and their heightened vulnerability particularly in emerging economies (Mitroulis & Kitsios, 2019; Palacios-Marqués et al., 2022; Neffati & Khemiri, 2025).

In Morocco, digital transformation has become a strategic national priority, promoted through a series of structured public initiatives, including Maroc Numeric 2013, Digital Morocco 2020, and the National Digital Transformation Strategy 2030, in alignment with the New Development Model's strategic vision (CSMD, 2021). This context makes Morocco a particularly relevant setting for this study for three key reasons: first, the existence of an active policy framework allows for the empirical testing of national digital strategies on the ground; second, while small and very small Moroccan enterprises play a central role in the country's economic fabric, they remain insufficiently represented in academic studies linking digitalization, innovation, and performance (Elbaz & Haddoud, 2017; Benhayoun et al., 2022); and third, the structural challenges faced by emerging economies balancing ambitious digital aspirations with persistent institutional constraints make Morocco an insightful case for analyzing the actual conditions under which digital leverage can be activated.

To justify our simultaneous focus on both small and very small enterprises rather than isolating one category, it is important to emphasize that these two types of firms share significant economic, organizational, and institutional similarities within the Moroccan context. Their small size, vulnerability to external shocks, limited human and technological resources, and common obstacles in accessing finance and innovation support a unified analytical treatment (Cordova et al., 2025; Ayyagari et al., 2011; OECD, 2017). This approach is further reinforced by the design of public support mechanisms in Morocco, which rarely distinguish between small and very small enterprises, instead addressing them collectively under the umbrella of "very small, small, and medium-sized enterprises" in national policy frameworks (World Bank, 2020; UNCTAD, 2018). Recent research increasingly argues for moving beyond linear models that treat digitalization as an isolated driver of performance. Instead, scholars stress the need to incorporate mediating variables such as innovation, as well as contextual factors like organizational culture and digital leadership (Bharadwaj et al., 2013; Lopes & Oliveira, 2020; López-Nicolás & Meroño-Cerdán, 2011; Iivari et al., 2020). Innovation thus plays a central role in transforming digital resources into concrete competitive advantages by enhancing adaptability, differentiation, and operational efficiency.

As economic disruption intensifies under the impact of digitalization, small and very small enterprises must strengthen their innovation capacities to remain competitive. Understanding the interrelationships between digital transformation, innovation, and financial performance has therefore become essential (Vial, 2019; Scuotto et al., 2022). While this research is grounded in the Moroccan context, it also resonates with other developing economies facing similar challenges in adopting digital technologies (OECD, 2021; World Bank, 2023).

At the international level, this study contributes to ongoing scholarly debates on the relationship between digital transformation and business performance, particularly in small firms. It does so by offering original empirical insights from a Global South country (Al-Okaily et al., 2022; Kraus et al., 2021; Pavithra & Sundari, 2025). The study not only enriches comparative analyses across regional contexts but also identifies actionable levers that may be relevant for other economies facing comparable structural and institutional challenges (Elia et al., 2020).

Within this framework, the study pursues three main objectives: first, to analyze the direct effect of digital transformation on the financial performance of Moroccan small and very small enterprises in an emerging economy context; second, to examine the influence of digital transformation on firms' innovation capacity; and third, to investigate the mediating role of innovation in the relationship between digital transformation and financial performance, with the aim of

better understanding the mechanisms underlying digital value creation.

To address these objectives, the article is structured as follows. The first section presents a literature review covering digital transformation, innovation, and small enterprise performance, along with the theoretical foundations. The second section outlines the research methodology, including the conceptual model, data collection and analysis methods. The third section presents the empirical results obtained via structural equation modeling (PLS-SEM), followed by a discussion of theoretical and managerial implications. The final section concludes the study, highlighting its main contributions, limitations, and suggestions for future research.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. DIGITAL TRANSFORMATION AND FINANCIAL PERFORMANCE IN SMALL AND MEDIUM-SIZED ENTERPRISES AND VERY SMALL ENTERPRISES

The theory of dynamic capabilities (Teece, 1997) asserts that the performance of a business depends on its ability to adapt, integrate, and reconfigure internal and external resources in response to environmental change. When applied to the context of digital transformation, this framework underlines the essential role of organizational agility, continuous learning, and strategic alignment in leveraging digital technologies effectively (Kraus et al., 2022; Verhoef et al., 2021). For small and medium-sized enterprises as well as very small enterprises, which often operate under severe resource constraints, this dynamic is critical yet difficult to implement, as it may provoke internal resistance and lead to increased organizational complexity (Organisation for Economic Co-operation and Development, 2021; Hadjielias et al., 2021).

Although digitalization is progressing globally, small businesses continue to lag behind large corporations due to their higher aversion to risk and their limited access to financial, technical, and human resources required for successful digital adoption (Eller et al., 2020; Kallmuenzer et al., 2024). Nonetheless, several studies suggest that these smaller firms could capitalize on their inherent flexibility, customer proximity, and agile decision-making processes to turn such limitations into opportunities for sustainable growth (Escoz and Becker, 2024; Kraus et al., 2023). These levers not only help mitigate the initial costs associated with digital transition but also open up new markets and improve medium-term financial performance (Hess et al., 2016).

Emerging technologies associated with the so-called Industry 4.0 era such as the Internet of Things, artificial intelligence, and predictive analytics significantly strengthen small firms' capabilities in areas such as financial forecasting, lead-time reduction, and inventory control (Schumacher et al., 2016; Zhou et al., 2015). They also foster ongoing product improvement through enhanced customization and quality, thereby increasing both profitability and customer loyalty (Moeuf et al., 2018; Rußmann et al., 2015). Predictive maintenance further contributes by reducing operational costs while ensuring business continuity (Qi and Tao, 2018). Despite requiring substantial investments, these technologies are widely recognized for their positive long-term impact on financial outcomes (Oesterreich and Teuteberg, 2016).

However, digital transformation extends well beyond the mere adoption of new tools. It entails a fundamental reconfiguration of structures, business processes, and value creation logics (Kraus et al., 2022; Elia et al., 2024). Such transformation requires strategic coherence between digital competencies, organizational culture, and corporate growth strategies. Recent empirical studies emphasize the importance of combining qualitative aspects such as governance models and internal digital readiness with quantitative indicators like profitability or return on investment, in order to more accurately assess the effects of digitalization (De Silva et al., 2024; Marolt et al., 2025).

In addition, a number of contextual factors such as company size, industry characteristics, own-

ership structure, and geographic location strongly shape the firm's ability to successfully implement digital initiatives (Omrani et al., 2024; Usai et al., 2021). While some benefit from favorable innovation ecosystems, others remain constrained by underdeveloped or rigid institutional frameworks (Feliciano-Cestero et al., 2023; Meyer et al., 2023). The firm's long-term capacity to invest in research and development and to continuously enhance its digital capabilities has therefore become a critical determinant of economic resilience and sustained financial performance (Xia et al., 2024; Agustian et al., 2023).

In light of these insights and in line with the theory of dynamic capabilities, the following hypothesis is proposed:

H1: The implementation of a digital transformation strategy has a positive effect on the financial performance of Moroccan small and medium-sized enterprises and very small enterprises.

2. 2. DIGITAL TRANSFORMATION AS A LEVER FOR INNOVATION IN SMALL AND MEDIUM-SIZED ENTERPRISES AND VERY SMALL ENTERPRISES

Digital transformation plays a strategic role in reshaping innovation mechanisms within small and medium-sized enterprises as well as very small enterprises. It has a profound influence on organizational structures, internal resources, and external interactions (Egodawele et al., 2022; Zhang and Wang, 2024).

The adoption of digital technologies enhances the ability of these enterprises to learn, adapt, and mobilize resources effectively in order to innovate. However, this dynamic can only function if there is a harmonious alignment between technological, organizational, and environmental dimensions (Toscano-Jara et al., 2022; Rizana et al., 2023).

Collaborative platforms and data analytics tools facilitate the identification of market needs, stimulate open innovation, and support knowledge management processes (Scuotto et al., 2022; Ciampi et al., 2021). They also contribute to more personalized customer experiences and faster decision-making (Mir and Barka, 2024). One study indicates that process innovations exert a particularly strong impact on the vitality of entrepreneurial ecosystems by strengthening local collaboration and diversifying services (Adile and Sossi Alaoui, 2025).

Small and medium-sized enterprises and very small enterprises can also benefit from digital business models such as platforms and ecosystems, but doing so requires a clear strategic alignment between digital initiatives and organizational objectives (Bijou and Elmoutaouakkil, 2024; Verhoef et al., 2021).

Relational capital and inter-firm networks play a crucial role in compensating for the limited resources of these enterprises. The development of digital competencies, organizational learning, and collective agility appear as key drivers of successful innovation outcomes (Gonzalez-Varona et al., 2023; Vial, 2019; Susanti et al., 2023).

Nevertheless, an excessive reliance on digital tools can hinder creativity and lead to standardized forms of innovation, especially in enterprises that lack sufficient digital skills (Lee et al., 2024; Hadjimanolis, 2023).

A successful digital transformation in small and medium-sized enterprises and very small enterprises requires a progressive and context-sensitive adaptation process, taking into account organizational culture, regional specificities, and the realities of local ecosystems (Bocquet et al., 2020; Adomako et al., 2023).

Organizational agility, together with strong customer orientation and decentralized decision-making capacity, enables these enterprises to transform digital challenges into opportunities for innovation (Berente et al., 2021; Li et al., 2024).

In developing countries, many small enterprises continue to adopt only basic technologies, facing cultural and socioeconomic obstacles in implementing more advanced solutions such as artificial intelligence or cloud computing (Díaz-Arancibia et al., 2024). Nevertheless, digital transformation has been shown to enhance the resilience of small businesses during periods of crisis by strengthening their organizational responsiveness and innovation capabilities, particularly through marketing digitalization, data-driven decision-making, and automation (Hokmabadi et al., 2024).

Based on this literature review, the following hypothesis is proposed:

H2: The adoption of digital transformation has a positive effect on the financial performance of Moroccan small and medium-sized enterprises as well as very small enterprises.

2. 3. THE MEDIATING ROLE OF INNOVATION IN THE RELATIONSHIP BETWEEN DIGITAL TRANSFORMATION AND FINANCIAL PERFORMANCE IN SMALL AND VERY SMALL ENTERPRISES

The effect of digital transformation on the financial performance of small and very small enterprises operates primarily through their capacity to innovate. The introduction of digital tools generates real economic benefits only when it leads to deep transformations in products, processes, or business models (Ciampi, Cheffi & Ferraris, 2021). Innovation thus becomes the vector through which digital resources acquire strategic value especially by enhancing adaptability, differentiation, and responsiveness in smaller firms (Scuotto et al., 2022).

In contexts where organizational capabilities are limited, as is often the case for very small enterprises, innovation acts as an amplifier: it channels the effects of digitalization into concrete financial outcomes, provided it is embedded within a logic of internal restructuring (Susanti et al., 2023). While digital technologies facilitate knowledge circulation, data management, and decision-making, it is only through an innovative redefinition of internal processes that lasting improvements in profitability can be achieved (Rizana et al., 2023).

In small-sized enterprises, the financial impact of digitalization is heavily conditioned by the ability to align technological use with innovative mechanisms particularly in management, customer relations, and financial practices (Egodawe et al., 2022; Zhang & Wang, 2024). Innovation here functions as a filter that selects, adapts, and converts digital contributions into performance drivers. This strategic alignment becomes all the more critical since digitalization without innovation risks remaining superficial, with no lasting effect on margins or growth.

In low-staffed firms, a significant portion of the performance attributed to digital transformation in fact results from the innovation dynamics triggered by new technologies (Kraus et al., 2022). This effect is even more pronounced in flexible and less hierarchical organizations, which typically characterizes very small and micro-enterprises. In these structures, innovation acts as a relay between digital investment and financial outcomes by enabling rapid implementation, customized offerings, and cost optimization (Del Vecchio et al., 2023).

Innovation in financial practices such as the use of business intelligence tools or automated financial management also enables small firms to enhance profitability by better leveraging data generated through digital technologies (Zhang & Wang, 2024). These practices increase transparency, reduce administrative costs, and accelerate response times, which constitute a critical competitive advantage in unstable environments.

The Input–Mediator–Output (IMO) model (Ilgen et al., 2005) offers a relevant theoretical lens to understand how innovation mediates the relationship between digital inputs and performance outcomes. Several studies highlight innovation as a key intermediary that transforms digital invest-

ments into tangible performance gains (Vial, 2019; Kraus et al., 2022; Del Vecchio et al., 2023). Without a strategic innovation capability, digital transformation may fail to generate financial returns and can even lead to inefficiencies (Maroufkhani et al., 2020). Conversely, firms that combine digital tools with innovation-oriented practices tend to outperform their counterparts. Based on the IMO model and supporting empirical evidence, we propose the following hypothesis:

H3: Innovation mediates the relationship between digital transformation strategy and the financial performance of Moroccan small and very small enterprises.

3. RESEARCH GAPS AND JUSTIFICATION OF THE STUDY

Despite theoretical and empirical advances regarding digital transformation, many gray areas remain concerning its effects on the performance of small enterprises, particularly in emerging economies. This study aims to analyze the impact of digital transformation on the financial performance of Moroccan small and medium-sized enterprises and very small enterprises, while exploring the mediating role of innovation in this relationship. Although digital technologies are increasingly seen as drivers of competitiveness, their strategic appropriation remains unevenly mastered and theoretically underexplored in African contexts (Bharadwaj et al., 2013; Vial, 2019). Existing empirical research largely focuses on large companies or advanced institutional environments, particularly in Europe, North America, or Southeast Asia. The digital maturity of major European firms appears closely tied to strategic governance and innovation culture, both of which shape the success of digital initiatives (Lopes & Oliveira, 2020). In North America, digital transformation relies on strong managerial commitment and a deep overhaul of business models (Sebastian et al., 2017). In Indonesia, digitalization is seen as a competitiveness engine for small and medium-sized enterprises, yet its effects remain limited in the absence of support policies tailored to the realities of small businesses (Jatmiko, 2025). In these contexts, innovation plays a crucial mediating role between digital transformation and performance, demanding a shift away from linear analytical models in favor of approaches that account for organizational and cultural specificities (Susanti et al., 2023).

While informative, these studies reflect structural realities that differ considerably from those of Moroccan small and medium-sized enterprises and very small enterprises, which operate in less consolidated institutional settings, within fragmented digital ecosystems, and under multiple resource constraints (González-Varona et al., 2021; Palacios-Marqués et al., 2022). The Moroccan context remains largely underexplored from an empirical standpoint, especially through representative primary surveys.

Moreover, existing studies rarely incorporate mediating or moderating variables into their explanatory models, often limiting their analysis to correlations or unidimensional relationships. This limitation hinders understanding of why some firms benefit more from digitalization than others. Yet innovation—whether technological, organizational, or managerial—is a recognized lever for enhancing the value of digital investments (Hanelt et al., 2021; Teece, 2018), but it remains underutilized as an explanatory intermediary.

In addition, the very notion of digital transformation is still too often reduced to the adoption of tools or technological infrastructures such as enterprise resource planning systems, electronic commerce platforms, or customer relationship management software, without consideration for its strategic, managerial, and cultural dimensions (Matt et al., 2015; Wessel et al., 2021). Furthermore, performance indicators used in these studies tend to emphasize productivity, innovation, or growth, whereas financial performance—a critical issue for managing small enterprises—remains largely marginalized.

In light of these findings, this study aims to provide an original contribution on several levels. Empirically, it relies on a representative sample of Moroccan enterprises from various regions and sectors, using a primary database specifically designed for this research, thereby addressing the lack of investigations based on local data. Theoretically, it integrates two complementary conceptual frameworks: the dynamic capabilities theory, which explains how small and medium-sized enterprises can strategically redeploy their resources to seize digital opportunities (Teece, 2007; Eisenhardt & Martin, 2000), and innovation management theory, which highlights the role of innovation as a conduit and amplifier linking digital transformation to overall performance (Dodgson et al., 2008; Crossan & Apaydin, 2010).

Methodologically, the study adopts a rigorous hypothetico-deductive approach based on structural equation modeling using the partial least squares structural equation modeling technique, which is particularly suited for analyzing complex relationships including direct, indirect, and moderating effects. This approach enables assessment of the strength of the relationships between variables and empirical testing of the mediating role of innovation within the proposed model. From a managerial perspective, the expected results aim to formulate concrete recommendations to support small and medium-sized enterprise leaders in the strategic integration of digital technologies, taking into account their resource constraints and adaptive capacities. Finally, on an institutional level, the study seeks to provide actionable insights for public decision-makers, support organizations, and financial institutions such as the Moroccan Agency for Small and Medium Enterprises, the General Confederation of Enterprises of Morocco, or the Moroccan Company for Business Financing to design digital transformation policies better aligned with the realities of Morocco's entrepreneurial fabric.

4. . RESEARCH METHODOLOGY AND DATA COLLECTION

4. 1. SAMPLE AND DATA COLLECTION

Very small, small, and medium-sized enterprises form the backbone of the Moroccan economy. They account for approximately 95% of the formal entrepreneurial fabric, generate nearly 40% of the national gross domestic product, and provide more than 70% of formal private-sector employment (FEMISE, 2020; Chambre Française de Commerce et d'Industrie du Maroc, 2011). Despite this substantial economic weight, they continue to face relatively low productivity levels and struggle to integrate into global value chains. This reality explains the growing academic interest in such structures in recent research (Organisation for Economic Co-operation and Development, 2024).

The selection of Morocco as a study context is grounded in a relevant contextualization rationale. On the one hand, the country has launched a deep transformation of its economic model through the New Development Model, adopted in May 2021, which emphasizes innovation, productivity, and sustainability as levers for inclusive growth (Haut-Commissariat au Plan, 2021). On the other hand, Moroccan small and medium-sized enterprises and very small enterprises face specific challenges limited access to finance, weak managerial structuring, and delays in digital transition which make them a rich empirical field for understanding the determinants of sustainable performance.

Several public initiatives have also been implemented to support this segment, including programs such as Intelaka, Innov Invest, Tamwilcom, and the auto-entrepreneur status, all of which aim to strengthen entrepreneurial empowerment, governance, and organizational innovation (Ministry of Industry, 2023).

This study is based on a sample of 223 Moroccan enterprises, composed primarily of very small enterprises (53.5% with fewer than 50 employees) and small and medium-sized enterprises

(34% with between 50 and 250 employees), reflecting the actual structure of the national entrepreneurial landscape. This sample size meets methodological recommendations for structural equation modeling. (Kline, 2015) states that a minimum of 200 respondents is generally required to ensure estimation stability in moderately complex models, while (Hair et al. 2016) recommend a ratio of at least 10 observations per estimated parameter. Similarly, (Boomsma,1985) argue that samples over 200 are considered “robust” for models involving multiple latent variables.

The sectoral diversity of the sample reinforces its external validity. The firms surveyed operate primarily in agriculture and agri-food (35%), financial services (21%), and education and training (19%), which are considered strategic sectors in the Moroccan context (Haut-Commissariat au Plan, 2023).

A quantitative hypothetico-deductive approach was adopted, with data collected through a self-administered questionnaire directed at business owners and managers. Given the declarative nature of the responses, the risk of common method variance was addressed. Following the recommendations of (Podsakoff et al, 2012), procedural remedies were implemented: guaranteed anonymity, neutral item wording, and randomized item order. In addition, a marker variable test was conducted following (Khosravi et al, 2020). The variable “gender of the manager,” assumed to be unrelated to the constructs, showed an average correlation of 0.04 with the other variables below the 0.05 threshold suggested by (Rönkkö and Ylitalo,2011) thus confirming the absence of significant common method variance bias.

By analyzing how Moroccan small businesses leverage digital transformation, participatory governance, and continuous training to enhance their overall performance, this study addresses a dual objective: theoretical (validation of a performance model) and managerial (identification of action levers). Recent studies confirm that digital transformation, when effectively integrated, has a significant and positive effect on both financial and organizational performance (Vial, 2019; Scuotto et al., 2022; Ciampi et al., 2021; Multidisciplinary Digital Publishing Institute, 2023).

This positioning contributes to ongoing academic debates on the performance of small and medium-sized enterprises in developing countries while offering practical insights for public policymakers and innovation support stakeholders.

4. 2. MEASUREMENT

The examination of a model in which the marker variable was linked to the study constructs did not reveal any significant changes in parameter estimates, confirming that common method variance was unlikely to bias our dataset (Podsakoff et al., 2003). In line with best practices in PLS-SEM (Hair et al., 2019), this research relied on measurement scales that had been previously validated in the literature to ensure content validity and comparability across studies. In some cases, these scales were slightly condensed or extended with additional items in order to adapt them to the specific context of Moroccan enterprises, while maintaining their psychometric properties (MacKenzie et al., 2011). The final questionnaire was therefore developed on the basis of established theoretical frameworks, by selecting validated variables and specifying the structural relationships between them, which strengthens the robustness and validity of the proposed research model.

Table 1. Variables and Measurement Instruments Adopted

Variable	Item (Summary)	Code	Author(s)
The digital transformation	A clear strategy	STN1	Venkatesh et al (2003), El Byere & El Khalkhali (2019)
	Digital investments	STN2	
	Digital vision	STN3	
Firm innovation	Internal processes	IE3	Walker et al (2010), Lumpkin & Dess (1996)
	New technologies	IE4	
	Management practices	IE5	
	Management support	IE6	
financial performance	Financial targets	EO1	Pierre Richard et al (2009)
	Business growth	EO2	

Source: Constructed by the authors

Following Table 1, additional clarification is provided regarding the operationalization of the constructs. Financial performance was measured using two items adapted from (Pierre Richard et al, 2009). The first indicator (EO1) captures the achievement of financial objectives, reflecting aspects such as profitability ratios, margins, and the attainment of targeted financial results. The second indicator (EO2) measures business growth, which refers to the increase in sales, turnover, and market share over time. Digital transformation was assessed through three dimensions (STN1–STN3). STN1 and STN2 reflect the implementation of digital transformation, expressed through the presence of a clear strategy and concrete digital investments. STN3, by contrast, captures the adoption dimension, which refers to the degree to which digital initiatives are integrated into the organizational vision and effectively embedded in business practices. This distinction between implementation and adoption clarifies how digital transformation is not limited to resource allocation but also requires strategic alignment and cultural integration to generate value.

4. 3. DESCRIPTIVE STATISTICS

This section reports the descriptive statistics of the main variables in the study, providing a quantitative overview of participant responses. The mean reflects the central tendency of the data, while the standard deviation indicates the degree of dispersion around the mean. Skewness and kurtosis are also presented to capture the distributional characteristics of the variables.

Table 2. Descriptive Statistics

Item	Mean	Median	Standard deviation	Excess kurtosis	Skewness	Number of observations used	Cramér-von Mises test statistic
EO1	3,802	4	1,128	1,031	-1,174	276	2,762
EO2	3,762	4	1,072	1,5	-1,289	276	3,715
IE3	3,79	4	1,377	-0,289	-1,026	276	4,215
IE4	3,383	4	1,4	-1,024	-0,542	276	2,31
IE5	3,597	4	1,385	-0,813	-0,676	276	2,2
IE6	3,847	4	1,394	-0,329	-0,986	276	3,712
STN2	3,532	4	1,444	-1,133	-0,518	276	2,244
STN3	3,637	4	1,382	-0,705	-0,715	276	2,139
STN1	3,581	4	1,372	-0,783	-0,671	276	2,072

Source: Constructed by the authors using Smart-PLS 4

Based on the descriptive statistics in Table 2, the mean scores for the observed items range between 3.38 and 3.85, indicating that participant responses generally gravitate around moderate to high levels. The standard deviations, which vary between 1.07 and 1.44, suggest a relatively consistent spread of responses across items. In terms of distributional shape, excess kurtosis values show both positive and negative figures, ranging from -1.13 to 1.50, which implies that the data distributions are in some cases flatter and in others slightly more peaked than the normal distribution. Skewness values are mostly negative, between -0.52 and -1.29, indicating a tendency toward left-skewed distributions, meaning that higher response categories were more frequently chosen by participants. Overall, the results highlight that the data distributions approximate normality, while demonstrating a general inclination toward positive responses with moderate variability across items.

4. 4. COLLINEARITY ASSESSMENT

The variance inflation factor (VIF) was used to assess collinearity among the indicators. Table 3 reports the obtained values.

Table 3.Inner VIF

	VIF
EO1	5,945
EO2	5,945
IE3	6,441
IE4	9,549
IE5	8,800
IE6	8,607
STN2	8,331
STN3	11,026
STN1	10,113

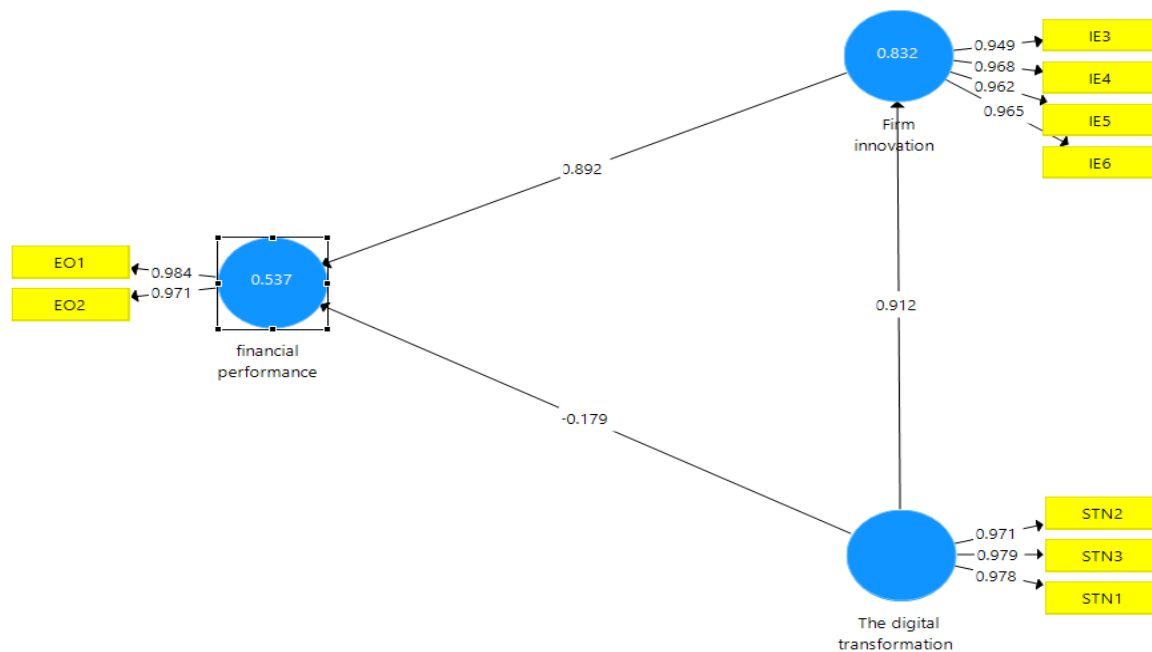
Source: Constructed by the authors using Smart-PLS 4

The collinearity assessment based on the variance inflation factor (VIF) shows that the indicator values range between 5.945 and 11.026. Although some indicators slightly exceed the commonly suggested threshold of 5 (Kline, 2011; Hair et al., 2011; Ojeleye & Ojeleye, 2024), these values remain within an acceptable range in PLS-SEM applications. Prior research emphasizes that VIF values up to 10 can be tolerated, particularly in exploratory models where constructs are theoretically related and high correlations among indicators are expected (Hair et al., 2013; Becker et al., 2012). More recent guidelines also confirm that VIF values below 10 do not indicate serious collinearity issues and therefore do not compromise the validity of the model (Hair et al., 2019). Moreover, other scholars argue that the importance of VIF should not be overstated in the context of PLS-SEM, since additional indicators such as construct reliability, convergent validity, and discriminant validity provide more decisive evidence regarding the robustness of the model (Sarstedt et al., 2014; Henseler et al., 2015). Accordingly, the relatively high VIF values observed in this study can be justified by the strong theoretical proximity of the constructs and do not threaten the overall validity of the structural model.

4. 5. MEASUREMENT MODELS

The algorithm illustrated in Figure 1 serves as a powerful statistical tool for modeling complex relationships, thereby strengthening the validity and reliability of the constructs in this study.

Figure 1. Measurement Models



Source: Constructed by the authors using Smart-PLS 4

Table 4. Factor loadings

Constructs	items	Factor loadings	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Firm innovation	IE3	0,949	0,972	0,974	0,98	0,923
	IE4	0,968				
	IE5	0,962				
	IE6	0,965				
Financial performance	EO1	0,984	0,954	1,016	0,977	0,955
	EO2	0,971				
The digital transformation	STN2	0,971	0,975	0,977	0,984	0,953
	STN3	0,979				
	STN1	0,978				

Source: Constructed by the authors using Smart-PLS 4

Table 4 presents the factor loadings, Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) for the three constructs examined in this study: Firm innovation, Financial performance, and Digital transformation. The factor loadings are consistently high, ranging from 0.949 to 0.984, all well above the recommended threshold of 0.7 (Hair et al., 2014), confirming that each item strongly represents its underlying construct. Specifically, items measuring Firm innovation (IE3–IE6) load between 0.949 and 0.968, those measuring Financial performance (EO1–EO2) load between 0.971 and 0.984, and the indicators of Digital transformation (STN1–STN3) load between 0.971 and 0.979.

In terms of internal consistency, Cronbach's alpha values are very high, ranging from 0.954 to 0.975, thus far exceeding the minimum threshold of 0.7. Composite reliability values (rho_a

and rho_c) also demonstrate excellent reliability, ranging from 0.974 to 1.016, which confirms the robustness of the constructs. Regarding convergent validity, all AVE values exceed the recommended minimum of 0.5, with values ranging from 0.923 to 0.955. This indicates that each construct explains a substantial proportion of the variance in its respective indicators.

Taken together, these results demonstrate that the measurement model exhibits outstanding reliability and convergent validity, confirming that all items significantly and effectively measure their intended constructs.

4. 6. DISCRIMINANT VALIDITY

Discriminant validity refers to the extent to which reflective indicators represent their respective latent constructs, as assessed through cross-loadings. A latent construct is considered valid when the square root of its Average Variance Extracted (AVE) is greater than or equal to 0.50. The results of the discriminant validity assessment, using the Fornell–Larcker criterion, are presented in Table 4.

Table 5. Fornell-Larcker Criterion

	Firm innovation	Financial performance	The digital transformation
Firm innovation	0,961		
Financial performance	0,729	0,977	
The digital transformation	0,912	0,635	0,976

Source: Constructed by the authors using Smart-PLS 4

Based on Table 5, the square root of the AVE values (diagonal elements) for each construct is greater than the correlations with the other constructs (off-diagonal elements). For instance, Firm innovation has a Fornell–Larcker value of 0.961, which is higher than its correlations with Financial performance (0.729) and Digital transformation (0.912). Similarly, Financial performance records a value of 0.977, exceeding its correlations with Firm innovation (0.729) and Digital transformation (0.635). Finally, Digital transformation shows a value of 0.976, which is also greater than its correlations with Firm innovation (0.912) and Financial performance (0.635).

These results confirm that each construct shares more variance with its own indicators than with other constructs, thereby demonstrating good discriminant validity in accordance with the Fornell–Larcker criterion.

Table 6. Heterotrait-monotrait ratio (HTMT)

	Firm innovation	Financial performance	The digital transformation
Firm innovation			
Financial performance	0,740		
The digital transformation	0,935	0,644	

Source: Constructed by the authors using Smart-PLS 4

Table 6 presents the heterotrait-monotrait ratio (HTMT) values between the constructs. The results range from 0.644 to 0.935. Specifically, the HTMT value between Firm innovation and Financial performance is 0.740, between Digital transformation and Financial performance is 0.644, while the highest value is observed between Firm innovation and Digital transformation (0.935). According to (Henseler et al. 2015), HTMT values below 0.90 (or 0.85 for a stricter threshold) indicate satisfactory discriminant validity. In this study, all relationships meet the criterion except for the pair Firm innovation – Digital transformation (0.935), which slightly exceeds the 0.90 threshold. This suggests a strong conceptual overlap between these two con-

structs, which remains theoretically justifiable. Overall, the results indicate acceptable discriminant validity across the constructs.

4. 7. STRUCTURAL MODEL RESULTS

Before testing the research hypotheses, the structural model was assessed to examine the strength and significance of the relationships between the latent constructs. This step makes it possible to determine the extent to which the independent variables explain the variance of the dependent variables, while also highlighting the direct and indirect relationships specified in the conceptual framework. The analysis relies on path coefficients, statistical significance levels, and mediation effects to provide empirical validation of the proposed hypotheses.

4. 7. 1. PATH COEFFICIENTS AND HYPOTHESES TESTING

The first step in assessing the structural model was to evaluate the significance and strength of the hypothesized relationships between constructs. Table 7 presents the path coefficients, standard errors, t-statistics, and p-values for all proposed hypotheses. The results show that Firm innovation has a strong and highly significant positive effect on Financial performance ($\beta = 0.892$, $p < 0.001$), supporting H1. Digital transformation exerts an even stronger positive effect on Firm innovation ($\beta = 0.912$, $p < 0.001$), supporting H2. Interestingly, the direct path from Digital transformation to Financial performance is negative but significant ($\beta = -0.179$, $p < 0.05$), providing support for H3.

Table 7. Path Coefficients and Hypotheses Testing Results

Hypothesis	Relationship	β (Original sample)	Erreur standard (STDEV)	T-Statistic	P-Value	Décision
H1	Firm innovation \rightarrow Financial performance	0.892	0.085	10.538	0.000	Supported
H2	Digital transformation \rightarrow Firm innovation	0.912	0.011	84.453	0.000	Supported
H3	Digital transformation \rightarrow Financial performance	-0.179	0.088	2.027	0.043	Supported

Source: Constructed by the authors using Smart-PLS 4

These findings highlight that while digital transformation directly reduces financial performance, it simultaneously creates conditions that strongly foster innovation within firms, which may act as a compensating mechanism.

4. 7. 2. MEDIATION EFFECTS

To further explore the role of Firm innovation as a mediator, we assessed the direct, indirect, and total effects between constructs. Table 8 summarizes these results. While Firm innovation directly improves Financial performance (0.892), Digital transformation exerts a strong indirect effect on Financial performance through Firm innovation (0.814). This mediating effect is large enough to offset the negative direct effect of digital transformation (-0.179), resulting in a substantial and positive total effect of 0.635.

Table 8. Total, Direct and Indirect Effects

Relationship	Direct Effect	Indirect Effect	Total Effect
Firm innovation → Financial performance	0.892	–	0.892
Digital transformation → Firm innovation	0.912	–	0.912
Digital transformation → Financial performance	-0.179	0.814	0.635

Source: Constructed by the authors using Smart-PLS 4

This confirms that Firm innovation plays a critical mediating role, transforming digital transformation efforts into tangible improvements in financial performance. In other words, digital transformation alone may not directly yield higher performance, but when it triggers firm-level innovation, the overall impact on financial outcomes becomes positive.

4. 7. 3. MODEL EXPLANATORY AND PREDICTIVE POWER

Finally, we evaluated the explanatory and predictive power of the model. Table 9 presents the coefficient of determination (R^2), predictive relevance (Q^2), and PLSpredict results. The results show that the model explains a very high proportion of variance in Firm innovation ($R^2 = 0.832$) and a moderate proportion of variance in Financial performance ($R^2 = 0.537$). Both Q^2 values are positive (0.832 for Firm innovation and 0.399 for Financial performance), confirming that the model has predictive relevance.

Table 9. Predictive Power and Model Accuracy of Endogenous Constructs

Dependent Variable	R^2	Q^2 predict	RMSE	MAE
Firm innovation	0.832	0.832	0.413	0.331
Financial performance	0.399	0.399	0.784	0.623

Source: Constructed by the authors using Smart-PLS 4

In addition, the PLSpredict results show relatively low RMSE and MAE values, further supporting the model's out-of-sample predictive accuracy. These results indicate that the model not only explains the observed relationships well but also demonstrates strong predictive power.

Taken together, the structural model results demonstrate that digital transformation strongly influences firm innovation, which in turn drives financial performance. Although the direct effect of digital transformation on financial performance is negative, the indirect effect through firm innovation is both positive and substantial, highlighting the mediating role of innovation. The high R^2 and Q^2 values further validate the robustness and predictive relevance of the proposed framework.

5. DISCUSSION AND IMPLICATIONS

The results of the structural model provide robust empirical support for the hypothesized relationships. First, the path analysis confirmed that Firm innovation has a strong and significant positive effect on Financial performance ($\beta = 0.892$, $p < 0.001$), thereby supporting H1. Similarly, Digital transformation exerts a very strong and highly significant effect on Firm innovation ($\beta = 0.912$, $p < 0.001$), supporting H2. Interestingly, the direct effect of Digital transformation on Financial performance was negative but significant ($\beta = -0.179$, $p < 0.05$), supporting H3. These findings suggest that digital transformation, taken in isolation, may not automatically improve financial outcomes, but instead creates conditions that strongly foster innovation within firms, which in turn compensates for the negative direct effect.

The mediation analysis further reinforces this conclusion. Firm innovation emerged as a key mediating variable, as the indirect effect of Digital transformation on Financial performance

through Firm innovation was both positive and substantial ($\beta = 0.814$). This mediating effect was strong enough to offset the negative direct effect, resulting in an overall positive total effect ($\beta = 0.635$). This confirms that innovation represents the main mechanism through which digital transformation translates into improved financial performance, in line with the Input–Mediator–Output (IMO) framework (Ilgen et al., 2005).

Beyond the individual path relationships, the explanatory and predictive power of the model were also validated. The model explained 83.2% of the variance in firm innovation ($R^2 = 0.832$) and 53.7% of the variance in financial performance ($R^2 = 0.537$). Both Q^2 values were positive, confirming predictive relevance, while the PLSpredict results showed low RMSE and MAE values, further supporting the model's out-of-sample accuracy. Taken together, these results demonstrate that the proposed framework is not only theoretically grounded but also empirically robust and predictive.

Overall, the findings highlight the crucial role of Firm innovation as a mediator between Digital transformation and Financial performance. While the direct effect of digital transformation may even appear detrimental, its indirect effect through innovation is both positive and substantial, ultimately reinforcing firm competitiveness. These results are consistent with prior studies such as (Vial, 2019), (Kraus et al. 2022), and (Scuotto et al. 2022), which have emphasized that digital transformation becomes a strategic driver of performance primarily when coupled with innovation.

This dynamic is even more pronounced in the Moroccan context, where small and medium-sized enterprises, despite technological delays, have demonstrated a high capacity for adaptation, especially when innovation is supported by leadership and integrated into the overall strategy. These findings extend the works of (Susanti et al. 2023) and (Adomako et al. 2023), which emphasize the importance of agile governance in converting digital investments into tangible outcomes.

However, these effects are not homogeneous. The study reveals that innovation plays a differentiated role depending on its nature (product or process), in line with the findings of (Egodawele et al. 2022) and (Wang, 2024). Consequently, managers should avoid a technology-centered approach and instead favor a comprehensive transformation logic that takes into account their organizational environment and internal capabilities.

The validity of the model is reinforced by the absence of critical multicollinearity ($VIF < 10$) and by the statistical significance of the estimated coefficients, confirming the solidity of the analyzed structural relationships. This study enriches the academic literature by providing original empirical data on small and medium-sized enterprises in an African context, while emphasizing that innovation constitutes an essential relay between digital strategy and sustainable financial performance.

From a theoretical perspective, these results contribute to the dynamic capabilities theory (Teece, 1997) by demonstrating that Moroccan small and medium-sized enterprises, despite resource constraints, can mobilize digital technologies to reorganize their processes, adapt managerial practices, and enhance agility. The study shows that the ability to reconfigure existing resources through innovation is a necessary condition for the successful implementation of digitalization. It also provides an important nuance to recent literature: while some studies have asserted a direct effect of digitalization on performance (Verhoef et al., 2021; Vial, 2019), our results suggest that this effect is marginal or even negative when disconnected from innovation dynamics. This interpretation helps explain the contradictory results found in previous meta-analyses (Maroufkhani et al., 2020) and justifies the use of models that include mediating variables to better capture the true effects of digital transformation.

From a managerial standpoint, the implications are clear: investing in technological tools alone is not sufficient to improve financial performance. Internal activation levers must be estab-

lished, with innovation playing a central role. Managers of small and medium-sized enterprises should adopt a strategic vision of digitalization grounded in experimentation, employee training, organizational agility, and internal collaboration. In particular, process innovations which are often more accessible than product innovations represent powerful levers for improving short-term performance, notably through cost reduction, quality enhancement, and responsiveness to customer needs (Zhang and Wang, 2024; Egodawele et al., 2022).

On the public policy side, the results underline the necessity of rethinking support mechanisms for digital transformation. Funding technological equipment is not sufficient; it is crucial to assist companies in developing skills (Hunady et al., 2025), structuring innovation governance, and accessing co-development networks. It is therefore recommended to introduce managerial coaching modules, create knowledge-sharing platforms between enterprises, research centers, and incubators, and design sector-specific programs tailored to each industry. Initiatives such as territorial “Living Labs” or “Innovation Hubs” can provide collective learning environments that align with this logic (Elia et al., 2020; Gonzalez-Varona et al., 2023).

Nonetheless, the study has certain limitations. First, the data are cross-sectional, which does not allow for causal inference over time. A longitudinal approach could better capture the evolving effects of digital transformation and innovation. Secondly, although the sample covers regional and sectoral diversity, it remains limited to 223 enterprises. Extending the analysis to other emerging countries would make it possible to test the robustness of the model across comparable institutional contexts. Furthermore, the study focuses on perceived financial performance. The integration of actual accounting data or additional dimensions such as operational or environmental performance could offer a more comprehensive understanding of digitalization’s impact. Finally, moderating effects related to managerial profile, industry sector, or level of digital maturity were not modeled. These represent promising avenues for future research.

This study demonstrates that the financial performance of Moroccan small and medium-sized enterprises does not stem directly from digitalization, but rather from their ability to transform digitalization into tangible innovation. It highlights the strategic role of innovation as a lever of competitiveness in a context where constraints are numerous but real opportunities exist for firms capable of adopting an integrated, aligned, and participatory vision of digital transformation.

6. CONCLUSIONS

This study examined how innovation mediates the relationship between digital transformation and financial performance within Moroccan SMEs and VSEs. Based on structural equation modeling using data from 220 firms, the findings demonstrate that digital strategy significantly enhances innovation capabilities, which in turn serve as a key driver for improved financial performance. In contrast, the direct effect of digital transformation on financial results remains weak and even negative, highlighting the critical importance of innovation as a transmission mechanism between digital initiatives and economic outcomes.

These empirical results align with the dynamic capabilities theory and the Input–Mediator–Output (IMO) model, emphasizing the need for firms to strategically link digital investments with innovation-driven practices. The main contribution of this research lies in identifying an integrated value chain in which financial performance is not directly driven by technology itself, but by the firm’s ability to convert digital tools into internal innovative processes.

From a strategic perspective, SME and VSE managers should view digital transformation not as an end in itself but as a strategic lever to foster organizational innovation. This requires strong leadership, investment in training, and the creation of an internal environment that supports agility and experimentation. For policymakers, the results point to the need for integrated sup-

port programs that combine digital infrastructure with innovation capacity building, tailored to sector-specific and regional contexts.

Ultimately, this study demonstrates that digital transformation yields meaningful financial benefits only when coupled with a well-structured and embedded innovation strategy. It is this alignment that enables Moroccan SMEs and VSEs to strengthen their resilience, competitiveness, and growth in an increasingly dynamic economic environment.

REFERENCES

- Adile Zouhir, & Fatima Zohra Sossi Alaoui. (2025). Innovations and Entrepreneurial Ecosystems: A Structural Equation Modeling Approach. *International Journal Of Applied Management And Economics*, 2(13), 299. <https://doi.org/10.5281/zenodo.15258502>
- Adomako, S., Amankwah-Amoah, J., Danso, A., & Boso, N. (2023). Digital transformation, governance quality and SME innovation in sub-Saharan Africa. *Technovation*, 122, 102726. <https://doi.org/10.1016/j.technovation.2022.102726>
- Berneth, J., & Aguinis, H. (2016). A critical review and meta-analysis of the role of moderators in leadership research. *Journal of Organizational Behavior*, 37(S1), S57–S88. <https://doi.org/10.1002/job.2030>
- Cassel, C., Hackl, P., & Westlund, A. H. (1999). Robustness of Partial Least-Squares Method for Estimating Latent Variable Quality Structures. *Journal of Applied Statistics*, 26(4), 435–446. <https://doi.org/10.1080/02664769922322>
- Chin, W. W. (1998). The partial least squares approach to structural equation modeling. In G. A. Marcoulides (Ed.), *Modern Methods for Business Research*, 295–336. Lawrence Erlbaum Associates. <https://www.taylorfrancis.com/chapters/edit/10.4324/9781410604385-10/partial-least-squares-approach-structural-equation-modeling-wynne-chin>
- Chin, W. W., & Newsted, P. R. (1999). Structural Equation Modeling Analysis with Small Samples Using Partial Least Squares. In R. H. Hoyle (Ed.), *Statistical Strategies for Small Sample Research*, 307–341. Sage Publications. <https://us.sagepub.com/en-us/nam/statistical-strategies-for-small-sample-research/book5148>
- Ciampi, F., Cheffi, W., & Cinquini, L. (2021). Exploring the impact of digital technologies on business model innovation: The mediating role of internal knowledge sharing. *Journal of Business Research*, 128, 236–246. <https://doi.org/10.1016/j.jbusres.2021.02.046>
- Cordova, W., N. Lim, C. T., Ong, H. T., Caraan, H. S., Dela Cruz, G. A. R., & C. Jimenez, E. F. . (2025). Digital Innovation and Entrepreneurial Success in the Philippine MSME Sector: Challenges and Opportunities. *ECONOMICS - Innovative and Economics Research Journal*, 13(3), 69–82. <https://doi.org/10.2478/eoik-2025-0056>
- Del Vecchio, P., Mele, G., Ndou, V., & Secundo, G. (2018). Creating value from social big data: Implications for smart tourism destinations. *Information Processing & Management*, 54(5), 847–860. <https://doi.org/10.1016/j.ipm.2017.10.006>
- Egodawele, A. D., Wijewardena, N., & Dissanayake, D. (2022). Understanding the effects of digital transformation and innovation capabilities on performance of SMEs. *Journal of Small Business and Enterprise Development*, 29(3), 374–396. <https://doi.org/10.1108/JSBED-09-2020-0327>
- El Byere, A., & El Khalkhali, M. (2019). L'impact de la transformation digitale sur la performance des PME marocaines. *Revue Marocaine de Recherche en Management et Marketing*, 21, 7–27. <https://revue-isg.com/index.php/home/article/view/1874>
- Elia, G., Margherita, A., & Passiante, G. (2020). Digital entrepreneurship ecosystem: How digital technologies and collective intelligence are reshaping the entrepreneurial process. *Technological Forecasting and Social Change*, 150, 119791. <https://doi.org/10.1016/j.techfore.2019.119791>
- Fornell, C., & Bookstein, F. L. (1982). Two Structural Equation Models: LISREL and PLS Applied to Consumer Exit-Voice Theory. *Journal of Marketing Research*, 19(4), 440–452. <https://doi.org/10.1177/002224378201900406>
- Gonzalez-Varona, J. M., Garcia-Morales, V. J., & Martín-Rojas, R. (2023). Digital transformation and learning processes in innovation: The mediating role of absorptive capacity. *Technological Forecasting and Social Change*, 184, 122006. <https://doi.org/10.1016/j.techfore.2022.122006>
- Götz, O., Liehr-Gobbers, K., & Krafft, M. (2009). Evaluation of Structural Equation Models Using the Partial Least Squares (PLS) Approach. In V. Esposito Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of Partial Least Squares*, 691–711. Springer. https://doi.org/10.1007/978-3-540-32827-8_30

- Haenlein, M., & Kaplan, A. M. (2004). A Beginner's Guide to Partial Least Squares Analysis. *Understanding Statistics*, 3(4), 283–297. https://doi.org/10.1207/s15328031us0304_4
- Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., & Danks, N. P. (2022). *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R* (2nd ed.). Springer. <https://doi.org/10.1007/978-3-030-80519-7>
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2016). Testing Measurement Invariance of Composites Using Partial Least Squares. *International Marketing Review*, 33(3), 405–431. <https://doi.org/10.1108/IMR-09-2014-0304>
- Hunady, J., Demeova, E., Chylakova, V. (2025). The Role of Digital Skills and Digitalization in Enhancing Labour Productivity In The EU. *Collection of papers new economy*, 3, 33-45. <https://doi.org/10.61432/CPNE0301033h>
- Ilgen, D. R., Hollenbeck, J. R., Johnson, M., & Jundt, D. (2005). Teams in Organizations: From Input–Process–Output Models to IMO Models. *Annual Review of Psychology*, 56, 517–543. <https://doi.org/10.1146/annurev.psych.56.091103.070250>
- Kraus, S., Durst, S., Ferreira, J. J., Veiga, P. M., & Meier, F. (2022). Digital transformation in business and management research: An overview of the current status and a call for further research. *International Journal of Information Management*, 63, 102439. <https://doi.org/10.1016/j.ijinfomgt.2021.102439>
- Lumpkin, G. T., & Dess, G. G. (1996). Clarifying the Entrepreneurial Orientation Construct and Linking it to Performance. *Academy of Management Review*, 21(1), 135–172. <https://doi.org/10.5465/amr.1996.9602161568>
- Maroufkhani, P., Wagner, R., Wan Ismail, W. K., Baroto, M. B., & Nourani, M. (2019). Big data analytics and firm performance: A systematic review. *Information*, 10(7), 226. <https://doi.org/10.3390/info10070226>
- Neffati, M., & Khemiri, I. (2025). The Impact of Digital Economy on Green Growth in the Kingdom of Saudi Arabia. *ECONOMICS - Innovative and Economics Research Journal*, 13(3), 261–282. <https://doi.org/10.2478/eoik-2025-0065>
- Ojeleye, Y.C. & Ojeleye, C.I. (2024). Toxic supervision, dehumanisation and SMEs performance in Nigeria: Moderating role of resilience. *Oeconomica Jadertina*, 14(1), 41-61. <https://doi.org/10.15291/oc.4421>
- Pavithra, J. C., & Sundari, V. M. (2025). Economic transformation in the digital age: The nexus between learning and innovation. *ECONOMICS - Innovative and Economics Research Journal*, 13(3), 167–193. <https://doi.org/10.2478/eoik-2025-0061>
- Pierre, R., Dionne, M., & Lavigne, V. (2009). Une typologie de la performance organisationnelle : Une analyse empirique basée sur les pratiques de gestion des ressources humaines. *Relations Industrielles/Industrial Relations*, 64(3), 394–420. <https://doi.org/10.7202/038603ar>
- Scuotto, V., Magni, D., Theofilos, T., & Del Giudice, M. (2022). Chief Digital Officer and organizational creativity toward digitalization. *IEEE Transactions on Engineering Management*. Advance online publication. <https://doi.org/10.1109/TEM.2022.3153395>
- Susanti, E., Mulyanti, R. Y., & Wati, L. N. (2023). MSMEs performance and competitive advantage: Evidence from women's MSMEs in Indonesia. *Cogent Business & Management*, 10(2), 2239423. <https://doi.org/10.1080/23311975.2023.2239423>
- Tece, D. J. (1997). Dynamic Capabilities and Strategic Management. *Strategic Management Journal*, 18(7), 509–533. [https://doi.org/10.1002/\(SICI\)1097-0266\(199708\)18:7<509::AID-SMJ882>3.0.CO;2-Z](https://doi.org/10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z)
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27(3), 425–478. <https://doi.org/10.2307/30036540>
- Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Qi Dong, J., Fabian, N., & Haenlein, M. (2021). Digital Transformation: A Multidisciplinary Reflection and Research Agenda. *Journal of Business Research*, 122, 889–901. <https://doi.org/10.1016/j.jbusres.2019.09.022>

- Vial, G. (2019). Understanding Digital Transformation: A Review and a Research Agenda. *The Journal of Strategic Information Systems*, 28(2), 118–144. <https://doi.org/10.1016/j.jsis.2019.01.003>
- Walker, R. M., Jeanes, E., & Rowlands, R. (2002). Measuring innovation: Applying the literature-based innovation output indicator to public services. *Public Administration*, 80(2), 201–214. <https://doi.org/10.1111/1467-9299.00300>
- Wold, H. (1980). Model construction and evaluation when theoretical knowledge is scarce: The use of PLS. In K. Jöreskog & H. Wold (Eds.), *Evaluation of Econometric Models*, 47–74. Academic Press. <https://doi.org/10.1016/B978-0-12-416550-2.50007-8>
- Zhang, Z., Zhang, J., & Wang, P. (2024). Measurement of disruptive innovation and its validity based on improved disruption index. *Scientometrics*, 129(11), 6477–6531. <https://doi.org/10.1007/s11192-024-05134-9>