Data and Metadata. 2025; 4:482
doi: 10.56294/dm2025482

ORIGINAL

The mediating effect of blue ocean strategy on the relationship between management control system and competitive advantage

El efecto mediador de la estrategia del océano azul en la relación entre el sistema de control de gestión y la ventaja competitiva

Mustapha RAZZOUKI[1], Rachid ZAMMAR[2], Adil GAROHE[2], Karima SALAH-EDDINE[2]

[1]Sultan Moulay Slimane University, Faculty of Economics and Management, Laboratory of Multidisciplinary Research in Economics and Management (LARPEG), Beni Mellal, Morocco.
[2]Mohammed V University in Rabat, Morocco.

Cite as: RAZZOUKI M, ZAMMAR R, GAROHE A, SALAH-EDDINE K. The mediating effect of blue ocean strategy on the relationship between management control system and competitive advantage. Data and Metadata. 2025; 4:482. https://doi.org/10.56294/dm2025482

Submitted: 07-03-2024 **Revised:** 28-07-2024 **Accepted:** 13-11-2024 **Published:** 01-01-2025

Editor: Adrián Alejandro Vitón-Castillo

ABSTRACT

This research examines the impact of management control systems on the competitive advantage of industrial companies, with a focus on the role of the blue ocean strategy as a mediating variable in this relationship. To achieve these objectives, a quantitative methodology was employed. Data was gathered through a structured questionnaire distributed online via Google Forms, and the analysis was performed using Smart PLS Version 4 software. The sample consisted of 405 Moroccan industrial companies. The analysis revealed that management control systems significantly impact competitive advantage, and the blue ocean strategy mediates this relationship. Based on these findings, future research should explore various approaches to implementing blue ocean strategies and their effects on company performance.

Keywords: Management Control System; Ocean Blue Strategy; Competitive Advantage; PLS- SEM.

RESUMEN

Esta investigación examina el impacto de los sistemas de control de gestión en la ventaja competitiva de las empresas industriales, con un enfoque en el papel de la estrategia del océano azul como variable mediadora en esta relación. Para alcanzar estos objetivos, se empleó una metodología cuantitativa. Los datos fueron recolectados mediante un cuestionario estructurado distribuido en línea a través de Google Forms, y el análisis se realizó utilizando el software Smart PLS versión 4. La muestra incluyó 405 empresas industriales marroquíes. El análisis reveló que los sistemas de control de gestión influyen significativamente en la ventaja competitiva, y que la estrategia del océano azul actúa como variable mediadora en esta relación. Con base en estos resultados, futuras investigaciones deberían explorar diversos enfoques para la implementación de estrategias de océano azul y sus efectos en el rendimiento empresarial.

Palabras clave: Sistema de Control de Gestión; Estrategia del Océano Azul; Ventaja Competitiva; PLS-SEM.

INTRODUCTION

The industrial sector is crucial to the global economy (Haraguchi et al., 2017), yet it faces increasing challenges, including globalization, heightened competition, and rapid technological advancements (Fallah & Lechler, 2008). In this context, effective management control has become indispensable for optimizing the performance and competitiveness of industrial companies (Martins et al., 2023). Therefore, a thorough

understanding of the impact of management control on this sector is vital for harnessing its full potential and driving business success.

Management control, as a discipline, provides companies with a methodological framework for evaluating, analyzing, and improving their economic and financial performance (Duréndez et al., 2016). It is a vital tool for helping companies achieve their strategic and operational objectives by utilizing relevant financial and non-financial information. Management control enables managers to make informed decisions (Langevin & Mendoza, 2013) and proactively guide the business by identifying potential areas for improvement and taking corrective actions. Management control provides a holistic view of the business, improving the visibility of costs and risks (Gomez-Conde et al., 2021), allowing decision-makers to better anticipate problems and implement preventive measures. Additionally, it fosters a culture of performance (Einhorn et al., 2024) and continuous improvement within the organization through the establishment of key performance indicators and ambitious targets (Gschwantner & Hiebl, 2016).

Management control aims to enhance oversight of activities, costs, overall performance, and profitability (Naranjo-Gil, 2016). It is a critical component of corporate governance (Freidank et al., 2014), ensuring the efficient use of resources, optimizing operational processes, and supporting strategic decision-making (Felício et al., 2021). This involves establishing systems for monitoring, reporting, performance evaluation, budget forecasting, risk management, and continuous improvement (Arjaliès & Mundy, 2013). Management control is essential for achieving strategic objectives (Toldbod & Laursen, 2024), maximizing profits, and creating shareholder value (Knauer et al., 2018). It also facilitates communication among various stakeholders within the organization by providing clear and relevant information on both financial and non-financial performance (Phan et al., 2023). Through the use of tools like dashboards, performance indicators, and profitability analyses, management control empowers managers to make well-informed decisions and steer the company effectively within a dynamic competitive landscape (Lewis et al., 2024). In this way, it helps ensure the long-term viability and growth of the organization, while optimizing resource use and fostering sustainable value creation (Crutzen et al., 2017).

Management control in the industrial sector is characterized by the critical need to monitor and manage highly complex and often financially significant production processes with precision (Gomez-Conde et al., 2023). It is essential to account for and effectively control cost and volume variability while maintaining solid profit margins in a competitive and constantly evolving environment (Hermundsdottir & Aspelund, 2023). To address these challenges and successfully manage these demanding tasks, sophisticated management control systems and evaluation methods specifically tailored to the industry are required (Awan, 2020). These specialized approaches facilitate in-depth performance assessment, offering a clear perspective and accurate analysis of relevant data to guide informed strategic decision-making and maximize positive outcomes.

The industry is characterized by production cycles and manufacturing processes that involve significant costs, substantial investments in equipment, and the need for close coordination between various stages (ElMaraghy et al., 2021). Moreover, inventory and supply management play a pivotal role, as raw materials and semi-finished products often face strict time and quality requirements. Management control must tackle these challenges to achieve optimal operational efficiency. This calls for the implementation of advanced monitoring and planning methods, such as performance indicators and integrated management systems (Braglia et al., 2022). Proactive and rigorous management helps in reducing costs, optimizing processes, and responding rapidly to market changes (Handoyo et al., 2023). In conclusion, management control is a crucial element for the long-term success of industrial companies. This study explores the impact of management control systems on the competitive advantage of industrial companies, with a specific focus on the mediating role of the blue ocean strategy in this relationship.

The article is structured into five sections. Following the introduction, the second section reviews the relevant literature and presents the research hypotheses. The third section outlines the research methodology and data analysis techniques. The fourth section presents and discusses the results. The final section concludes the study and suggests directions for future research.

Literature review and hypothesis development

Management control system

The definition of management control encompasses all the systems used to collect, analyze, and use information to steer the organization (Arjaliès & Mundy, 2013; Nasereddin, 2023). It also includes systems, procedures, rules, values, and all activities designed to guide employee behavior in order to achieve set objectives (Flamholtz et al., 1985), thus influencing human activity within an organization. Its goals are to control costs, optimize company performance, and guide strategic decisions (Langfield-Smith, 1997). This cross-functional role involves all stakeholders within the company and contributes to achieving the set objectives. From this perspective, management control plays a crucial role in the organization's management. It enables close monitoring of the company's various activities to identify areas that require improvement

https://doi.org/10.56294/dm2025482

(Martins et al., 2023). By gathering relevant information, management control allows for the analysis of each department's performance and proposes corrective measures where necessary (Aliyu et al., 2014).

Furthermore, the role of management control is to enhance the overall performance of the company (Travaillé & Naro, 2017). This includes the establishment of dashboards and performance indicators to evaluate the effectiveness of implemented actions (Badawy et al., 2016). These tools enable managers to make informed decisions and develop effective strategies to meet the organization's objectives.

Management control also helps ensure the efficiency of operations, optimizes the use of resources (Dávila et al., 2023), provides reliable and relevant management information, and contributes to decision-making (Nixon & Burns, 2005). In other words, management control aims to ensure that the objectives set by the organization are achieved under the best possible conditions, while taking into account both internal and external constraints.

Management control plays an essential role in strategic decision-making. By providing reliable and accurate information on the company's economic and financial situation, it helps managers make informed decisions about the company's future. By leveraging its analyses and forecasts, management control facilitates the anticipation of market trends and the development of suitable strategies to secure the company's long-term survival and growth (Gomez-Conde et al., 2023).

Management control systems can be classified into different categories (Acquaah, 2013) and are linked to various aspects of the company (Langfield-Smith, 2007). Our approach is based on the conceptual framework of Malmi and Brown (2008), who argued that financial MCSs are more tactical, while non-financial MCSs have a more strategic orientation. As a result, MCSs are divided into two categories: financial and non-financial (Gomez-Conde et al., 2023). Financial management control systems focus on tools and methods that monitor and analyze the company's financial data, including costs, investments, and profitability. Non-financial management control systems utilize qualitative and quantitative indicators to evaluate overall company performance, measuring non-financial factors such as customer satisfaction, product quality, operational efficiency, and human resource performance. These measures offer a comprehensive view of a company's health and competitiveness, enabling managers to make strategic decisions based on tangible, holistic data.

Management control system and competitive advantage

Competitive advantage is defined as a company's ability to outperform its competitors in a specific market by offering unique features and proactively meeting customer needs (Hosseini et al., 2018). This advantage may arise from various factors, including innovation, superior product or service quality, enhanced production efficiency, adoption of advanced technologies, strategic cost management, brand recognition, strong partnerships, customer loyalty, effective resource utilization, adaptability to market changes, among others (Farida & Setiawan, 2022). The integration of these key elements enables a company to differentiate itself from competitors and maintain a leading position in the market (Mahdi et al., 2019).

It is important to note that competitive advantage can be either sustainable or temporary (Abbasi Kamardi et al., 2022). A sustainable competitive advantage is one that competitors find difficult to imitate or surpass. This advantage is based on unique resources, specific capabilities, and in-depth knowledge that are challenging to replicate. For instance, a company with exclusive technological patents or specialized expertise in a particular field can achieve a sustainable competitive advantage. Conversely, a temporary competitive advantage may stem from less enduring factors, such as market trends, favorable economic conditions, or quickly outdated innovations (Veríssimo et al., 2024). These elements are easily imitated or surpassed by competitors, rendering the advantage short-lived (Mariani & Belitski, 2023).

Management control contributes to creating a competitive advantage by facilitating more efficient resource allocation (Simons, 1990) and providing accurate, timely information to support managers in making well-informed strategic decisions (Martins et al., 2023). By delivering precise data on costs and market trends, the management control system enables companies to adapt swiftly to changes and take proactive measures. Additionally, by measuring performance with relevant indicators, companies can identify their strengths and areas for improvement, enhancing their competitive edge (Farida & Setiawan, 2022). The management control system also fosters innovation by encouraging the constant pursuit of improvements and new ideas to stay ahead of the competition (Barros & Ferreira, 2023). We therefore propose the following hypothesis:

H1: The management control system positively influences competitive advantage

Management control system and blue ocean strategy

The concept of Blue Ocean Strategy, developed by W. Chan Kim and Renée Mauborgne, is centered around the idea of creating new market spaces rather than competing in existing, highly saturated and competitive markets (Lohtander et al., 2017). The central objective of this approach is to render competition irrelevant by promoting radical innovation in the creation of value for both the company and its customers, thereby generating sustained growth and long-term profitability (Madsen & Slåtten, 2019). By leveraging

https://doi.org/10.56294/dm2025482

innovative ideas and unconventional strategies, the Blue Ocean strategy enables an organization to stand out from its competitors and conquer new, previously untapped areas of the market (Hajar et al.,2021). Through rigorous strategic thinking, it becomes possible to identify little-known opportunities, discover new markets, and create unprecedented demand. This innovative approach is built on a thorough analysis of customer needs, market trends, and the company's distinct capabilities to create a value proposition that sets it apart from conventional industries. By undertaking this bold transformation, the company becomes innovative while avoiding the challenges posed by competition and market disruption. Ultimately, the Blue Ocean strategy offers a way to stand out in an increasingly competitive global market by creating tangible advantages for the company (Dias et al., 2020).

The intersections between management control and Blue Ocean Strategy are found in management controls ability to effectively support the strategy's implementation (Haseeb et al., 2019). This includes not only the precise identification and evaluation of key performance areas, but also the development of accurate metrics to track progress toward creating new opportunities and achieving Blue Ocean objectives. The ultimate goal of this alignment is to ensure that all resources—financial, human, and material—are fully synchronized with blue ocean strategic initiatives, allowing for the most efficient use of these resources to meet and exceed the ambitious goals of the strategy (Langfield-Smith, 1997). For management control to maximize benefits and opportunities while minimizing risks and potential losses, it must work in harmony with Blue Ocean Strategy. Based on this, we propose the following hypothesis:

H2: The management control system positively impacts the implementation of Blue Ocean Strategy

Blue ocean strategy and competitive advantage

Blue Ocean Strategy significantly enhances a company's competitive advantage by enabling it to differentiate from competitors and strategically position itself in the market. By creating new markets and unbundling value, companies can achieve a sustainable competitive advantage that clearly distinguishes them from their competitors (Farida & Setiawan, 2022). In addition, Blue Ocean Strategy fosters the sustainability of a company's market position by encouraging continuous innovation and proactively addressing the evolving needs of customers. This allows companies to maintain their edge over time and further distinguish themselves in a competitive marketplace.

By adopting a value-driven approach, companies can attract new customers while retaining existing ones by offering unique and unparalleled products and services. By prioritizing innovation and personalization, businesses can develop offerings that accurately cater to the specific needs of their customers. This differentiation enables companies to outpace competitors, stay ahead of market trends, and strengthen customer loyalty.

In summary, Blue Ocean Strategy serves as an effective approach for companies to distinguish themselves and strategically position within a competitive market (Lindič et al., 2012). By creating new markets, unbundling value, continuously innovating, and proactively responding to customer needs, companies can maintain a sustainable competitive advantage that sets them apart from competitors, while retaining existing customers and attracting new ones. This strategy allows businesses to stay ahead of the market and thrive in an ever-evolving business environment. Therefore, we propose the following hypothesis:

H3: Blue Ocean Strategy positively influences competitive advantage.

The Role of Management Control Systems in Achieving Competitive Advantage through Blue Ocean Strategy

Management control plays a vital role in building and enhancing a company's competitive advantage (Simons., 1990). Management control helps to identify the key areas where a company can stand out from the competition. It helps to measure performance, identify sources of competitive advantage, and make strategic decisions to strengthen the company's position in the market. Furthermore, management control enables the monitoring of costs, the optimization of processes, and quicker adaptation to market changes, all of which can serve as significant sources of competitive advantage. The integration of Blue Ocean Strategy can further provide numerous competitive benefits to a company (Christodoulou & Langley, 2020). These include the ability to significantly reduce costs while maintaining added value for the customer. This cost reduction can be achieved by reorganising internal processes, optimising resources or eliminating certain non-essential activities. In addition, this integration may also enable the company to differentiate itself from its competitors by offering products or services that are unique on the market, thereby meeting specific customer needs in an innovative way. Therefore, we therefore propose the following hypothesis:

H4: Blue Ocean Strategy mediates the relationship between the management control system and competitive advantage.

Figure 1 presents the hypotheses and keywords of our research.

https://doi.org/10.56294/dm2025482

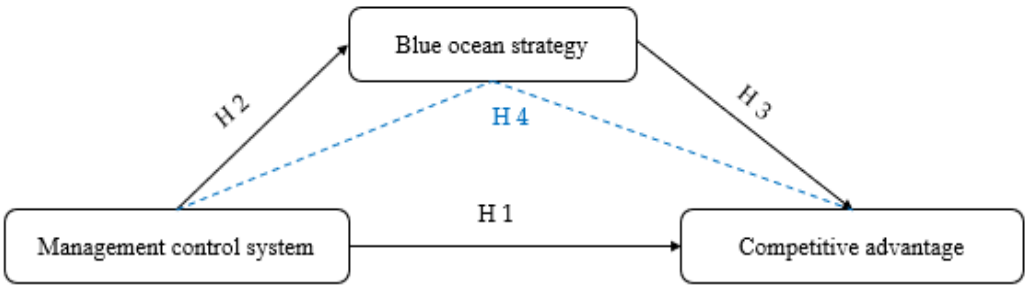

Figure 1. Research model

METHOD

The methodology chosen for this study was based on several criteria, including the nature of the data required, the study's objectives, and the availability of resources. After evaluating various methodological approaches, a quantitative method was selected to analyze the cause-and-effect relationships between management control, Blue Ocean Strategy, and competitive advantage. This approach will provide relevant insights and allow for drawing robust conclusions.

Data Collection and Sampling

The target population for this quantitative study comprises companies operating within the Moroccan industrial sector. A random sampling method was employed to ensure data representativeness, resulting in a substantial sample of 407 companies to enable reliable statistical analysis and valid generalizations. Data was primarily collected through a structured questionnaire administered to senior managers of the selected companies. To ensure the quality of the information gathered, confidentiality of responses was guaranteed, and additional interviews were conducted as needed.

Measurement of variables

Accurate measurement of variables in academic research is essential for ensuring the validity and reliability of results. In this study, the variables were measured using items that have been previously validated in the literature. The management control system was assessed with eight items, covering two dimensions, adapted from the work of Gomez-Conde et al. (2023). Competitive advantage was measured with five items from Farida and Setiawan (2022). The Blue Ocean Strategy was evaluated using 20 items, spanning four dimensions, based on Nasereddin (2023). All variables were measured using a five-point Likert scale.

RESULTS

Descriptive statistics results

The descriptive analysis includes statistics such as the mean, maximum value, minimum value, and standard deviation for each indicator under consideration. As shown in table 1, the mean for all indicators exceeds the standard deviation, indicating that the mean serves as a reliable estimate of the overall data distribution.

Table 1. Descriptive Statistics

Name	Mean	Min	Max	Standard deviation	kurtosis	Skewness
COAD1	3,272	1	5	1,326	-1,069	-0,304
COAD2	3,388	1	5	1,313	-0,931	-0,467
COAD3	3,042	1	5	1,283	-1,056	-0,036
COAD4	3,306	1	5	1,245	-0,877	-0,342
COAD5	3,173	1	5	1,307	-1,025	-0,29
REDU1	3,351	1	5	1,334	-0,946	-0,461
REDU2	3,262	1	5	1,339	-1,055	-0,357
REDU3	3,081	1	5	1,343	-1,158	-0,241
REDU4	3,326	1	5	1,316	-0,988	-0,409
REDU5	3,365	1	5	1,333	-0,999	-0,44
RAIS1	3,39	1	5	1,332	-0,992	-0,414
RAIS2	3,4	1	5	1,308	-0,939	-0,445
RAIS3	3,158	1	5	1,324	-1,106	-0,286
RAIS4	3,081	1	5	1,324	-1,148	-0,202
RAIS5	3,138	1	5	1,304	-1,126	-0,271
CREA1	3,373	1	5	1,354	-1,097	-0,358

https://doi.org/10.56294/dm2025482

CREA2	3,333	1	5	1,326	-1,001	-0,374
CREA3	3,356	1	5	1,351	-1,015	-0,425
CREA4	3,247	1	5	1,338	-1,082	-0,279
CREA5	3,314	1	5	1,306	-0,97	-0,369
ELIM1	3,378	1	5	1,226	-0,713	-0,477
ELIM2	3,41	1	5	1,211	-0,82	-0,425
ELIM3	3,368	1	5	1,217	-0,815	-0,395
ELIM4	3,084	1	5	1,196	-0,94	-0,076
ELIM5	3,2	1	5	1,244	-0,99	-0,237
NFMCS1	3,41	1	5	1,275	-0,893	-0,43
NFMCS2	3,351	1	5	1,259	-0,885	-0,408
NFMCS3	3,373	1	5	1,306	-0,974	-0,421
NFMCS4	3,077	1	5	1,121	-0,603	-0,352
FMCS1	3,264	1	5	1,181	-0,587	-0,416
FMCS2	3,178	1	5	1,171	-0,583	-0,424
FMCS3	3,346	1	5	1,318	-0,922	-0,461
FMCS4	3,321	1	5	1,346	-1,071	-0,392

Note: Competitive advantage (COAD), Reduce (REDU), Raise (RAIS), Create (CREA), Eliminate (ELIM), Non-financial MCS (NFMCS), Financial MCS (FMCS)

Pls test results

The data collected was analyzed using Smart PLS Version 4 software, a sophisticated method for examining relationships between latent variables. The evaluation of the conceptual model using this approach is conducted in two phases. The first phase involves assessing the measurement model, which defines the relationships between latent variables and their corresponding indicators. The second phase focuses on evaluating the structural model, which examines the relationships among the latent variables.

Evaluation of the Measurement Model

The criteria for evaluating the measurement model include both reliability and validity. Reliability examines the internal consistency of the items, while validity assesses whether the model accurately measures what it is intended to measure. Reliability is often assessed using Cronbach's alpha, which evaluates the internal consistency of items on a scale, along with indicator reliability, which assesses the reliability of individual indicators. Validity is verified through methods such as convergent and discriminant validity. Convergent validity measures the strength of relationships between the latent variables in the PLS model, while discriminant validity ensures that the latent variables are distinct from one another. These evaluation criteria are critical for determining the robustness and effectiveness of the measurement model.

Reliability of Individual Indicators

The reliability of individual indicators is critical, as it determines the level of confidence that can be placed in the data they provide. Decisions made based on these indicators rely entirely on their reliability, emphasizing the importance of accurate measurements. The standard method for assessing indicator reliability is the loading factor, where a value of 0,7 or higher is considered acceptable (Hair Jr et al., 2017). The results in table 2 confirm that all the indicators used in this study meet the reliability threshold.

Table 2. Reliability of individual indicators

	Outer loading	T statistics (|O/STDEV|)	P values
COAD1 <- Competitive advantage	0,879	69,266	0,000
COAD2 <- Competitive advantage	0,919	114,860	0,000
COAD3 <- Competitive advantage	0,717	19,894	0,000
COAD4 <- Competitive advantage	0,848	46,321	0,000
COAD5 <- Competitive advantage	0,714	17,895	0,000
CREA1 <- Create	0,863	49,904	0,000
CREA2 <- Create	0,904	83,626	0,000
CREA3 <- Create	0,877	53,500	0,000
CREA4 <- Create	0,899	89,170	0,000
CREA5 <- Create	0,816	43,571	0,000
ELIM1 <- Eliminate	0,868	57,765	0,000
ELIM2 <- Eliminate	0,888	62,912	0,000
ELIM3 <- Eliminate	0,913	95,137	0,000

https://doi.org/10.56294/dm2025482

ELIM4 <- Eliminate	0,828	41,461	0,000
ELIM5 <- Eliminate	0,801	35,707	0,000
FMCS1 <- Financial MCS	0,804	38,343	0,000
FMCS2 <- Financial MCS	0,819	39,492	0,000
FMCS3 <- Financial MCS	0,917	103,659	0,000
FMCS4 <- Financial MCS	0,899	98,712	0,000
NFMCS1 <- Non-financial MCS	0,884	70,996	0,000
NFMCS2 <- Non-financial MCS	0,902	78,525	0,000
NFMCS3 <- Non-financial MCS	0,912	97,103	0,000
NFMCS4 <- Non-financial MCS	0,810	38,973	0,000
RAIS1 <- Raise	0,872	62,199	0,000
RAIS2 <- Raise	0,901	99,600	0,000
RAIS3 <- Raise	0,835	33,099	0,000
RAIS4 <- Raise	0,786	34,023	0,000
RAIS5 <- Raise	0,773	26,729	0,000
REDU1 <- Reduce	0,868	55,035	0,000
REDU2 <- Reduce	0,897	72,815	0,000
REDU3 <- Reduce	0,747	20,391	0,000
REDU4 <- Reduce	0,888	62,015	0,000
REDU5 <- Reduce	0,847	51,292	0,000

Internal Consistency Reliability

To verify internal consistency, we assessed the reliability of each latent variable by calculating Cronbach's alpha coefficient and composite reliability. As shown in table 3, the results exceed the 0,7 threshold (Hair Jr et al., 2017), indicating that the model demonstrates strong internal consistency and reliability.

Table 3. Reliability of the internal consistency

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)
Blue ocean strategy	0,958	0,961	0,962
Competitive advantage	0,875	0,897	0,910
Create	0,921	0,921	0,941
Eliminate	0,912	0,917	0,934
Financial MCS	0,883	0,891	0,920
Management control systems	0,921	0,925	0,935
Non-financial MCS	0,900	0,904	0,931
Raise	0,891	0,906	0,920
Reduce	0,904	0,913	0,929

Convergent validity

Convergent validity assesses the degree to which multiple items intended to measure the same variable align with each other. In other words, it evaluates whether various measures designed to assess the same concept yield similar results, thereby increasing confidence in the study's validity. Ensuring convergent validity is crucial to confirm that the results accurately reflect the concept being measured. The criterion used to assess convergent validity is the Average Variance Extracted (AVE), where each AVE value should be at least 0,5 (Hair Jr et al., 2017). The results in table 4 confirm that all items meet this validity threshold.

Table 4. Convergent validity

	Average variance extracted (AVE)
Blue ocean strategy	0,559
Competitive advantage	0,672
Create	0,761
Eliminate	0,740
Financial MCS	0,742
Management control systems	0,645
Non-financial MCS	0,770
Raise	0,697
Reduce	0,724

https://doi.org/10.56294/dm2025482

Discriminant validity

The conceptualisation of discriminant validity in management science research involves the careful examination of how different concepts are distinguished from one another. It is essential to establish that the variables being studied are truly distinct and are not simply different manifestations of the same underlying concept. This is essential to ensure the accuracy and robustness of the research results. Fornell and Larcker (1981) proposed that discriminant validity is established when the square root of the Average Variance Extracted (AVE) for each construct is greater than its correlation with any other construct in the model. The results in table 5 confirm that the constructs in this study are distinct from one another, meeting the criteria for discriminant validity.

Table 5. Discriminant validity (Fornell-Larcker criterion)

	Competitive advantage	Create	Eliminate	Financial MCS	Non-financial MCS	Raise	Reduce
Competitive advantage	0,820						
Create	0,695	0,872					
Eliminate	0,635	0,681	0,860				
Financial MCS	0,700	0,718	0,647	0,861			
Non-financial MCS	0,665	0,692	0,754	0,707	0,878		
Raise	0,642	0,780	0,609	0,633	0,617	0,835	
Reduce	0,720	0,748	0,638	0,720	0,685	0,676	0,851

Structural model

The structural model is crucial for understanding the relationships between latent variables. Key criteria for evaluating a structural model include the coefficients of determination ($R^{2)}$, The Cross-validate redundancy coefficient (Q^2), effect size, and predictive validity Q, variance inflation factor (VIF), and path coefficient for hypothesis testing.

The coefficient of determination, commonly referred to as R^2, is a statistical measure that indicates the extent to which the variance in one variable is explained by the variance in another. It is widely used in management science and other disciplines to assess the strength of relationships between variables. The significance of R^2 lies in its ability to provide insights into the relevance of explanatory variables. An R^2 value close to 1 signifies a strong correlation, indicating that the explanatory variable accounts for a significant portion of the variation in the dependent variable. Conversely, an R^2 value close to 0 suggests a weak correlation, implying that the explanatory variable does not effectively explain the variation in the dependent variable (Hair Jr et al., 2017). Table 6 shows high R^2 values for each dependent variable.

Table 6. R^2 values

	R-square	R-square adjusted
Blue ocean strategy	0,716	0,715
Competitive advantage	0,619	0,617
Create	0,849	0,848
Eliminate	0,695	0,695
Financial MCS	0,849	0,848
Non-financial MCS	0,858	0,858
Raise	0,758	0,757
Reduce	0,767	0,767

The Q^2 redundancy coefficient is used to evaluate the quality of predictive models, especially in multivariate analysis. Its primary purpose is to assess the accuracy of a model's predictions relative to the variation in the observed data. In other words, it evaluates how well the model predicts the outcomes based on the data provided, it is used to determine the extent to which the explanatory variables in a model help to explain the variation in the data, with an emphasis on cross-validity to guarantee the reliability of the results (Hair Jr et al., 2017). The results in table 7 indicate that all constructs have Q^2 values greater than 0, signifying that the model demonstrates predictive relevance.

https://doi.org/10.56294/dm2025482

Table 7. Q^2 values

	Q^2predict	RMSE	MAE
Blue ocean strategy	0,714	0,536	0,425
Competitive advantage	0,542	0,679	0,527
Create	0,580	0,651	0,519
Eliminate	0,572	0,657	0,515
Financial MCS	0,848	0,392	0,293
Non-financial MCS	0,858	0,379	0,283
Raise	0,453	0,743	0,578
Reduce	0,576	0,654	0,513

Effect size (f^2) is a metric used in multiple linear regression analysis to quantify the proportion of variance in the dependent variable that is explained by the independent variable(s). An f^2 value between 0,15 and 0,35 indicates a moderate effect (Hair Jr et al., 2017). The f^2 values are presented in table 8.

Table 8. f^2 values

	f-square	Effect
Blue ocean strategy -> Competitive advantage	0,192	Medium
Management control systems -> Blue ocean strategy	2,515	Large
Management control systems -> Competitive advantage	0,072	Small

The Variance inflation factor (VIF) is employed to detect multicollinearity within a research model. Multicollinearity arises when explanatory variables are highly correlated with one another, potentially leading to inaccurate regression coefficient estimates and reduced model predictive power. The VIF is calculated using the formula 1 / (1 - R^2), where R2 is the coefficient of determination from a regression model that includes the variable in question along with the other explanatory variables. A VIF value greater than 5 typically indicates the presence of multicollinearity (Hair Jr et al., 2017). The results in table 9 show no evidence of multicollinearity among the explanatory variables in the model.

Table 9. Collinearity statistics (VIF)

Items	VIF	FMCS2	1,922
COAD1	3,198	FMCS3	3,823
COAD2	4,005	FMCS4	3,425
COAD3	1,716	NFMCS1	2,735
COAD4	2,319	NFMCS2	3,148
COAD5	1,633	NFMCS3	3,287
CREA1	2,719	NFMCS4	1,917
CREA2	4,020	RAIS1	3,194
CREA3	3,383	RAIS2	3,929
CREA4	3,417	RAIS3	3,014
CREA5	2,150	RAIS4	1,926
ELIM1	2,881	RAIS5	2,494
ELIM2	3,336	REDU1	2,938
ELIM3	3,792	REDU2	3,516
ELIM4	2,415	REDU3	1,754
ELIM5	2,142	REDU4	3,169
FMCS1	1,837	REDU5	2,561

Source: Authors via PLS-SEM

The path coefficient is a statistical tool commonly used in research to test hypotheses about the relationships between variables. It assesses the strength and direction of an independent variable's impact on a dependent variable, while accounting for the influence of other variables in the model. In other words, the path coefficient measures both the direct effect of one variable on another, as well as the influence of indirect variables. The results in table 10 and figure 2 indicate that the path coefficients are both positive and substantial, validating all the hypotheses.

https://doi.org/10.56294/dm2025482

Table 10. Path coefficient and testing hypothesis

Direct effect	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Blue ocean strategy -> Competitive advantage	0,507	0,509	0,061	8,370	0,000
Management control systems -> Blue ocean strategy	0,846	0,846	0,014	61,987	0,000
Management control systems -> Competitive advantage	0,310	0,309	0,064	4,817	0,000
Indirect effect					
Management control systems -> Blue ocean strategy -> Competitive advantagegy ->ve	0,429	0,430	0,052	8,175	0,000

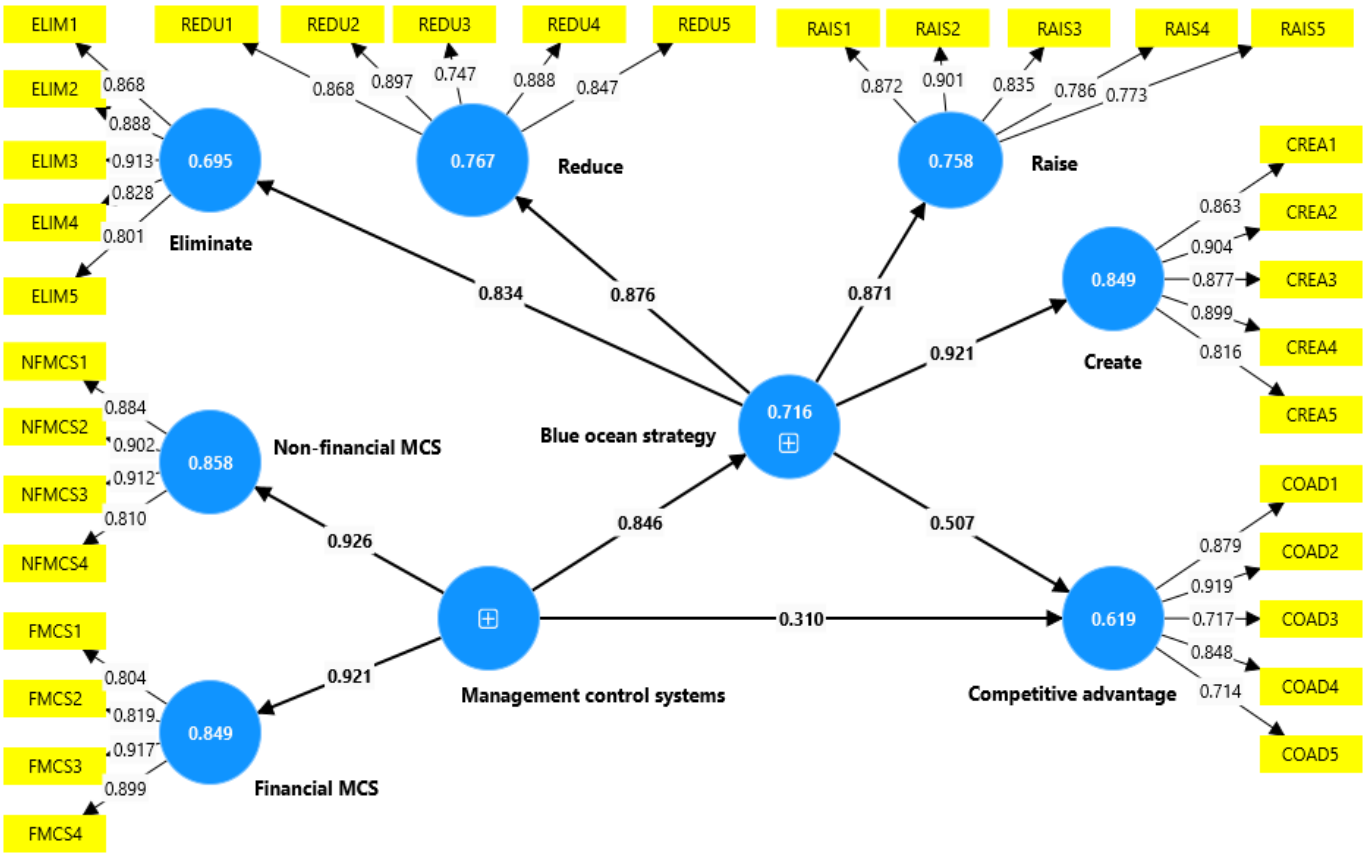

Figure 2. SEM analysis outcomes

DISCUSSION

The first hypothesis suggests that the management control system has a positive effect on competitive advantage. The results in table 10 reveal a path coefficient of 0,310 and a p-value of 0,000, which is well below the 0,05 threshold. Thus, H1 is supported. Management control plays a vital role in maintaining and enhancing a company's competitive advantage by identifying key success factors, such as effective cost management, resource optimization, and the adoption of innovative technologies. By addressing these factors, management control ensures optimal resource allocation and continuous performance monitoring. These results corroborate the findings of Pant and Yuthas (2001).

The second hypothesis posits that the management control system positively influences the Blue Ocean Strategy. The results in Table 10 show a path coefficient of 0,846 and a p-value of 0,000, which is below the 0,05 threshold, confirming H2. The management control system is crucial for the effective implementation of the Blue Ocean Strategy, as it ensures that the strategy's objectives are met efficiently. It serves as a guiding tool for performance measurement, supports informed decision-making, and allows for strategic adjustments based on achieved outcomes.

The third hypothesis proposes that the Blue Ocean Strategy positively impacts competitive advantage. The results in table 10 indicate a path coefficient of 0,507 and a p-value of 0,000, which is below the 0,05

threshold, confirming H3. The Blue Ocean Strategy, by focusing on creating new market spaces and driving value innovation, allows companies to differentiate themselves from competitors and attract a broader customer base. By emphasizing both differentiation and cost reduction, companies can draw in new customers while minimizing competitive threats in their industry. Additionally, the Blue Ocean Strategy provides a structured framework for companies to reevaluate their current strategies, identify growth opportunities, and foster innovation, thereby strengthening their competitive advantage.

The final hypothesis suggests that the Blue Ocean Strategy mediates the relationship between the management control system and competitive advantage. The data in table 10 show a path coefficient of 0,429 and a p-value of 0,000, which is below the 0,05 threshold, thus confirming H4. The Blue Ocean Strategy plays a crucial mediating role by enabling the creation of new competitive spaces and enhancing differentiation. Companies that successfully integrate the Blue Ocean Strategy within their management control systems can achieve a sustainable and substantial competitive advantage.

CONCLUSIONS

This study aims to evaluate the impact of management control systems on the competitive advantage of Moroccan industrial firms, while also examining the mediating role of the Blue Ocean Strategy in the relationship between management control systems and competitive advantage.

In conclusion, this study demonstrates that management control systems significantly influence a company's competitive advantage by shaping decision-making processes and steering actions toward strategic objectives. The alignment between management control systems and corporate strategy is crucial for optimizing resource utilization. Moreover, the Blue Ocean Strategy serves as a vital mediator by fostering the creation of new competitive spaces and enhancing differentiation. Companies that successfully integrate the Blue Ocean Strategy with their management control systems are more likely to attain a sustainable and substantial competitive advantage.

The limitations of this study include the sample size, which was confined to a single industry sector, potentially limiting the generalizability of the findings. Additionally, the quantitative methodology employed may not have fully captured the complexity and nuances of the impact of management control systems on competitive advantage, as well as the mediating role of the Blue Ocean Strategy. Moreover, the data collected may be subject to biases due to participants' subjectivity, despite efforts to minimize these biases. Finally, unexamined variables that were not considered in this study could also influence scontrol systems and competitive advantage.

The practical implications of this study emphasize the importance for companies to recognize the mediating role of the Blue Ocean Strategy between management control systems and competitive advantage. This necessitates adapting management control practices to incorporate the Blue Ocean Strategy and fostering the ability to create new, uncontested markets. For future research, it will be crucial to further explore the impact of the Blue Ocean Strategy on organizational performance and investigate various approaches to implementing this strategy across different contexts.

REFERENCES

1. D Abbasi Kamardi, A., Amoozad Mahdiraji, H., Masoumi, S., & Jafari-Sadeghi, V. (2022). Developing sustainable competi-tive advantages from the lens of resource-based view: evidence from IT sector of an emerging economy. Journal of Strategic Marketing. https://doi.org/10.1080/0965254X.2022.2160485

2. Acquaah, M. (2013). Management control systems, business strategy and performance: A comparative analysis of family and non-family businesses in a transition economy in sub-Saharan Africa. Journal of Family Business Strategy, 4(2), 131–146. https://doi.org/10.1016/j.jfbs.2013.03.002

3. Aliyu, N. S., Jamil, C. Z. M., & Mohamed, R. (2014). The Mediating Role of Management Control System in the Relation-ship between Corporate Governance and the Performance of Bailed-out Banks in Nigeria. Procedia - Social and Behavioral Sciences, 164, 613–620. https://doi.org/10.1016/j.sbspro.2014.11.154

4. Arjaliès, D. L., & Mundy, J. (2013). The use of management control systems to manage CSR strategy: A levers of control perspective. Management Accounting Research, 24(4), 284–300. https://doi.org/10.1016/j.mar.2013.06.003

5. Badawy, M., El-Aziz, A. A. A., Idress, A. M., Hefny, H., & Hossam, S. (2016). A survey on exploring key performance indicators. Future Computing and Informatics Journal, 1(1–2), 47–52. https://doi.org/10.1016/j.fcij.2016.04.001

6. Barros, R. S., & Ferreira, A. M. D. S. da C. (2023). Management control systems and innovation: a case study grounded in institutional theory. Journal of Management Control, 34(1), 109–133. https://doi.org/10.1007/s00187-023-00351-4

7. Braglia, M., Gabbrielli, R., Marrazzini, L., & Padellini, L. (2022). Key Performance Indicators and Industry 4.0 - A struc-tured approach for monitoring the implementation of digital technologies. Procedia Computer Science, 200, 1626–1635. https://doi.org/10.1016/j.procs.2022.01.363

8. Burns, John & Nixon, William. (2005). Management Control in the 21st Century. Management Accounting Research. 16. https://doi.org/10.1016/j.mar.2005.07.001

9. Christodoulou, I., & Langley, P. A. (2020). A gaming simulation approach to understanding blue ocean strategy development as a transition from traditional competitive strategy. Journal of Strategic Marketing, 28(8), 727–752. https://doi.org/10.1080/0965254X.2019.1597916

10. Crutzen, N., Zvezdov, D., & Schaltegger, S. (2017). Sustainability and management control. Exploring and theorizing control patterns in large European firms. Journal of Cleaner Production, 143, 1291–1301. https://doi.org/10.1016/j.jclepro.2016.11.135

11. Dávila, A., Derchi, G. B., Oyon, D., & Schnegg, M. (2023). External complexity and the design of management control systems: a case study. Management Accounting Research, 63. https://doi.org/10.1016/j.mar.2023.100875

12. Dias, A. S. M. E., Abreu, A., Navas, H. V. G., & Santos, R. (2020). Proposal of a holistic framework to support sustainability of new product innovation processes. Sustainability (Switzerland), 12(8). https://doi.org/10.3390/SU12083450

13. Duréndez, A., Ruíz-Palomo, D., García-Pérez-de-Lema, D., & Diéguez-Soto, J. (2016). Management control systems and performance in small and medium family firms. European Journal of Family Business, 6(1), 10–20. https://doi.org/10.1016/j.ejfb.2016.05.001

14. Einhorn, S., Fietz, B., Guenther, T. W., & Guenther, E. (2024). The relationship of organizational culture with management control systems and environmental management control systems. Review of Managerial Science, 18(8), 2321–2371. https://doi.org/10.1007/s11846-023-00687-0

15. Fallah, M. H., & Lechler, T. G. (2008). Global innovation performance: Strategic challenges for multinational corporations. Journal of Engineering and Technology Management - JET-M, 25(1–2), 58–74. https://doi.org/10.1016/j.jengtecman.2008.01.008

16. Farida, I., & Setiawan, D. (2022). Business Strategies and Competitive Advantage: The Role of Performance and Innovation. Journal of Open Innovation: Technology, Market, and Complexity, 8(3). https://doi.org/10.3390/joitmc8030163

17. Felício, T., Samagaio, A., & Rodrigues, R. (2021). Adoption of management control systems and performance in public sector organizations. Journal of Business Research, 124, 593–602. https://doi.org/10.1016/j.jbusres.2020.10.069

18. Flamholtz, E.G., Das, T.K., & Tsui, A.S. (1985). Toward an integrative framework of organizational control. Accounting Organizations and Society, 10, 35-50.

19. Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with un-observable variables and measurement error. Journal of Marketing Research, 18(1),39–50.

20. Freidank, CC., Haldma, T. & Velte, P (2014). Corporate governance reforms and management control. Journal Manag Control 25, 77–79. https://doi.org/10.1007/s00187-014-0199-1

21. Gomez-Conde, J., Lopez-Valeiras, E., Malagueño, R., & Gonzalez-Castro, R. (2021). Management control systems and innovation strategies in business-incubated start-ups. Accounting and Business Research, 53(2), 210–236. https://doi.org/10.1080/00014788.2021.1986365

22. Gomez-Conde, J., Lopez-Valeiras, E., Rosa, F. S., & Lunkes, R. J. (2023). The effect of management control systems in managing the unknown: Does the market appreciate the breadth of vision? Review of Managerial Science, 17(8), 2769–2795. https://doi.org/10.1007/s11846-022-00601-0

23. Gschwantner, S., & Hiebl, M. R. W. (2016). Management control systems and organizational ambidexterity. Journal of Management Control, 27(4), 371–404. https://doi.org/10.1007/s00187-016-0236-3

24. Hair, J. F., Jr., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2017). A primer on partial least squares structural equation modeling (PLS-SEM). Los Angeles, CA: Sage Publications.

25. Hajar, Mohammed & Alkahtani, Ammar & Nasir, Daing & Darun, Mohd Ridzuan & Al-Sharafi, Mohammed A. & Tiong, Sieh Kiong. (2021). The Approach of Value Innovation towards Superior Performance, Competitive Advantage, and Sustainable Growth: A Systematic Literature Review. Sustainability. 13. 1-32. https://doi.org/10.3390/su131810131

26. Handoyo, S., Suharman, H., Ghani, E. K., & Soedarsono, S. (2023). A business strategy, operational efficiency, ownership structure, and manufacturing performance: The moderating role of market uncertainty and competition intensity and its implication on open innovation. Em Journal of Open Innovation: Technology, Market, and Complexity. https://doi.org/10.1016/j.joitmc.2023.100039

27. Haraguchi, N., Cheng, C. F. C., & Smeets, E. (2017). The Importance of Manufacturing in Economic Development: Has This Changed? World Development, 93, 293–315. https://doi.org/10.1016/j.worlddev.2016.12.013

28. Haseeb, M., Lis, M., Haouas, I., & Mihardjo, L. W. W. (2019). The mediating role of business strategies between management control systems package and firms stability: Evidence from SMEs in Malaysia. Sustainability (Switzerland), 11(17). https://doi.org/10.3390/su11174705

29. Hosseini, A. S., Soltani, S., & Mehdizadeh, M. (2018). Competitive advantage and its impact on new product development strategy (Case study: Toos Nirro technical firm). Journal of Open Innovation: Technology, Market, and Complexity, 4(2). https://doi.org/10.3390/joitmc4020017

30. Knauer, T., Silge, L., & Sommer, F. (2018). The shareholder value effects of using value-based performance measures: Evidence from acquisitions and divestments. Management Accounting Research, 41, 43–61. https://doi.org/10.1016/j.mar.2018.02.001

31. Langevin, P., & Mendoza, C. (2013). How can management control system fairness reduce managers' unethical behaviours? European Management Journal, 31(3), 209–222. https://doi.org/10.1016/j.emj.2012.12.001

32. Langfield-Smith, K. M. (1997). Management Control Systems and Strategy: A Critical Review. Accounting, Organizations and Society, 207 - 232.

33. Langfield-Smith, K. (2007). A review of quantitative research in management control systems and strategy. In C. S. Chapman, A. G. Hopwood, & M. D. Shields (Eds.), Handbook of Management Accounting Research (1st ed., Vol. 2, pp. 753-783). (Handbooks of Management Accounting Research). Elsevier. https://doi.org/10.1016/S1751-3243(06)02012-8

34. Lewis, R. L., Sutton, N., & Brown, D. A. (2024). How senior managers use interactive control to manage strategic uncertainties: An attention-based view. Management Accounting Research, 62. https://doi.org/10.1016/j.mar.2023.100864

35. Lindič, J., Bavdaž, M., & Kovačič, H. (2012). Higher growth through the Blue Ocean Strategy: Implications for economic policy. Research Policy, 41(5), 928–938. https://doi.org/10.1016/j.respol.2012.02.010

36. Lohtander, M., Aholainen, A., Volotinen, J., Peltokoski, M., & Ratava, J. (2017). Location Independent Manufacturing – Case-based Blue Ocean Strategy. Procedia Manufacturing, 11, 2034–2041. https://doi.org/10.1016/j.promfg.2017.07.355

37. Madsen, D. Ø., & Slåtten, K. (2019). Examining the emergence and evolution of blue ocean strategy through the lens of management fashion theory. Social Sciences, 8(1). https://doi.org/10.3390/socsci8010028

38. Mahdi, O. R., Nassar, I. A., & Almsafir, M. K. (2019). Knowledge management processes and sustainable competitive advantage: An empirical examination in private universities. Journal of Business Research, 94, 320–334. https://doi.org/10.1016/j.jbusres.2018.02.013

39. Malmi, T., & Brown, D. A. (2008). Management control systems as a package-Opportunities, challenges and research directions. Management Accounting Research, 19(4), 287–300. https://doi.org/10.1016/j.mar.2008.09.003

40. Mariani, M. M., & Belitski, M. (2023). The effect of coopetition intensity on first mover advantage and imitation in innovation related coopetition: Empirical evidence from UK firms. European Management Journal, 41(5), 779–791. https://doi.org/10.1016/j.emj.2022.05.001

41. Martins, A., Oliveira, C., Silva, R., & Castelo Branco, M. (2023). Management Control Practices as Performance Facilitators in a Crisis Context. Administrative Sciences, 13(7). https://doi.org/10.3390/admsci13070163

42. Naranjo-Gil, D. (2016). The role of management control systems and top teams in implementing environmental sustain-ability policies. Sustainability, 8(4). https://doi.org/10.3390/su8040359

43. Nasereddin, A. Y. (2023). Impact of the Blue Ocean Strategy Dimensions in Achieving Competitive Advantage from the Perspective of Faculty Members. Information Sciences Letters, 12(6), 2685–2698. https://doi.org/10.18576/isl/120639

44. Pant, L. W., & Yuthas, K. (2001). Using the management control system to promote competitive advantage in organizations: Behavioral and sociological perspectives. https://doi.org/10.1016/S1474-7979(01)04072-8

45. Phan, T., Baird, K., Bhuyan, M., & Tung, A. (2023). The associations between management control systems, organisational capabilities and performance. Journal of Management Control, 34(4), 435–462. https://doi.org/10.1007/s00187-024-00365-6

46. Simons, R.A. (1990). The role of management control systems in creating competitive advantage: New perspectives. Accounting Organizations and Society, 15, 127-143.

47. Toldbod, T., & Laursen, L. N. (2024). Time and the sequential integration of management controls in open innovation between Unilever and its partners: A procedural perspective. Management Accounting Research. https://doi.org/10.1016/j.mar.2024.100901

48. Travaillé, D., & Naro, G. (2017). Management control facing the challenges of overall performance. Society and Business Review, 12(2), 175–199. https://doi.org/10.1108/sbr-11-2016-0065

49. Veríssimo, C., Pereira, L., Fernandes, A., & Martinho, R. (2024). Complex problem solving as a source of competitive ad-vantage. Journal of Open Innovation: Technology, Market, and Complexity, 10(2). https://doi.org/10.1016/j.joitmc.2024.100258

FINANCING

The authors did not receive financing for the development of this research.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHORSHIP CONTRIBUTION

Conceptualization: Mustapha RAZZOUKI, Rachid ZAMMAR, Adile garouhe.
Data curation: Rachid ZAMMAR, Adile garouhe, Mustapha RAZZOUKI.
Formal analysis: Mustapha RAZZOUKI, Rachid ZAMMAR, Adile garouhe.
Research: Adile garouhe, Mustapha RAZZOUKI, Rachid ZAMMAR.
Methodology: Mustapha RAZZOUKI, Rachid ZAMMAR, Adile garouhe.

Drafting - original draft: Karima SALAHEDDINE, Mustapha RAZZOUKI, Rachid ZAMMAR, Adile garouhe.

Writing - proofreading and editing: Karima SALAHEDDINE, Adile garouhe, Mustapha RAZZOUKI, Rachid ZAMMAR.

https://doi.org/10.56294/dm2025482