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Analysis Of The Relationship Between Sustainability And Competitiveness: A Management And Control Model For The Global Goals Of Sustainable Development And The Competitive Positioning Of The Country

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ABSTRACT: *The objective of the present study was to ascertain the correlation between sustainability and competitiveness. It is imperative for companies to achieve a balance between these two factors in order to maintain their competitive edge and ensure their continued operation in the future. A relationship was established through a comprehensive review of management models based on sustainability and competitiveness, the methods by which they are measured, and their results. This relationship indicates that there is a contribution from the administrative management of organizations toward the Sustainable Development Goals proposed for 2030 at the global level. This determination was reached subsequent to an in-depth analysis of the objectives inherent to each goal, culminating in the selection of seven that were deemed to be particularly pertinent. These objectives are believed to be intimately associated with the developmental, growth-oriented, and innovative endeavors that organizations undertake as a component of their business operations.*
KEYWORDS: *Sustainability, competitiveness, management, indicators, control*

INTRODUCTION

The challenges confronting companies in the post-pandemic era have proven to be more arduous. The company's strategic approach has centered on maintaining its presence in the market, ensuring the continuity of operations, implementing measures to mitigate employee layoffs, and contributing to the state's economic vitality. One of their primary objectives has been to adapt their management model to the evolving market conditions and societal landscape.

Society today is confronted with numerous changes, thereby placing heightened demands on organizations to adopt sustainable management models. These models must not only ensure the continuity of growth indicators but also prioritize environmental sustainability, social responsibility, and the safeguarding of future generations' development prospects. Additionally, these models must respect the constraints imposed by current resources. Conversely, states, as guarantors of their citizens' well-being, require companies that are competitive in the market and capable of sustaining themselves and growing under different circumstances. These companies obtain part of their profits in the form of taxes, thereby acquiring the resources that must be distributed among citizens to guarantee general well-being.

In this scenario, the elements necessary for the achievement of individual and collective objectives are apparent on both sides. This prompts the following question: The present study seeks to ascertain the relationship between sustainability and competitiveness as management models in contemporary companies. Furthermore, it will examine the contribution that this relationship can make to the achievement of sustainable development goals.

BACKGROUND

A 2020 analysis of the relationship between the Sustainable Development Goals (SDGs) and business competitiveness sought to determine whether the SDGs have become a factor in organizational competitiveness. The analysis concluded that, in general, organizations have established a robust link between sustainability and competitiveness, incorporating the SDGs as a management model as a strategy, thereby integrating the objectives and goals (García & Granda 2020).

This conclusion was reached subsequent to an analysis of the 2019 Sustainable Development Report, which demonstrates the progress achieved toward the SDGs in UN member countries, and the 2019 Global Competitiveness Index, published by the World Economic Forum, which also quantifies the productivity and economic growth of countries. The findings of the present study demonstrate a positive correlation between the degree of compliance with the Sustainable Development Goals (SDGs) and the level of competitiveness, as indicated by various indicators. This relationship suggests a nexus between competitiveness and sustainability as strategic and management elements within diverse public and private institutions.

In relation to the business sector, other reports were reviewed, including Forética 2018, which was carried out in Spain and analyzed the main trends in social responsibility in the business sector; a study on sustainability and competitiveness published by Advantage MIT Sloan in 2008; and the analyses carried out by the Accenture Global Compact in 2018. The latter concluded that the SDGs have become a roadmap for sustainability in the business sector (García & Granda 2020). Consequently, it is determined that a close relationship exists between sustainability and competitiveness. The adoption of sustainability strategies has been demonstrated to contribute to market positioning, which is regarded as a significant competitiveness variable (García & Granda 2020).

A subsequent study conducted at the University of Sonora discovered a significant correlation between sustainability variables and competitiveness, concluding that the strongest relationship between competitiveness and sustainability is with the social factor (Angulo 2017). The present study was conducted in the agricultural input marketing sector in the state of Sonora, Mexico. A total of 100 micro-enterprises participated in the study.

The study yielded a series of conclusions that underscore the significance of the nexus between sustainability and competitiveness. Firstly, when examining the reference frameworks utilized, it is evident that value creation is identified as a relationship element (Angulo 2017). This element serves as a crucial benchmark indicator of a company's competitiveness. According to the study, the creation of value is a consequence of effective corporate sustainability management. In essence, corporate entities have leveraged their corporate sustainability strategy to engender value within their organizations.

The document posits several conclusions, including the notion that corporate activities undertaken for the benefit of surrounding communities, such as sporting events, recycling initiatives, and job creation, have enhanced their corporate image and acceptance within the sector (Angulo 2017). This, in turn, has prompted organizations to adhere to significant competitiveness indicators. However, the study's findings indicate that the relationship with competitiveness has yielded positive outcomes in the context of social issues. Conversely, in the economic and environmental dimensions, the results have been less favorable (Angulo 2017).

REFERENCE FRAMEWORKS

The theoretical framework model is constructed by describing the main concepts in the development of the project. In this section, the objective is to establish a precise definition of the aforementioned concepts within the contemporary context. This endeavor draws upon the theoretical framework proposed by Sampier in 2006, which delineates the delineation of a concept as a composite criterion comprising a definition, characteristics, components, and a delimitation of the conditions and context within which these concepts are presented.

The conceptualization of these notions is contingent upon the significance attributed to them by corporate entities. These entities prioritize sustainability and competitiveness indicators in order to substantiate their managerial practices within the prevailing context. Alternatively, compliance with these indicators is necessitated by the imperative to sustain their market presence and maintain a favorable corporate image.

CORPORATE SUSTAINABILIT

Concept or definition

The notion of sustainability was initially introduced during the Brundtland Conference in 1987, where sustainable development was conceptualized as a commitment to ensure the needs of the present generation are met without compromising the needs of future generations. This event is widely regarded as the inception of a paradigm shift in environmental thought, with the establishment of a model of environmental culture (Luffiego & Rabadán 2000).

The commitment, initiated by government leadership, gradually disseminated to all levels of society, encompassing numerous non-governmental organizations, private companies, and the general public. The evolution of legislation towards stricter regulation at both the international and national levels is one of the main factors explaining this phenomenon (Picard & Manfredi 2023). This is how governments have sought to involve different actors in the path towards sustainability.

In particular, governments have placed considerable emphasis on the productive sector due to its use of raw materials and natural environments. In the contemporary business landscape, enterprises that have elected to adopt a stance on the matter of sustainability recognize the imperative to reconceptualize their policies, incorporating the notion of sustainability into their corporate ethos and leveraging it as a competitive strategy. This strategic approach necessitates the utilization of performance indicators to evaluate outcomes (Picard & Manfredi 2023).

In a similar way, they have categorized the concept of sustainability into three primary components: economic, social, and natural. To elucidate its relationship with the external environment, they have opted for definitions of natural capital, which has to do with the flow of natural resources and the basic services and functions received from the environment, and social capital, which is recognized as trained personnel, existing technology, monetary capital (Luffiego & Rabadán 2000), and all stakeholders directly and indirectly involved in business activity.

This evolution of the concept of sustainability has given rise to a range of technical concepts, delineated by expert economists who aim to provide companies with guidance on the implementation of the sustainability model within their business models. In this evolution, an initial approach was made to the concept of the Green Economy. However, it was not until 1990 that Pearce and Turner literally coined the term "Circular Economy," proposing a closed economic flow that explained how it could work (Prieto et al. 2017). In light of this conceptual framework, the management model predicated on requisite sustainability has garnered considerable traction, having been instituted as a strategic policy in nations such as Germany, China, and Japan (Prieto et al. 2017).

In a similar vein, the notion of sustainability has undergone a transformation within the micro sector of the economy, giving rise to the concept of corporate sustainability. According to Espstein (2009), corporate sustainability can be defined as a set of elements that involve an entire management model in organizations that seek to incorporate environmental, social, and economic issues within a strategy with short-, medium-, and long-term actions.

Characteristics of a Sustainable Management Model

In response to the notion of sustainable development, companies have begun to adopt more sustainable policies, incorporating principles of equity, social and economic justice, and environmental stewardship (Reyes 2021). This exercise has resulted in the formulation of a management model grounded in sustainability criteria, thereby prompting contemporary management models to recognize the value of contributing to the ideal model of sustainable development. However, this undertaking is challenging, as the discourse on sustainability entails maintaining equilibrium among environmental, economic, and social factors.

According to Reyes (2021), contemporary enterprises are compelled to devise novel strategies that engender value for their products, processes, and human capital, employing a sustainable approach. Moreover, it is imperative that this management model is firmly entrenched as an organizational ethos and a modus operandi within the enterprise (Reyes 2021). These proposals have given rise to the fourth element of sustainability: institutionality. This element involves the phenomenon as a culture, adhered to, created, and maintained among the members of the company over time.

The extant literature has identified several theories that are currently employed to analyze corporate sustainability and its effects. These theories include agency theory, legitimacy theory, stakeholder theory, and resource and capability theory (Angulo 2017). These theories support a management model that involves owner leadership, based on the agency model; care and respect for the environments surrounding the business, based on legitimacy theory; and the importance of stakeholders or related parties and ongoing interaction with them, based on stakeholder theory. In a similar vein, the management model is predicated on the value ascribed to the capabilities and resources embodied by its workforce or associated with it.

The objective of contemporary sustainable management models is to attain an equilibrium between environmental, economic, and social factors. Consequently, the company acquires societal legitimacy and cultivates its intangible assets, including its reputation and brand (Barcellos 2012). These factors also favor it in the measurement of stock market indices related to sustainability, such as the Dow Jones indices already established in the United States, Europe, and Asia-Pacific, among others.

Measurement tools

Conversely, organizations aspiring to a more sustainable model have chosen to certify their processes through the implementation of standards such as ISO 14000, primarily as management tools that facilitate a comprehensive evaluation of their alignment with sustainable development planning (Barcellos 2012).

The global dissemination of this management paradigm has prompted numerous organizations and institutions to seek measurement models that ensure outcomes in terms of sustainability, while concurrently serving as a medium for disseminating these outcomes. This has led to the establishment of the GRI, widely recognized as the guidelines for sustainability reporting employed on a global scale. According to Barcellos (2012), the fundamental objective of the GRI is "the measurement, disclosure, and accountability to their internal and external stakeholders." This tool has been meticulously

engineered to distinctly and unambiguously illustrate the contributions that the company makes or intends to make to achieve sustainable development (GRI 1: Fundamentals 2021, 2023).

The Global Reporting Initiative (GRI) comprises two components: the first delineates the principles and provides guidance for the preparation of the report, and the second consists of performance indicators. Consequently, this model, which was developed to accommodate diverse corporate types and sectors, has emerged as the most widely adopted report globally in the domain of sustainability reporting. This distinction can be attributed to its dynamism, clarity of application, and the guidance it provides for its development. The initial segment comprises three operational directives, designated as Universal Standards from 1 to 3. The subsequent segment is divided into two distinct groups.

As delineated by the Global Reporting Initiative (GRI) in its 2021 and 2023 Sector Standards and Topic Standards, respectively, The model proposed here is based on global guidelines, regulations, and objectives established on the subject. It has been created for different types of organizations, regardless of their size, activity, or nationality, so that they can be understood, used, or analyzed by different users. This functionality delineates several pivotal elements, including impact, material topics, due diligence, and stakeholder groups. The objective of this delineation is to provide enhanced clarity to both the individuals responsible for report preparation and the intended audience. The most recent iteration of the GRI model was revised in 2021 and formally adopted on January 1, 2023 (GRI 1: Foundations 2021, 2023).

BUSINESS COMPETITIVENESS

Concept or definition

The concept of competitiveness has its origins in ancient times, when market relations were initially delineated. Adam Smith's concept of free competition and David Ricardo's theory of comparative advantage underscore the importance of diversity in providing consumers with a range of options. This exercise fosters a healthy form of competition, which is now subject to more rigorous measurement and is defined as competitiveness. The concept of competitiveness, as outlined by Michael Porter's theory of competitive advantage, encompasses all market forces within both the private and public sectors.

The concept of competitiveness has evolved, and its focus has shifted from the traditional factors of productivity and market share. In contemporary business practice, the evolution of this concept encompasses factors such as product quality and technological innovation (Andreoni & Miola 2016). However, the concept of advantage persists as a metric of achievement within the framework of the Strategic Management model, particularly in regard to aligning the entire company towards the realization of stipulated strategic objectives (Angulo 2017). This is a collaborative endeavor in which the public sector is tasked with formulating strategies and policies, while the private sector is responsible for generating employment and expanding opportunities for all segments of the population (Echeverri 2015).

A number of studies have demonstrated that, in the context of Latin America, despite the advancement observed in competitiveness indicators related to finance, human capital, marketing, strategic planning, and partnerships, persistent competitive gaps persist when these indicators are integrated with the management of ICTs (Gutiérrez & Alberto 2020). This discrepancy is particularly salient in the aftermath of the pandemic, as the utilization of technology in business operations has undergone a substantial surge.

Characteristics of a competitive management model

In general, companies are constantly searching for a management model capable of adapting to market situations, national and international regulations, and environmental and social factors that

affect the development of their businesses. This search is reflected in an exercise that is open to change. This change is manifested in the creation of scenarios, planned strategies, and rapid movement toward new administrative proposals. These proposals are generally implemented by leading organizations in each market sector.

This evolution in administrative management has consistently compelled companies to consolidate their results to maintain a market presence and compete effectively in their respective sectors. Consequently, competitiveness has emerged as a pivotal metric for evaluating the efficacy of management models employed by these entities.

Systems theory, resource and capability theory, chaos theory, interorganizational relations theory, strategic management, knowledge management-based theory, and competitive advantage are some of the theories deemed most applicable to companies seeking to improve their positioning and location in the market (Martínez et al. 2020).

Competitive advantage, a model proposed by Michael Porter, has emerged as the prevailing paradigm, to which all other models aspire to conform. This model posits that the ability to reach one's destination first is a key factor in achieving competitive advantage. Consequently, each administrative management model endeavors to attain a competitive advantage that generates value within the organization, whether through a differentiating factor, cost leadership, or a clear focus that prevents the waste of resources.

Measurement tools

The Global Competitiveness Index, a tool utilized by the World Economic Forum (WEF), is a primary metric for evaluating competitiveness. This index is measured on an annual basis. Although the methodology is not fully disclosed by the organization, which instead provides only a summary of its formula, the index has been endorsed and accepted as a tool on a global scale. As a result, the index's results are accepted.

Another tool employed to measure global competitiveness is that developed by the World Competitiveness Center, an institution of the International Institute for Management Development (IMD). The model in question organizes its performance measurement indicators into four factors: economic performance, government efficiency, infrastructure, and business efficiency.

Harvard University produces an economic complexity map from which countries' competitiveness indicators are measured, as described by Echeverri (2015): The Economic Complexity Index is a metric that quantifies two fundamental aspects of a nation's economic profile, thereby facilitating the assessment of its growth potential. The initial strategy entails the diversification of the production and export portfolio. Conversely, the map quantifies the complexity of each nation, contingent on the extent to which know-how is incorporated in production, thereby yielding knowledge-intensive products from diverse economic sectors."

The 2022 World Competitiveness Ranking is compiled by the Institute of Management Development (IMD) in Switzerland. The competitiveness index is measured based on four fundamental elements: economic performance, government efficiency, business efficiency, and infrastructure. In accordance with the model under consideration, competitiveness is linked to the concepts of productivity and efficiency. Productivity and efficiency are defined as the optimal use of a nation's available resources. This optimal use of resources is in accordance with the concept of sustainability. The concept of sustainability proposes the correct use of resources to ensure development for present and future generations within an economically stable and competitive model.

The economic performance of a nation is analyzed in terms of the domestic economy, international trade, international investment, employment, and prices. The efficiency of government

is measured in terms of public finances, tax policy, the institutional framework, business legislation, and the social framework. The evaluation encompasses various aspects of infrastructure, including but not limited to basic infrastructure, technological infrastructure, scientific infrastructure, health, the environment, and education. Finally, with respect to business efficiency, productivity, and efficiency, the labor market, finance, administrative practices, and attitudes and values are measured.

Conversely, the World Economic Forum employs a distinct approach to assessing competitiveness, utilizing a multifaceted framework encompassing three fundamental factors, 12 distinct categories, and an extensive array of 114 variables. The first factor, which pertains to fundamental requirements, encompasses concepts related to the protection of private property, the efficiency and transparency of public administration, the independence of the judiciary in the country, physical security, business ethics, and corporate governance. This factor also measures market integration through transportation and communications. Furthermore, it encompasses the quality of energy supply. In addition to these factors, the macroeconomic environment is defined by fiscal and monetary indicators. Such indicators include the savings rate and debt rating. Finally, this factor relates to the variable of health and primary education. The latter considers aspects such as the quantity and quality of health and basic education in the country.

The second factor, termed "Efficiency Promoters," pertains to the variables of higher education and training, wherein the quantity and quality of these are measured. The second variable is the goods market, which measures the possibility of healthy competition at the domestic and international levels. The subsequent variable under consideration is the labor market, wherein the prospects for job growth, flexibility, and promotion are appraised. The fifth variable measured is the financial market, the ability of which to sustain the country's economic fluctuations is measured. Subsequently, the variable of technological availability is evaluated. This variable measures the possibility of technological improvement in the country's industry, the ease of access to these changes, and the use of information and communication technologies to improve the country's productivity. Finally, the market size variable is employed to measure the share of the country's products and services in domestic and foreign markets.

The third factor is composed of the business sophistication variable, which measures the quality and quantity of the business network, as well as its strategic development. The second variable is innovation, which is defined as the design of new products and services and their contribution to high wages. Of the 114 variables, 30% (34 variables) are indicators that have been adopted by other institutions. The remaining 80 variables are perception-based, accounting for 70% of the total. These 80 variables were obtained from the Executive Opinion Survey of business leaders.

In Colombia, there are internal measurement tools such as that of the Private Competitiveness Council, which is based on the methodology of the World Economic Forum, and that developed by the Center for Latin American Studies (CEPAL). The objective of both tools is to assess the competitiveness of departments and to evaluate the evolution of development, infrastructure, education, employment, and other factors in each region. However, there is a paucity of functional or applicable tools for each sector of the economy that allow for competitive analysis. The industrial sector has been the driving force behind the development of tools for this measurement (Echeverri 2015), underscoring the necessity to persist in the advancement of models that prioritize the assessment of companies and their contributions to the nation's competitiveness.

In Colombia, competitiveness is measured by considering 16 fundamental areas, including government efficiency, justice and security, infrastructure, transportation and logistics, energy, digital economy, education, health, labor market, pensions, internationalization, tax system, agricultural productivity, business financing, science, technology and innovation, green growth, and productivity and entrepreneurship.

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METHODOLOGIES

To analyze the relationship between sustainability and competitiveness, a multi-criteria analysis model is employed, defining four equal factors for each criterion and 16 variables, four variables for each factor. It is important to note that these variables may vary. The criteria for evaluation are sustainability and competitiveness, and a scale of 1 to 10 has been defined to determine their weighting. The process under scrutiny involves the evaluation of the relationship between these variables and the goals defined in seven Sustainable Development Goals. The selection of these goals was made with consideration for the contribution that the business sector can make to each of them.

The variables are defined in consideration of the measurements delineated in the Global Reporting Initiative's standards for sustainability, which are utilized by companies in their annual reports. With regard to competitiveness variables, those considered in the international measurement conducted by the Institute of Management Development (IMD) in Switzerland and the World Economic Forum are taken into account, as well as those considered to measure national competitiveness by the Private Council for Competitiveness.

The weighting is established on a scale of 1 to 10, considering the contribution of each variable to the construction of SDG 8, 9, 10, 11, 12, 15, and 17. However, it should be noted that not all objectives were considered in the study.

The SDG selection process enables the determination of the contribution scenario of companies towards the goals established for each of them. The objective of the project is not to ascertain the extent of contribution, but rather to undertake comprehensive research to identify the opportunities, actions, or scenarios that companies are developing. In addition to evaluating their sustainable and competitive management, this research aims to identify actions that contribute to the achievement of the global goals established for 2030 and described in each Sustainable Development Goal (SDG).

The objectives that were selected are presented below, accompanied by a brief description of the rationale behind their selection.

TABLE 1

Sustainable Development Goal 8

OBJECTIVE	GOALS
Promoting inclusive and sustainable economic growth, employment, and decent work for all	8.1 Maintain per capita economic growth in accordance with national circumstances and, in particular, gross domestic product growth of at least 7% per year in the least developed countries 8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high value-added and labor-intensive sectors 8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro, small and medium-sized enterprises, including through access to financial services 8.4 By 2030, progressively improve global resource efficiency in production and consumption and strive for decoupling economic growth from environmental degradation, in accordance with the 10-year framework of programs on sustainable consumption and production patterns, starting with developed countries 8.9 By 2030, develop and implement policies aimed at promoting sustainable tourism that creates jobs and promotes local culture and products 8.a Increase support for the Aid for Trade initiative in developing countries, in particular the least developed countries, including through the Enhanced Integrated

| Framework for Technical Assistance to Least Developed Countries on Trade

Source: own elaboration

These goals were selected considering that the sustainable dynamics developed by companies and their competitiveness strategies contribute to job creation and economic growth. Furthermore, it is common for them to invest in innovation and the improvement of environmentally friendly technology, promoting the efficient consumption of resources.

TABLE 2

Sustainable Development Goal 9

OBJECTIVE	**GOALS**
Building resilient infrastructure, promoting sustainable industrialization, and fostering innovation	9.2 Promote inclusive and sustainable industrialization and, by 2030, significantly increase industry's contribution to employment and gross domestic product, in accordance with national circumstances, and double that contribution in the least developed countries 9.4 By 2030, modernize infrastructure and upgrade industries for sustainable development, with greater resource efficiency and the adoption of clean and environmentally sound industrial technologies and processes, and ensuring that all countries take action in accordance with their respective capabilities

Source: Own elaboration

These goals were selected because the sustainable dynamics developed by companies and their competitiveness strategies contribute to revenue growth, job creation, and economic growth.

Table 3

Sustainable Development Goal 10

OBJECTIVE	*GOALS*
Reducing inequality within and between countries	10.1 By 2030, progressively achieve and sustain income growth of the poorest 40% of the population at a rate higher than the national average.

Source: Own elaboration

Companies must commit to linking disadvantaged populations to their job creation plans.

TABLE 4

Sustainable Development Goal 11

Objective	*Goals*
Making cities more inclusive, safe, resilient, and sustainable	11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and to municipal and other waste management 11.a Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning

Source: own elaboration

Improvements in production processes favor productivity, efficiency, and effectiveness indicators in resource management and likewise allow for improvements in the environmental effects that are generated.

TABLE 5

Sustainable Development Goal.12

OBJECTIVE	**GOALS**
Ensuring sustainable consumption and production patterns	12.1 Implement the 10-year framework of programs on sustainable consumption and production patterns, with the participation of all countries and under the leadership of developed countries, considering the level of development and capabilities of developing countries 12.2 By 2030, achieve sustainable consumption and production patterns 12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses 12.4 By 2020, achieve environmentally sound management of chemicals and all waste throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil to minimize their adverse impacts on human health and the environment 12.5 By 2030, significantly reduce waste generation through prevention, reduction, recycling and reuse 12.6 Encourage all businesses, especially large and transnational enterprises, to adopt sustainable practices and incorporate sustainability information into their reporting cycle 12.b Develop and implement instruments to monitor the impact on sustainable development, with a view to achieving sustainable tourism that creates jobs and promotes local culture and products.

Source: own elaboration

Products manufactured for consumption must comply with guidelines that protect the environment during their production stage and during their use and final disposal by the consumer.

TABLE 6

Sustainable Development Goal 15

Objective	*Goals*
Sustainably manage forests, combat desertification, halt and reverse land degradation, and halt biodiversity loss.	15.4 By 2030, ensure the conservation of mountain ecosystems, including their biological diversity, in order to enhance their capacity to provide essential benefits for sustainable development.

Source: own elaboration

Companies should create, support, or participate in activities related to the protection of mountain ecosystems, diversity, and the entire natural environment.

TABLE 7

OBJECTIVE	GOALS
Revitalizing the Global Partnership for Sustainable Development	Technology 17.6 Enhance North-South, South-South and triangular regional cooperation in science, technology and innovation and access to them, and increase knowledge sharing on mutually agreed terms, including by improving coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism 17.7 Promote the development of environmentally sound technologies and their transfer, dissemination and diffusion to developing countries on favorable terms, including concessional and preferential terms, as mutually agreed 17.8 Bring fully operational by 2017 the technology bank and capacity-building support mechanism on science, technology and innovation for least developed countries and increase the use of enabling technologies, in particular information and communications technology Capacity-building 17.9 Increase international support for effective and targeted capacity-building activities in developing countries to support national plans for the implementation of all Sustainable Development Goals, including through North-South, South-South and triangular cooperation Trade 17.10 Promote a universal, rules-based, open, non-discriminatory and equitable multilateral trading system within the World Trade Organization, including through the conclusion of the Doha Development Agenda negotiations 17.11 Significantly increase the exports of developing countries, in particular with a view to doubling the least developed countries' share of global exports by 2020 17.12 Achieve timely and sustained duty-free and quota-free market access for all least developed countries, in accordance with World Trade Organization decisions, including by ensuring that preferential rules of origin applicable to imports from least developed countries are transparent and simple and contribute to facilitating market access 17.17 Encourage and promote effective public, public-private and civil society partnerships, drawing on the experience and resource mobilization strategies of partnerships.

Source: own elaboration

In order to ensure the efficient use of resources, it is essential to incorporate technologies into production, commercial, and administrative processes. This approach will prevent excessive consumption of raw materials or an increase in waste or scrap.

The methodological model employed in this research is regarded as quantitative and non-experimental in nature. It aims to ascertain the correlation between management models grounded in sustainability and competitiveness, and subsequently, to assess their contributions to the realization of the sustainability objectives delineated in the SDGs 2030. This model is predicated solely on observation, in this instance, of the variables utilized to assess these components of sustainability and competitiveness.

The development of the multi-criteria analysis entailed the construction of a weighting matrix employing a scale from 1 to 10, where 1 signifies the variable's minimal contribution to the SDG and 10 denotes its maximum contribution. The weighting in question was determined by the assessment

of three experts in the field and the Council for Competitiveness. The measurements described in the results were derived from this assessment.

TABLE 8

ODS Evaluation per variable, facto and citeria.

CRITERIA	FACTORS	VARIABLES	ODS 8	ODS 9	ODS 10	ODS 11	ODS 12	ODS 15	ODS 17
SOSTENIBILITY	Economic growth	Employment							
		Indicador Edbita							
		Export							
		Sales level							
	Environmental responsibility	Energy efficiency							
		Efficient use of resources							
		Emissions control							
		Waste management							
	Management model	Corporate governance							
		Culture of sustainability							
		Sustainability reports							
		Inclusion							
	Productivity and innovation	Product innovation							
		Clean production							
		Sustainable consumption							
		Green labels and certifications							

CRITERIA	FACTORS	VARIABLES	ODS 8	ODS 9	ODS 10	ODS 11	ODS 12	ODS 15	ODS 17
	Economic performance	Employment and labor market							
		Finance							
		Goods market							
		Financial							

COMPETITIVITY		market							
	Environmental responsibility	Environmental culture							
		Efficient use of resources							
		Clean technologies							
		Green growth							
	Management model	Corporate governance							
		Administrative practices							
		Trade associations							
		Business ethics							
	Productivity and innovation	Product innovation							
		Productivity							
		Green certifications							
		Digital economy							

RESULTS

Relationship between sustainability and competitiveness

The review of the theory allowed us to establish that, for both sustainability and competitiveness, companies need to generate value around their corporate image. This value is determined by market acceptance, which is validated by society. Hence, many sustainable management actions framed within the principles of economic, environmental, and social balance are also used by organizations to improve their leadership in the sector in which they operate.

Through the application of models such as systems theory, relationship theories, and stakeholder theories, among others, companies seek to move toward more competitive and sustainable management models. Some authors have even defined the resource theory, stakeholder theory, and competitive advantage models in their differentiation and focus strategies as theories applicable to the two management models analyzed.

TABLE 9

Administrative Theories Used

SUSTAINABILITY	COMPETITIVENESS
Agency theory	Systems theory
Legitimacy theory	Chaos theory
Stakeholder Theory	Relationship theory

Resource and Capabilities Theory	Resource and capability theory
Differentiation approach – Competitive advantage	Competitive advantage theory

While not all theories are applied uniformly across both study criteria, it is possible to discern the similarities between them. In the majority of cases, the concept of relationships with the natural or social environment in which they operate prevails. This validates the need to generate value and recognition for greater market acceptance. This is based on a responsible culture that is no longer so aggressive. It seeks a healthy environment for the finances of organizations and for the quality of life of society.

This establishes a preliminary relationship between sustainability and competitiveness, as well as the necessity for organizations to incorporate into their management model strategies that are not only sustainable but also competitive.

A further element to be considered in this analysis pertains to international measurements that have demonstrated a correlation between countries with superior sustainability outcomes and those with optimal competitiveness. This observation suggests a close relationship between these two criteria, which is evident in management strategies that favor both the sustainable balance of organizations and their competitive standing in the market.

Finally, another element of analysis is the exercise itself to build the project's methodological model, where a group of seven SDG targets were selected because it was considered that the management of organizations can contribute to their achievement. In order to consider their contribution, the factors that organizations measure in their annual reports to demonstrate sustainability and competitiveness were taken into account, as well as how their indicators show their own actions that contribute to the fulfillment of the goals in each objective.

The following list contains the selected goals for each objective, as well as the factors contributed by organizations in terms of sustainability and competitiveness.

TABLE 10

The Council for Competitiveness

CRITERIA	FACTORS	GOAL
SUSTAINABILITY AND COMPETITIVENESS	ECONOMIC GROWTH AND PERFORMANCE	8.1 Maintain per capita economic growth in accordance with national circumstances
		8.3 Promote decent work
		10.1 By 2030, progressively achieve and sustain income growth of the poorest 40% of the population at a rate higher than the national average.
		15.4 By 2030, ensure the conservation of mountain ecosystems, including their biological diversity, in order to enhance their capacity to provide essential benefits for sustainable development.
	ENVIRONMENTAL RESPONSIBILITY	8.4 By 2030, progressively improve global resource efficiency in production and consumption

		11.6 By 2030, reduce the negative per capita environmental impact of cities
		12.1 Implement the 10-year framework of programs on sustainable consumption and production patterns
		12.5 By 2030, significantly reduce waste generation through prevention, reduction, recycling, and reuse
	MANAGEMENT MODEL	11.a Support positive economic, social, and environmental links between urban, peri-urban, and rural areas by strengthening national and regional development planning
		12.2 By 2030, achieve sustainable consumption and production patterns
		12.4 By 2020, achieve the environmentally sound management of chemicals and all waste throughout their life cycle
		12.b Develop and implement monitoring instruments for sustainable development
		17.10 Promote a universal multilateral trading system
		17.17 Encourage and promote effective public, public-private and civil society partnerships
	PRODUCTIVITY AND INNOVATION	8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation
		9.2 Promote inclusive and sustainable industrialization
		9.4 By 2030, modernize infrastructure and upgrade industries for sustainable development
		17.6 Enhance North-South, South-South and triangular cooperation in science, technology and innovation and access to them

An analysis of this relationship reveals that the sustainability factors defined in the SDG 2030 targets are also factors required to achieve competitiveness indicators. Therefore, organizations that are aware of this relationship can better structure their policies, plans, and strategic projects. This, in turn, supports the argument that companies with good sustainability results also perform well in terms of competitiveness.

6.2 Contributions of the sustainability and competitiveness relationship to the 2030 SDGS

In order to validate the contributions made by sustainability and competitiveness to the 2030 SDG targets, it is first necessary to establish a relationship between the sustainability indicators used by companies in their reports and the 2030 SDG targets. We then proceed to compare the related variables that are also used to measure competitiveness.

In the initial process of analyzing the sustainability indicators with the SDG 2030 goals, the best companies in Latin America and Colombia, as measured by different institutions, were

considered as benchmarks. For the Latin American context, the assessment conducted by Brand Finance, a global brand valuation firm that identifies the 100 most valuable brands, was employed. The following ten entities have been identified as the top performers: The following companies are represented: Corona of Mexico, Itau of Brazil, Claro of Mexico, Premex of Mexico, Ecopetrol of Colombia, Modelo Especial of Mexico, Brandesco of Brazil, Mercado Libre of Chile, Banco do Brasil of Brazil, and Petrobras of Brazil.

In Colombia, the ranking of the leading organizations is also measured, and for the present study, the first 2023 report issued by the Superintendency of Companies was examined. The report is primarily based on financial data, and it highlights Ecopetrol, Organización Terpel, Grupo EPM, Reficar, and Grupo Argos as the leading companies. The final stage of the analysis involved the examination of two companies with the most valuable brand in Latin America and three of the firms with the highest revenues in Colombia. These companies developed management or sustainability reports in 2022. The analysis entailed the construction of a matrix that relates the environmental, economic, and social dimensions of the sustainable development model and the management indicators presented by each organization in its report. This exercise serves to validate the organizations' commitment to meeting the SDG targets. It provides an overview of how they address each commitment, how they measure it, their strategies for moving forward, and their results.

In accordance with various international sustainability standards, including the Global Reporting Initiative (GRI), the Sustainability Accounting Standards Board (SASB), and the Principles for Responsible Investment (PRI), it was determined that, in general, irrespective of the model selected to prepare the report, organizations have delineated their contribution to the achievement of the DOS 2030 goals as part of their strategic objectives.

By establishing a correlation between the objectives and goals selected and the sustainability indicators utilized by the five companies examined, a set of variables applicable to the various objectives is determined. These variables serve to establish relationships between the indicators employed to measure each variable. The analysis reveals that indicators vary according to economic sector, geographical location, and strategic position within the production chain.

A group of variables is selected and defined as follows: employment, economic growth, technology, innovation, inclusion, exports, energy efficiency, resource efficiency, productivity, clean technologies, emissions control, waste, training programs, sustainable processes, waste, information, environmental culture, and unionization. This analysis is the foundation for the subsequent discussion.

Each variable is associated with a distinct set of indicators, which organizations employ in accordance with their specific objectives or established programs. Ultimately, the evaluation of the analysis indicates that the fulfillment or enhancement of each indicator contributes to the realization of a sustainable development goal. For instance, when discussing SDG 8, its target concerning the promotion of sustained economic growth, particularly in the least developed countries, a direct correlation is posited between such growth and the generation of employment opportunities. Consequently, the variable of employment, measured in terms of the number of sustained jobs, the number of new jobs, and the number of jobs for young people, is significant in demonstrating the contribution being made to the achievement of SDG 8.

Consequently, variables are defined for each goal, and indicators are linked to each variable. Nevertheless, a variable may be applicable to multiple targets of varying Sustainable Development Goals (SDGs). This further underscore the necessity for coordinated and organized efforts to achieve the SDGs in general.

TABLE 11
SDG 8: Promote inclusive and sustainable economic growth, employment, and decent work for all

GOAL	VARIABLE	INDICATOR
8.1 Maintain per capita economic growth in accordance with national circumstances and, in particular, gross domestic product growth of at least 7% per annum in the least developed countries.	Employment	Job creation Number of jobs Jobs for young people Women hired Characterization of employees
	Economic Growth	Increase in revenue EBITDA

Source: own elaboration

TABLE 12
SDG 9: Build resilient infrastructure, promote sustainable industrialization, and foster innovation

GOAL	VARIABLE	INDICATOR
9.2 Promote inclusive and sustainable industrialization and, by 2030, significantly increase industry's contribution to employment and gross domestic product, in accordance with national circumstances, and double that contribution in the least developed countries	Energy efficiency	Replacement of lighting fixtures Use of renewable energy sources
	Resource efficiency	Carbon gas capture, storage, and utilization % of raw material utilization
	Product innovation	Digitization of archives Production of green hydrogen
9.4 By 2030, modernize infrastructure and upgrade industries for sustainable development, with greater resource efficiency and the adoption of clean and environmentally sound industrial technologies and processes, and ensuring that all countries take action in accordance with their respective capabilities	Productivity	Productivity indicator Occupational Safety and Health (OSH) System Indicators
	Clean technologies	Use of biogas for wastewater treatment Creation of a solar eco-park with renewable energy sources
	Responsible use of resources	Culture of environmental protection, internally and throughout the supply chain

Source: own elaboration

TABLE 13
SDG 10: Reduce inequality within and among countries

GOAL	VARIABLE	INDICATOR
10.1 By 2030, progressively achieve and sustain income growth of the poorest 40% of the population at a rate higher than the national average.	Employment	Employment generated

Source: own elaboration

TABLE 14
SDG 11: Make cities more inclusive, safe, resilient, and sustainable

GOAL	*VARIABLE*	*INDICATOR*
11.6 By 2030, reduce the adverse per capita environmental impact of cities,	Emissions control	Energy savings emissions indicator Waste management emissions

including by paying special attention to air quality and to municipal and other waste management.		indicator Environmental tree planting program Carbon neutral
	Waste management	Reuse of containers or packaging Solid waste management program
11.a Support positive economic, social, and environmental links between urban, peri-urban, and rural areas by strengthening national and regional development planning	Training programs	Environmental training programs International forum on corporate volunteering Financial education program Training program on ethical practices and financial codes of conduct Community training on water conservation Code of conduct training program.

Source: own elaboration

TABLE 15

SDG 12: Ensure sustainable consumption and production patterns

GOAL	VARIABLE	INDICATOR
12.1 Implement the 10-year framework of programs on sustainable consumption and production patterns, with the participation of all countries and under the leadership of developed countries, taking into account the level of development and capabilities of developing countries	Sustainable processes	Sustainable production processes
12.2 By 2030, achieve sustainable management and efficient use of natural resources	Efficiency in the use of resources	Use of resources
12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.	Waste	Waste management
12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil so as to minimize their adverse effects on human health and the environment. 12.5 By 2030, significantly reduce waste generation through prevention, reduction, recycling and reuse.	Waste	Conditions for the final destination of sold products % of returnable packaging Construction of sewerage networks Waste control Maintenance of septic tanks
12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and incorporate sustainability information into their reporting cycle	Information	Sustainability reports Comprehensive management report

Source: own elaboration

TABLE 16
SDG 15: Sustainably manage forests, combat desertification, halt and reverse land degradation, and halt biodiversity loss

GOAL	VARIABLE	INDICATOR
15.4 By 2030, ensure the conservation of mountain ecosystems, including their biological diversity, in order to enhance their capacity to provide essential benefits for sustainable development.	Environmental Culture	Environmental Culture Campaigns ITAU Bike Program for Bogotá School for community leaders in water management Corporate environmental management indicator

Source: own elaboration

TABLE 17
SDG 17: Revitalize the global partnership for sustainable development

GOAL	VARIABLE	INDICATOR
17.6 Enhance North-South, South-South and triangular regional and international cooperation in science, technology and innovation and access to them, and increase knowledge sharing on mutually agreed terms, including by improving coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism	Science and technology	Investment in science and technology Water protection
17.10 Promote a universal, rules-based, open, non-discriminatory, and equitable multilateral trading system within the World Trade Organization, including through the conclusion of the Doha Development Agenda negotiations	Exports	Export indicator
17.17 Encourage and promote effective public, public-private and civil society partnerships, drawing on the experience and resource mobilization strategies of partnerships	Associations	Partnerships with public and private entities. Links to trade associations. Development of a supplier relations plan. Relations with stakeholders. Creation of social value.

Source: own elaboration

The concept of competitiveness described through revised national and international measurements, in relation to a country's business or productive sector, is based primarily on issues of productivity, efficiency in the use of resources, innovation, international markets, and contribution to job creation. This review exercise leads us to the construction of a concept of business competitiveness with a group of indicators that bring us closer to its relationship with the concept of sustainability, which organizations must also take into account to ensure their longevity and good performance. This establishes indicators that measure both the sustainability of the company and its

competitive level in an interrelated manner, i.e., each indicator points to the two concepts that evaluate the optimal management of an organization. To this end, a parallel is constructed that aims to show the relationship found through this study.

TABLE 18

Business Sustainability and Competitiveness Indicators

SUSTAINABILITY	COMPETITIVENESS
Employment	Employment and Labor Market
Economic Growth	Finance
	Goods market
	Financial market
Energy efficiency Resource efficiency Corporate governance	Sustainable Administrative Practices
Product innovation	Innovation
Productivity	Productivity
Emissions control Waste management Sustainability reports Environmental culture campaigns	Business ethics - Attitudes and values
Science and technology	Technological availability
Exports	International trade
	International investment
Associations	Quality and quantity of the business network

Source: own elaboration

The notion of sustainability encompasses the concept of environmental stewardship. However, the concept also encompasses other elements that are equally important in society, such as caring for social relationships, culture and customs, and the economic performance that financially sustains all productive projects. This element establishes a relationship with the concept of competitiveness, which is regarded as an indicator of permanence and growth, not only for the company but also as a guarantee of the competitiveness of the country and, consequently, the fulfillment of social objectives, thereby facilitating a circular relationship between the company, society, and the state.

The analysis conducted has elucidated that, in the context of strategically planned long-term management, organizations do not merely incorporate elements such as permanence factors; rather, they also take into account their relationship with the natural and social environment as permanence factors.

Consequently, as part of the multi-criteria analysis developed, a weighting was carried out by experts who contributed their experience to determine whether the variables used in the study really contribute to the selected objectives and whether our analysis is acceptable within the context proposed. Utilizing a contribution scale ranging from 1 to 10, where 1 denotes a minimal contribution of the variable to the SDG and 10 signifies a substantial contribution, the variable is categorized as follows: The subsequent results were obtained subsequent to the calculation of the participants' weightings (Figure 1).

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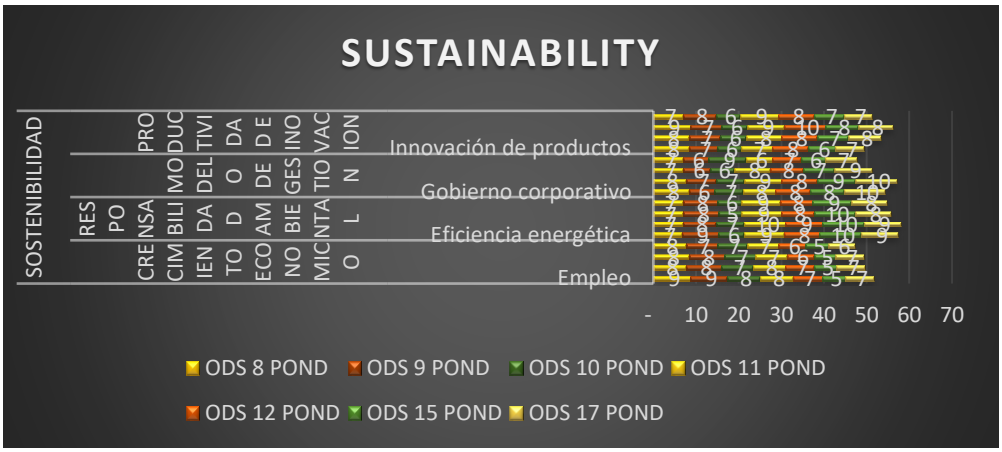

Figure 1. Results related to sustainability

With regard to the sustainability criterion, it was determined that all the selected variables made a contribution rated as greater than 6, which shows the strong relationship between this variable and the SDGs studied. The weighting shows that the sustainability variables analyzed make their greatest contribution to goals 8, 11, 12, and 17, which means that companies with sustainability-based management are important elements in the achievement of these goals.

Figure 2. Results related to Competitiveness

In the case of competitiveness, the results do not vary greatly, with all values provided by the experts above 6, which suggests that these variables, developed within organizations, are fundamental to the fulfillment of the SDGs analyzed. Thus, the greatest contributions are made to SDGs 9, 10, 11, and 12. This result shows a variation with the SDGs with the highest contribution in the Sustainability criterion, but within the same trend.

Analyzing the contribution in relation to the four factors, the results are within the same trend. In relation to the sustainability criterion, the Environmental Responsibility factor, composed of variables of highly environmentally friendly and economical management, is the factor evaluated as the greatest contributor to the construction of the SDG targets set for 2030.

This can be seen in Figure 3.

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Figure 3. Sustainability factors

However, analyzing the results of competitiveness factors, it is in the Environmental Responsibility factor where the highest value is placed on the contributions that can be made towards the achievement of the SDGs.

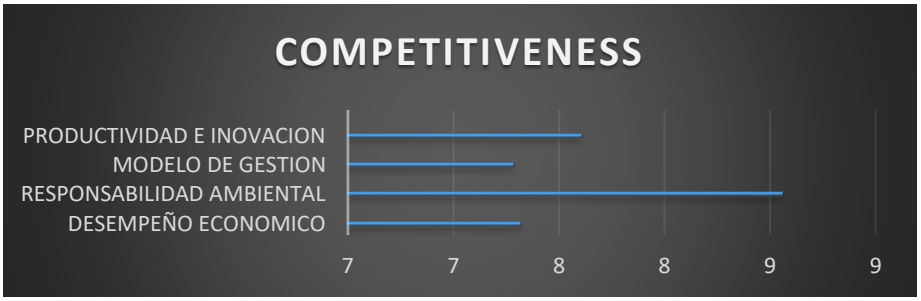

Figure 4. Competitiveness factors.

CONCLUSIONS

In conclusion, there is a contribution from the administrative management of organizations toward the SDG goals proposed for 2030 at the global level. We have reached this conclusion after analyzing the goals of each SDG and selecting a group of seven SDGs because we consider that these goals are closely related to the development, growth, and innovation activities carried out by organizations as part of their business life.

Our research allows us to conclude that when an organization or company builds a management model based on sustainable and competitive management, it moves toward a model of sustainable development, seeking to be efficient today and guarantee its permanence over time for future generations.

The structuring of sustainability and competitiveness criteria, analyzed as management models and analyzed under measurement variables, allowed us to build a reference framework of eight factors, four for each criterion, and 16 variables that were reviewed in each criterion, as they were considered turning points in their management models for the purpose of measurement and development in each organization or company.

The entire exercise led us to conclude that companies today are looking for a competitive sustainable management model based on sustainable development criteria. The results allow us to observe that SDG 11, related to achieving safe, sustainable, resilient, and inclusive cities, and SDG 12, ensuring sustainable consumption and production patterns, are the objectives to which administrative management models based on sustainability and competitiveness criteria make their greatest contribution. According to our analysis, this contribution is generated from the variables of

energy efficiency, resource efficiency, emissions control, and waste management in the case of the sustainability criterion, resource efficiency, clean technologies, and green growth in the case of the competitiveness criterion. Based on this result, it is established that companies go beyond their economic objectives, which directly benefit their owners and indirectly benefit their employees and the state itself, to achieve objectives in building a more responsible society when they take on the task of leading cultural processes from within, with the principles and values created in their employees and with the development and innovation of more environmentally friendly and less polluting products and services. and it is even better when they manage to generate a change in the consumption patterns of their customers and society under a clear commitment to the final disposal of the product, waste management, and care for the culture and social environment around them.

In addition to the aforementioned SDGs, the other SDGs with the highest sustainability scores were SDG 8, related to promoting inclusive and sustainable economic growth and decent employment for all. Here, the variable with the greatest application in the policies of organizations and companies is related to job creation and the conditions that come with it. due to its contribution to individual growth, which builds collective growth. However, there are also variables that measure the economic performance of organizations or companies, which becomes the lifeblood of other business management activities. Another SDG with a good score is SDG 17, which is part of the need for a global partnership for sustainable development, in a clear need to achieve connectivity between the plans and projects of companies and organizations towards a sustainable planet. It highlights the need for and importance of cooperation to achieve the proposed SDGs.

The analysis has also allowed us to understand that good sustainable management based on the criteria expected to achieve the Sustainable Development model on the planet contributes positively to the good image of the organization or company and, consequently, allows it to establish a competitive position within the market. This very general analysis already shows another element of the growing relationship between competitiveness and sustainability and how organizations or companies are increasingly moving towards it.

CONFLICTS OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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