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IMPACT OF GREEN ABSORPTIVE CAPACITY ON CORPORATE SUSTAINABILITY: A MODEL FOR SUSTAINABLE DEVELOPMENT

IMPACTO DE LA CAPACIDAD DE ABSORCIÓN VERDE EN LA SOSTENIBILIDAD CORPORATIVA: UN MODELO DE DESARROLLO SOSTENIBLE

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ABSTRACT

All sectors of society have faced numerous economic, social, technological, competitive, and environmental changes in a dynamic and changing marketplace. The purpose of the study is to examine the relationship of the green absorptive capacity on the environmental integrity, economic prosperity, and social equity of sustainable development in the industrial context in Mexico. The research method was a quantitative cross-sectional design, with a sample size of 108, and the data analysis used PLS-SEM. The results showed a strong and significant relationship between green absorptive capacity with environmental integrity, economic prosperity, and social equity. The results of this research support to argue how to promote sustainable development, based on the pillars of Resource-Based Theory. This study fills a research gap, and provides new theoretical arguments. The world of business is increasingly challenging and dynamic, so the results could also help to solve practical problems.

KEYWORDS

Green absorptive capacity, sustainable development, environmental integrity, economic prosperity, social equity.

RESUMEN

Todos los sectores de la sociedad han enfrentado numerosos cambios económicos, sociales, tecnológicos, competitivos y ambientales en un mercado dinámico y cambiante. El propósito del estudio es examinar la relación de la capacidad de absorción verde sobre la integridad ambiental, la prosperidad económica y la equidad social del desarrollo sostenible en el contexto industrial de México. El método de investigación fue un diseño cuantitativo transversal, con un tamaño de muestra de 108, y el análisis de datos utilizó PLS-SEM. Los resultados mostraron una relación fuerte y significativa entre la capacidad de absorción verde con la integridad ambiental, la prosperidad económica y la equidad social. Los resultados de esta investigación sirven para argumentar cómo promover el desarrollo sostenible, basándose en los pilares de la teoría basada en los recursos. Este estudio llena un vacío en la investigación y aporta

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nuevos argumentos teóricos, ya que el mundo de la empresa es cada vez más desafiante y dinámico, por lo que los resultados también podrían ayudar a resolver problemas prácticos.

PALABRAS CLAVE
Capacidad de absorción verde, desarrollo sostenible, integridad ambiental, prosperidad económica, equidad social.

1. INTRODUCTION

In recent decades, all sectors of society (especially the business sector) have faced numerous economic, social, technological, competitive, and environmental changes. In 1992, one of the United Nations conferences created a new framework for action focused on greenhouse gasses in order to safeguard the planet from the major problem of climate change (Chen et al. 2015). In addition, the 2030 Agenda came into effect in 2016 in order to address worldwide challenges (United Nations, 2016). The World Commission on Environmental and Development (1987, p.43) proposed the following definition of sustainable development "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Therefore, some companies are modifying their processes to improve ecology, economy, and social equity (Mativenga et al. 2017). Modifying processes and services is also conducive to the fulfillment of norms and regulations, as well as to creating strategies which lessen the impact of environmental problems.

This is in view of the fact that an increasing number of businesses are now focusing on environmental sustainability. Numerous Mexican companies are fulfilling the requirements of the Global Reporting Initiative (GRI) by reporting on corporate sustainability. In this way, Mexican companies contribute to the lessening of environmental problems and join the sustainable development movement. What is more, these reports will also aid the process of creating policies and strategies which support sustainable development by way of knowledge absorptive capacity. One of the critical, complex, and pressing issues of this era is undoubtedly addressing sustainability in general, and specifically in the business sector (Shaukat et al. 2021).

During the last decade, environmental protection became a focal point for strategy and is now a cornerstone of management approaches as a result of its importance for society (Shahzad et al. 2020; Albort-Morant et al. 2018). The damage caused by the industrial sector is a matter of global concern, and organizations have felt considerable social pressure to reduce environmentally-harmful emissions (Tseng et al. 2015; Zhu & Lai, 2016). The wide variety of organizational changes has affected the organizational environment, the knowledge economy, and the digital revolution. In consequence, the importance of knowledge has increased and has become a strategic resource for organizations, especially for the modern manufacturing industry operating in a competitive and challenging market. Hence, the acquisition of external knowledge should be strategically and efficiently managed in order to fulfill Sustainable Development Objectives. The success of organizations depends on knowledge resources to a large extent (Shahzad et al. 2020; Jamali et al. 2015).

With the strategic management of knowledge resources, strategies which allow organizations to create efficient production processes can be formed (Ooi, 2014). Knowledge absorptive capacity is a strategic resource which allows companies to acquire, assimilate, transform, and exploit external knowledge in order to create dynamic capabilities within the organization as a strategic skill for to achieve sustainability as a competitive advantage

(Zahra & George, 2002). From our point of view, this type of dynamic capabilities helps a company to achieve sustainable development. Nowadays, companies which succeed in developing capabilities centered on the economy, society, and the environment are considered sustainable companies internally and externally. Cohen and Levinthal (1990) view absorptive capacity as a value capability which assimilates and applies new knowledge in the business sector.

In recent years, absorptive capacity has been the focus of attention in empirical investigation. Strategic management and organizational dynamics have focused on the links between environmental, organizational, performance, and innovation factors because concerns regarding environmental impact are of great interest due to their effect on resources (Pacheco et al. 2018). The new green economy focuses on ecologization as a strategy for reducing global environmental impact in order to achieve sustainable development, and innovation performance driven by dynamic absorptive capacity (Barbier & Markandya, 2013; Alves et al. 2016).

Some of the literature suggests that environmental problems should be addressed on a global scale, but many companies have chosen to address them according to their available resources. However, these companies are able to create and apply absorptive capacities related to green knowledge which can limit the effect on numerous social, environmental, and economic problems. Doing so is a dynamic capability strategy to further sustainable development. The literature on absorptive capacity and environmental practices is extensive; there are, however, still gaps regarding studies on absorptive capacity, green knowledge, and Sustainable Development from the perspective of Resource-Based Theory and the Knowledge-Based View (Wernerfelt, 1984; Grant, 1991; Barney & Clark, 2007, Barney, et al. 2011).

Aligned to theoretical and empirical perspectives the research question is proposed: Does green absorption capacity have an effect on the environmental integrity, economic prosperity and social equity of sustainable development? To what extent does green absorptive capacity affect the environmental integrity, economic prosperity, and social equity of sustainable development? Continuing with the methodological elements of the problem statement, the objective is to examine the impact and extent of the influence of green absorptive capacity on the environmental integrity, economic prosperity, and social quality of sustainable development in the Mexican business context. The sample size of this empirical study was 108 observations, and data was collected in the January and February of 2022.

The findings of this study have certain contributions. Firstly, we proved the impact of green absorptive capacity on the environmental integrity, economic prosperity, and social equity of sustainable development. It is therefore possible to reflect on the importance that absorptive green absorptive capacity has on sustainable development. Secondly, these results contribute to the scientific debate on how a dynamic capability can contribute to sustainable development. In concrete terms, manufacturing companies, as part of their processes, create dynamic capabilities for the absorption of new green knowledge. Companies that do so will reap the environmental, economic, and social benefits. Finally, we test the theory used in the research, and contribute new structural relationships theoretically. In addition, we show the practical implications for decision making at the directive level. Processes and operations should be focused on sustainable results. This can

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be achieved by applying and creating dynamic capabilities. Furthermore, these results fill the gap in the lack of empirical studies of the effect of green absorptive capacity on sustainable development. This is the main contribution of this study and what makes it original.

In terms of the structure of this paper, the introduction analyzes and discusses the problem. The second section presents the theoretical framework upon which our hypothesis is based. Then, part three, describes the method used in order to detail the research model. The sample, measuring variables, and data analysis are all discussed here. Empirical proof is based on the sample size of 108 automobile, food, and pharmaceutical manufacturing companies. The reliability and validity of the measurement models is then shown, and the structural model tests the hypotheses. In the last section of the paper, the results are discussed, and suggestions are made to increase scientific knowledge in this field.

2. THEORETICAL BACKGROUNDS AND RESEARCH MODEL

Resource-based theory (Barney, et al. 2011) and a natural resource-based view of the firm, which has emerged from this theory (Hart, 1995), have become the most prominent approaches in strategic management to understand organisations today, despite being an approach that has been explained since 1991 by Barney. However, its growth has proliferated in our days to explain sustainability, because of the remains and restrictions imposed by governments towards the natural environment of companies, as the view of resources is relevant and important to understand how companies should use those resources for sustainable competitive advantage. In addition, the knowledge-based theory of the firm (Grant, 1996; Nonaka, 1994) which conceptualises the firm as an institution for integrating knowledge, and which gives value to organisations, was another reference that explains these valuable and strategic resources at the organisational level postulated by the research. These pillars are useful in explaining the importance of resources for sustainable development given that we focus on strategic organizational resources, such as the absorptive capacity of green knowledge.

Specifically, sustainable development is an approach that encourages organizations to face environmental challenges as a collection of interconnected resources. This entails not only focusing on finances, but also on society and the environment. Through this type of value-generating intangible assets, relevant capacities are created. In terms of strategy, these can accelerate sustainable development (Aragón-Correa et al. 2016; Hart, 1995).

2.1 Green absorptive capacity

Nowadays knowledge is acquired from various media, but there is a need for individuals and organisations to distinguish quality, important and necessary information coming mainly from electronic media, as an essential part of knowledge management that allows to evaluate, combine and exploit new information experiences (Namdarian et al., 2020), as the absorption capacity comes precisely from knowledge management. Based on Zahara & George's (2002) view of dynamic capabilities reconceptualized absorptive capacity as a dynamic capability related to knowledge creation and use which improves companies' ability to maintain a competitive advantage through two sub-aspects of absorptive capacity: (1) potential, and (2) realized. These two dimensions integrate the acquisition, assimilation, transformation and exploitation of knowledge. Recently, these capacities have become more

important and relevant in terms of business innovation, and in technology companies (Sancho-Zamora et al. 2022; Müller et al. 2021), and corporate sustainability focused on sustainable development (Shahzad et al. 2020).

Therefore, absorptive capacity focuses especially on the capacities which certain companies develop in order to recognize the new external knowledge in order to generate value and address the challenge of the environment. The ecologization of the economy has been emphasized as a strategy for dealing with the environment (Pacheco et al. 2018; Barbier & Markandya, 2013). Owing to the concern over environmental change and its effect on resources and survival, green innovations are now crucial aspects for the transition to the green economy (Droste et al. 2016). In this sense, Pacheco et al. (2018) conceptualized Green Absorptive Capacity, focused on knowledge-based capabilities of sustainability and environmentalism.

2.2 Sustainable Development

Sustainability is a topic that has shown great interest in recent years, both in academia and in the business sector, as it is the result of sustainable practices that help care for the planet, towards the achievement of the Sustainable Development Goals (SDGs) (Jaimes- Valdez et al., 2022; Mohieldin, 2021). The World Commission on Environment and Development (1987, p. 43) defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Sustainable development contemplates economic, social, and environmental considerations. This approach is also related to green practices, and most important of these include: green human resources management, green performance, green intellectual capacity, green knowledge absorptive capacity, among others. This requires that companies adhere to environmental norms, as well as develop and implement green strategies in the products they design and the services they offer. This must be done integrally and in order to benefit society and the economy.

This approach emphasizes environmental protection and resource preservation. At present, numerous companies have begun to feel considerable pressure from society and the government in terms of environmental regulation. Therefore, green culture and new practices are now being implemented in order to promote sustainable development by way of environmental, social, and economic sustainability (Albort-Morant et al. 2018; Davenport et al. 2018; Guerrero-Villegas et al. 2018). In general, sustainability refers to a three-interconnected-pronged approach to guarantee environmental protection, profitability, and social responsibility as pillars of organizational activities (Lo, 2010; Schategger et al. 2013).

2.3 Environmental integrity

Environmental sustainability focuses on the environment and natural resources. The literature discusses numerous practices focused on environmental protection, which lead to sustainable development and corporate social responsibility, (Guerrero-Villegas et al. 2018), green innovation (Abbas & Sagsan, 2019), green supply chains (Tseng et al. 2019), green human resource management practices (Jamal et al. 2021), green corporate performance (Abbas, 2020), green purchasing, green corporate image, green brand loyalty, among others. Hence, companies ought to focus on the environment and green marketing as a part of a

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worldwide effort to protect the environment (Chen et al. 2018). These principles should be applied to numerous organizational processes.

2.4 Economic prosperity

The economic aspect of sustainable development emphasizes maximizing profit, greater income, and reducing operation costs. Al-Qudah, et al. (2021) consider that economic prosperity can be the value of everything produced during the year in the country, divided by the population size in any given year. Nonetheless, environmental issues, resource shortages, and social impact may halt economic growth in the industrial sector in the near future. In the past, companies only focused on economic prosperity, but in accordance with new government regulations and environmental awareness, economic prosperity ought to be tied to environmental protection and social equity. In accordance with sustainable development, non-renewable resources should be administered to benefit future generations and social welfare (Al-Qudah et al. 2021).

2.5 Social equity

This dimension focuses on the equity that should exist in organisations, society, and individuals. The objective is to promote society, culture, and equity in order to further social welfare (Guerrero-Villegas et al. 2018). Kawesittisankhun & Pongpeng (2020) argue that the social dimension focuses on the satisfaction of owners and the community. At the enterprise level it requires priority study, because individuals, local communities, and society in general continue to suffer the undesirable consequences of environmental mismanagement. This area is now being studied to a greater extent; nonetheless, there remains a large area of opportunity for its inclusion as a pillar of sustainable development.

2.6 Green absorptive capacity and its connection with environmental protection, economic prosperity, and social equity.

In recent years, sustainability has grown in importance for organizations because it is now considered a strategic resource (Rosati & Faria, 2019). Likewise, knowledge management has become the most valuable strategic resource for all organizations (Rabeea et al. 2019) because it entails knowledge creation, access, and use for sustainability and gaining competitiveness (Hussinki et al., 2017; Peng et al., 2007). It is likely that those companies which acquire and apply environmental knowledge will create new vision for sustainability (Albort- Morant et al. 2018). More specifically, green absorptive capacity is considered to be a process of acquiring, assimilating, transforming, and exploiting green knowledge, as well as creating new dynamic capabilities for new environmental practices.

Numerous studies, such as Chen et al. (2014), have focused on green absorptive capacity in terms of environmental variables, such as green innovation services and green dynamic capabilities, and this study revealed a strong positive effect. Pacheco et al., (2018) also studied the absorptive capacity of green knowledge and the performance of green innovation. Given the need to study sustainability, it is necessary to provide knowledge management processes and practices for the assessment of social, environmental, and economic impacts (Burki et al. 2018). The success of such green strategies depends on organizational knowledge (Patterson & Ambrosini, 2015). Therefore, organisations should

make use of dynamic green knowledge capabilities towards sustainability (Shahzad et al. 2020).

On the other hand, the emerging interest in the green economy has sustainability for development as its starting point. Nowadays, however, growth strategies and the objectives of new economic policies have intensified owing to the fact that economic growth, or "green growth" as it is now known, provides the solution to numerous economic, environmental, and economic issues (Wanner, 2015). This implies that green and economic growth are the new shared vision and the best approach for achieving sustainable development (World Bank, 2012: 24). The Brundtland Report (WCED, 1987) emphasizes the importance of synergy for integrated development across both dimensions. With these arguments, three research hypothesis are formed:

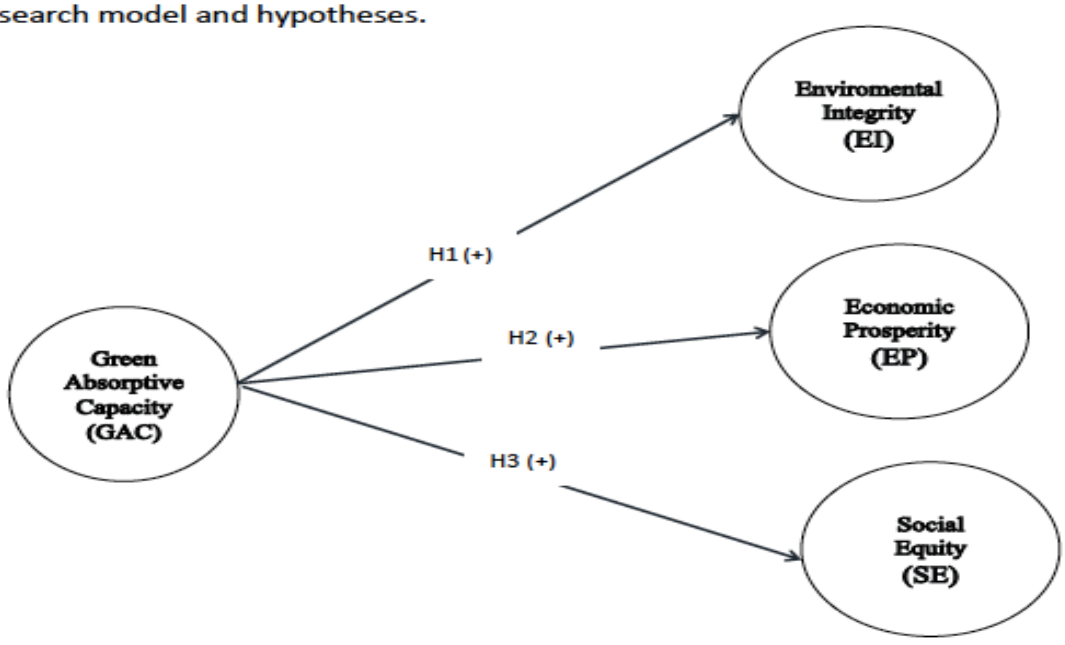
H1: Green absorption capacity impacts on environmental integrity.

H2: Green absorptive capacity impacts on economic prosperity

H3: Green absorptive capacity impacts on social equity

According to the planted hypotheses, Figure 1 presents the research model, whose structural relationships are based on the theoretical foundations described in previous paragraphs.

Figure 1. Research model and hypotheses.



Source: Data Availability Statement—Requests for data are available to Martinez (mmartineza@uaemex.mx).

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3 METHOD

3.1 Scope of the research

This research is quantitative (Creswell, 2018), transactional or transversal, and deductive in approach. The researchers examine the theory based on the hypothesis to explain the phenomenon of the investigation (Bryman 2007; Stockemer, 2018). The scope of this investigation is confirmatory, because the measures of goodness of fit make PLS appropriate for this project (Dijkstra & Henseler, 2015).

3.2 Data collection and sampling

This empirical research obtained data from top-level directors, department leaders, and supervisors by way of an online survey in various companies; specifically, the automotive industry, processed foods, and the pharmaceutical industry in the State of Mexico. 115 answers were received. These were then checked to ensure that no information was missing. Missing data are a big problem in social science research. Hair et al. (2022) explains that a response with more than 15% of data missing ought to be eliminated. Missing data can be dealt with by replacing it with the mean or the nearest neighbor value when less than 5% of the required data is missing. In the present case, 7 answered surveys were less than 95% complete. These were eliminated. 108 answered surveys formed the basis of this research. Data were collected in January and February of 2022. Table 2 provides details of the sample.

Table 1. Sample profile

		N	*%*			*N*	*%*
Gender	Female	77	71.29	***Enterprise***	***size***		
	Male	31	28.71		Medium	74	68.51
Age	26-30 years old	14	12.97		Large	35	31.49
	31-35 years old	35	32.40	***Industrial Sector***			
	36-40 years old	18	16.67		Foods	44	40.74
	40 years old or older	41	37.96		Chemical	22	20.37
Job title					Automotive	42	38.89
	Senior managers	14	12.96				
	Middle manager	62	57.40				
	Supervisor level	32	29.64				
Education							
	Undergraduate degree	86	79.62				
	Posgraduate	22	20.38				

Source: Data Availability Statement—Requests for data are available to Martinez (mmartineza@uaemex.mx).

3.3 Measures

Sustainable development (the dependent variable) was measured using the scale found in Bansal (2005). This included three dimensions: (1) environmental integrity, based on 10 items, (2) economic prosperity, based on 6 items, and (3) social equity, based on six items. Despite this scale being reliable and valid, for the purposes of this study, it was tested for validity and flexibility. In the case of environmental integrity, only seven items satisfied the established parameters. Items 1, 3, and 6 were removed from the original version of the survey. In terms of economic prosperity, all six items satisfied the established parameters. In terms of social equity, only five items satisfied the parameters. The items were measured on a seven-point Likert scale. The independent variable (green absorptive capacity), the ten-item scale found in Pacheco et al. (2018) was used. During the validation process, it was observed that items GAC2, GAC4, and GAC7 did not satisfy the established parameters for reliability and validity. Therefore, this variable was operationalized with seven items.

3.4 Data analysis

A second-generation technique known as Partial Least Squares Structural Equations Modeling (PLS-SEM) was used for data analysis. PLS works with complex and robust models. It estimates parameters efficiently. It is a composite-based approach, based on the law of total variance (Hair, et al. 2022; Dijkstra, et al. 2014; Dijkstra, et al. 2015). The use of PLS for the purposes of this research is justified because it works extremely well for small samples. Its statistical power and precision can model two types of mediation: reflective and causal-formative mediation. Nonetheless, for the purposes of this research, all constructs were modeled reflectively.

4. RESULTS

4.1 Evaluation of overall fit

Benítez et al. (2020), Gefen et al. (2011), and Henseler et al. (2016)-recommend that the first step in assessment should be the overall fit of the model by way of evaluation of the structural saturated model, in which all constructs are freely correlational. The overall fit of the saturated model is necessary for the validity of compound measurement models. Measurement metrics contain discrepancy measures, and quartiles at 95% and 99%. In this case, the SRMR value must be below the established threshold of 0.80 (Henseler et al. 2014; Hu, et al., 1992). The discrepancy measures must be below the quartile of 95% (HI95) and (HI99). Next, evaluate the fit of the estimated model, under the same metrics as the saturated model. Table 2 shows the overall fit of the measurement model by assessing the saturated model as a compound confirmatory analysis to prove the theory used (Henseler et al. 2014; Dijkstra & Henseler, 2015).

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Table 2. Evaluation of overall fit

Models	*SRMR			**d_{ULS}			***d_G		
	Original sample	95% (HI95)	99% (HI99)	Original sample	95% (HI95)	99% (HI99)	Original sample	95% (HI95)	99% (HI9)
Saturated Model	0.062	0.068	0.076	1.235	1.484	1.854	1.079	1.178	1.385
Estimated Model	0.067	0.071	0.079	1.447	1.659	2.046	1.104	1.170	1.348

Source: Data Availability Statement—Requests for data are available to Martinez (mmartineza@uaemex.mx).

4.2 Reliability and validity of the measurement model.

In these types of models, reliability, convergent and discriminant validity must be assessed. The values of the loading of the indicators must be greater than 0.707, given that 50% of variance can be explained by the latent variable (Hair, et al. 2022). An Average Variance Extracted (AVE) higher than 0.5 provides strong empirical evidence of convergent validity. Composite reliability was evaluated, and the parameters of composite reliability are between 0.07 and 0.95, because constructs with a reliability higher than 0.95 may be measuring the same thing (Hair et al. 2022). Tables three provide evidence of reliability and convergent validity.

Table 3. Reliability and validity.

Construct / indicators	***Loads***	***Cronbach's Alpha***	***Composite reliability***	**AV*E***
Green Absorptive Capacity (*first order-mode A)*				
GAC1	0.854	0.910	0.929	0.652
GAC2	0.845			
GAC3	0.808			
GAC4	0.723			
GAC5	0.749			
GAC 6	0.819			
GAC7	0.845			
Environmental Integrity *(first-order mode A)*		0.918	0.921	0.673
EI1	0.807			
EI2	0.871			
EI3	0.727			
EI4	0.809			
EI5	0.826			
EI6	0.783			
EI7	0.905			
Economic Prosperity (*first-order mode A)*		0.934	0.935	0.673
EP1	0.833			
EP2	0.868			
EP3	0.850			
EP4	0.880			
EP5	0.921			
EP6	0.855			
Social Equity *(first-order mode A)*		0.788	0.855	0.542
SE1	0.725			
SE2	0.746			
SE3	0.691			
SE4	0.788			
SE5	0.727			

Source: Data Availability Statement—Requests for data are available to Martinez (mmartineza@uaemex.mx).

4.3 Discriminant validity

Discriminant validity makes it possible to assure that two or more latent variables represent theoretically different concepts. In order to evaluate this type of validity, there are numerous tests, such as the Fornell-Larcker criterion, Heterotrait-Monotrait ratio (HTMT) in terms of correlations, and HTMT confidence intervals. The most recent criterion in the field of PLS-SEM is HTMT (Henseler, Ringle & Sarsted, 2015). The measurements for HTMT correlations must be lower than 0.85 (the strictest threshold) or 0.90. Furthermore, the unilateral confidence interval of 95% for HTMT does not require a zero to be significantly different. Tables four and five show the discriminant validity.

Table 4. Discriminant validity

	Fornell-Larcker criterion				Heterotrait-Monotrait ratio (HTMT)			
	EP	**EI**	**GAC**	**SE**	**EP**	**EI**	**GAC**	**SE**
EP	**0.868**							
EI	0.660	**0.820**			0.712			
GAC	0.823	0.707	**0.808**		0.893	0.770		
SE	0.560	0.593	0.749	**0.736**	0.650	0.694	0.878	

Note: The square root of AVES is shown diagonally in bold.
Source: Data Availability Statement—Requests for data are available to Martinez (mmartineza@uaemex.mx).

Table 5. Discriminant validity (HTMT): confidence Interval Bias Corrected.

Constructs	Original sample	Bias	2.5%	97.5%
IE -> EP	0.712	0.002	0.557	0.818
SE -> EP	0.650	0.001	0.457	0.801
SE -> GAC	0.878	0.001	0.762	0.958
SE -> EI	0.694	0.000	0.520	0.824
GAC -> EP	0.893	-0.000	0.823	0.939
GAC -> EI	0.770	-0.000	0.645	0.854

Source: Data Availability Statement—Requests for data are available to Martinez (mmartineza@uaemex.mx).

4.4 Assessment of the structural model

The assessment of the structural model included empirical evidence that assessed path coefficients, coefficients of determination (R^2), effect sizes (f^2), and predictive relevance (Q^2). Table six shows the results of the path or Beta coefficients, interpreted as standardized regression coefficients. They provide information regarding the effect of every explanatory variable on the dependent variable; i.e., a unit change in the exogenous construct changes the endogenous variable by the value of the path coefficient. To assess the path coefficient, the reference value was established as -1 + 1. Furthermore, the confidence interval, the *t* value, and the *p* value were all assessed to verify statistical significance.

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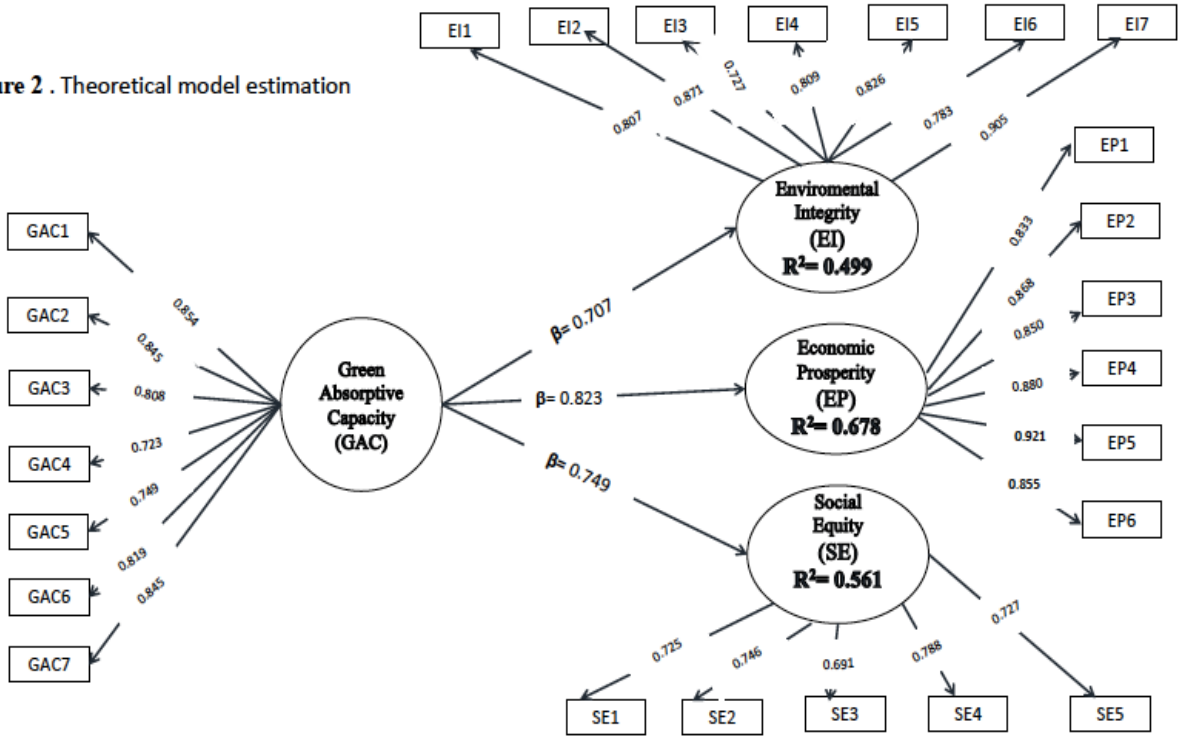
Table 6 Structural model: hypotheses result

Direct Effects / Constructs	Path Coefficient	5% 95% CIBC	t-value*	p-value	f^2	Support
GAC ⇒ EI	0.707*	[0.602, 0.775]	13.892	0.000	0.998	Yes (H1)
GAC ⇒ EP	0.823*	[0.752, 0.867]	24.968	0.000	2.107	Yes (H2)
GAC ⇒ SE	0.749*	[0.648, 0.817]	14.967	0.000	1.287	Yes (H3)

Notes: C*onfidence Intervals Bias Corrected (CIBC), t-value (one-tailed test); t (0.05, 4999) = 1.645; t (0.01, 4999) = 2.327; t (0.001, 4999) = 3.092; * p < 0.05. ** p < 0.01. *** p < 0.001.*
Source: Data Availability Statement—Requests for data are available to Martinez (mmartineza@uaemex.mx).

Finally, figure two shows the R^2 values, which implies the explained variation in the dependent constructs explained by the endogenous constructs. The R^2 values provide information about the predictive power of the model within the sample (Hair et al. 2022). Rhe parameter set to evaluate the R^2 is recommended from 0 to 1. High R^2 values mean high predictive power. R^2 values of 0.75, 0.50, or 0.25 are significant, moderate, and weak respectively (Hair et al. 2011; Henseler et al., 2009). Therefore, it is evident that 49.9%, 67.8%, and 56.1% variance for environmental integrity, economic prosperity, and social equity for green absorptive capacity respectively, provide an explanation of the considerable predictive power of the model. In addition, predictive relevance (Q^2) was calculated. The model has predictive relevance if the Q^2 value is below zero. The following Q^2 values were calculated EI=0.330, EP= 0.497, and SE= 0. 295. Figure 2 shows the results of the structural estimation model.

Figure 2 . Theoretical model estimation



Source: Data Availability Statement—Requests for data are available to Martinez (mmartineza@uaemex.mx).

5. DISCUSSIONS AND CONCLUSIONS

The 2030 Agenda for Sustainable Development has established 19 goals to ensure sustainable economic and social progress around the world. Achieving these goals does not only imply the eradication of extreme problems; rather, the inclusion of the three dimensions of sustainable development: economic prosperity, environmental integrity, and social equity, which form part of a global vision (United Nations, 2016). Resource-Based Theory (Wernerfelt 1984; Barney et al. 2011), specifically, A Natural-Resource-Based View of the Firm (Hart, 1995), and a knowledge-based theory of the firm (Grant, 1991, 1996) were instrumental in fulfilling the goals of this study, and in examining the extent to which green absorptive capacity influences the environmental integrity, economic prosperity, and social equity of sustainable development, in the context of the manufacturing industry in the State of Mexico. Sustainable development is a new worldwide philosophy, the underlying economic, social, and environmental pillars are key factors for the development of modern society. This has been especially true since 2016, when the Agenda 2030 was published.

The results of this research indicate a strong and significant relationship between green absorptive capacity with environmental integrity, economic prosperity, and social equity. These results support Lozano (2008), who argues that sustainability implies that organizations are made of three equally-important aspects. These are economic, environmental, and socio-economic considerations. Sustainability is now considered as an alternative to the socioeconomic paradigm which has prevailed for many years. The environment, the value of society, and individuals cannot be expressed in purely economic terms. Sustainable development, therefore, must form part of our understanding of economic disparity, environmental destruction, and society. Achieving balance is a difficult challenge.

The findings of this investigation are aligned with Shahzad et al., (2020) regarding the positive and significant impact of knowledge absorptive capacity on the sustainability of multinational, ISO-certified manufacturing companies of the Asia-Pacific region. Specifically, Shahzad et al., (2020) tested the performance of a corporate sustainability model, in which knowledge absorptive capacity was the predictor variable, and corporate social responsibility was the mediator variable. Pacheco et al. (2018) also studied green knowledge absorptive capacity in terms of sustainability. Their study focused on environmental factors, organizational factors, and the performance of green innovation. Their results were positive and significant. This implies that absorptive capacity is crucial in the modern world because it responds to the needs of the changing era of modernity.

In the era of knowledge and information, companies must acquire new external knowledge. Doing so allows for sustainable development locally, nationally, and internationally. Therefore, new lines of research and interesting findings are constantly emerging in this field; however, there is still a lot to be discovered in terms of absorptive capacity as a predictor of sustainable development. In conclusions, this study encourages companies to focus more on green absorptive capacity as one of the chief knowledge resources for promoting sustainable development, environmental integrity, economic prosperity, and social equality. Therefore, it is important to prioritize these valuable tangible and intangible resources because they contribute to sustainable development in manufacturing companies. This study focuses on manufacturing companies and sustainable development it does not focus exclusively on local markets; rather, it focuses on any market

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that creates and promotes green knowledge absorptive capacities as a strategy for economic, environmental, and social progress.

5.1 Implications for theory

The results of this research argue that if a company drives green absorptive capabilities in processes and services as strategic resources, this will promote sustainable development, based on the pillars of Resource-Based Theory (Wernerfelt 1984; Grant 1991; Hart, 1995; Barney et al. 2011), and The Knowledge Based View (Grant, 1996). Therefore, in addition to testing and strengthening the existing theory, the results make import contributions, because they generate and test new structural relations of green knowledge absorptive capacity with environmental integrity, economic prosperity, and social equity. Although absorptive capacity is relevant for many studies because it relates to sustainability in terms of numerous environmental practices, in the recent literature, there have been very few studies which concretely tackle the potential of green knowledge in terms of sustainable development. For this reason, this study is original, unique, and contributes to the existing theory.

5.2 Implications for practice

The need for further research in the field of sustainable development of the manufacturing industry, is a challenge for Mexican companies aiming to align with the sustainable development goals found in the 2030 Agenda. This is an area of opportunity for scientific research to promote understanding of the achievements related to the structural relationships which exist between societal development, environmental development, and economic development (Winston et al, 2021). Many companies are now reporting to the Global Reporting Initiative; however, this is still a small fraction of the total number, according to the most recent reports. The world of business is increasingly challenging and dynamic, and this obliges directors to keep up to date with environmental norms concerning sustainable consumption behaviors, societal demands for sustainable development, and the financial benefits that can be gained from sustainable development. Based on this new sustainable vision, directors will have to promote and implement dynamic capabilities to achieve sustainable development. Organizations are dynamic entities which must acquire new knowledge constantly. In particular, the contribution of these findings to the management of companies in emerging economies is to present a predictive model that shows how the absorptive capacity of green knowledge impacts sustainable development as part of the Sustainable Development Goals of the 2023 Agenda (Gomez-Trujillo et al., 2021). Traditionally, companies have used economic and financial results to identify their development. Nowadays it requires that integral part of sustainable development, which this article provides. Furthermore, the research contributes to the field of sustainable business management literature, testing the theory in order to strengthen it, and introducing a new first-generation statistical analysis methodology.

5.3 Limitations of the study

The present study has certain limitations. Further studies could contribute to progress in the field of sustainable development. Firstly, the sample size should be expanded to include other sectors, as well as including all the companies that report to the Global Reporting Initiative.

Secondly, mediating and moderating variables can be included, in order to determine what kind of variables strengthen the relationship. Furthermore, sociodemographic control variables could explain the result through indirect effects. Thirdly, this study collected data at one time only. Therefore, a longitudinal study could be valuable for observing changes over time.

5.4 Future research

There still exist numerous challenges that must be faced in order to broaden knowledge of sustainable development. In the company context, numerous lines of research could be derived in terms of functional areas such as sustainable marketing, sustainable human resources management, sustainable FinTech, sustainable production processes, and sustainable IT systems. Likewise, in the field of education, new lines of research into the present and future of sustainable education. In this way, a sustainable knowledge economy can be created.

In conclusion, this study empirically demonstrated that green absorptive capacity positively impacts sustainable development, as strategic resources that give value to the organisation in changing and challenging environments. The findings provide empirical evidence for the phenomenon studied, as well as confirming the theory that was postulated, recalling that the research design addressed a confirmatory level of research. The results of the global fit indices gave support to the empirical evidence. In this sense, the study provides theoretical contribution and application to business practice.

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