



Environmental Awareness During COVID-19: Spur Organizational Performance through Environmental Motivation and Environmental Management System

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Abstract: The COVID-19 pandemic profoundly disrupted lives through direct and indirect channels, leaving an indelible global imprint on businesses and their workforces. This study investigates the influence of environmental management system on organizational performance grounded in business and sustainable environmental motivation. Additionally, it delves into the moderating role of environmental awareness during pandemics. Using data from 279 respondents in Pakistan's manufacturing sector, collected through an online survey and analyzed with SmartPLS 3.0, the study findings reveal that environmental management system significantly enhance environmental performance based on business and sustainable environmental motivation. However, their impact on economic performance is deemed insignificant. Notably, environmental awareness during the COVID-19 crisis amplified this influence. The results underscore the significance of fostering both business and sustainable environmental motivation to enhance environmental management system and the performance of Pakistan's manufacturing sector. Furthermore, policy formulation and enduring strategies should consider COVID-19's repercussions and safeguarding industries, such as manufacturing, from future calamities. Additionally, this study underscores that heightened employee motivation yields a favorable upswing in organizational performance. Policymakers and governments are encouraged to integrate motivational enhancement initiatives when sculpting organizational strategies and regulations.

Keywords: Environmental Motivation, Environmental Management System, Environmental Performance, Economic Performance, COVID-19.

Introduction

In recent years, various industrial sectors have faced mounting pressure to align their organizational operations and activities with the imperative of environmental preservation. Organizational commitment to this causes a hinge on internal practices, notably the reduction of waste generated through production processes and minimization of production discharge (Ahmed, Ahmed, & Najmi, 2018; Chaudhry & Amir, 2020). Concurrently,

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optimizing energy consumption, enhancing efficiency, and managing resource costs are essential for aligning an organization's objectives with the goal of positively impacting the natural environment, necessitating heightened environmental motivation. This correlation not only mitigates risks but also bolsters the organization's reputation, thereby influencing both business viability and environmental sustainability (Danso, Adomako, Lartey, Amankwah-Amoah, & Owusu-Yirenkyi, 2020; Ali, Kausar, & Amir, 2023).

The pervasive adoption of an environmental management system (EMS) is contingent upon managers recognizing the advantages of environmental motivation and integrated environmental management. Over the past few years, organizations have increasingly embraced initiatives aimed at environmental protection. Extensive research on EMS has consistently demonstrated its role in augmenting an organization's environmental responsiveness (Amankwah-Amoah, 2020). The motivations driving these environmentally beneficial endeavors encompass stakeholder expectations, the ethical stance of the organization, and the drive to enhance both organizational sustainability and economic well-being. A noteworthy research gap exists in comprehending the full scope and impact of environmental motivation, particularly concerning its implications for business performance and sustainability within the environment (Asrar-ul Haq & Kuchinke, 2016).

However, recent research has highlighted the dearth of managerial processes and practices required for effective EMS implementation. This deficiency, coupled with a scarcity of environmental motivation among organizations and their management, has garnered scholarly attention. The underlying cause of the limited adoption of EMS is the lack of knowledge and motivation among managers and employees, perpetuating the cycle of under-research and limited awareness of its organizational benefits (Malik, Ali, Kausar, & Chaudhry, 2021). Nonetheless, researchers have focused on the role of environmental motivation in elevating organizational performance and sustainability, prompting a thorough evaluation of organizational and behavioral frameworks to seamlessly align with environmental motivation, thereby enhancing both environmental and organizational performance.

Simultaneously emphasizing the environmental and economic aspects has shown promising growth outcomes for organizations. Another aspect of research in this domain is the exploration of how environmental motivation and management systems interact to influence both environmental performance (ENP) and economic performance (ECP) (Long, Chen, Du, Oh, & Han, 2017; Amir & Chaudhry, 2019; Appannan, Mohd Said, Ong, & Senik, 2023). Furthermore, the COVID-19 pandemic has upended multiple facets including ECP, sustainability, and management practices. In this context, any factor fostering superior economics and ENP is imperative from both organizational and research perspectives. The study posits that the pandemic could serve as a catalyst, amplifying interest in implementing EMS to simultaneously bolster the environment and ECP. Notably, quantitative explorations of the impact of the pandemic on management practices are emerging. This study contributes to the field by employing a comprehensive model to test the dynamic impact of organizational performance.

A pivotal advantage of improved ENP lies in its potential to enhance an organization's financial standing, compelling the study to delve into the relationship between ENP and ECP, particularly within Pakistan's manufacturing sector. Several reasons underpin the

significance of this research, including the chaos precipitated by the COVID-19 pandemic. Nonetheless, organizations can leverage this crisis to identify emerging threats, recognize opportunities, and make informed decisions to elevate both the environment and ECP (Qian, Burritt, & Chen, 2015; Cheng, Hu, & Zhou, 2019). This study anticipates that COVID-19 has heightened awareness of environmental preservation and performance, a shift that necessitates managerial support, congruent organizational objectives, and alignment between employees and learning facilities.

To holistically address the factors that enhance organizational environmental and financial performance, this study develops a comprehensive model that assesses the influence of business environmental motivation (BEM) and sustainable environmental motivation (SEM) on EMS. This model aims to unveil how environmental awareness, catalyzed by the COVID-19 pandemic, can elevate both the environment and ECP. This study's theoretical underpinning revolves around leveraging the core concept of EMS to advance both environmental and economic outcomes. Furthermore, this study offers insights crucial for meeting the diverse environmental expectations posed by stakeholders and organizational owners (Asrar-ul Haq & Kuchinke, 2016; Cheval et al., 2020), as EMS addresses gaps within an organization's environmental stewardship, ultimately leading to predictability and substantial economic and ENP.

Literature Review and Theoretical Framework

This section introduces motivation behavior theory for the current study. It draws upon the analyzed prior studies, discusses the literature, and subsequently formulates hypotheses based on this foundation.

Motivations-Behavior Theory

Motivation-Behavior Theory plays a pivotal role in elevating EMS, bolstering the environment, and ECP in organizations, particularly under the influence of COVID-19 awareness. Rooted in psychological principles, this theory elucidates the profound connection between individuals' motivation and their actions (Cheng et al., 2019). It posits that intrinsic or extrinsic motivation significantly shapes behavior. Leveraging this theoretical framework alongside an environmental and sustainable business lens, we employ it in this study. EMS are strategically designed to guide organizations to optimize their environmental impact through tailored policies, procedures, and processes. In this context, Motivation-Behavior Theory serves as a potent tool for fortifying EMS efficacy (Amir, Iqbal, & Tahir, 2021). By deciphering how to inspire employees to adhere to environmental protocols and practices wholeheartedly, as suggested by Danso et al. (2020), this theory accentuates the human factor in environmental management. Furthermore, ripple effects extend beyond ecology. Enhanced ENP translates to tangible economic advantages, such as reduced energy expenditure, augmented operational efficiency, and enhanced reputation. Consequently, Motivation-Behavior Theory becomes instrumental in unraveling the intricate dynamics that encourage employee engagement in environmental conservation

efforts, thereby precipitating economic outcomes. Based on this theoretical foundation, the following sections present the development of the study hypotheses.

Hypotheses Development

Environmental motivation plays a pivotal role in augmenting organizational commitment to environment-centric programmes and strategies. These strategies positively influence both the economy and ENP (Ali et al., 2023). Furthermore, EMS enables integrated practices, aligning employees' efforts with stakeholders' interests, while safeguarding the organization's surroundings. Conversely, environmental motivation caters to human needs and cultivates safer work practices. This theory serves as a catalyst for sustainable behavioral changes within organizations. As we transition into hypothesis development, the synergy between EMS, ENP, and economic outcomes can be fortified by integrating the motivation-behavior theory. Amid COVID-19 awareness, the rationale for prioritizing sustainability and investing in EMS has become even more compelling, given the intrinsic link between environmental and public health. By harnessing intrinsic and extrinsic motivations, organizations foster a sustainable culture that benefits both the environment and economy (Amir, Rehman, & Khan, 2020; Appannan et al., 2023). Now, as we delve into a detailed review of the literature, we formulate the hypotheses that underlie our study.

Business environmental motivation and EMS

The uptake and implementation of EMS are directly related to the organization's business motivation to enhance environmental management and performance (Espejo, Celis, Chiang, & Bahamonde, 2020; Ali et al., 2023). Organizations currently believe that a firm's image, compliance with environmental incidents, and prevention of environmental incidents are essential and significant drivers for implementing EMS. Business environment motivation significantly and positively impacts implementation and using EMS. It also enhances organizations' economic and ENP and enhances positive relationships with stakeholders. The drivers and behaviors discussed previously are also anticipated by Eccles et al. (2014) to significantly impact the environment, as they lead to several environmental innovations that directly and positively impact the organization's EMS (Amir et al., 2021). Various environmental designs can be obtained owing to business environment motivation, also called rational motivation for environmental management. Business environment motivations significantly and directly impact EMS because of environmental drivers and behaviors (Ghisellini, Cialani, & Ulgiati, 2016). Therefore, it can be stated that:

H₁: The impact of BEM on EMS is significant.

Sustainable environmental motivation and EMS

SEM is not only significant and, in the organization's, best interest, but also substantial and in the best interest of the environment. As suggested by Graves, Sarkis, and Zhu (2013), there are several reasons for this. First, environmental motivation is necessary

for organizations because of ongoing operational processes, which can impact the organizations and the environment positively or negatively. Second, companies are now focusing on sources that can be sources of pollution, and are also starting to realize how these sources and pollution can be decreased (Korai, Mahar, & Uqaili, 2017). Third, it has been observed in various studies and articles that companies feel the need to improve the production process so that at least pollution is produced to preserve the environment and natural resources in the present condition. Growing concerns and the escalating imperative to enhance production processes and organizational systems for environmental preservation and care, the development and implementation of EMS have come to the forefront (Malik et al., 2021; Chaudhry, Asad, Abdulghaffar, & Amir, 2021). Several studies have proposed that there is a significant and positive role of SEM in the application of EMS in organizations. Therefore, based on the impact of SEM on EMS, we can hypothesize that:

H₂: The impact of SEM on EMS is significant.

EMS and environmental performance

The EMS possesses our system or database that integrates all the processes and procedures involved in training personnel, monitoring, summarizing, and reporting specific ENP information to the firm's external and internal stakeholders. Lai and Wong (2012) established that there is a significant and positive impact of EMS on ENP because this database is entirely focused on information, specifications, and reporting of the functioning and operations of an organization concerning the environment and the impacts of the organization on the environment (Ammenberg & Hjelm, 2003; Amir & Chaudhry, 2019). The organization's operations and strategies are harmonized with its objectives and environmental preservation goals. Personnel are equipped with training in both BEM and sustainable environmental practices, ensuring the achievement of organizational objectives while concurrently improving ENP. Moreover, production and operations are monitored to see how they impact the environment in which the firm is operating, and several studies support this sort of check and balance to enhance the organization's ENP (Paillé, Chen, Boiral, & Jin, 2014). Nonetheless, some studies have also supported the idea that checks and balances on an organization's operations concerning ENP are also in the best interests of external and internal stakeholders. Based on the ideas proposed by previous studies, the following hypothesis is derived:

H₃: The impact of EMS on ENP is significant.

Environmental performance and economic performance

Paital, Das, and Parida (2020) stated that ENP is supported by several factors that help organizations build a positive image and result in economic gains. Market organizations that have adopted organizational strategies aligned with environmental strategies have greater value in the market and a tremendous competitive advantage over their com-

petitors. Moreover, environmental performance builds up a positive image and positive word-of-mouth of organizations implementing EMS and environment-preserving strategies, implying that giving and taking from the environment and natural resources are equal. Based on motivational theory, organizations can be powerful tools for enhancing both environmental and ECP by creating a culture of sustainability that is aligned with the values and interests of employees, customers, and other stakeholders (Amir, Siddique, & Ali, 2022). By integrating sustainability into their business strategy and creating a sense of purpose, direction, and accomplishment around sustainability goals, organizations can achieve long-term success in both areas, while contributing to a more sustainable future (Baloch et al., 2022). Similarly, several researchers have concluded that the impact of ENP on organizations' ECP is significant and positive. In summary, ENP can have a significant impact on the ECP of organizations (Cheng et al., 2019). By prioritizing sustainability and taking proactive measures to address environmental risks and opportunities, organizations can improve their bottom lines, attract new customers and investors, and create long-term value for themselves and the environment. Therefore, it can be concluded from a review of previous studies:

H₄: The impact of ENP on ECP is significant.

EMS and economic performance

Some prior studies have concluded that EMS on the ECP has negative impact (Prajogo, Tang, & Lai, 2012). They said personnel training that maintains and manages this system also adds to business costs. However, the majority of studies have concluded that the impact of EMS on the ECP of organizations is positive and significant because the initial cost of installation and management and the ongoing cost of maintenance and management by the person cannot be compared with the economic benefits that this system will bring into the firm (Qi, Zeng, Li, & Tam, 2012). EMS can help organizations create a more engaged and motivated workforce by giving employees a sense of purpose and contribution. Organizations can improve employee morale, retention, and productivity by involving employees in sustainability initiatives and providing them with training and development opportunities. EMS is a strategic resource for organizations that enhances organizational performance and provides organizations with tremendous competitive advantages. Several sources will enhance the organization's ECP, including pollution prevention strategies and sustainability factors. These firms are also expected to perform better in the stock market because of stakeholders' higher levels of support. Moreover, EMS also reflects that a company has a greater sense of corporate social responsibility, which builds a positive image for the public, consumers, and stakeholders (Qi et al., 2012). Governmental pressure also decreases in such organizations, saving costs and enhancing the incoming economic benefits (Raza, Qazi, Khan, & Salam, 2021). Overall, EMS can help organizations achieve a more sustainable and profitable future by reducing costs, managing risks, increasing revenue, engaging stakeholders, and improving employee motivation and retention. By integrating sustainability into their business strategy, organizations can create long-term value for themselves and the environment. Therefore, the following hypothesis

was derived:

H₅: The impact of EMS on ECP is significant.

Moderation of environmental awareness during COVID-19

The COVID-19 pandemic has impacted all organizations worldwide, irrespective of the sector or industry; organizations have been challenged and impacted financially, economically, managerially, and concerning operations. To consolidate the previous position over maintaining elasticity in the situation, specific strategies and steps are taken by organizations to preserve reputation and performance. After the significant impact of the COVID-19 pandemic, organizations are now finding threats and opportunities to restore their financial and operational performance (Shahzad et al., 2020). To compete with competitors, the COVID-19 pandemic has once and for all changed the whole dynamics of the relationship of organizations with the environment, and the value and importance of environmental preservation and maintenance strategies has now increased as a part of the after-effects of a heavy wave of the pandemic. Implementing environmental management strategies and systems will counter the pandemic, bring competitive advantages, and enhance organizational performance. Checking and balancing organizational activities, improving the quality of organizational operations and production, taking corrective steps, and preserving the natural environment and resources will enhance the ENP of organizations, thereby improving economic and operational performance (Sharma et al., 2020). Motivation-behavior theory can help organizations navigate the changing circumstances brought on by COVID-19 and achieve better environmental and ECP. By prioritizing sustainability, organizations can reduce waste and increase resource efficiency, leading to cost savings and improved ECP. Simultaneously, organizations can contribute to better public health outcomes and improve their reputation by reducing their environmental impact. This implies that the pandemic positively impacts ENP because of the enhanced awareness that calls for the implementation of EMS and strategies. Therefore, the following hypothesis was derived:

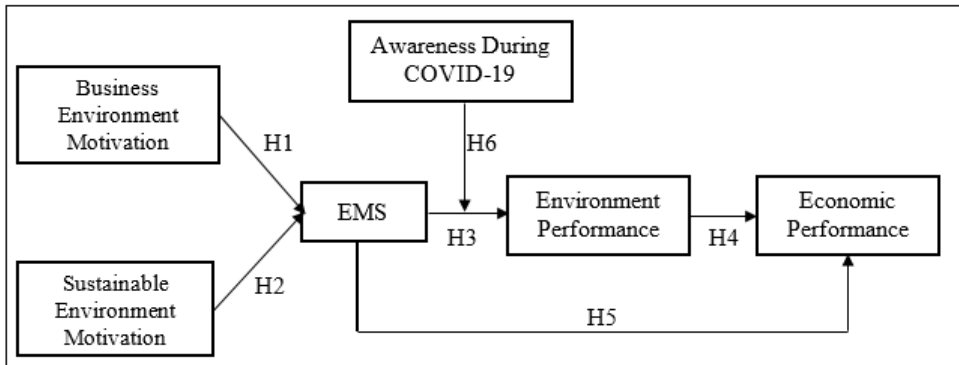
H₆: The moderating effect of ENP on EMS and ENP is significant.

Theoretical Framework

Figure 1 is the derived theoretical framework of this study, which has been drawn based on relationships present among the variables based on a review of previous studies:

Based on previous studies, this theoretical framework explains the relationship between business environment motivation, EMS, sustainable environment motivation, and EMS. Moreover, the paths also showed an association between EMS, ENP, EMS, and ECP. Therefore, this study also examined the relationship between environmental factors and ECP, while studying the moderation of environmental awareness during COVID-19 between EMS and ENP.

Figure 1
Research Framework



Research Methodology

The following sections outline the comprehensive methodological framework of this study.

Research Design

This study is based on a quantitative research approach because it reflects preliminary information from the primary data gathered during the current pandemic COVID-19. This research approach helps to examine the impact of EMS on organizational performance in the manufacturing sector of Pakistan during the pandemic COVID-19. [Wagner \(2015\)](#) also suggests adopting a quantitative approach in such cases. BEM and SEM are also factors of great interest to researchers; therefore, the quantitative approach is the most suitable way to examine the impacts of these factors on EMS, which in turn impacts the ENP and ECP of the organizations.

Research Population and Sample

The focal point was Pakistan's manufacturing sector with the aim of conducting a thorough and insightful research study. This sector, being the second largest contributor to the nation's economic growth, emerged as the natural choice for this investigation. It's important to note that this sector encountered significant challenges during the pandemic, making the study of its sustainability and operational effectiveness even more pertinent. A thoughtfully designed sampling strategy was employed to effectively guide this research towards its objectives. The guidelines provided by [Hair, Black, Babin, and Anderson \(2019\)](#) led to the adoption of purposive sampling techniques. This method involves selecting participants based on specific criteria such as their expertise, experience, and knowledge. For this study, professionals working in management roles within manufacturing organizations were chosen, as suggested by [Amankwah-Amoah \(2020\)](#).

Given the inherent uncertainty about the precise size of the total population, opting for working managers with firsthand insights into management systems and policy establishment is a practical approach. This selection ensured that the study benefitted from individuals possessing both a depth of experience and a solid understanding of the complexities at play. To address the challenge of determining the appropriate sample size, the G*Power tool initially recommended a sample size of 119. However, this was reconsidered the sample size based on (Kline, 2023)'s advice on sample calculation and established practices advocated by Hair et al. (2019). Consequently, the sample size was adjusted by multiplying the number of items (28 in this case) by ten. This adjustment aimed to enhance the accuracy and relevance of the study by accommodating a more diverse range of perspectives.

Through meticulous efforts, 279 meaningful and usable responses were obtained from professionals in Pakistan's manufacturing organizations. The response rate of 82% reflects a rigorous and earnest endeavor to gather insights from those directly involved in the sector. These collected responses represent a valuable foundation for hypothesis testing, offering a well-rounded understanding of the intricacies within the manufacturing landscape.

Data Collection and Analysis Method

Data for this study were collected via an online questionnaire developed using Google Forms. The questionnaire consisted of three main sections: an introduction to the study and its purpose, a section capturing the respondents' demographic profiles, and a set of objective questions related to the study's variables. Respondents rated these questions on a five-point Likert scale, ranging from 'strongly disagree' to 'strongly agree'. A total of 279 valid responses were analyzed using SPSS v26 for descriptive statistics and frequencies, and SmartPLS 3 was used to test for normality, reliability, validity, and hypothesis assessment.

Measurement of Variables

The measurement of each variable is adapted from the prior studies, such as Four item measures for BEM included "Marketing/advertising opportunity" opted from Amankwah-Amoah (2020). Moreover, there were five measures for SEM, including "Reducing environmental impacts and pollution," which were also adopted in the studies of Bilal et al. (2020). Five EMS measures, including 'strict compliance with environmental policy,' were adopted (Klemeš, Van Fan, & Jiang, 2020). Four measures for ECP, including "Sales growth," were adopted from the study (Cheng et al., 2019). (Babiak & Trendafilova, 2011; Pondeville, Swaen, & De Rongé, 2013; Windolph, Harms, & Schaltegger, 2014) also adopted these measures. Finally, six measures of environmental awareness during Covid19; these were adopted from the study (Severo, De Guimarães, & Dellarmelin, 2021); moreover, the exact measurements were adopted by Rousseau and Deschacht (2020). The four measures for the ENP were adopted from the study of Lisi (2015), involving

"Educating employees and the public about the environment." The same measures were adopted by [Walls, Berrone, and Phan \(2012\)](#); [Hsu and Zomer \(2014\)](#).

Empirical Findings

The empirical results were obtained, leading to the subsequent section for discussion. This section presents and interprets the outcomes of the analyses conducted in this study.

Demographics

The results presented in Table 1 provide a breakdown of respondents based on demographic profiles. Among the respondents, 54.1% were male and 45.9% were female. In terms of age distribution, 30.5% fell within the 18-to 24-year bracket, 42.7% were aged between 25 and 30 years, 22.9% were in the 31-to 35-year range, and a smaller percentage of 3.9% were above 35 years. When considering educational qualifications, 15.1% held a bachelor's degree, 35.8% completed a master's program, 22.9% pursued further studies with an MS/MPhil, and 26.2% held diplomas or other qualifications. Furthermore, 15.1% of the respondents had less than two years of experience, 43.7% had accumulated three to five years, 31.9% had worked between five and eight years, and 9.3% had over eight years of experience.

These demographic insights provide a nuanced understanding of the respondent pool, allowing for the consideration of potential correlations between demographics and perceptions of environment-oriented strategies and management practices.

Table 1
Demographical profile

Demographics	Dimensions	N	%
Gender	Male	151	54.10%
	Female	128	45.90%
Age	18 - 24 Year	85	30.50%
	25 to 30 Years	119	42.70%
	31 to 35 Years	64	22.90%
	More Than 35 Years	11	3.90%
Education	Bachelor	42	15.10%
	Master	100	35.80%
	MS/MPhil	64	22.90%
	Diploma/Other	73	26.20%
Experience	Less than 2 Year	42	15.10%
	3 to 5 Year	122	43.70%
	5 to 8 Year	89	31.90%
	More than 8 Year	26	9.30%

Measurement Model

Table 2 presents the results for the factor loading, reliability, and validity. Factor loading assesses the strength of the relationship between an item and an underlying construct, generally accepted above 0.3 or 0.4 ([Hair et al., 2019](#)).

Table 2
Factors Loading, Reliability, and Validity

Constructs	Items	BEM	ECP	ENA	ENS	ENP	SEM	A	CR	AVE
Business Environmental Motivation	BEM1	0.877						0.895	0.926	0.758
	BEM2	0.852								
	BEM3	0.869								
	BEM4	0.884						0.883	0.920	0.744
Economic performance	ECP1		0.740							
	ECP2		0.922							
	ECP3		0.887							
	ECP4		0.889							
Environmental management system	EMS1				0.795			0.873	0.908	0.663
	EMS2				0.755					
	EMS3				0.833					
	EMS4				0.840					
	EMS5				0.846					
Environmental Awareness	ENA1			0.455*				0.850	0.883	0.558
	ENA2			0.741						
	ENA3			0.815						
	ENA4			0.779						
	ENA5			0.733						
	ENA6			0.750						
Environmental Performance	ENP1					0.707		0.869	0.912	0.725
	ENP2					0.871				
	ENP3					0.899				
	ENP4					0.912				
Sustainable Environmental Motivation	SEM1						0.892	0.919	0.939	0.755
	SEM2						0.853			
	SEM3						0.853			
	SEM4						0.839			
	SEM5						0.907			

Note: BEM= Business Environment Motivation, SEM=Sustainable Environment Motivation EMS= Environmental management system, ENP= environmental performance, ECP=economic performance, ENA = environmental Awareness during COVID-19.

Reliability indicates measurement consistency, with Cronbach’s alpha and composite reliability over 0.7 considered good (Hair et al., 2019). Convergent validity ensures accurate measurement of a trait, established through various evidence types but mostly recommended over 0.5 (Kline, 2023; Walls et al., 2012).

The item loadings fell within a favorable range compared to the threshold, indicating consistency. Moreover, for measures such as Cronbach’s alpha and Composite Reliability, values should meet acceptable criteria to showcase reliability. Additionally, the AVE related to convergent validity appears to be satisfactory. In conclusion, considering the reliability of other values, the dataset appears to be dependable for subsequent testing and analysis. Table 3 shows the results for Mean, Normality, and Discriminant Validity via FL below and HTMT in the upside:

Table 3
Mean, Normality and Discriminant Validity – Fornell and Larcker and HTMT criteria

Constructs	Range	Mean	Skewness	BEM	ECP	ENA	EMS	ENP	SEM
BEM	1-5	3.405	-0.390	0.871	0.396	0.502	0.524	0.514	0.419
ECP	1-5	3.512	-0.432	0.362	0.862	0.297	0.503	0.559	0.646
ENA	1-5	3.402	-0.522	-0.318	-0.190	0.747	0.778	0.488	0.438
EMS	1-5	3.315	-0.523	0.457	0.252	-0.516	0.814	0.531	0.566
ENP	1-5	3.375	-0.485	0.490	0.458	-0.284	0.529	0.851	0.561
SEM	1-5	3.594	-0.437	0.390	0.591	-0.348	0.397	0.509	0.869

The resulting values lie within the valid range of 1 to 5, demonstrating a typical distribution pattern. Statistical measures, such as skewness, along with standard error within a range, suggest the presence of a normally distributed dataset without significant outliers. Discriminant validity is supported by values of 0.8 and higher, indicating strong correlations of variables with themselves compared to others via FL and HTML values, further confirming good discriminant validity (Ringle, Wende, & Becker, 2022). Notably, significant correlations are evident in the upper diagonal values. Add model fitness outcomes are presented in Table 4.

Table 4
Model Fitness

Model Fit	Saturated Model	Estimated Model	Threshold Range
SRMR	0.051	0.056	<0.08
NFI	0.941	0.945	≥ 0.90

Structural Model

The results of the hypotheses testing via the structural model are presented in Table 5, which indicates that the impact of BEM on EMS is significant and positive, with an estimated value of 35%. The effects of SEM on EMS are also substantial and positive, so Hypothesis 2 is accepted as well.

Furthermore, Hypothesis 3 regarding EMS and ENP is also accepted because there is a significant and positive impact of the estimated 46% value. The impact of ENP on ECP is substantial and positive. Hypothesis 5 was rejected because the impact of EMS on ECP was insignificant. Moreover, Hypothesis 6 is accepted because the moderating influences are significant and positive. Figure 2 shows the results of the structural model assessment.

Table 5
Hypotheses Testing

Hypothesis	Hypothetical Path	Estimate	STDEV	T-Value	P-Values	Support?
H1	BEM ->EMS	0.356	0.054	6.568	0.000	Yes
H2	SEM ->EMS	0.258	0.058	4.487	0.000	Yes
H3	EMS ->ENP	0.469	0.076	6.129	0.000	Yes
H4	ENP ->ECP	0.455	0.057	8.011	0.000	Yes
H5	EMS ->ECP	0.011	0.068	0.166	0.868	No
H6	Moderating Effect	0.177	0.058	3.058	0.002	Yes

The figure above shows a causal modeling approach for exploring the correlations within the network of the variables. For example, the impact of the ENP on the ECP is drawn in the path diagram, and the intensity is represented as 0.455. Figure 3 shows the Moderating Effect of ENA Between EMS and ENP, which can be significant and positive. Furthermore, by enhancing environmental awareness, ENP improves as well, so changes in ENA are supposed to enhance ENP positively and significantly.

Figure 2
Structural Model Assessment

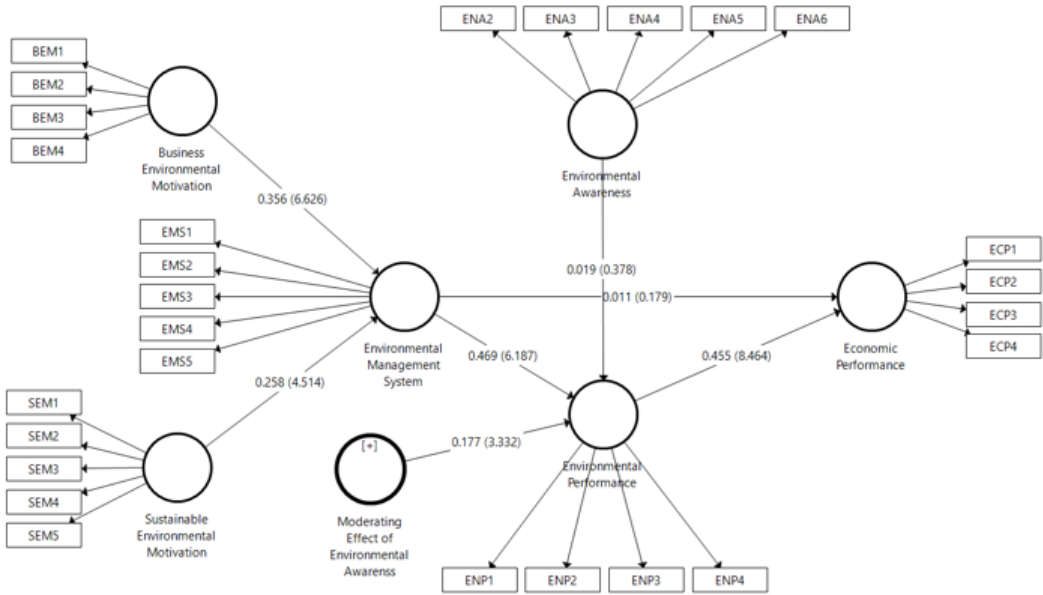
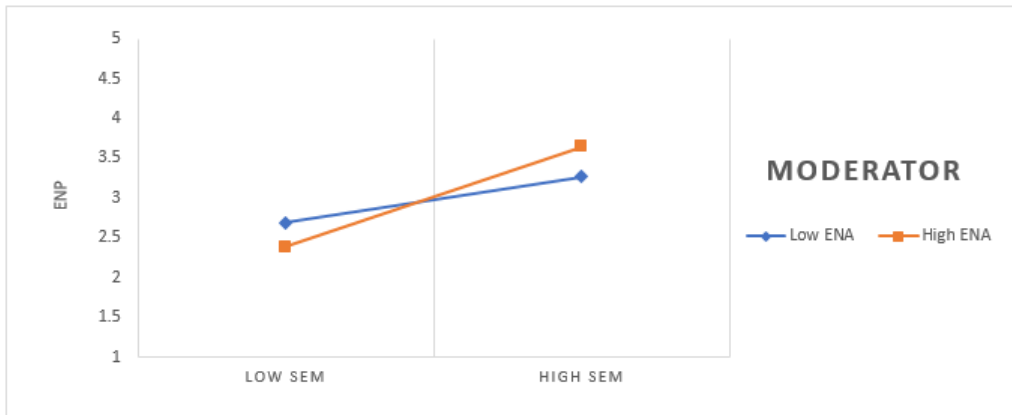


Figure 3
Moderating Effect of ENA Between EMS and ENP



Discussion and Conclusion

The following sections include the results, discussion with prior studies, subsequent quality assessment, and the overall conclusion of the study.

Discussion

The primary objective of this study was to ascertain the influence of BEM and SEM on EMS. Additionally, this study aimed to examine the impact of EMS on both ENP and ECP. One of the goals of this study was to investigate whether EMS has a direct impact on ECP. Furthermore, this study explored the moderating role of ENA between EMS and ENP.

Upon analyzing the collected responses, the study's findings revealed a significant impact of both BEM and SEM on EMS. This outcome is consistent with the findings of [Babiak and Trendafilova \(2011\)](#), who arrived at similar conclusions. [Mazzi, Toniolo, Mason, Aguiari, and Scipioni \(2016\)](#) also align with these results, asserting that investments in environmental motivation correlate with improved sustainability of the EMS. This alignment underscores the notable relationship between these variables, as evidenced in previous studies ([Cheng et al., 2019](#); [Wu, Yang, & Zhou, 2020](#)).

Moreover, this study observed a significant and positive impact of EMS on ENP, which is in line with the findings of [Rousseau and Deschacht \(2020\)](#). The study's findings resonate with the suggestion that the proper application of EMS in an organization's daily operations can lead to enhanced ENP. Similarly, this study identified a substantial and positive impact of ENP on ECP. However, while these results align with the conclusions of [Hsu and Zomer \(2014\)](#), the significant impact of EMS on ECP has not been established.

Notably, the study also revealed a significant moderation by ENA. This aligns with the findings of [Baloch et al. \(2022\)](#). Notably, [Long et al. \(2017\)](#) elucidated that the lack of attention to the importance of COVID-19 awareness by authorities resulted in inadequate organizational preparedness to address its challenges. This deficiency renders the impact between EMS and ECP insignificant, with a consequent decrease in organizational profitability.

In short, the study's sequential exploration yielded valuable insights into the interplay between BEM, SEM, EMS, ENP, and ECP, accentuated by the moderating effect of ENA. This alignment with prior research underscores the robustness of these relationships, unveiling both direct and mediated influences on organizational performance within the unique backdrop of the COVID-19 pandemic.

Conclusion

In line with the motivation-behavior theory, this research explored the intricate dynamics between environmental motivation, EMS, ENP, and ECP. This study also considered the contextual factor of COVID-19 awareness as a potential influencer. Utilizing a quantitative data approach and employing SEM-PLS yielded valuable insights. These findings shed light on the multifaceted relationship between environmental motivation and performance outcomes. Notably, the results underscored the positive and significant impact of EMS on ENP. This impact is particularly pronounced in the realms of business and SEM. This signifies that organizations driven by a combination of these motivations are more likely to witness improvements in their ENP. However, a notable aspect emerged regarding the relationship between EMS and ECP. Contrary to expectations, the study

revealed an insignificant impact of EMS on ECP. This suggests that while EMS can contribute to enhancing environmental aspects, it may not necessarily translate into immediate economic gains. This highlights the complexity of balancing environmental and economic considerations. Remarkably, this research also unearthed the intriguing moderating role of COVID-19 awareness. The positive acceleration of the influence process of environmental awareness during the pandemic shows the heightened significance of environmental concerns in the face of global crises. This underscores the need for organizations to adapt and respond to emerging challenges, like the COVID-19 pandemic, with heightened environmental consciousness. The results of this study have several implications. This underscores the crucial role that both BEM and SEM play in driving enhancements in the EMS and ENP. By embracing these motivations, organizations can make substantial strides towards their environmental goals. However, nuances related to the ECP call for a delicate equilibrium between economic and environmental priorities. The research implications are discussed in detail in the following sections.

Implications of the study

This study contributes significantly to the theoretical landscape by offering valuable insights into the domains of EMS, ENP, and ECP. Through its comprehensive analysis, this study not only expands the academic discourse around these variables but also enriches the existing body of literature by providing detailed and elaborate material. By shedding light on the intricate interplay between environmental motivations and performance outcomes, this study enhances our understanding of the underlying mechanisms and factors that shape these relationships.

The practical implications of this study are significant, particularly in the context of the COVID-19 pandemic. The incorporation of a distinct factor-naïve awareness during the COVID-19 - underscores the study's practical relevance. The findings underscore the essential role that both the business environment and SEMs play in driving enhancements in EMS, ENP, and ECP in Pakistan's manufacturing sector. Businesses can leverage these insights to strategize for a sustainable future while simultaneously ensuring growth and environmental responsibility. This study underscores that fostering a culture of sustainability can bolster EMS, thereby reducing the negative impact of business operations on the environment. By embracing eco-friendly practices, minimizing waste, and improving energy efficiency, businesses can positively impact the environment while reducing costs. The resulting improved ECP can pave the way for heightened profitability and enhanced marketplace competitiveness.

Beyond the academic and practical realms, the social implications of this study are far from reaching. It holds the potential to serve as a benchmark for sectors beyond manufacturing, creating a ripple effect across various Pakistani industries. By adopting the principles and insights presented in this study, businesses can align with the ideals of sustainability and environmental preservation. In a world where conscious consumer choices are on the rise, this study's emphasis on environmentally conscious practices can drive consumer loyalty and attract new customers who prioritize sustainability. Moreover, the study highlights the need for proactive measures in the face of global crises

such as COVID-19. The insights garnered can inform policies and long-term strategies to safeguard Pakistan's manufacturing sector from the aftershocks of the pandemic, thereby demonstrating the study's practical relevance in shaping a more resilient and sustainable future.

Limitations and future research suggestions

This study was influenced by the context of the COVID-19 pandemic and had certain limitations. Collecting self-administered primary data within lockdown constraints is a challenge, and concerns about the authenticity of online data persist owing to the absence of direct observation, potentially affecting response reliability. Moreover, the prominence of variables such as proactive strategies and Environmental Management Accounting (EMA) practices could introduce biases that impact the study's overall findings.

To enhance the depth of the study, future research could consider incorporating EMA to illuminate the financial and operational impacts of environmental considerations. When adding proactive environmental strategies, it is essential to address potential bias, aiming for a more comprehensive analysis. Exploring protective strategies may enhance the cross-sector applicability and provide additional insights. Furthermore, top management commitment could shed light on how organizations prioritize environmental concerns within broader strategies, potentially adding another layer of insight for future exploration.

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