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Green Entrepreneurial Self-efficacy and Environmental Performance of SMEs: Mediating and Moderating Role of Green Innovation and Green Purchase Behaviour

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ABSTRACT

Purpose: The main purpose of this study is to investigate how green entrepreneurial self-efficacy (GESE) influences environmental performance (EP) in the Gauteng province: the mediating and moderating role of green innovation (GI) and green purchase behaviour (GPB).

Design/methodology/approach: The study followed the quantitative research design and a self-administered questionnaire was employed during the data collection process. Data was collected from one hundred ninety-five SME owners in a cross-sectional survey. The participants of this study were in the retail, service and manufacturing sectors. The data was analysed using SmartPLS 4.0.

Findings: The empirical findings of this study show that there is a significant positive relationship between GESE and the EP of SMEs. The study further shows that the relationship between GESE and EP is partially mediated by GI and the relationship is also moderated by GPB at an average weight.

Research limitations/implications: The study has the following limitations and suggests some new study areas. First, the cross-sectional nature of the survey limits the ability to separate cause-and-effect relationships, and a longitudinal study will help to improve the results. Second, the survey was done on firms in one industry and one country. To improve the generalisability of the findings, further studies can include other industries in other countries.

Originality/value: This paper fills a gap in the literature by exploring external business variables mediating and moderating the relationship between GESE and EP and contributes to the discussion on the contradictory results regarding the relationship between GESE and EP.

Keywords: *Entrepreneurship self-efficacy, Environmental performance, Green innovation, Green purchase behaviour, Small medium business*

I. Introduction

In modern times, the implementation of environmental protection in business practices has evolved extensively. The continuous decline in environmental

stability has insisted businesses be aware of growing environmental challenges and generate an environment of internationally coordinated green settings that provide a shared response to critical environmental issues. This involves protecting or limiting the utilization of natural resources along with eco-friendly business operations (Ali and Ahmad, 2016). In addition to the self-conscious behaviours of business entities, the increased customer awareness regarding sustainable

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goods and services also encourages firms to focus on green business practices to enhance customer satisfaction and generate competitive advantage (Zaman and Shamsuddin, 2017). Simultaneously, the rise in environmental regulation also enforced several limitations on organizations to follow globally accepted business activities and incentivize firms for implementing eco-friendly business methods (Zhang et al., 2019; Zhou et al., 2017).

Self-efficacy has been linked to green entrepreneurship and is defined as one's confidence in one's ability to pursue business goals while also taking environmental protection into account. Additionally, it refers to one's conviction that one's business endeavours can contribute to positive social change. Self-efficacy has been linked in studies to the success of new enterprises because it fosters optimistic thinking, which is essential for business starts (Rivai et al., 2020; Prodanova et al., 2021). Regarding green entrepreneurship, self-efficacy is defined as one's confidence and belief in one's skills to address the problem of environmental deterioration (Chu et al., 2021). One of the largest existential risks to humanity's survival has been identified as environmental degradation. Wang and Zhang (2021). Green innovation (GI), which is believed to be of utmost importance for environmental conservation, is on the rise because of the clamour to safeguard the environment (Yang et al., 2017). The study contributes by incorporating green purchasing practices into the comprehensive analytical framework that investigates the connection between GESE and environmental performance (EP). This study's framework offers a novel explanation of the theoretical viewpoint. Both theoretical and practical ramifications flow from the investigation. While providing practical advice for the stakeholders of green entrepreneurship, it theoretically expands the literature on the resource-based view (RBV) theory.

II. Literature Review and Hypotheses Development

A. Theoretical Support and Background

There are multiple methods to view and gauge the advantage and performance of a firm, however, according to the theory of RBV, it depends on how a firm utilized its strategic resources (Barney, 1991; Jayasinghe et al., 2022). The competitive advantage rests on the nature of the strategic resources. For instance, if the available resources are not imitable and rival firms do not have any means to carve up alternative resources of the same value and function then the competitive advantage will be long-lasting yielding superior performance in the shape of achieving targets (Bhandari et al., 2022). This research argues that green entrepreneurial self-efficacy, green knowledge, and employees are the strategic resources as we apply the theory of RBV to ESE. The study contends that these resources fulfill the criteria of the theory of RBV by enabling higher performance and competitive advantage.

B. Green Entrepreneurial Self-efficacy and Environmental Performance

According to Alaraifi et al. (2012), environmental sustainability is the efficient use of natural resources to support business objectives without compromising the demands of other organisations and stakeholders. The literature on the relationship between environmental performance and entrepreneurial self-efficacy (ESE) is not conclusive. While some research reveals a substantial association, others reveal a detrimental relationship. ESE and environmental performance were revealed to be significantly correlated in earlier empirical investigations (Musa, 2016; Garca-Machado and Martnez-vila, 2019). The findings showed that ESE increases both business activity confidence and environmental issue understanding. A further characteristic of entrepreneurs is a high degree of confidence, which translates into lower production

costs and higher levels of productive expertise when applying green techniques to their businesses. As opposed to larger companies, most SMEs, according to Ghazilla (2015), do not believe that their operations have a good impact on the environment. Due to their insufficient or non-existent environmental understanding, many SME owners lack ESE on environmental tasks. A study found that self-efficacy was a crucial prerequisite for achieving pro-social behaviour. Subsequently, the same was found true for entrepreneurial behaviour as well (Pong et al., 2005). Now as far as the matter of measurement of self-efficacy is concerned it depends on the problem as well as the field involved. Therefore, self-efficacy with regard to green entrepreneurship refers to one's belief about his/her abilities and confidence to solve the issue of environmental degradation (Chu et al., 2021). Henceforth, the following hypothesis has been made:

H1: There is a significant positive relationship between green entrepreneurial self-efficacy and environmental performance.

C. Green Entrepreneurial Self-efficacy and Green Innovation

Green entrepreneurship is emerging, however, it is starkly different from ordinary entrepreneurship because of two aspects. Firstly, its dependence on the green market as well as the green consumer base is what separates it from ordinary entrepreneurship (Lotfi et al., 2018). The second aspect is that of policy orientation on which green entrepreneurship depends heavily. As green entrepreneurship tends to have greater environmental and social responsibilities, and simultaneously must handle the issue of a longer payback period as well, therefore, encouraging policy regimes is highly important for green entrepreneurship encouragement (Chu et al., 2021). The requirements in sense of responsibility are high in the case of green entrepreneurship as compared to ordinary entrepreneurship since there is not only the issue of economic requirements that need to be considered but an additional requirement of social and environmental responsibilities must also be taken care of

Aghelie (2017). Entrepreneurs who have environmental ambitions embedded in their sense of social responsibility tend to vigorously pursue their business goals and not give up in the wake of challenges. The intensity and vigour of green entrepreneurship intentions strongly depends on the green entrepreneurial self-efficacy and entrepreneurship abilities of the intention holders (Alvarez-Risco et al., 2021). The adaption and improvement of green products and the green process are at the core of green innovation. It also included the technologies that aim at conservation and protection of the environment by consuming less energy, spreading less pollution and adopting green design regimes (Yang et al., 2017). Based on the above arguments, the following hypothesis is proposed:

H2: There is a significant positive relationship between green entrepreneurial self-efficacy and green innovation.

D. Green Innovation and Environmental Performance

Green innovation is the right step to preserve nature to achieve economic profitability. The literature shows that companies use green innovation to reduce production costs and minimize raw material waste (Awan et al. 2021; Mahto and Khanin 2015). Thus, green innovation not only improves the financial and social performance of a business but also reduces the negative environmental impacts caused by its activities (Ullah et al. 2022). Thus, green innovation aligns SMEs' economic interests with the organization's environmental management objectives. The development of green innovation has become an inevitable choice to low-carbon development, transformative economic growth mode, and ecological civilisation. Green innovation may reduce the negative impact of economic activities on the environment through strategic innovation in products, processes, society, institutions, or organisations (Borghesi et al., 2015). Many enterprises choose to use strategic green innovation as an effective means to achieve sustainable competitive advantages.

Since across-the-board acceptability toward green innovation, the idea has attracted increased attention as it ensures a win-win situation that guarantees better, sustainable environmental protection as well as advancement in innovation, and progress. Based on the above arguments, the following hypothesis is proposed:

H3: There is a significant positive relationship between green innovation and environmental performance.

E. Green Innovation Mediates the Relationship Between Green Entrepreneurial Self-efficacy and Environmental Performance

Organizations having implemented green innovativeness tend to have a higher success rate. The overall performance of such organizations is also better than their competitors because of their readiness to adapt to the needs of their customers. This readiness adds value to the organization resultantly (Chen et al., 2015). Moreover, the firms which have a genuine commitment to environmental protection seem to do well both environmentally and economically. Furthermore, green initiatives of a firm allow it to develop its products in a better way that positively affects the green developmental culture of the business (Weng et al., 2015). Moreover, green entrepreneurial self-efficacy is also found to provide impetus to the cause of environmental awareness, promote the green performance of the firm and increase green creativity. Though there has been evidence that green self-efficacy influences green innovation, however, the aspect of handling the regulatory pressure while having green environmental intentions still needs to be empirically supported by further studies (Jia et al., 2018). It is further suggested by multiple studies that to continue for a firm to execute its green operation green recruitment standards need to be adopted to ensure that fresh employees share the same environmental commitment as the firm itself and there is no discrepancy as far as environmental goals of a team of people are concerned (Dragomir, 2020). This is a compounding process during which GI leads to

a further increase in green efficiency of the firm enhancing environmental commitment further (Afsar et al., 2018). Therefore, green entrepreneurial self-efficacy is shown to have a key role in carving out a clear vision, recruiting employees in accordance with the vision of the leader, striving for GI, and adapting to the green policies and practices to get as close to the stated goals as possible (Jia et al., 2018). Thus, the following hypothesis is proposed:

H4: Green innovation mediates the relationship between green entrepreneurial self-efficacy and environmental performance.

F. Green Purchase Behaviour Moderates the Relationship Between Green Entrepreneurial Self-efficacy and Environmental Performance

Green purchase behaviour relates to consumers' willingness to purchase green products (Joshi and Rahman, 2015). Behaviours capture the motivational factors that influence the green purchase intention of consumers (Ramayah et al., 2010). Marcelli (2013) also observes that there has been a significant increase in the demand for green products and services, as well as for green enterprises. It implies that consumers' demand for environmentally friendly products is the primary motivation behind green marketing practices (Govender and Govender, 2016). The importance of having a clear vision regarding the current and future trajectory of the firm is paramount for green entrepreneurs since the nature of the market is mostly dynamic and a clear vision help navigate amidst challenges (Dragomir, 2020). The onus of responsibility for having concrete and clearer vision rests on the leaders of entrepreneurial ventures, additionally, studies recommend that the concrete vision and trajectory course should be explicitly elaborated to the entire team so that they can know the importance of the vision and be excited about achieving green targets (Chen et al., 2015). The same study suggests that such a shared vision enables higher motivation, commitment, and better performance. Studies have shown that

leaders having a favourable belief system at the core of their intellect regarding green entrepreneurship positively influences the overall operations of the firm from a better performance at all levels to talent and resource management (Jia et al., 2018). Thus, the following hypothesis is proposed:

H5: Green purchase behaviour moderates the relationship between green entrepreneurial self-efficacy and environmental performance.

III. Research Methodology

The study utilised the quantitative research design. Data was collected from the respondents through the cross-sectional survey method. The sample population was SMEs in Polokwane municipality in Limpopo province. The questionnaire was divided into three sections, demographic variables, green entrepreneurial self-efficacy, environmental performance, green innovation and green purchase behaviour. The participants in the survey were conveniently sampled. A self-administered questionnaire was employed during the data collection process. The participants in the survey were SMEs owners in Johannesburg municipality. The researcher contacted the hotel's management via phone calls and emails, requesting their participation in the study. Following that, the questionnaire outlining the purpose of the study, as well as a cover letter, were sent to the managers of the hotels that agreed to participate in the survey. Two trained field agents helped collect data from participating hotels using self-administered questionnaires. During the questionnaire distribution, the participants' emails and phone numbers were obtained, and weekly reminders were sent to request the completion of the questionnaire. A questionnaire that was not completed within two months was considered a non-response. A cover letter explaining the study's goal, as well as anonymity and confidentiality, was sent with the questionnaire. The questionnaire was reviewed by two sustainability and strategy specialists.

Furthermore, the questionnaire was pretested to improve face and content validity. The study was conducted between October 2022 and February 2023. The questionnaire was adapted from previous studies with acceptable psychometric properties. The study used SmartPLS 4.0 to analyse the data from the respondents. Reliability and validity were ensured using the PLS-SEM.

A. Measures

Green entrepreneurial self-efficacy was measured using the 3 items. The green entrepreneurial self-efficacy questionnaire was adapted from a previous study by Wang et al. (2021). The five-point Likert scale ranging from 1 = "Strongly disagree" to 5 = "Strongly agree" was used as the response category.

Environmental performance was measured using the 5 items. The environmental performance questionnaire was adapted from a previous study by Guo (2022). The five-point Likert scale ranging from 1 = "Strongly disagree" to 5 = "Strongly agree" was used as the response category.

Green innovation was measured using the 4 items. The green innovation questionnaire was adapted from a previous study by Soewarno et al. (2018) and Singh et al. (2020). The five-point Likert scale ranging from 1 = "Strongly disagree" to 5 = "Strongly agree" was used as the response category.

Green purchase behaviour was measured using the 4 items. Green purchase behaviour questionnaire was adapted from a previous study by Sinnappan and Abd Rahman (2011). The five-point Likert scale ranging from 1 = "Strongly disagree" to 5 = "Strongly agree" was used as the response category.

IV. Results

A. Response Rate and Biographical Characteristics

A total of 400 questionnaires were distributed in the actual survey, and 195 usable questionnaires were returned. In this study, there are 15 question items (Appendix A). As depicted by Table 1, most of the respondents were male in the 31-40 age group. In addition, the hotels that participated in the survey had a three-star grade and have been in existence for between six and ten years. Furthermore, most SMEs focus on retail and have been operating for 6-10 years with 11 to 50 employees.

B. Evaluation of PLS-SEM

The valuation of PLS-SEM includes the measurement and structural models.

1. Measurement model

Hair et al. (2019) remark that the assessment of the measurement model should comprise of the following factors. First, the factor loading should be greater than 0.78. The composite reliability should be greater than 0.790. Cronbach's alpha should be above 0.700, and the Avera6ge Variance Extracted should be greater than 0.500. Table 2 shows that all the requirements highlighted by Hair et al. (2019) have been satisfied. In addition, Table 3 shows that the AVE of each construct has a square root that is greater than the correlation coefficients of the constructs.

Table 3. The measurement model

Constructs	Items	Mean and Standard Deviation	Factor Loading	Cronbach's Alpha	Composite Reliability	AVE
Green entrepreneurial self-efficacy		4.25		0.823	0.874	0.641
		1.03				
	GESE1		0.805			
	GESE2		0.746			
	GESE3		0.738			

Table 1. Biographical details of the respondents

Biographical Details of the Respondents	Frequency (N = 195)	Percentage
Gender of the respondents		
Male	118	60.5
Female	77	39.5
Age of the respondents		
Less than 20	2	1
20-30 years	58	29.7
31-40 years	82	42.1
41-50 years	35	18
Above 50	18	9.2
Type of industry of respondents		
Retail	123	63.1
Service	49	25.1
Manufacturing	23	11.8
Age of business operation		
0-1 year	12	6.2
2-5 years	42	21.5
6-10 years	92	47.2
11-15 years	20	10.3
16+ years	29	14.8
Number of employees		
0 to 10 employees	14	7.2
11 to 50 employees	143	73.3
51 to 250 employees	38	19.5

Table 2. Discriminant validity

	EP	GI	GEO	GCA
EP	0.798			
GPB	0.604	0.826		
GESE	0.517	0.602	0.782	
GI	0.482	0.549	0.599	0.780

Note: Diagonals depicted in bold depict the square root of the AVE, and other figures show the correlations.

Table 3. Continued

Constructs	Items	Mean and Standard Deviation	Factor Loading	Cronbach's Alpha	Composite Reliability	AVE
Environmental performance		3.75		0.784	0.883	0.684
		1.04				
	EP1		0.735			
	EP2		0.800			
	EP3		0.902			
	EP4		0.819			
Green innovation	EP5		0.843			
		3.34		0.762	0.879	0.621
		1.01				
	GI1		0.808			
	GI2		0.762			
	GI3		0.854			
Green purchase behaviour	GI4		0.792			
		3.28		0.803	0.858	0.611
		1.02				
	GPB1		0.769			
	GPB2		0.839			
	GPB3		0.818			
	GPB4		0.846			

Table 4. Path coefficient test

Hypothesised Path	Path Coefficient	T-Statistics	Decision
GESE→EP	0.389	5.421*	Accepted
GESE→GI	0.203	4.552*	Accepted
GI→EP	0.199	3.002*	Accepted
GI→GESE→EP	0.486	6.048	Accepted
GPB→GESE→EP	0.523	7.165	Accepted

* $p < 0.01$; ** < 0.05 .

Table 4 shows that both GESE and EP are significantly positively related in support of hypothesis one. Furthermore, GESE and GI are significantly positively related in support of hypothesis two. In addition, GI and EP are significantly positively related in support of hypothesis three. The above table shows the results of mediation and moderation. The indirect paths are positive and significant. In addition, the Variance Accounted For (VAR) values are less than

80%, indicating a complementary partial mediation and moderation (Hair et al., 2019; Nitzi et al., 2016). Thus, hypotheses four and five are accepted.

V. Discussion

The study investigated the effect of GESE on the EP of SMEs. In addition, the study examined the mediating effect of GI in the relationship between GESE and EP. Furthermore, the study examined the moderating effect of GPB on the relationship between GESE and EP. The results indicated that GESE and EP are significantly positively related, which supports hypothesis one. The results are corroborated by Wang et al. (2021), who underlined the importance of green entrepreneurship self-efficacy and explained that it is the conviction that one can resolve environmental

issues and exhibits self-assurance in one's efforts to rescue the environment. Employees with high ESE tend to establish challenging goals, put in a lot of effort to achieve those goals in the face of difficult conditions and recover fast from trying situations (Hmieleski and Baron, 2008). The findings of the study indicate that GESE and GI are significantly positively related in support of hypothesis two. These findings support past research (Chen et al., 2015; Akhtar et al., 2021; Farooq et al., 2022). This research emphasised the value of employees' green ESE for a company's GI. Furthermore, efficient GI can contribute to social advancement and sustainable company practices. It is crucial for companies to adopt green trends and obtain a competitive edge, according to Farooq et al. (2022). Environmental management might help companies in the green era not only get over difficulties but also spur green inventiveness (Akhtar et al., 2021). Employees with green ESE may also help businesses achieve ideal outcomes for their green performance. Companies that are pioneers in GI may profit from increased competitiveness while lowering manufacturing waste and industrial pollution. The findings indicate that GI and EP are positively related in support of hypothesis three. The results are in line with earlier empirical research on the mediating role of GI. These findings are consistent with those from earlier investigations (Chiou et al., 2011, Singh et al., 2020, Rehman et al., 2021). These studies demonstrate how GI significantly affects environmental performance in two areas: reducing environmental impact and safeguarding against resource exploitation. According to Rehman et al. (2021), a business's environmental strategy and proactive efforts to develop eco-friendly technologies may increase the effectiveness of that firm in terms of the environment. The findings confirm the mediating effects of GI in the relationship between GESE and EP in support of hypotheses four. The results are consistent with earlier research (Chen et al., 2015; Zailani et al., 2015; Ahmed, 2020; Asadi et al., 2020). These studies made the case that employees' green ESE helps businesses improve their GI, which in turn improves the environmental,

financial, and social performance of those businesses. Several social and environmental issues related to sustainable business practises could be resolved by employing GI as a crucial organisational resource (Khanra et al., 2022). Also, by employing GI as a corporate resource, your business may have long-term competitive advantages because to lower production costs. According to Watts et al. (2021), GI is necessary to ensure strong, environmentally friendly industrial expansion. GI also serves as a bridge between environmental law and the progressive modernization of industrial businesses. According to Takalo and Tooranloo (2021), GI has a direct impact on how well enterprises and communities perform in terms of the economy, the environment, and their capacity to adhere to environmental regulations. The findings confirm the moderating effects of GPB in the relationship between GESE and EP in support of hypothesis five. The findings do not support a survey by Sinnappan and Rahman (2011) showed that although consumers in Malaysia possess a high level of knowledge about green products and sustainable issues, it does not necessarily stimulate green purchasing behaviour.

VI. Conclusions

The study aimed to investigate the effect of GESE on the EP of SMEs and the mediating and moderating role of GI and GPB using the RBV theory. The study developed a theoretical model that depicts GPB as a mechanism through which GESE can affect GI. Empirically, the study contributes to the literature on the effect of environmental strategy on the competitive advantage of SMEs. The study has the following managerial implications. First, the findings of the study show that GESE is a driver of EP. Although environmental initiatives often come with costs and risks, the findings show that an environmental strategy can positively affect the competitive advantage of SMEs. It is important for the SMEs owners to develop an environmental strategy to obtain GI. There is a

need for the owners to provide workshops and training on environmental strategy for the management and employees of SMEs. One of the findings of the study is the indirect effect of GPB. Therefore, SMEs must focus on GPB that focuses on energy conservation, waste recycling, pollution prevention, waste reduction, green product design, and an environmental management system to gain a green competitive advantage. SME owners need to develop effective green marketing strategies, including improvising green advertising and green label. This will increase their green knowledge and chances of trusting green products and potentially increase their GPB. The study has the following limitations and suggests some new study areas. First, the cross-sectional nature of the survey limits the ability to separate cause-and-effect relationships, and a longitudinal study will help to improve the results. Second, the survey was done on firms in one industry and one country. To improve the generalisability of the findings, further studies can include other industries in other countries. In addition, other studies can examine if environmental quality awareness can play an indirect role in the link between GI and GPB of SMEs.

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Table A1. Questionnaire

Construct	Items	Source	Response Category
Green entrepreneurial self-efficacy	I believe that if I do it with my heart, I can contribute to the environment.	Wang et al. (2021)	Five-point Likert scales (1 = Strongly Disagree; 5 = Strongly Agree)
	I can find a way to help solve environmental problems.		
	Solving environmental problems is a contribution that each of us can make.		
Environmental performance	Our organization has achieved important environment-related certifications.	Guo (2022)	Five-point Likert scales (1 = Strongly Disagree; 5 = Strongly Agree)
	On average, the overall environmental performance of our organization has improved over the past five years.		
	The resource consumption our organization e.g., water, electricity, and gas has been decreased during the last 3 years.		
	Our organization has improved on environmental compliance.		
	Our organization is complying with environmental regulations (i.e., carbon dioxide emissions, waste disposal).		
Green innovation	Our organization uses less or non-polluting/toxic materials.	Soewarno et al. (2018); Singh et al. (2020)	Five-point Likert scales (1 = Strongly Disagree; 5 = Strongly Agree)
	Our organization improves environmentally friendly packaging for existing and new products.		
	Our organization recovers end-of-life products and recycling.		
	Our organization uses eco-labelling.		
Green purchase behaviour	Our organization prefers green products over non-green products when the products qualities are similar.	Sinnappan and Abd Rahman (2011)	Five-point Likert scales (1 = Strongly Disagree; 5 = Strongly Agree)
	Our organization choose to buy products that are environmentally friendly.		
	Our organization buys green products even if they are more expensive than the non-green ones.		
	Our organization look at the ingredients label to see if it contains thing that are environmentally damaging.		