The behavioural uncertainty and environmental sustainability of restaurant businesses: the moderating role of purchasing technical knowledge

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Received 28 October 2022 Revised 4 July 2023 Accepted 24 July 2023

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Abstract

Purpose – The study investigates the effect of behavioural uncertainty on the environmental sustainability of restaurant businesses in Tanzania. Also, the study examines the moderating role of purchasing technical knowledge on the main relationship between the study variables.

Design/methodology/approach – The quantitative approach was used and cross-sectional data were collected at a specific time from restaurant businesses in Dodoma, Tanzania. The PROCESS macro was used to analyse the relationships between behavioural uncertainty, purchasing technical knowledge and environmental sustainability.

Findings – Behavioural uncertainty has a significant and negative effect on the environmental sustainability of restaurant businesses. Purchasing technical knowledge, on the other hand, has a positive and significant effect on the environmental sustainability of restaurant businesses. Finally, purchasing technical knowledge has a positive and significant moderating effect on the relationship between behavioural uncertainty and environmental sustainability such that the negative effect of behavioural uncertainty is reduced with increasing purchasing technical knowledge.

Research limitations/implications – This study considers purchasing skills in terms of purchasing technical knowledge as a moderating variable; hence, other studies may take into account other moderating variables to extend this study. Also, the study considered only environmental sustainability and hence is limited in terms of other dimensions of sustainability and provide an avenue for further research in social and economic sustainability. Practical implications – Since purchasing technical knowledge reduces the negative effect of behavioural uncertainty on the relationship with environmental sustainability, restaurant managers should be encouraged to improve their purchasing technical knowledge by attending short- and long-term training on purchasing functions in the restaurant industry.

Social implications – The social implications of the investigated link between behavioural uncertainty, purchasing technical knowledge and environmental sustainability in the restaurant industry include raising awareness, promoting sustainable practises and fostering an environmentally responsible culture. By addressing behavioural uncertainty, leveraging purchasing technical knowledge and embracing sustainability the industry can contribute to a more environmentally conscious society.

Originality/value – By providing empirical evidence from Tanzania, the study extends literature on examining the environmental sustainability of restaurant businesses. The study also establishes the interaction effect of purchasing technical knowledge as an important skill in reducing the negative effect of behavioural uncertainty on enhancing environmental sustainability in restaurant businesses.

Keywords Behavioural uncertainty, Environmental sustainability, Purchasing technical knowledge, Restaurants, Tanzania

Paper type Research paper

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LBS Journal of Management & Research Emerald Publishing Limited e-ISSN: 0974-1852 p-ISSN: 0972-8031 DOI 10.1108/LBSJMR-10-2022-0068

1. Introduction

Restaurants are categorised as a highly volatile business sector because there is a high level of uncertainty regarding customer demands and available resources (Cho. Bonn. & Kang. 2016). Globally, the environmental sustainability of restaurant businesses is critical to the firm's competitiveness (Bagur-Femenías, Martí, & Rocafort, 2015). It helps businesses save money by lowering operating costs and becoming more sustainable by reducing food, water and energy waste (Kasim & Ismail, 2012). Sustainability assists the company in preserving high-quality restaurant services in a friendly and attentive environment. It assists businesses in developing a greater sense of responsibility for giving back to the community and becoming proactive stewards of the precious environment (Galbreath, 2010). It also promotes a better economy through reduction of pollution and waste, lowering emissions, creating more jobs and promoting more equitable income distribution (Ayuso & Navarrete-Báez, 2018). It is historically recognised as a global public health concern as well as a contribution to the national environmental economy and preservation. The environmental sustainable practices benefit the health and well-being of its customers and communities (Gandhi, Thanki, & Thakkar, 2018). However, most restaurants struggle to incorporate environmental considerations into their restaurant operations in order to improve environmental sustainability.

Despite the fact that environmental sustainability is important in hotels and restaurant business operations (Shanti & Joshi, 2022), there is a common misconception that it costs more than what restaurant businesses end up receiving (Kasim & Ismail, 2012). Nonetheless, the link between eco-friendly sustainable practices remains crucial in the restaurant environment, which challenged such a belief. Second, much of what restaurant managers know about the restaurant business is not based on long-term environmental concerns. They believe in the core activity of serving food consistently in a humble and welcoming environment (Jha, Kapoor, Kaul, & Srivastava, 2022). However, as environmental responsibility becomes more integrated into business plans (Engert, Rauter, & Baumgartner, 2016; Sozen, Rahman, & O'Neill, 2022), small restaurant businesses cannot avoid it. Furthermore, studies show that the majority of small restaurant operators are overburdened with the day-to-day pressures of running a business (Makona, Elias, Makuya, & Changalima, 2023). Because of the nature of restaurant operations, environmental sustainability has been recognised as an area of concern.

Studies demonstrate that the majority of activities related to a sustainable restaurant environment are carried out on a daily basis (Cantele & Zardini, 2018). Thus, literature provides advice on how to improve the daily operations of a restaurant in order to create a more sustainable environment (Sozen et al., 2022). There are routine activities such as selecting a supplier, identifying the item to be purchased, selecting the energy to be used, identifying water sources, storage systems and so on. Thus, when done strategically, it contributes to the restaurant's environmental sustainability. Similarly, organisations exist to mitigate behavioural uncertainty during market transactions, according to transaction cost theory (Williamson, 1981). In this sense, behavioural uncertainty can be avoided once the firm is established and the transaction is internalised.

A body of literature emphasises the purchasing role in the restaurant industry (de Belo, Amaral, & Belo, 2020; Cho, Bonn, Giunipero, & Divers, 2019). These studies discuss the importance of purchasing skills in restaurant operations. Purchasing skills enable a manager to predict or explain supplier behaviour, firm behaviour expectations and firm actions. It takes significant ability for suppliers to conform to specifications, deliver on time, with the right quality and quantity and so on. The ability of a manager to predict and resolve behavioural uncertainty may increase the likelihood of environmental sustainability in the restaurant industry. In this aspect, purchasing technical knowledge may play a significant role in ensuring that restaurants achieve the desired level of environmental sustainability with an increased degree of behavioural uncertainty.

Also, Cho, Bonn, Giunipero, and Divers (2019) emphasised the importance of purchasing technical knowledge for a successful restaurant operation. In general, purchasing skills continue to be critical in explaining organisational performance (Changalima & Mdee, 2023), and purchasing technical skills are also required to deal with market trends, difficulties in responding to rapid changes in customer demands and updated strategies that rivals use (Cho et al., 2016; Giunipero & Pearcy, 2000). This demonstrates the need of comprehending the interaction effect of behavioural uncertainty and purchasing technical knowledge on environmental sustainability of restaurant businesses. Based on this discussion, the purpose of this study is to investigate the effect of behavioural uncertainty on environmental sustainability in the restaurant industry. The study also investigates the moderating effect of purchasing technical knowledge on the influence of behavioural uncertainty on environmental sustainability in restaurant businesses.

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2. Literature review and study hypotheses

According to transaction cost theory, behaviour uncertainty is connected to anticipated changes relating to how organisations interact with their counterparties when conducting transactions (Williamson, 1981). Similarly, among the important constructs in the transaction cost theory, according to Hoffmann, Schiele, and Krabbendam (2013), is uncertainty, which occurs when unanticipated changes occur in the context of exchange relationships. As a result, this concept is concerned with restaurant operations in which behavioural uncertainty may affect the way restaurants achieve the desired environmental sustainability's outcomes. Furthermore, the resource-based view contends that the involvement of resources allows organisations to achieve desired performance and competitive advantage (Wernerfelt, 1984). Thus, the theory emphasises the significance of both tangible and intangible resources in firm operations (Barney, 1991). Purchasing technical knowledge as a relevant purchasing skill in the restaurant industry (Cho et al., 2019) is classified as an intangible resource required for restaurant business operations. Therefore, restaurants with these managers are more likely to achieve environmental sustainability in their operations.

- 2.1 Behavioural uncertainty and environmental sustainability of small restaurants

 The difficulty that parties face when monitoring contractual performance when exchanging causes behavioural uncertainty (Williamson, 1981). For example, late deliveries and poor quality of supplies may be linked to difficulties that organisations encounter when suppliers are contacted for delivery (Changalima, Mchopa, & Ismail, 2023). Behaviour uncertainty relates to anticipated changes that may affect the relationships between parties (Hoffmann, Schiele, & Krabbendam, 2013). With the increasing uncertainties that affect most supply chains, it is expected that the extent to which the restaurant industry achieves environmental sustainability will be impacted by these unanticipated changes that are linked to behavioural uncertainty. Therefore, the following hypothesis is proposed:
 - H1. Behavioural uncertainty negatively and significantly influences environmental sustainability of restaurant businesses.
- 2.2 Purchasing technical knowledge and environmental sustainability of small restaurants In general, owners and managers of small businesses face sustainability challenges such as inadequate knowledge, which leads to a high rate of business failure (Ismail, 2022). Our study's foundation is based on improving purchasing technical knowledge which can help businesses achieve environmental sustainability. We defined purchasing technical knowledge as the manager's knowledge of evaluating products, price levels and major market suppliers, product quality requirements and demonstrating a good understanding of

the product to be purchased frequently to improve restaurant operations (Cho *et al.*, 2019). Therefore, purchasing technical knowledge relates to skills that are possessed by purchasing managers within organisations (Changalima & Ismail, 2019; Omoruyi & Ntshingila, 2021). Purchasing managers can use these skills to identify products and potential suppliers for the availability of required requirements.

Despite the fact that purchasing technical knowledge has been articulated as a well-established purchasing skill for restaurant managers (Cho et al., 2019), its role in environmental sustainability remains understudied. Our study centres on the influence of purchasing technical knowledge on the restaurant's environmental sustainability. Therefore, managers in the restaurant industry must be knowledgeable about the marketability of products that affect environmental aspects in order to carry out effective environmental sustainability initiatives. In this regard, restaurant managers are expected to understand the quality and quantity of each product, its price level and fluctuation and the major suppliers in the market. Despite the value of purchasing technical knowledge to support environmental practices in restaurant businesses, its influence on environmental sustainability has not been adequately studied. In this case, the following hypothesis is worth considering:

H2. Purchasing technical knowledge positively and significantly influence environmental sustainability in restaurant businesses.

2.3 The moderating role of purchasing technical knowledge

Purchasing technical knowledge influences the direction of searching for quality products, improves the level of future searching and helps to understand information (Baumgartner & Rauter, 2017). Since purchasing technical knowledge is able to deal with market trends and difficulties in responding to rapid changes in customer demands (Cho et al., 2016), it also combines the probability of what will happen with the logic of why it will happen on purchasing issues. Thus, using the same logic to predict the outcomes that are useful to the firm, restaurant managers with a high level of purchasing technical knowledge are able to enhance environmental sustainability in their respective restaurant operations than those with a low level of purchasing technical knowledge. This means that purchasing technical knowledge may play a significant role in reducing uncertainties that are linked to potential suppliers and may affect environmental sustainability. Based on this, the study hypothesises that:

H3. Purchasing technical knowledge positively and significantly moderates the relationship between behavioural uncertainty and environmental sustainability of restaurant businesses.

3. Methodology

3.1 Research design and study area

We used a quantitative approach under which data were collected and analysed to investigate the statistical relationships between the variables. This approach was used because the study sought to establish a link between behavioural uncertainty and environmental sustainability, as well as the moderating effect of purchasing technical knowledge on the relationship between behavioural uncertainty and environmental sustainability. The cross-sectional data were obtained only once from restaurant businesses located in Dodoma, Tanzania. The study area was chosen because it has recently experienced an increase in business operations for small and medium-sized enterprises, including restaurant businesses, following the relocation of the government's main offices from Dar es Salaam (Changalima, Mushi, & Mwaiseje, 2021; Ismail, 2022).

3.2 Sampling and data collection

This study collected data from 169 managers of restaurant businesses located in Dodoma, Tanzania. The managers were selected randomly to ensure that the obtained data are unbiased. Therefore, each unit of inquiry had the same chance of being involved in our study (Saunders, Lewis, & Thornhill, 2019). Managers were involved because they are in charge of the operations of their respective restaurant businesses. Restaurant managers are also concerned with the purchasing functions in their organisations (Cho, Bonn, Giunipero, & Jaggi, 2021). Self-administered questionnaires with a series of closed-ended questions were employed to collect primary data using a drop-off/pick-up technique. The use of a closed-ended questionnaire has been attributed to being significant in ensuring standard questions for all respondents who are included in the survey.

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3.3 Measurements

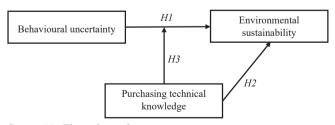
This study had three main variables, which include the independent variable (behavioural uncertainty), the moderating variable (purchasing technical knowledge) and the dependent variable (environmental uncertainty) (see Figure 1). We adapted the previously validated items to measure all the variables (see Table 1). Therefore, three items were used to measure the behavioural uncertainty as used by Hoffmann *et al.* (2013). Five items were used to measure purchasing technical knowledge, as adopted from Cho *et al.* (2019). Lastly, environmental sustainability was measured by using items adapted from Cantele and Cassia (2020).

3.4 Reliability and validity

The values of Cronbach's alpha and construct reliability (CR) were involved in this study to test for the reliability under which values of 0.7 and above were considered adequate (Hair, Black, Babin, & Anderson, 2010). The presented results in Table 1 show that all Cronbach's alpha coefficients and CR are within the acceptable range; hence, reliability was attained. Furthermore, the convergent validity was attained as all values of average variance extracted (AVE) are above 0.5 (Bagozzi & Yi, 1988) and values for the square root of AVE (italicised values in a diagonal) are not less than the values of corresponding intercorrelations, which suggests that discriminant validity was attained as presented in Table 2 (Fornell & Larcker, 1981).

3.5 Data analysis

In this study, CFA and Hayes' PROCESS were used to satisfy data analysis procedures. Therefore, CFA was conducted to evaluate the measurement model properties and analyse the reliability and validity of the data. PROCESS moderation regression was conducted to analyse the moderating effect of purchasing technical knowledge. The CFA was conducted as



Source(s): Figure by authors

Figure 1.
The conceptual framework

Variables/Items	Factor loadings	AVE	Cronbach's alpha	CR
Behavioural uncertainty (BUN)		0.607	0.819	0.822
It takes significant effort to detect whether or not suppliers conform to specifications and quality standards (BUN1)	0.746	0.607	0.819	0.822
 Accurately evaluating our major suppliers requires a lot of effort (BUN2) 	0.768			
 It is costly, in time and effort, to clearly monitor the performance of our key suppliers. (BUN3) 	0.822			
Purchasing technical knowledge (PTK) I am very knowledgeable about products in our market (PTK1)	0.677	0.525	0.843	0.844
I am very knowledgeable about product price levels in our market (PTK2)	0.614			
 I am very knowledgeable about the major suppliers of our products (PTK3) 	0.641			
- I am familiar with quality requirements of our products (PTK4)	0.787			
 I have a good understanding of every product that should be purchased (PTK5) 	0.871			
Environmental sustainability		0.657	0.846	0.851
- The restaurant implements water-saving practices (ESU1)	0.712			
 The restaurant implements energy-saving practices (ESU2) ^a 	_			
 The restaurant adopts practices to reduce emissions (ESU3)^a 	=			
 The restaurant adopts practices to reduce solid waste (ESU4) 	0.877			
 The restaurant adopts practices to reduce liquid waste (ESU5) 	0.833			
Note(s): "Denotes dropped items during CFA Source(s): Table by authors				

Table 1. Variables' measurements, reliability and validity

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Table 2.	ES
Discriminant validity	So

	AVE	MSV	BUN	PTK	ESU
BUN	0.607	0.156	0.779		
PTK	0.525	0.156	0.395	0.724	
ESU	0.657	0.112	-0.085	0.334	0.810
Source(s):	Table by authors				

it is considered to be relevant for determining the reliability and validity of constructs with adapted items in multivariate analysis (Ab Hamid, Sami, & Mohmad Sidek, 2017), while PROCESS was involved because it is a more robust tool for analysing the interaction (moderating) effect of a given variable in the link between predicting and outcome variables (Hayes, 2022). Therefore, in order to examine the relationships between variables, Hayes' PROCESS was employed, as it combines the majority of the functions relating to regression analysis into a single user-friendly command or dialogue box and also includes a variety of additional features (Hayes & Rockwood, 2017).

4. Results

4.1 Common method bias (CMB)

The methodological approaches applied in our research may have resulted in bias, and to test for CMB, the study used Harman's single-factor technique, which revealed that only one factor explained 32.09% of the total variance. Because the obtained percentage of total variance is less than 50% (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003), it is inferred that CMB was not a concern in our research.

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4.2 CFA

The conducted CFA produces important outputs for evaluating the model fit indices and the validity and reliability of adapted measurement items. The CFA (measurement model) has indices of $X^2 = 71.985$, df = 41 and p = 0.002. Also, $X^2/df = 1.756$, GFI = 0.929, NFI = 0.914, IFI = 0.961, TLI = 0.947 and CFI = 0.961. Also, RMSEA = 0.067, PCLOSE = 0.133 and SRMR = 0.072. All indices are within the acceptable range as recommended in the literature (Hooper, Coughlan, & Mullen, 2008; Hu & Bentler, 1999). Also, all results on factor loadings for observed items were above 0.6 (as presented in Figure 2) and adequately explained their respective latent variables (Hair *et al.*, 2010).

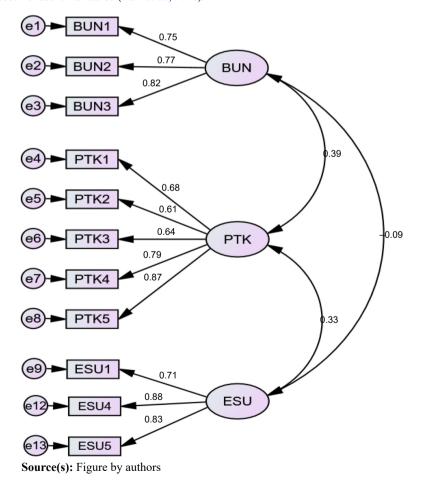


Figure 2. The CFA for the measurement model

4.3 Structural and hypothesis testing

We used Hayes' PROCESS macro to perform the moderation analysis. The results in Table 3 unveil that BUN negatively and significantly relates to ESU, confirming H1 ($\beta = -0.1192$, p = 0.0006). Also, the link between PTK and ESU is positive and significant ($\beta = 0.3117$, p < 0.0001) with a non-zero value between the confidence intervals; these results support the H2. Therefore, the results imply that behavioural uncertainty negatively affects the environmental sustainability of restaurants, while purchasing technical knowledge positively determines the environmental sustainability of restaurants. Lastly, as hypothesised (H3), the interaction term (BUN*PTK) positively and significantly moderates the effect of BUN on ESU ($\beta = 0.1319$, p = 0.0030, with no zero value between confidence intervals). Therefore, the study's results reveal that the hypothesised relationship is supported, with $\Delta R^2 = 0.0443$, indicating that the interaction effect contributes significantly to explaining variations in ESU. These results imply that purchasing technical knowledge positively moderates the relationship between behavioural uncertainty and the environmental sustainability of restaurants. Thus, purchasing technical knowledge dampens the negative relationship between behavioural uncertainty and the restaurants' environmental sustainability. The negative effect of behavioural uncertainty on the environmental sustainability of restaurants decreases with the increase in purchasing technical knowledge in such a way that at a high level of purchasing technical knowledge, the negative effect of behavioural uncertainty is weak compared to a low level of purchasing technical knowledge (see Figure 3).

Variables	coeff	se	t	P	LLCI	ULCI
BUN	-0.1192	0.0340	-3.5052	0.0006	-0.1864	-0.0521
PTK	0.3117	0.0534	5.8409	****	0.2064	0.4171
BUN*PTK	0.1319	0.0438	3.0078	0.0030	0.0453	0.2185
R^2	0.1915					
F(sig.)	13.0256			****		
ΔR^2	0.0443					
F(sig.)	9.0470			0.0030		
Note(s): ****	denote $p < 0.001$					
Source(s): Ta	4					

Table 3. Results on the hypothesised relationships

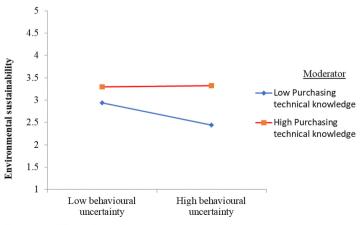


Figure 3.
The moderating effect of purchasing technical knowledge

Source(s): Figure by authors

5. Discussion

The study establishes a link between behavioural uncertainty and environmental sustainability of restaurant businesses. According to the findings, behavioural uncertainty is both negative and significant in relation to environmental sustainability. As a result, behavioural uncertainty reduces the ability of restaurant businesses to achieve environmental sustainability. The plausible explanation is that behavioural uncertainty, which reflects restaurant managers' efforts to detect if potential suppliers conform to needed specifications and desired quality, efforts to ensure that suppliers are accurately evaluated and associated costs in terms of time and efforts to monitor potential suppliers' performance, all have a negative outcome on environmental sustainability. Despite the differences in contexts, these findings corroborate Hoffmann *et al.* (2013), who found that behavioural uncertainty has a negative impact on supply chain risk management performance.

Furthermore, the study establishes a strong link between purchasing technical knowledge and environmental sustainability. The study's findings show that improving purchasing technical knowledge improves restaurant environmental sustainability. This suggests that there is a positive relationship between purchasing technical knowledge and environmental sustainability. Despite the fact that purchasing technical knowledge was not found to be important in enhancing strategic purchasing and thus restaurant performance in the restaurant industry (Cho *et al.*, 2019), the current study emphasises the importance of purchasing technical knowledge in enhancing environmental sustainability. This relationship exists because restaurant managers who are well-versed in the products available in the market, as well as potential suppliers for the offered products, are more likely to improve the environmental aspects of the required products. This may provide opportunities for environmental sustainability in the restaurant industry.

Also, the study's findings show that when purchasing technical knowledge is low, the negative effect of behavioural uncertainty on environmental sustainability is stronger than when purchasing technical knowledge is high. In this regard, increasing purchasing technical knowledge for restaurant purchasing managers reduces the negative effect of behavioural uncertainty. Kolchin and Giunipero (1993) linked purchasing skills in terms of technical knowledge to aspects of cost analysis, which increases the likelihood of encountering behavioural uncertainty and thus increasing environmental suitability. In the presence of behavioural uncertainty, restaurant managers with vital purchasing technical knowledge are more likely to improve environmental sustainability in their restaurants than those with low levels of purchasing technical knowledge.

6. Conclusions and study implications

6.1 Conclusions

By using the resource-based view and transaction cost theory, we investigated the moderating effect of purchasing technical knowledge on the relationship between behavioural uncertainty and environmental sustainability. Based on the main findings, it is concluded that behavioural uncertainty, as defined in transaction cost theory, has a negative effect on the environmental sustainability in restaurant businesses. As a result, behavioural uncertainty impedes environmental sustainability. Purchasing technical knowledge, on the other hand, is critical for determining environmental sustainability. In this regard, purchasing technical knowledge as an important resource for restaurant managers is critical to the environmental sustainability of the restaurant. Correspondingly, purchasing technical knowledge has a significant and positive moderating effect on the relationship between behavioural uncertainty and environmental sustainability. The study concludes that purchasing technical knowledge is a positive factor in reducing the negative

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impact of behavioural uncertainty on restaurant environmental sustainability. Since purchasing technical knowledge is an important purchasing skill, it reduces the negative effect of behavioural uncertainty on restaurant businesses' achievement of environmental sustainability. In this regard, with presence of behavioural uncertainty, restaurant managers are more likely to improve environmental sustainability as their purchasing technical knowledge increases.

6.2 Theoretical implications

By analysing the environmental sustainability of restaurant businesses in Tanzania as a developing country, the study adds to existing research on environmental sustainability in restaurants and other businesses by providing empirical-based evidence from an emerging economy (del Mar Alonso-Almeida, Bagur-Femenias, Llach, & Perramon, 2018; Cantele & Cassia, 2020; Ismail, Amani, & Changalima, 2023). Also, the study establishes the moderating effect of purchasing technical knowledge on the relationship between behavioural uncertainty and environmental sustainability and emphasises the role of purchasing skills in the restaurant industry. Furthermore, the study integrates the resource-based view and transaction costs theory into a single study and hence contributes to the two theories by providing insights into their application in the context of restaurant businesses. Therefore, the study's findings contribute in understanding of the resource-based view and transaction costs theory in theorising behavioural uncertainty, purchasing technical knowledge and environmental sustainability.

6.3 Practical implications

Restaurant managers are more likely to reduce the negative effect of behavioural uncertainty on environmental sustainability by enhancing their purchasing technical knowledge. Despite the fact that behavioural uncertainty negatively affects the attainment of environmental sustainability, purchasing skills in terms of technical knowledge may save the day. In this regard, the study has two main practical implications: first, restaurant managers should be encouraged to improve their purchasing technical knowledge through attending short- and long-term training on purchasing functions in the hospitality industry, like restaurant businesses. Secondly, restaurant managers should encourage an environmental sustainability culture in their respective restaurants to ensure that environmental concerns are considered in restaurant practices to reduce the environmental issues resulting from their operations.

7. Limitations and areas for future studies

The study has some limitations, which may provide avenues for further research. First, the study focused on subjective measures of all main constructs; hence, the results reflect the perceptions of restaurant managers who were involved during the process of collecting data. Therefore, future studies may consider other objective measures to capture the information needed to establish the link between behavioural uncertainty and environmental sustainability. Also, to examine the moderating effect of purchasing technical knowledge on the influence of behavioural uncertainty and environmental sustainability, other studies may consider other moderating variables to extend this study. Second, the study considered only environmental sustainability; future research may consider other important dimensions of sustainability, under which the consideration of social and economic sustainability may extend the current study. Finally, given the increasing pace of information technologies in business (Ismail, 2023; Mehra, Paul, & Kaurav, 2021), future studies should consider technological factors related to restaurant businesses when addressing their sustainability.

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