

Article

Factors Affecting the Sustainability of Halal Product Performance: Malaysian Evidence

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Abstract: The purpose of this research is to examine the impact of supply chain integration (SCI), demand for halal products (DHP), halal marketing (HM), process quality improvement (PQI), food safety concerns (FSCs), and health consciousness (HC) on sustainable product performance (SPP) in the halal food industry in Malaysia. A survey was conducted with 212 respondents from Malaysian halal-certified companies, and the partial least squares (PLS-SEM) method was used for the data analysis. The findings indicate a positive and significant link between SCPI, HC, PQI, and SPP. In contrast, the findings show no significant link between HM, FSC, and SPP. DHP was found to have a negative, non-significant association with SPP. This paper concludes by discussing the implications of the findings and opportunities for future research.

Keywords: supply chain integration (SCI); demand for halal products (DHP); halal marketing (HM); process quality improvement (PQI); food safety concerns (FSCs); health consciousness (HC) on sustainable product performance (SPP)

1. Introduction

The term “sustainable” describes the degree to which a particular action or process contributes to the long-term well-being of the environment without negatively impacting it [1]. Businesses must consider the impact of their actions when designing a sustainable supply chain. The term sustainable performance refers to an organization’s performance from an economic, social, and environmental perspective [2]. Sustainable performance is the key to building an organization and operating it in an ideal way. Sustainable performance allows colleagues to perform their jobs well without falling into the trap of burning out or becoming workaholics. It also allows organizations to efficiently and effectively provide high-quality products and services, and it contributes to a low absenteeism rate and a low turnover rate [3]. All of this is good for the bottom line.

However, according to Qorri, et al. [4], determining the sustainable performance of supply chains is challenging. It requires suitable materials and tools that can capture and analyze data on every supply chain action and every aspect of sustainability. It shows that different performance indicators have been suggested, but they are rarely executed in the real world.

The 1.8 billion Muslims in the world must follow strict food consumption regulations [5]. In the field of halal food, some researchers have focused on the relationship between Muslim purchase of halal items, marketing strategies for halal items, how halal production differs from conventional catering production techniques, and the relationship between halal food and its quality standards. People should differentiate between halal food and organic food. Organic food is made from natural substances such as earth, water, air, and bacteria. This type of food is becoming popular in many countries around the world. It is also considered the healthiest way to eat. Many believe that organic food is better for the environment and human health [6]. However, not all organic foods are halal. That is why Muslims must know the difference between halal and organic food [7].



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These research areas are closely linked, showing that in both Muslim countries and non-Muslim countries, the consumption of halal food is the middleman between the manufacturing procedure and monetary achievements of halal companies. Therefore, this research seeks to verify the sustainability of the performance of halal products on Malaysian companies during the coronavirus pandemic. This study took place in Malaysia because Malaysia is a multicultural country that is home to Malays, Chinese, Indians, and other international cultures. The diversity of ethnicities in Malaysia also results in a diversity of faith, although the country's formal religion is Islam. There is a lot of concern about the quality and integrity of halal food due to difficulties in maintaining its integrity, the need to prevent doubtful materials from entering products, the lack of control over food norms, as well as the need to maintain high standards [8]. The 2020 Population and Housing Census of Malaysia reported that Muslims accounted for 61.3% of the total population, while 19.8% of the population were Buddhist, 9.1% were Christian, 6.1% were Hindu, and 2.7% belonged to other religions or were not religious [9].

The supply chain is the most critical part of any business organization. Vulnerabilities in the supply chain network affect the entire chain. The reason for the failure of supply chain activities is usually a lack of understanding or knowledge of the nature of demand. The supply chain is more chaotic than before, and cruelty and supply chain disruptions appear to be increasing. These situations may be the worst for companies that have not yet developed a responsive supply chain strategy. For example, during the Movement Control Order (MCO) of COVID-19, there was a bread supply shortage in Malaysia that greatly impacted the Malaysian people.

Sustainability is a concept that has become increasingly popular in recent decades; it refers to creating products and practices that can sustain future generations without damaging the environment [10]. Many organizations now have sustainability at their core and are promoting awareness of the challenges and possibilities that accompany it [11]. However, not all interpretations of sustainability are consistent with each other. For instance, some define sustainability as a process, while others view it as an end result [12]. Additionally, some interpretations of sustainability emphasize economic or social aspects over environmental aspects, while others emphasize both aspects equally. Furthermore, whether or not a product remains profitable depends on how well it performs in the long run. Therefore, understanding how products perform over time is crucial to designing sustainable products [3]. Sustainability is an essential concept in today's rapidly evolving world. Over the past few decades, sustainability has gained attention as a way to plan for future needs and resources. Product sustainability proves that a product has the ability to function within the environment without affecting it negatively [3]. At the same time, product sustainability proves that a product has been designed with the health and welfare of humans in mind [13]. Essentially, sustainability is a way to ensure that technological advancements benefit humankind and conserve natural resources at the same time [14].

2. Literature Review

2.1. Halal Production Process

Food production is essential for life. Most countries produce food for their citizens, and many nations grow food to export. Each year, billions of tons of food are produced globally. Most food is produced using farming techniques, but there are drawbacks to farming. Food production processes help produce more food without taking up additional space or resources [15]. Halal emphasizes the principles of cleanliness, hygiene, nutrition, security, virtue, creation, reliability, preproduction, honesty, and administrative activities related to money and social life [16]. These principles dictate that manufacturing plants producing halal products should not use alcohol-based products, pork, or synthetic materials. The primary objective of the halal production process is to maintain and assure halal integrity at all stages, including material integrity, production process integrity, information integrity, and capital integrity. At the factories, the production process must be carried out in the halal-only line. Halal equipment and worker practices must adhere to Shariah-compliant

hygiene standards. It is critical to monitor the segregation of halal and non-halal products, storage conditions, impacts, humidity, temperature, and adequate control of contamination with non-halal products in warehouses [17].

2.2. Supply Chain Integration (SCI)

The halal certification process aims to produce pure and clean food in a convenient way. Khan, et al. [18] suggested that halal supply chain management (HSCM) be defined as improving the sensible perception of halal from the supply chain perspective by grouping the present definitions in this area according to the concentrate of halal and supply chain management. Ali, et al. [19] proposed that through supply chain integration (SCI), halal food integrity risks could be decreased. They proposed six halal food integrity risk measurements: raw material, food processing, food safety, externalization actions, services, and logistics.

SCI refers to the degree to which a manufacturer interacts with its supply chain partners and collaboratively manages processes, materials, and people to enhance its products and services and improve the flow of information and money [20]. Essentially, integration means bringing supply chains together so that they function as a single unit. A company should integrate its supply chains so that materials flow from one part of the chain to another without interruption or conflict. In this way, all parts of the supply chain can function as a single entity while minimizing costs and maximizing efficiency. For example, a company can integrate its manufacturing, distribution, retail, and sales processes into one system. Doing so will increase efficiency while reducing costs and increasing revenue-generation capabilities.

Because SCI reduces waste and increases efficiency, it has huge benefits for companies and countries alike [21]. The successful integration of supply chain management with other business processes is essential to improving efficiency and profitability. The integration of supply chain management with other departments helps to streamline operations and create a better customer experience. It also facilitates the efficient flow of products and services across all organizational boundaries [22].

The way in which a company manages its supply chains directly impacts its performance and growth but also has huge benefits beyond the company's needs. SCI practices increase the chances of a company's success in the market because they can procure materials without errors or failures that can harm production lines. SCI also promotes sustainable practices, such as carbon neutrality, reduced energy consumption, water conservation, and reduced solid waste generation [21]. Businesses need to integrate their supply chains if they want to achieve sustainable practices and increased efficiency; doing so helps reduce burdens on the environment and promotes ethical business practices for customers, employees, and consumers. Hence, while SCI is not easy, it is necessary for businesses to succeed in today's competitive market environment [20]. It is for the above reasons that we need more sustainable supply chains in the future [23]. SCI plays an important role in contributing to improving the sustainable performance of products. Previous studies have identified the positive impact of SCI and SPP [20,24]. Based on Lii and Kuo [25]'s conclusion, SCI significantly impacts the performance of companies and provides a competitive advantage. As a first hypothesis, we therefore propose the following:

H1. *There is a significant and positive link between SCI and (SPP).*

2.3. Demand for Halal Products (DHP)

Halal food refers to pure and healthy food that does not contain *haram* substances (prohibited goods), such as pork, blood, carrion, dead animals, carnivores, birds, or amphibians [26]. According to data released by the Pew Research Centre, the world's Muslim population is currently 1.9 billion, amounting to 24.9% of the global population [27].

Today, with the increasing number of Muslims worldwide, the demand for halal products (DHP) is growing. The halal market is no longer limited to Muslim countries; it has expanded to non-Muslim countries. In non-Muslim countries, halal food provides a

new standard for the safe, immaculate, and sanitary consumption of food [28]. Countries that are known as non-Muslim countries (e.g., Thailand, the Philippines, China, and India) have been at the fore of entry into the international halal market. Of course, the production of halal food requires a supply chain that meets halal requirements and remains pollution-free from the origin of the food to its sale to customers. It is crucial for food producers in the halal supply chain to convey their credibility to Muslim consumers. Muslim consumers need to have greater guarantees about the halal food they eat. Additionally, research shows that modern Muslim customers are more conscious of their food intake and would like the halal food supply chain to further expand the integrity of halal food [16].

Supply chain participants can improve business performance and meet consumers' needs by providing output supplies, information, and services in a manner consistent with Shariah. Because of the complexity of supply chain management, suspicious halal status, and halal honesty issues, HSCM is urgently needed [29,30].

Logistics service suppliers participate in the halal food supply chain business by innovating and providing various halal services, such as halal-only warehouses, halal food examination teams, and ceremonial cleaning services [31,32]. Moreover, it has been proven that consumers are willing to pay for high-quality halal logistics [33,34].

According to experts, halal products follow somewhat different quality standards and processes than other products within the same category, which contributes to the growing demand for halal products among consumers. There is a huge DHP among Muslim and non-Muslim consumers in many countries [16]. However, during the COVID-19 pandemic, consumers were especially afraid of foods [35], which affected DHP. Muslim consumers know the meaning of halal foods. Many studies assumed that halal foods are accepted among non-Muslim consumers, which increased the demand and sustainability and performance of products [36–39]. Therefore, as a second hypothesis, we propose the following:

H2. *There is a significant and positive link between DHP and SPP.*

2.4. Halal Marketing (HM)

Halal marketing (HM) is the promotion of products and services based on Islamic teachings. Since the late 1990s, it has become increasingly popular among marketers as a way to promote halal products to consumers. Many different marketing strategies are used in HM, including word-of-mouth, email, SMS advertisements, and social media strategies [40]. Several HM strategies can be identified by looking at the naming format of products, which may include *halal* (Arabic for “permissible” or “allowed”) and logos or symbols of the Quran or the Hanifah tree [41].

Marketing-related concerns (e.g., positioning, packaging, branding, and labeling) have become one of the main themes of halal food management research [40]. Putting a company's brand/product in the consumer's mind and brand positioning are crucial marketing strategies that must be applied once a product enters the market. Identifying which characteristics of a halal product to highlight will help businesses achieve successful positioning of their product in the market [42]. Similarly, while studying issues related to halal food packaging, Ab Talib and Mohd Johan [43] argued that the procedure of packaging and labeling products should be considered to produce truly halal products. Halal trademarks constitute another issue frequently raised in halal food research. The previous literature has comprehensively discussed identifying factors that may affect customers' attitudes and awareness of halal brands, especially halal food brands [44].

Globally, there are opportunities to produce and sell halal food. Halal is no longer only for Muslims; it is for all countries that can fulfill the demand for halal food [45]. The meat produced in Muslim countries accounts for less than 20% of the international demand for halal meat. Many countries without a Muslim majority (e.g., New Zealand, India, France, China, Canada, Argentina, Brazil, Australia, the United States, and the United Kingdom) produce halal meat and export it all over the world. For example, countries belonging

to the Gulf Cooperation Council (GCC) import more than 54% of their halal meat from Brazil [46,47].

Non-Muslim countries not only produce a lot of halal food but the consumption of halal food by non-Muslim groups is also increasing [16]. Halal has even become a sign of quality, integrity, and cleanliness; it represents a more humane and environmental approach to production [39]. Halal consciousness, halal certification, and awareness of halal brands have a positive impact on Muslims and, non-Muslims' intentions to buy halal food [48].

HM is a marketing strategy that promotes customers' consumption of halal products. By promoting the consumption of halal products, the goal of HM is to create responsible consumers and promote harmonious relations between customers and companies. HM offers several advantages to marketers and consumers alike, and it promotes a positive image of halal products to the general public. Companies embrace HM to make their marketing more effective and relevant to customers [49]. HM promotes unity among businesses, as companies try to follow Islamic laws while doing business. HM also helps businesses reach out to consumers with resources that meet their needs. In both Muslim and non-Muslim countries, halal is a critical tool for rationalizing the thinking of marketers, producers, and governments to produce and market halal products effectively [50]. To fulfill consumers' halal needs, halal marketers should incorporate their customers' needs and wants into their manufacturing and marketing strategies.

Consumers are becoming more aware of the environmental and health impacts of food. Many people want to live sustainably and buy responsibly produced food, and governments are becoming more concerned with the environment due to public pressure and regulations. Businesses are also adopting sustainable practices to cut costs and contribute to the economy. Restaurants are particularly incentivized to adopt sustainable marketing, since most are small operations with low budgets. For example, McDonald's has introduced sustainable practices, such as using recycled paper for its menu covers. This has allowed the company to cut costs while appeasing sustainability-minded buyers [51]. Therefore, sustainable marketing is the best way to appeal to consumers without offending them with wasteful practices. Adopting halal food as a marketing strategy saves businesses money on costly customization services. Plus, it attracts new customers who may be willing to pay more for sustainably produced products. Additionally, some restaurants offer discount coupons for customers who order halal food, so these strategies are also about boosting profitability. The concept of halal is essential for Muslims and non-Muslims alike to rationalize marketing and production decisions while implementing effective marketing and production strategies [50]. A conceptual study by Haleem, et al. [52] suggested that halal marketing can affect the sustainable product performance. Thus, as a third hypothesis, we propose the following:

H3. *There is a significant and positive link between HM and SPP.*

2.5. Process Quality Improvement (PQI)

The core goal of controlling the halal product supply chain is to obtain consumers' trust by ensuring and maintaining honesty regarding resources, personnel, processes, and data. Halal certification is also a quality monitoring tool that combines equitable trade and the humanitarian treatment of animals. The creation of green halal supply chains can enable halal food companies to achieve better performance and quality improvement, significantly reducing waste levels and leading to higher cost efficiency.

The pursuance of a quality management system (QMS) can help halal food manufacturers increase trust, reduce operating costs, and increase overall profitability [53]. QMS helps maintain quality-related policies and plans and ensures quality improvement, quality control, and quality assurance. This means that halal food companies must adopt the QMS method to enhance the effectiveness of the halal food supply chain, thus reducing the number of recalls and decreasing the overall risk associated with halal food chain safety.

In this case, product integrity means maintaining food quality during transportation (especially cold-chain transportation), ensuring food safety, eliminating the risk of cross-

contamination, and protecting the authenticity of products to prevent dishonest behaviors (e.g., forgery or economically motivated adulteration) throughout the expansion of halal food chains. Halal food manufacturers should continuously improve their products by applying a high-quality overall process management system. To accomplish this, raw materials must be monitored carefully and labor skills must be improved [54].

Quality improvement refers to making improvements to products or services based on user feedback. This can result in better-quality products or services that are more enjoyable for users [55]. Sustainability is an integral part of the quality improvement process. Companies must incorporate sustainability into their strategies when improving the quality of their products and services. Companies implement sustainable practices to continuously improve the quality of their products and services. This approach has many benefits. It is faster and cheaper than inventing new products and services, it creates more jobs than does producing inferior goods, and it improves the environment by reducing waste and recycling resources [56].

Improving the quality of manufacturing processes is critical to the success of any business. The process must be reliable and efficient so that products can be produced quickly and at a reasonable price [57]. Additionally, sustaining higher productivity is easier when processes are reliable and efficient. Sustaining these improvements over time is much more difficult without sound process management practices. Past studies indicated that there is link between PQI and SPP [52,58]. A conceptual study suggested that PQI is a critical factor to contribute to SPP [58]. Thus, as a fourth hypothesis, we propose the following:

H4. *There is a significant and positive link between process quality improvement (PQI) and SPP.*

2.6. Food Safety Concerns (FSCs)

Food safety is a concern for everyone, but many people buy food products from the market without actively thinking about food safety. They can do this because the food is safe; it appears fresh and tastes good. However, there are several health risks associated with unsafe food; hence, checking your purchases and preparing your own meals responsibly will help you stay healthy. It is important to understand how to buy safe food.

There has been an increase in global concern both among Muslim and non-Muslim consumers about food safety, especially during the COVID-19 pandemic. Food can contain a variety of harmful and poisonous substances, and the pandemic has generated great worry about food safety and the way in which food is prepared and transported [16]. By monitoring and evaluating all hazards throughout the entire food production process, food detection approaches must ensure the safety of food at every step of the food supply chain [59,60].

Food safety and sustainability are holistic concepts that encompass the entire supply chain. All those involved in food production can implement sustainable practices. To meet future production demands, a variety of practices are being used, ranging from production agriculture and the use of natural and synthetic resources, to manufacturing and processing, to retail and consumer practices. Among these practices are composting, packaging, recycling, and many others [61]. Food safety and health concerns have an impact on consumer behaviors. Changing consumer preferences and consumption patterns can lead to changes in product sustainability and increased demand, or vice versa. Recently, consumers have become more aware of their health, especially after the pandemic. Changes in societies are causing consumers to start considering consumption patterns that lead to the sustainability of products. As a result of the pandemic, people became more aware of sustainable consumption during and after the pandemic, which led them to adopt new sustainable consumption behaviors [62]. Food safety concerns (FSCs) play an important role in increasing product performance and achieving sustainability, which is why companies must make an effort to maintain food safety and gain the trust of their customers [51]. Thus, as a fifth hypothesis, we propose the following:

H5. *There is a significant and positive link between FSCs and SPP.*

2.7. Health Consciousness (HC)

According to Prazak, et al. [63], HC is the awareness of one's state of physical, mental, and social well-being. It is the willingness to make positive changes toward a better lifestyle by embracing healthy habits and behaviors. According to Hoque, et al. [64], HC refers to a person's level of concern for their own health. The four levels of HC have been defined as caring about health, having greater health worries, searching for health information, and valuing healthy conditions [65]. HC is the practice of using one's senses to identify and avoid unhealthy products, and consumers are now reinventing the ways they approach threats to health- and wellness-related decisions.

A proper and informed diet is necessary to maintain a healthy lifestyle [66]. Serikbayeva, et al. [67] indicated that animals used for halal meat are raised on organic feed without hormones. In this sense, halal food responds to consumer worries and health awareness regarding food safety and quality.

Health consciousness and sustainable consumption are crucially related; due to health consciousness, people started eating healthy and hygienic food items [68]. The health consciousness of consumers impacts how they buy and consume food [69]. Therefore, health conscientiousness predicts attitudes and intentions toward food purchases, which increase the sustainability of products [70]. Health is the foundation of sustainable development, emphasizing the interrelationship of health and sustainability [71]. A healthy and sustainable lifestyle is promoted when health awareness and sustainable consumption are interrelated [72]. Companies must create more sustainable products to reduce the pressure on consumers to change their habits. To achieve sustainable development, health must be a priority because health and sustainability are not mutually exclusive. Sustainable consumption and manufacturing are essential phases of sustainable improvement; these phases are primarily based on responsibility, cohesion, and accountability. To promote a healthy and sustainable future, it is necessary to acknowledge the relationship between health awareness and sustainable consumption [73]. Underlining the duality of health and sustainability, health is a prerequisite for sustainable development [74]. Since health consciousness and sustainable consumption are mutually supportive of sustainable development, consumption fosters a healthy and sustainable future [71]. Previous studies found a link between health consciousness and sustainable products [73,75]. Hence, as a sixth hypothesis, we propose the following:

H6. *There is a significant and positive link between HC and SPP.*

2.8. Sustainable Product Performance (SPP)

Companies should be responsible for the effect of their business processes on the environment and society as a whole, not just for using available resources to create economic value. This sentiment has led to the disclosure of a threefold bottom-line procedure for gauging organizational performance. This procedure supports the performance evaluation system by merging ecological and social measurements of performance with economic measures [76]. Sustainability is understood as an organization's ability to balance economic, social, and ecological performance to maintain its own long-term performance. The halal guarantee system ensures secure and sanitary consumer products from farm to table by combining Islamic values, such as animal rights, moral matters, sustainability, cleanliness, fairness, environmental friendliness, and equitable trading [13].

The production and processing of halal products can help address sustainability problems in processes and procedures. The main principle of producing halal products is the removal of elements that are harmful to human health and the environment. In addition to slaughter, halal values also regulate the feeding, transport, and treatment of animals, and other operations. The slaughtering method is especially vital in halal processing. In the literature, the halal slaughter process has been associated with higher animal welfare [77]. Competent halal certification agencies also require production facilities

to comply with critical control points, ISO 22000, good manufacturing practices, hazard analysis, and good agricultural practice standards to control physical, alchemical, and biological risks [78]. Furthermore, halal values require equitable trading practices to assist small-scale manufacturers with commodity production by paying fair prices and promoting sustainable livelihoods. Some sustainability indicators, such as food integrity, environmental friendliness, equitable trading, and animal interest, can be found in halal principles [72].

The topic of halal supply chain achievements has been discussed in previous studies. Ultimately, halal supply chain activities related to purchasing, warehousing, transportation, product handling, and marketing must all meet halal requirements. The authors of [79] argued that the halal food supply chain is fragile and requires a more stable structure. The new framework must include the credibility of halal products, factors related to Islamic values, and robustness requirements. This would allow the framework to optimize the performance of the halal supply chain effectively. According to Lau, Jamaludin, and Soon [57], every halal food company must have a halal control point system, resembling the Hazard Analysis Critical Control Point (HACCP) system for food safety. Such a system would control the individual stages of food production in a timely and adequate manner in accordance with halal standards, thereby improving the performance of halal food supply chains.

Supply chain performance evaluation is one of the key fields of supply chain research. Several studies have been concerned with traditional supply chain performance [80], but studies related to HSC performance are rare. For example, Azmi, et al. [81] conducted an empirical study on the impact of halal food supply chain factors adopted by Malaysian halal food manufacturers on business performance. They reported that in terms of technology, foreseeable benefits can best predict business performance. The purpose of this study is to investigate some factors which may affect the SPP of Malaysian companies' products during the COVID-19 pandemic.

3. Theoretical Framework

The literature indicates that SCPI, DHP, HM, PQL, FSCs, and HC have an impact on SPP. Hence, this research proposes that SCPI, DHP, HM, PQL, FSCs, and HC are associated with increased levels of SPP, as presented in Figure 1.

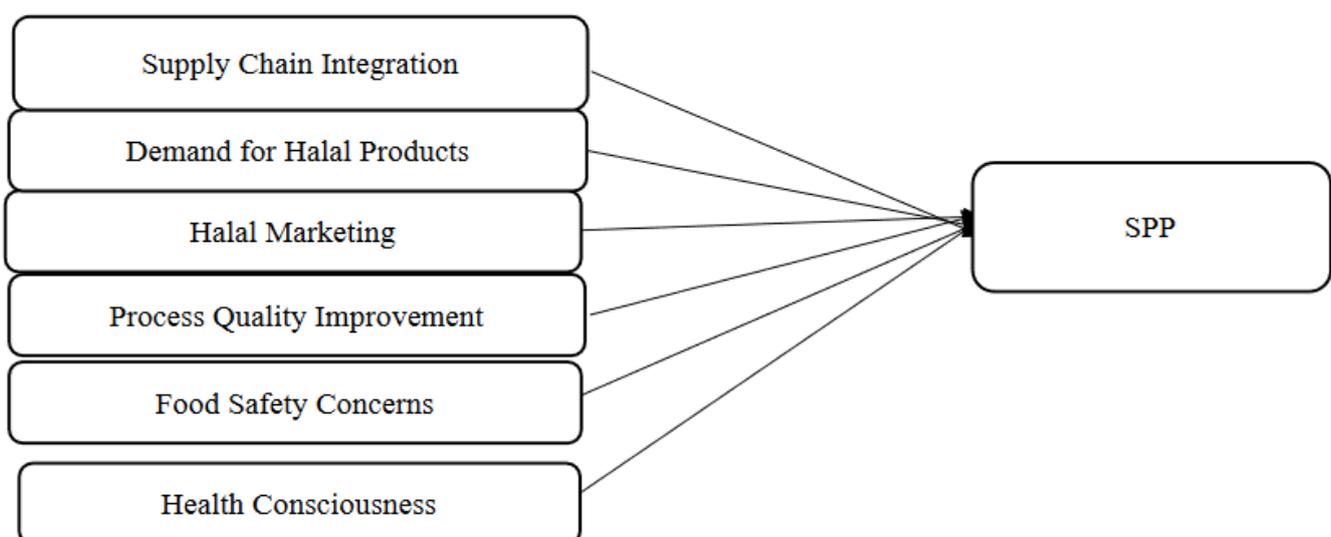


Figure 1. Theoretical framework.

4. Methodology

This research used a quantitative method, structured as a survey questionnaire. The survey questionnaire was developed based on previous research, and the specific contents of the measurement items are shown in Appendix A. To ensure the validity of the content, a 5-point Likert scale measurement was used for all variables [82]. This research focused on Malaysian halal companies. The study population included 5000 Malaysian halal-certified companies located using the *Malaysia Halal Directory 2020/2021 Report* published on 16 October 2020 [83]. To select a random group of 500 halal-certified companies using systematic random sampling, a list of 5000 companies was formed. The list was ordered from A to Z by email, and every 10th company on the list was chosen as a participant, since $5000 \div 10 = 500$. The questionnaires were then created online using Google Drive, and a link was distributed to the selected companies via email. The goal of this study was to generalize the findings of the sample to the targeted population. A total of 212 participants were obtained for data analysis.

Data Analysis and Measurement

The statistical measurement of the hypothesized relationships between the variables used in the research model was operationalized using items adapted from the literature. The classifications of the final measurement instruments were as follows: SCI (four items), DHP (five items), HM (four items), PQI (five items), FSCs (six items), HC (six items), and SPP (eight items). In this study, we employed SmartPLS3 (PLS-SEM) techniques to analyze the collected data and test the posited hypotheses and variables. This technique was chosen because PLS-SEM can analyze all pathways in one analysis.

5. Findings

In light of recent developments regarding the inadequacy of path modeling for PLS-SEM model validation, this research used a two-step procedure to analyze and report on the outcomes of PLS-SEM paths (as advised by [84]).

5.1. Measurement Model

As recommended by [85], this study used a two-stage model approach that included measurement and structural models using SmartPLS 3.0. A measurement model was used to test the link between indicators and latent variables. The structural model was used to examine the link between the latent variables in detail [86]. Composite reliability, convergent validity, and discriminant validity were used to evaluate the measurement model. Internal consistency reliability was determined by gauging whether the measure consistently represented the same construct, as determined by construct reliability (CR) and average variance extracted (AVE). For exploratory research, the acceptable level of CR is 0.60–0.70 [86].

To evaluate the CR, convergent validity, and discriminant validity of the measurement model, PLS-SEM procedures and thresholds were used. As illustrated in Table 1, we first assessed the item loadings of the relevant constructs to determine the reliability of the indicators. The reliability of internal consistency was examined using both Cronbach's Alpha (CA) and composite reliability (CR), which were greater than 0.76 for all constructs. The loading values for all constructs in Table 1 were above 0.517, indicating that they met the thresholds.

As shown in Table 1, composite reliability ranged from 0.850 to 0.913 for all study constructs, demonstrating the reliability of the measurement model. Convergent validity is "the extent to which different measures refer to the same conceptual construct" [87]. Convergent validity is determined by examining the value of AVE, or how closely one measure is related to the other to demonstrate the latent variables' contribution to variance [88]. Henseler, Ringle, and Sinkovics [84] proposed that the AVE should exceed 0.5. As shown in Table 1, the AVE ranged from 0.588 to 0.773 for all constructs.

Table 1. Item loadings, CR, AVE, and CA.

Constructs	Items	Loadings	(AVE)	(CR)	(CA)
Demand for Halal Products	DHP1	0.868	0.644	0.875	0.809
	DHP2	0.868			
	DHP3	0.887			
	DHP4	0.532			
Food Safety Concerns	FSC1	0.778	0.657	0.883	0.821
	FSC2	0.903			
	FSC3	0.889			
	FSC4	0.646			
Halal Marketing	HM1	0.894	0.755	0.902	0.837
	HM2	0.895			
	HM3	0.815			
Health Consciousness	HC1	0.793	0.602	0.899	0.865
	HC2	0.824			
	HC3	0.859			
	HC4	0.517			
	HC5	0.857			
	HC6	0.753			
Supply Chain Partner Integration	ISC1	0.915	0.773	0.910	0.854
	ISC3	0.930			
	ISC4	0.786			
Process Quality Improvement	PQI1	0.695	0.588	0.850	0.764
	PQI2	0.744			
	PQI3	0.853			
	PQI5	0.765			
SPP	SPP1	0.711	0.639	0.913	0.885
	SPP2	0.698			
	SPP3	0.877			
	SPP4	0.832			
	SPP5	0.811			
	SPP6	0.849			

Discriminant validity indicates “the extent to which the measure is adequately distinguishable from related constructs within the nomological net” [87]. According to Fornell and Larcker [89], discriminant validity is determined by using the square root of latent constructs. Because all values were below 0.90, discriminant validity was confirmed, as indicated in Table 2.

Table 2. Assessment of discriminant validity.

	1	2	3	4	5	6	7
Demand for Halal Products	0.802						
Food Safety Concerns	0.648	0.811					
Halal Marketing	0.800	0.471	0.869				
Health Consciousness	0.609	0.735	0.567	0.776			
Supply Chain Partner Integration	0.716	0.740	0.634	0.652	0.879		
Process Quality Improvement	0.633	0.515	0.747	0.502	0.560	0.767	
Sustainable Performance	0.682	0.677	0.717	0.682	0.795	0.766	0.799

The R-squared value, which is also known as the coefficient of determination [84], indicates the amount of variance in the construct that is explained by one or more predictor variable [90]. In this work, the R-squared value represents the proportion of variation in the dependent variable, SPP, that can be explained by one or more predictor variables.

R-squared values of 0.803 in PLS-SEM can be considered substantial. The research model explained 80% of the total variance in SPP.

5.2. Structural Model

This section explains the outcomes of using the path coefficients to test the hypotheses of the structural model and the variables under study. This study used SmartPLS 3 and a bootstrapping procedure with 5000 subsamples and 212 cases to test the significance of the path coefficients [86]. The findings of this study are shown in Figure 2 and Table 3.

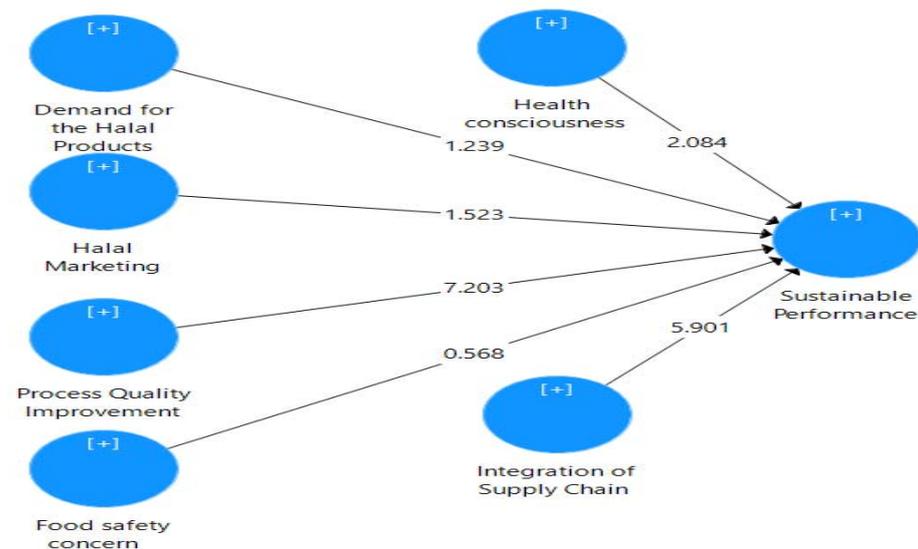


Figure 2. Path coefficients of the structural model.

Table 3. Structural model.

HyP	Relation	Beta	SE	T-Value	p-Value	Findings
H1	Supply Chain Partner Integration -> SPP	0.432	0.073	5.901	0.000	Accepted
H2	Demand for Halal Products -> SPP	-0.093	0.075	1.239	0.216	Rejected
H3	Halal Marketing -> SPP	0.106	0.069	1.523	0.129	Rejected
H4	Process Quality Improvement -> SPP	0.400	0.055	7.203	0.000	Accepted
H5	Food Safety Concerns -> SPP	0.039	0.070	0.568	0.570	Rejected
H6	Health Consciousness -> SPP	0.167	0.080	2.084	0.038	Accepted

Table 3 indicates that there is a positive and significant link between SCPI and SPP ($\beta = 0.432$, $t = 5.901$, $p < 0.000$), meaning that H1 is accepted. However, DHP maintained a negative, insignificant association with SPP ($\beta = -0.093$, $t = 1.239$, $p < 0.216$). Therefore, H2 was rejected. Regarding H3, no significant link was found between HM and SPP ($\beta = 0.106$, $t = 1.523$, $p < 0.129$). Hence, H3 was rejected. Regarding H4, we found a significant and positive link between the PQI and SPP ($\beta = 0.400$, $t = 7.203$, $p < 0.000$). Thus, H4 was accepted. Regarding H5, we found no significant link between FSCs and SPP ($\beta = 0.039$, $t = 0.568$, $p < 0.570$). Hence, H5 was rejected. Finally, regarding H6, we found a significant and positive link between HC and SPP, and thus, H6 was accepted.

Effect size indicates the relative effect of a particular exogenous latent variable on an endogenous latent variable(s) by means of changes in the R-squared [91]. According to [92], an effect size of 0.15 is considered a moderate effect, any value less than 0.1 is considered a small effect, and any value greater than 0.35 is considered a large effect. Table 4 shows the effect size of predictive variables.

Table 4. Effect size of predictive variables.

R-Squared	Effect Size (f ²)	Rating
SPP:		
Demand for Halal Products	0.011	Small
Food Safety Concern	0.002	Small
Halal Marketing	0.013	Small
Health Consciousness	0.056	Small
Integration of Supply Chain	0.316	moderate
Process Quality Improvement	0.328	moderate

This study applied Stone–Geisser’s procedures [93,94] to test the predictive relevance of the research model. This procedure is usually used as a supplementary assessment of goodness-of-fit in PLS-SEM [95]. We used blindfolding to determine the predictive relevance, and a cross-validated redundancy measure (Q^2) was applied to assess the predictive relevance of the research model [96,97]. The Q^2 is a criterion for measuring how well a model predicts the data of omitted cases [86]. A research model with Q^2 statistics (s) greater than zero is considered to have predictive relevance [84]. As shown in Table 5, the Q^2 for the endogenous latent variable was above zero, indicating that the model had predictive relevance.

Table 5. Construct cross-validated redundancy.

Total	SSO	SSE	1-SSE/SSO
Sustainable Product Performance	942.000	476.892	0.494

6. Discussion

This research investigated the impact of SCPI, DHP, HM, FSCs, and PQI on SPP in the halal food industry in Malaysia during the COVID-19 pandemic. The developed hypotheses were examined, and it was found that three were supported, while three were not supported. First, the study findings show a relationship between SCPI and SPP; there is a significant and positive link between these variables, demonstrating that H1 is supported. SCI involves the interaction of different factors and processes within the production, distribution, and consumption of goods and services. It is a vital concept in sustainability because it allows companies to produce goods in a sustainable manner and ensures that the right number of products are available on the market. Essentially, supply chains help create a more sustainable world. This means that SCI affects the way goods are produced, transported, and consumed. On the empirical front, these findings are consistent with previous studies [20,98]. Second, the findings show that DHP is not significantly related to SPP; unfortunately, H2 was not supported. Consumers are increasingly concerned about contaminated and unhealthy foods, which is why they are interested in halal products; customers’ concerns can affect their decisions about buying and demanding halal products [36]. Third, the findings show that HM is not significantly related to SPP. HM is a growing field because consumers are becoming more aware of the environmental impact of their diets and are demanding more sustainable products and more information about the foods they eat. In spite of the fact that HM promotes sustainable products, the results of this study were different, and this may be related to the COVID-19 pandemic and consumer anxiety. Consumers were negatively affected by the COVID-19 pandemic, so it may be that their views will change after the pandemic has ended [99]. Consumers have been buying more halal options since the public has become more aware of the marketing advertisements. Companies must find a new marketing strategy to address the problem, as well as Muslim and non-Muslim customers’ needs, but those strategies must also uphold ethical standards. However, during the COVID-19 crisis, companies faced difficulties in transporting goods and providing services [100]. Moving

forward, companies should pay attention to the changes that may be necessary to make the transition to a more sustainable future.

Fourth, the results show that PQI is significantly related to SPP. These findings show that halal food manufacturers continuously improve their products by implementing QMSs. PQI helps halal food manufacturers increase trust, reduce operating costs, and increase overall profitability [53]. The findings show that the participating Malaysian companies applied effective strategies that affected the sustainability of their products. Malaysian companies sustained consumer confidence, and halal supply chains ensured and maintained the integrity of resources, people, processes, and data. Furthermore, halal certification is a standard quality control tool that integrates humane treatment and fair-trade practices. Improved process quality can be achieved through effective HSCM.

Fifth, no link was found between FSCs and SPP. During COVID-19, customers were more concerned about their food. This finding is not consistent with a past study by Abutaleb and El-Bassiouny [75], which found that FSC has a positive and significant link with sustainable products. The reason behind H5 not being supported may be caused by COVID-19 and because customers are concerned about their health, and they are afraid of everything around them. Companies must use renewable resources and reduce waste generation; most sustainable products are eco-friendly and reduce the risk of food safety issues. Consumers look for sustainable practices when purchasing products for their homes. Moreover, sustainable product development is crucial for ensuring a healthy future for everyone [101]. Sustainable practices can reduce the negative impact of food safety problems. Specifically, sustainable methods can lower the risk of food safety issues by reducing the use of resources and minimizing waste generation. In this way, contaminated materials are less likely to create health risks in humans and animals. Sustainable methods also help to clean polluted environments so that food safety risks no longer affect living creatures [102].

Sixth, the findings indicate that the link between HC and SPP is positive and significant, meaning that H6 was supported. HC is one possible predictive factor affecting SPP. Past studies have shown that HC influences the performance of halal products [103,104]. The concept of HC has gained tremendous acceptance over time, and people now fully understand the importance of healthy living. They are aware that unhealthy living habits can lead to serious diseases, including COVID-19; moreover, their health concerns have increased, and they are inclined to adopt healthy behaviors in their daily life [105]. Other studies have suggested that HC influences the choice of halal products because hygiene, cleanliness, and health are at the core of the halal concept [106,107].

7. Implications of the Study

In this section, the academic and managerial implications of the findings are discussed.

7.1. Academic Implications

This study has developed a new paradigm for research on how SCPI, DHP, HM, and PQI impact SPP. This study contributes to the literature on supply chain management by proposing halal as a typical quality control system that emphasizes wholesome consumption. Additionally, there has been no other empirical research on critical factors for managing SPP, which means that this study adds value to the knowledge base. This research also links FSCs, HC, and SPP with empirical evidence, opening up a new research area in sustainable production. Researchers can suggest ways to improve sustainability based on empirically evaluated sustainability performance indicators.

7.2. Managerial Implications

This integration of six theoretical perspectives is intended to be viewed from the manager's perspective and serves as an approach that encompasses many aspects of SPP. This paper makes a substantive contribution to the managerially relevant conceptualizations of SPP. Although the ideas laid out in this paper are primarily aimed at empirical investigation,

they can also be used by halal supply chain managers to better understand how decisions regarding sustainability are made.

According to our results, managers should focus their limited resources and attention on the three factors that affect SPP (i.e., SCPI, PQI, and HC) and together shape the nature of strategic fit and increase a product's sustainable performance. Companies may disregard the three insignificant factors (i.e., DHP, HM, and PQI) by developing and increasing SPP [108]. This suggests that managers should develop proactive approaches to SPP rather than simply follow regulations.

8. Conclusions, Limitations, and Future Scope

The aim of this paper was to explore how SCPI, DHP, HM, PQI, FSCs, and HC have impacted SPP in the halal food industry in Malaysia during the COVID-19 pandemic. While the crisis has severely damaged all sectors of the world economy, problems in the food industry have been particularly acute [109]. SPP in the halal industry changed significantly as a result of the crisis [110]. Future trends in the halal food industry are difficult to predict, as are the future impacts of SCI, DHP, HM, and PQI on SPP in the halal food industry. The importance of halal food certification in the food industry cannot be underestimated. Halal certification provides consumers with the assurance that a company's products follow halal food production requirements and are suitable for consumption. SPP is key to establishing and maintaining an organization in its best condition.

The findings of this study have several limitations that should also be considered. First, the data were collected during the COVID-19 pandemic from halal-certified companies, and the results may be different if they are compared with new findings after the pandemic has ended. Researchers might also consider conducting comparative studies with other countries. Second, during the COVID-19 pandemic, people were especially worried about food safety [111]. This, in turn, may have led to the emergence of unique results, and the situation may someday return to how it was before COVID-19. Third, this research examines the direct relationship between the independent and dependent variables. Future studies could examine the mediating effect of sustainable marketing orientation between the factors and apply the current model to other industries.

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Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study are available on request from the corresponding author.

Conflicts of Interest: The author declares no conflict of interest.

Appendix A

Constructs	Items
Supply Chain Partner Integration	I think there is a commitment among supply chain partners to provide halal products and associated processes.
	There is trust among supply chain partners to provide halal products to the customer.
	There is strong coordination and collaboration among supply chain partners to provide halal products.
	There is a resource sharing (including information, technology, ingredients knowledge and skills, etc.) among supply chain partners to provide halal products to the consumer.

[18,112,113]

Constructs	Items	
Demand for Halal Products	<p>I feel there is availability of efficient flow of information across the halal supply chain.</p> <p>There is an awareness among Muslim consumers about halal and its cultural and religious aspects in Islam.</p> <p>There is a demand for halal products as they are perceived as safer goods by the customer.</p> <p>There is a demand for halal products due to a change in tastes and preferences of consumers.</p> <p>Increase in consumable income led to the demand for halal products.</p>	[18,113,114]
Halal Marketing	<p>I think there is steadfast adherence to ethics in the marketing and sales of halal products.</p> <p>The perception of halal products as being free from exploitation by external/internal stakeholders.</p> <p>Building trust through ethical marketing transaction among consumers.</p> <p>Help from improved awareness towards halal in positioning it as a brand.</p>	[18,79]
Process Quality Improvement	<p>Contribution by halal supply chain management HSCM in improving the quality culture of the organization.</p> <p>Improved safety inspection of halal products.</p> <p>Halal product standardization and process standardization help in manufacturing halal products.</p> <p>Halal products help in reducing non-conformities in products.</p> <p>Conformity to regulations of halal certification.</p>	[18,115]
SPP	<p>Use of environmentally friendly packaging for halal products. Operate within the biological limits of natural resources (especially soil, water, and biodiversity).</p> <p>Decrease the consumption and discharge of hazardous/harmful/toxic materials.</p> <p>Halal supply chain management enhances fair-trade practices.</p> <p>Halal supply chain management reduces the occurrence of food fraud.</p> <p>Halal slaughtering is concerned about animal welfare.</p> <p>The halal logo means the food products undergo a hygienic and clean process and are wholesome.</p> <p>Perception of halal products as being free from exploitation by external/internal stakeholders.</p>	[18,112,116,117]
Food Safety Concerns	<p>I consume halal food because it is safe.</p> <p>Halal food products follow stricter safety and quality standards than non-halal food products.</p> <p>Halal food products meet standards regarding animal welfare, food safety, and handiness of cooking.</p> <p>Halal food is free from substances that cause food poisoning.</p> <p>Halal food is safer than non-halal food.</p> <p>The quality and safety of meat nowadays concern me.</p>	[16]
Health Consciousness	<p>Halal food is clean and hygienic.</p> <p>Halal food products are safer and more hygienic.</p> <p>The halal food product is likely to have a beneficial impact on my personal health.</p> <p>I am really concerned about food safety because of my concerns with animal diseases.</p> <p>Halal foods are natural food products.</p> <p>Halal food has more nutritional value than conventional food.</p>	[16]

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