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Zöld ellátásilánc- menedzsment és fenntartható teljesítmény: a zöld marketing szerepe a Jordán élelmiszeriparban
Green Supply Chain Management and Sustainable Performance: The Role of Green Marketing in The Jordanian Food Industry

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Abstract.

A zöld és fenntartható működés fontossága az ellátási lánc, a teljesítmény és a marketing kutatásának előterében áll, ugyanakkor a korábbi tanulmányok csak szórványosan vizsgálták az ezek közötti kapcsolatokat. Kevés szakirodalom áll rendelkezésre, amely a zöld marketing moderáló szerepével foglalkozik a zöld ellátásilánc- menedzsment és a fenntartható teljesítmény kapcsolatára vonatkozóan. E kutatási hiányosság pótlása érdekében e tanulmány célja, hogy meghatározza a zöld ellátásilánc-menedzsment hatását a fenntartható teljesítményre, valamint a zöld marketing moderáló szerepét erre a kapcsolatra egy fejlődő gazdasági környezetben. A kutatási hipotéziseket 112 fős minta segítségével teszteltük. A feltételezett közvetlen és közvetett kapcsolatok értékelésére regresszióelemzést végeztünk. A kutatási eredmények a zöld ellátásilánc- menedzsment és a zöld marketing pozitív hatását mutatták az fenntartható teljesítményre. Ezen felül a zöld marketing moderáló szerepe a zöld ellátásilánc-menedzsment és a fenntartható teljesítmény közötti kapcsolatra részben alátámasztásra került. Összességében ezek az eredmények elméleti alapon támogatják ezen fogalmak közötti kölcsönhatások megértését, így a tanulmány hasznos lehet a zöld és fenntartható tevékenységekkel széles körben foglalkozó ellátási lánc- és marketingmenedzserek számára.

Kulcsszavak: zöld ellátásilánc- menedzsment; fenntartható teljesítmény; zöld marketing; Jordán élelmiszeripar

Abstract.

The importance of green and sustainable operations has been at the forefront of research for supply chain (SC), performance, and marketing. Previous studies have reported defragmented results about these relationships and there is a paucity of literature regarding the moderating role of green marketing (GM) on the green supply chain management (GSCM) and sustainable performance (SP) relationship. To address this research gap, this study aims to identify the impact of GSCM on SP, and the moderating role of GM on this relationship in a developing economy context. Research hypotheses have been tested using 112 questionnaires. Regression analysis is performed to evaluate assumed

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direct and indirect relationships. Research results revealed a positive impact of GSCM and GM on the SP. Moreover, the moderating role of GM on the GSCM-SP relationship was partially supported. Collectively, these findings provide a theory-based understanding of the GSCM-SP and GM interactions. Hence, this study will be useful for SC and marketing managers who are highly engaged in green and sustainable operations.

Keywords: Green Supply Chain Management; Sustainable Performance; Green Marketing; Jordanian Food Industry.

JEL Code: M00; M29; M30

Introduction

The environmental issues are one of the most important global concerns (Sarwar et al., 2021). Over the last decade, this planet has suffered from an unusual cycle of unprecedented heat waves, cold spells, droughts, floods, and wildfires (Choi et al., 2018). Business activities worldwide are seen as a cause of substantial threat to the environmental, social, and economic systems. Under the growing pressure of demand for goods and services, determined by global population multiplication, companies are at risk of causing damage to ecosystems. (Zampese et al., 2016). Despite the strong disagreement between supporters and disbelievers of global warming, societal and international awareness regarding the need to preserve environmental resources and adhere to the rules of sustainability is a reality (Capatina & Stoenescu, 2015). Hence, activities of supply chains (SCs) need to be managed, so that they do not adversely affect the environment (Sharma & Gandhi, 2015). It is essential to develop a new, systematic, and emerging environmental approach for whole SC commonly known as Green Supply Chain Management (GSCM) (Sarwar et al., 2021; Malviya & Kant, 2014). GSCM involves ecological practices such as: green design, green purchasing, cooperation with customers or green warehousing and buildings. When implementing GSCM, companies expected not only an improvement in environmental performance but also their corporate image and competitive advantage. Additionally, organizations are increasingly required to focus on creating, identifying, and implementing the sustainable management practices which simultaneously contributes to the economic as well as social and environmental performance (Sarwar et al., 2021; Thevanes & Weerasinghe, 2019). Business practices that focus on the sustainable environment, economic, and social are referred as sustainable performance. Sustainability has become a business imperative rather than a matter of choice (Ghosh, 2019). The rising concerns about the environment sustainability are encouraging firms to adapt their marketing process and strategies to focus on sustainability. Therefore, a new concept has been used; Green Marketing (GM). GM differs from traditional marketing in that it involves making fundamental changes to identify the customers' needs and satisfy them, but also focuses on environmental sustainability, unlike the latter that focuses on making a profit (White et al., 2019). Ideally speaking, concern for a healthy environment is the common point at which traders and clients meet (Caprita, 2015). In the recent years, customer awareness about the food distribution & production effect on the environment have increased, so there was always a need to integrate the green practices into food SCM. The industries are planning their environmental programs, by incorporating (GSCM) practices to play their role to avoid long-term damage to the planet and identifying the performance indicators or the critical success factors that accountable for the GSCM implementation (Gardas et al., 2019), especially in developing economies. Although Jordan has a big concern for applying the green economy through some regulatory laws (e.g., green investment law, renewable energy law), but the implementation of GSCM practices in developing countries like Jordan is still questionable (Al Shaar, 2021; Al-Majali & Tarabieh, 2020; Al-Khawaldah & Al Shoura, 2018). Thus, this study aims to examine the relationship of GSCM and SP in the Jordanian food manufacturing industry and the moderating role of the GM on this relationship. Including GM as a moderator between GSCM and SP is an issue to consider as it can possibly impact the relationship positively. The novelty of this research that it contributions to the GSCM, GM, and SP literature have been made, as it opens the way for more valuable facts and highlights the importance of such topic to be conducted to fill the literature gaps.

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On the other hand, it provided useful and important guidelines which may help the leaders of different enterprises in making informed decisions in adopting green supply chain technology in their organizations. The reminder of the paper is organized as follows. Following the introduction, section 2 presents a general background, literature review and hypotheses development. Section 3 discusses the Framework and study model and section 4 presents the methodology. Section 5 presents and discuss the results. The last section concludes this paper and presents implications and future research.

1. Background and Literature Review

Several studies have investigated the GSCM, SP and GM from different perspectives and for different purposes. Although the acceptable number of these studies, most of them were done separately, and very few studies that joint the GSCM-SP and GM in one study. Based on current literature, there is a positive expected relationship between GSCM practices and dimensions (as independent variable IV) and SP (as dependent variable DV). Moreover, marketing activities and operations – especially the green ones – are expected to positively impact the GSCM-SP relationship. This section proved more insight about the GSCM, SP, GM, and their expected impact relationships.

1.1 The Independent Variable: Green Supply Chain Management (GSCM)

Although the Modern Green Movement has been mostly active in the last half-century, the future of the movement has shown amazing growth in the numbers of supporters (Judd, 2016). The green movement emerged in the 1960s and 1970 and keep grow due to the scientific concerns about the global degradation of the physical environment (Meyer 2010). The need for greening the SCM has increased because of the outstanding features of leading green SCs include an emphasis on life cycle costing, asset efficiency, and waste reduction and service innovation and recycling (Salem et al., 2021; Sarwar et al., 2021; Bhattacharjee, 2015). GSCM is considered a promising SC concept that considers environmental elements when managing the SC. In a broader sense, GSCM strives to achieve inclusive environmental improvements by adopting a life cycle approach from product design, material selection, manufacturing, and end sales and recovery (Al-Ghwayeen & Abdallah, 2018). According to Luthra et al. (2016), the main aspect of GSCM is to make minimal waste production, less pollution, and minimal side effect of entire SC activities (Luthra et al., 2016). Green et al., (2012) defined GSCM as a Business process that must be integrated and coordinated include purchasing, manufacturing, marketing, logistics, and information systems. These practices require that manufacturers work with suppliers and customers to enhance environmental sustainability. Therefore, GSCM is an adding value (value creation) processes that aim to develop a key business strategy by integrating sustainable activities into the traditional SC to improve their sustainability performance through enhancing operations by decreasing the environmental problems, having less waste manufacturing/cost, and creating a positive image that enhances customer satisfaction. To this study, the following practices will be used to measure the GSCM level.

1.1.1 Green design

These designs concern with minimizing the consumption of materials, resources, and energy, and facilitate the implementation of reduce, reuse, and recycle concepts (Li et al., 2021; Despoudi, 2021). Therefore, it will be measured by items 1 to 5 (Table 1.).

1.1.2. Green Purchasing

It is also known as environmentally preferable purchasing (Despoudi, 2021; Sarwar et al., 2021; Diab et al., 2015). To this study, it defined as the integrating environmental concerns in procurement process, therefore, it will be measured by items 6 to 10 (Table 1.).

1.1.3. Internal Environmental Management

Represent the firm's internal polices to protect environment. Most green firms develop their own strategies and top-management commitment to setup their internal environment management (Sarwar et al., 2021; Diab et al., 2015), therefore, it will be measured by items 11 to 15 (Table 1.).

1.1.4. Cooperation with Customers

Is the jointly working projects with customers to set and achieve shared environmental goals (Despoudi, 2021; Diab et al., 2015). Customers can participate in designing clean production systems to produce environmentally sustainable products that compliance with both customer and environment requirements. Therefore, it will be measured by items 16 to 20 (Table 1.).

1.1.5. Reverse Logistics

Reverse logistics activities are gaining importance in terms of size and quantity due to both economic and environmental concerns (Despoudi, 2021; Kazancoglu et al., 2020)., therefore, it will be measured by items 21 to 25 (Table 1.).

1.1.6. Green Warehousing & Building

Green firms need to ensure that warehousing and building are safe during all the SC operations (Despoudi, 2021; Diab et al., 2015), therefore, green warehousing and building dimension will be measured by items 26 to 30 (Table 1.).

Table 1: GSCM gyakorlatok, azok méretei és mértékei
Table 1: GSCM Practices, their Dimensions and Measures

PRACTICE	DIMENSIONS	MEASURES	SUPPORTIVE REFERENCES
GREEN DESIGN GD	GD1	My firm emphasizes the design of products that can be reused, recycled, and recovery of component parts	Al-Ghwayeen & Abdallah, 2018; Younis et al., 2016
	GD2	My firm emphasizes design of products that reduce the use of harmful/toxic material	
	GD3	My firm emphasizes optimization of design process to reduce air emission and noise	
	GD4	My firm emphasizes optimization of design process to reduce solid and liquid waste	
	GD5	My firm Designs products to reduced consumption of material/energy	
GREEN PURCHASING GP	GP1	My firm cooperates with suppliers to meet environmental objectives	Al-Ghwayeen & Abdallah, 2018; Rao & Holt, 2005
	GP2	My firm has special partnerships with suppliers who develop environmental solutions and/or environmentally friendly products	
	GP3	My firm emphasizes purchasing eco-friendly materials	
	GP4	My firm motivates and supports suppliers to take environmental actions	
	GP5	My firm Choices suppliers based on environmental criteria	
INTERNAL ENVIRONMENTAL MANAGEMENT IEM	IEM1	Top managers in my firm are committed to green supply chain management	Al-Ghwayeen & Abdallah, 2018; Papadas et al., 2017
	IEM2	My firm emphasizes cross-functional cooperation for environmental improvements	
	IEM3	My firm emphasizes environmental compliance and auditing programs	

	IEM4	My firm has specific pollution-prevention plans	
	IEM5	In my firm, we created a separate department/unit specialize in environmental issues	
COOPERATION WITH CUSTOMERS CWC	CWC1	My firm cooperates with customers to produce eco-design products	Al-Ghwayeen & Abdallah, 2018; Rao & Holt, 2005
	CWC2	My firm use customers feedback to design a cleaner production process	
	CWC3	My firm cooperates with customers for better green packaging	
	CWC4	My firm shares related environmental information about products and/or processes with customers	
	CWC5	My firm informs consumers to look forward to products with green production	
REVERSE LOGISTICS RL	RL1	My firm is taking back products whose life cycles were ended rather than disposing those to landfills	Younis et al., 2016; Choi et al., 2018
	RL2	My firm focus on the process of recycling recovered products whose life cycles were ended	
	RL3	My firm recycles the containers for reuse in accordance with nutritional and health instructions	
	RL4	My firm have an effective recycling plan regarding paper and its types	
	RL5	My firm implement a system for recycling as much waste as possible so glass and plastic bottles, etc. can all be recycled	
GREEN WAREHOUSING & BUILDINGS GWB	GWB1	My firm's warehousing and buildings are committed with safety rules and regulations	Diab et al.,2015
	GWB2	My firm has the use of solar panels or green roofing options	
	GWB3	My firm use a sustainable lighting, by using for example more eco-friendly options, like LED light bulbs	
	GWB4	My firm are thinking to switch from traditional packing material such as synthetic plastics to biodegradable materials	
	GWB5	My firm's warehousing and buildings emissions are withing the acceptable international ranges such as Food Safety Management System	

Source: Own editing by researchers

1.2. The Moderating Variable: Green Marketing (GM)

Marketing is the process of building a long-term relationship with customers, reaching, and retaining them, including pricing, promotional efforts, placement, and the actual development of the product or service (Fernando, 2020). Marketing has an important role in encouraging sustainability in general and the sustainable consumer behavior (While et al., 2019). According to Gelderman et al. (2021) GM is an example of an environmental management practice, aimed at reducing or preventing negative

impacts on the environment and ideally oriented towards delivering the (green) product (or service) at the right price, place, and time. When exploring GM, several synonymous may be used for different aspects fields of study, e.g., ecological marketing, environmental marketing, and sustainable marketing. Based on a bibliometric analysis of GM research from 1977 to 2020, Saleem et al. (2021) found that, GM, sustainability, sustainable development, environment marketing and sustainable marketing have attracted extensive attention. The environment for marketing, is an increasingly important issue, as it helps businesses to try to identify safe and environmentally friendly ways to conduct their day-to-day operations (Furman, 2017). GM is the process of developing a product and using the 4p's (namely, Product, Price, Promotion, and Place) in a way that does not damage the natural environment (Sutduean et al., 2019). For example, consumers are paying more close attention to green products to reduce the environmental impact on health issues specifically (Nekmahmud & Fekete-Farkas, 2020) and more attention to marketing approaches and their impact on consumer behavior and firms' effectiveness towards the environment in general (Shabbir et al., 2020; Al-Majali & Tarabieh, 2020; Al-Khawaldah & Al Shoura, 2018).
To this study, the following dimensions will be used to measure the GM level:

1.2.1. Green Products

Green products, also known as ecological and environmentally friendly products (Suki, 2016) have need of several operations and techniques to ensure the complainant with the environment requirements in terms of emissions, recycling, reuse, and renewable source of energy (Gelderman et al., 2021). Therefore, this dimension will be measured by items 1 to 5 (Table 2.).

1.2.2. GM Channels

This dimension focuses on increasing the awareness of the distribution channels about the importance of connecting the green concept with all the marketing channel activities. Therefore, this dimension will be measured by items 6 to 10 (Table 2.).

1.2.3. Green Promotion (communication)

This dimension aims at promoting the GSCM practices and their impact on the SP. Green firms in this environmentally sensitive industry, need to put much effort in communicating to their customers those environmental issues are properly dealt with, and it is a big challenge to do so (Gelderman et al., 2021; Grebmer and Diefenbach, 2020). Therefore, this dimension will be measured by items 11 to 15 (Table 2.).

1.2.4. Green Pricing

Refers to the customer's willingness to pay a premium to cover any above-market costs of providing green products. Green pricing considers both the economic and environmental costs of production and marketing and creates value for customers and a fair profit for business (Martin and Schouten, 2013). Therefore, this dimension will be measured by items 16 to 19 (Table 2.).

Table 2.: Zöld marketing dimenziói és leírásuk
Table 2.: Green Marketing Dimensions and their Description

GREEN MARKETING	DIMENSIONS	MEASURES	SUPPORTIVE REFERENCES
GREEN PRODUCTS GPRD	GPRD 1	My firm use low-carbon technologies in the production processes	Papadas et al., 2017
	GPRD 2	Most of our products can be recycled and / or reused	
	GPRD 3	My firm is interested in the efficient use of materials as they are designed to help other products to work more efficiently	
	GPRD 4	My firm makes efforts to use renewable energy sources for our products	
	GPRD 5	My firm is interested in using environmentally	

		friendly packaging for most of its products	
GREEN MARKET CHANNELS GMCH	GMCH 1	My firm increases awareness and knowledge of channel members about the green concepts	Pathmini & Pushpakumara 2012
	GMCH 2	My firm designing and planning Ecological sales outlets	
	GMCH 3	My firm Retailers implementing solar energy panels in some of their stores	
	GMCH 4	My firm are looking at ways to reduce their carbon footprint	
	GMCH 5	My firm make efforts to have a sustainable distribution channel like using alternative energy sources	
GREEN PROMOTION GPROM	GPROM 1	My firm prefers digital communication methods for promoting our products/services because it is more eco-friendly	Papadas et al., 2017
	GPROM 2	My firm created internal environmental prize competitions that promote eco-friendly behavior	
	GPROM 3	My firm encourages the use of e-commerce because it is more eco-friendly	
	GPROM 4	My firm increases consumers' knowledge and awareness towards the green concepts	
	GPROM 5	My firm Advertising and Sales promotion tied with the ecological aspects	
GREEN PRICING GPRIC	GPRIC 1	My firm considers social and environmental cost when pricing its green products	Papadas et al., 2017; Pathmini & Pushpakumara, 2012
	GPRIC 2	My firm participates in green pricing programs to increase the amount of renewable energy supply	
	GPRIC 3	My firm attracts premium from environmentally conscious customers	
	GPRIC 4	My firm invests in R & D programs to create environmentally friendly products	

Source: Own editing by researchers

1.3. Sustainable Performance (SP)

Green practices focus on the commitment of minimizing the negative impacts of business processes on the environment. So, SP is the enhancement of sound management of the environment (Condign et al., 2013). The tendency to create value sustainably assumed a relevant role in the strategies of companies that aim to achieve high-quality performance while respecting natural resources (Hristov & Chirico, 2019). It is important to measure the success of SP using several key indicators (Ingram, 2020). Key performance indicators (KPIs) are business metrics used to track and analyze factors deemed crucial to the success of an organization (Rouse, 2017). The magnitude of going green by business firms directly linked with Environmental, Economic, and social performance. Also moving toward green practices can result in efficiency gains by reducing energy costs, allowing businesses to secure green tax credits, improving operational efficiency, and embedding circular economy principles internally (Tamvada & Shrivastava, 2020).
To this study, SP will be measured by:

1.3.1. Economic Performance

Economic performance under the GSCM practices focus on minimizing the costs of materials, energy, and disposal of wastes and on achieving sufficient returns. Therefore, this dimension will be measured by items 1 to 5 (Table 3.).

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1.3.2. Social Performance

Social performance includes several dimensions such as employees' health and safety; community education, health, and safety; and minimizing the impact of firm's product on local communities. Therefore, this variable will be measured by items 6 to 9 (Table 3.).

1.3.3. Environmental Performance

Environmental performance includes the reduction of hazardous, wastage, emission, and the frequency of environmental accidents. Additionally, it is related to improve reuse, and recycle activities. Therefore, this variable will be measured by items 10 to 14 (Table 3.)

Table 3.: Fenntartható teljesítmány dimenziói és leírásuk
Table 3.: Sustainable Performance Dimensions and their Description

PERFORMANCE	DIMENSIONS	MEASURES	SUPPORTIVE REFERENCES
ECONOMIC	ECO1	My firm succeed to decrease the cost of waste treatment and discharge	Younis et al., 2016; Rashid et al., 2019
	ECO2	My firm succeed to decrease the fine for environmental accidents	
	ECO3	My firm succeed to decrease the materials purchasing cost	
	ECO4	My firm succeed to decrease energy (e.g., electricity, gas, oil) consumption cost	
	ECO5	My firm has succeeded in achieving financial and investment opportunities, because of investing in green practices	
SOCIAL	SOC1	During the last 5 years, my firm has succeeded in improving its mental image in the Jordanian society	Younis et al., 2016; Rashid et al., 2019
	SOC2	During the last 5 years, my firm showed a strong commitment toward social responsibility	
	SOC3	During the last 5 years, my firm Enhanced their employee job satisfaction	
	SOC4	During the last 5 years, my firm developed several employees training and development initiatives	
ENVIRONMENTAL	ENV1	Comparing to competitors, during the last five years, my firm has reduced consumption of hazardous/toxic material	Al-Ghwayeen & Abdallah, 2018; Younis et al., 2016; Rashid et al., 2019
	ENV2	Comparing to competitors, during the last five years, my firm has reduced energy consumption	
	ENV3	Comparing to competitors, during the last five years, my firm reduced air emissions	
	ENV4	My firm Reduced waste of water and achieved good levels in water	

		recycling	
	EVN5	My firm has Decreased frequency for environmental accidents	

Source: Own editing by researchers

1.4. GSCM and SP Relationship

Motivating businesses to adopt GSCM practices starts by exploring the improvements these practices can bring about, not only on the economic side but also on other dimensions including operational, social, and environmental (Sarwar et al., 2021; Younis et al., 2016). Understanding more about the resources and capabilities needed to implement green practices and ensure sustained economic and environmental performance may lie in the firms' orientations toward green and SCM issues (Kirchoff et al., 2016). The strategic attitude of manufacturing enterprises in improving their overall performance and the competitive position requires joint coordination of internal and external GSCM practice. Therefore, it is necessary to achieve multiple performance benefits including environmental, economic, and Social. In the context of developing economies, Diab et al. (2015) found that GSCM practices (green purchasing, eco-design, and warehousing and green building) have an impact on the organizational performance (environmental, financial, and operational). According to Sarwar et al. (2021) GSCM practices have a positive impact on the environmental, economic, and social performance of the Pakistani firms. Thus, it is expected to have the same positive impact on the Jordanian firms too. Therefore, based on the objective of the study, the following main hypothesis were developed to measure this relationship:

H1: There is a significant positive relationship between GSCM and SP.
The **H1.** Hypothesis is divided into the following sub-hypotheses based on the GSCM Dimensions:

- **H1.1**: There is a significant positive relationship between green design and SP.
- **H1.2:** There is a significant positive relationship between green purchasing and SP.
- **H1.3:** There is a significant positive relationship between internal environmental management and SP.
- **H1.4:** There is a significant positive relationship between Cooperation with customer and SP.
- **H1.5**: There is a significant positive relationship between green warehousing and building and SP.
- **H1.6:** There is a significant positive relationship between Reverse Logistic and SP.

1.5. GM and SP relationship

The prioritization of consumers is crucial for organizations and economies seeking to enhance their engagement in the society, in particular sustainability (Al-dmour et al., 2023). Within the realm of business operations, it is imperative to prioritize consumer values, as they serve as the fundamental pillar for generating firm profits. This entails engaging in the context of running a business, conducting business activities, operating a business, and managing company relationships with other parties (Abadiyah et al., 2020). The primary focus of Green marketing strategies pertains to the modification of consumer behaviors and preferences with the aim of enhancing their consciousness regarding sustainability. This involves identifying strategies to facilitate the purchasing of goods and services that are produced in a more sustainable manner (Roh et al., 2022). Therefore, the magnitude of successfully using green marketing is directly linked with Environmental, Economic, and Social performance. But, operational, and economic efficiency is mostly facilitated by environment-friendly manufacturing processes that are key determinants of making a firm green (Ur Rashid et al., 2019). Therefore, based on the objective of the study, the following main hypothesis were developed to measure this relationship:

H2: There is a significant positive relationship between GM and SP.
The **H2.** Hypothesis is divided into sub-hypotheses based on the GM variables:

- **H2.1:** Green product has a significant positive relationship with SP

- **H2.2:** GM channels has a significant positive relationship with SP.
- **H2.3:** GM communication has a significant positive relationship with SP.
- **H2.4:** Green pricing has a significant positive relationship with SP.

1.6. The Moderating Role of GM on the GSCM-SP Relationship:

GM have an important role by formulating useful marketing strategies that will lead to creating income and result in the satisfaction of an enterprise or economic company and fulfillment of objectives related to social or environment performance (Parast, 2013). GM equally contributes to enhance the economic, social, and environmental performance of organizations (Liao et al., 2020; Thevanes & Weerasinghe, 2019). Liao et al. (2020) examined the moderating effects of GM and green psychological benefits on customers' green attitude, value, and purchase intention. There findings revealed that GM and green psychological moderate the relationships between customer value, attitude towards the green product, and green purchase intention. Ghosh (2019) confirmed a positive impact of green procurement implementation on firm performance. According to Shabbir et al. (2020) key factors of GM, environmental concerns and beliefs have a significant positive influence on consumer beliefs towards the environment in the UAE. Moreover, consumers' environmental concern, green perceived benefits, green awareness of price, green willingness to purchase, and future estimation of GM have a strong positive influence on consumer' green purchase decision (Nekmahmud & Fekete-Farkas, 2020). Additionally, it was assumed that the GM plays a moderating effect through which GSCM indirectly may affect the organizational performance (Zampese, et al., 2016). Therefore, GM may play an important role in enhancing the relationship between GSCM and SP. Therefore, based on the objective of the study, the following main hypothesis were developed to measure this relationship:

H3: There is a significant moderating impact of the GM over the GSCM-SP relationship.
The **H3.** Hypothesis is divided into sub-hypotheses based on the GM variables:

- **H3.1:** Green product has a significant positive moderating impact on the GSCM and SP relationship.
- **H3.2:** Green marketing channels has a significant positive moderating impact on the GSCM and SP relationship.
- **H3.3**: Green marketing communication has a significant positive moderating impact on the GSCM and SP relationship.
- **H3.4:** Green pricing has a significant positive moderating impact on the GSCM and SP relationship.

1.7. Jordanian Food Manufacturing Firms:

The production of food products focuses on providing the necessary quantities at the right level of quality and complying with the basic ecological requirements of the raw materials and their outputs, and protecting the environment for future generations (Ruscheva, 2019). The General Food Law aims at ensuring a high level of protection of human life, animal health and welfare, plant health, and the environment (Ruwaard & Nunen, 2006). The food industry in Jordan has various sub-sectors, such as the processing, preserving of meat and its product, manufacture of dairy products, canned goods, manufacture of soft drinks, and manufacture of vegetable oils and animal oils and fats (Hundaileh & Fayad, 2019; Fileccia et al., 2015). According to the Jordan Chamber of Industry (JCI), the Jordanian food sector with more than 541 establishments and 41,438 employees, accounts for 52% of the local market share; 15% of the total number of the industrial facilities; with more than JD557.6 million food exports during the 2020 (JCI, 2021). The volume of the existing production exceeds JD4.5 billion, which constitutes about a quarter of the total industrial production in the country and contributes about 6% to the gross domestic product (GDP) (Anani, 2020). Food companies willing to achieve high environmental performance must assist their suppliers in improving their environmental performance (Al-Zu'bi et al., 2015). GSCM, SP, and GM are crucial issues for the food industry in general and the Jordanian case specifically. Therefore, studying these aspects in this context is an issue.

2. Framework and Research model

Based on the theoretical background and literature studies, the following Model have been built (Figure 1).

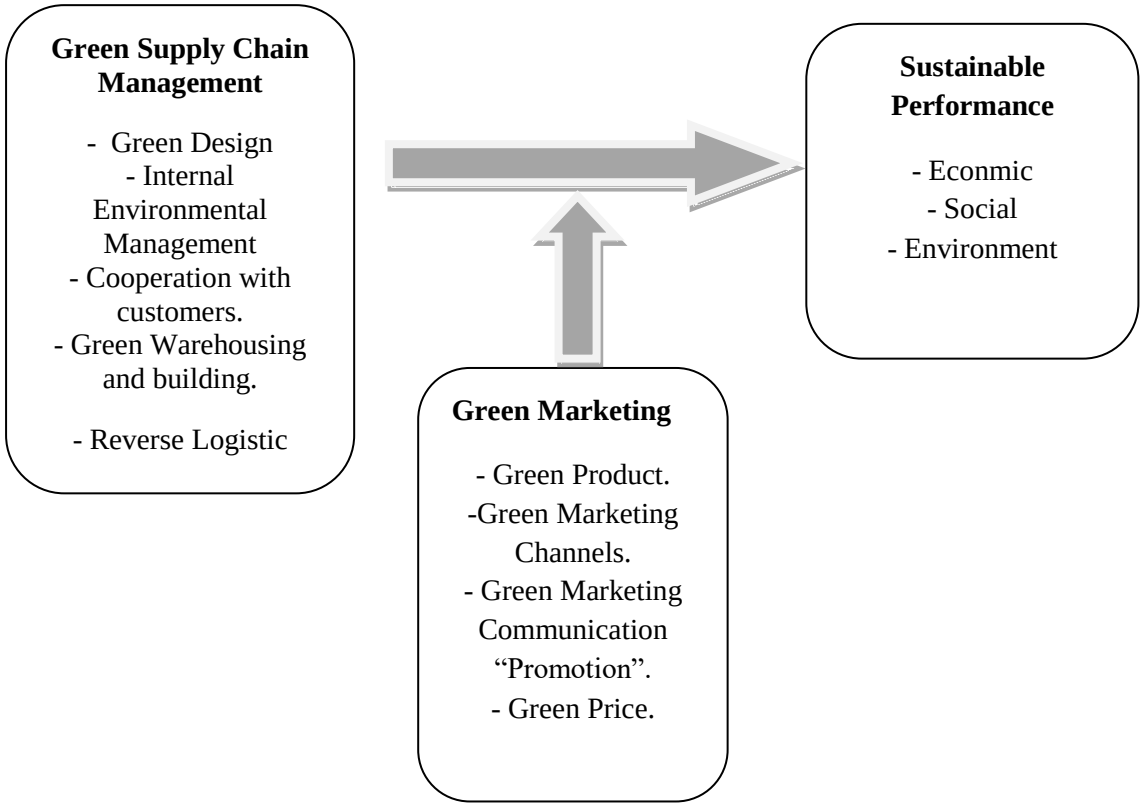

Figure 1. Kutatási model és hipotézisek
Figure 1: Research Model and Hypotheses
Source: Own editing by researchers

3. Research Methodology

To test the research hypotheses and answer its questions, this study relies on the descriptive-analytical approach. Both, primary and secondary data were collected to develop the hypotheses. The primary data collection was gathered from a (9) Jordanian food firms using a questionnaire in 2019. The regional nature of this research was mostly focused on collecting data from Amman, not only because all of those companies were located in Amman "The capital", but also because manufacturing is concentrated around Amman, food, clothing, and a variety of consumer goods companies are located in Amman. As for the secondary data it was generated using existing data like books, Government publications, websites, books, journal articles, internal records etc. and it was used to have a clear awareness about the best data source and method of analysis, and to develop the research questions. Then, the analytical approach was used to develop the data collection tool, select the sample, collect, and analyze the data using the SPSS software. Finally, results analysis and discussion have been used to reach conclusions and suggest some relevant recommendations.

3.1. Study Population and Sample

This research aimed to conduct a comprehensive study taken all the population firms. But, due to cooperation constraints, COVID-19 lockdowns, and the specialty of the topic (Green practices) that are not implemented among most of the food firms; a list of (9) Jordanian food firms have been identified and conducted, and managers related to operations, marketing, and SCM areas were the sample pool. These firms have been selected as they were compatible with the research questions and model in terms of understanding and implementing GSCM, GM, and SP concepts. The sampling process includes SC, production, marketing, and operations mangers who oversaw GSCM activities such as planning, production, procurement, purchasing, warehousing, and transportation. Those managers are expected to be the mostly knowledgeable about the GSCM activities, GM and SP. additionally, they are expected to have the needed knowledge about these practices over all the SC members and activities. Initially, 117 questionnaires out of 150 distributed ones have been collected. Five questionnaires were not valid for statistical analysis. Therefore, only 112 questionnaires were used (at 74.67% response rate). No incentives have been provided to subjects or recruit subjects.

3.2. Study Instrument

This study aims to test hypotheses, describe population's reality, and suggest practical recommendations. Therefore, the survey method was used gather the needed data from the Jordanian food sector. This instrument was developed by adopting several measures form relevant literature. The variables' dimensions were measured on five-point Likert scales with anchors ranging from strongly agree (5) to strongly disagree (1).

3.3. Instrument Validity and Reliability

To determine the integrity of this instrument, we pretested it with five academics and SC professionals to ensure that items were relevant, clear, and not difficult to answer. In addition to the face validity, we conformed the stability of the instrument by distributing it to a pilot sample of (15) participants and later they were excluded. Then, we tested the reliability of the constructs using the average correlation among items in the scale. Table (IV) summarizes the acceptable levels of Cronbach's Alpha values (above 0.70, Ursachi et al., 2015) for the items and scale.

Table 4.: Cronbach alfa eredményei
Table 4.: Cronbach's Alpha Outcomes

DIMENSIONS	NO. ITEMS	CRONBACH'S ALPHA
GREEN DESIGN	**5**	**0.72**
GREEN PURCHASING	**5**	**0.77**
INTERNAL ENVIRONMENTAL MANAGEMENT	**5**	**0.86**
COOPERATION WITH CUSTOMERS	**5**	**0.77**
GREEN WAREHOUSING AND BUILDING	**5**	**0.76**
REVERSE LOGISTIC	**5**	**0.74**
GSCM AS A WHOLE	**30**	**0.88**
ENVIRONMENTAL PERFORMANCE	**5**	**0.74**
ECONOMICS PERFORMANCE	**5**	**0.78**
SOCIAL PERFORMANCE	**4**	**0.72**
SUSTAINABLE PERFORMANCE "SP" AS A WHOLE	**14**	**0.82**
GM CHANNELS	**5**	**0.75**
GREEN PRODUCT	**5**	**0.76**

GM COMMUNICATION "PROMOTION"	**5**	**0.80**
GREEN PRICING	**4**	**0.78**
GM AS A WHOLE	**19**	**0.87**

Source: Own editing by researchers

4. Data Analysis & Hypotheses Testing:

Following measure validity and reliability, several descriptive and hypotheses tests have been conducted.

4.1. Descriptive Analysis

Table 5. presents the descriptive statistics of the participants demographic variables consisted of (112) individuals.

Table 5.: A demográfiai változók megoszlása
Table 5.: Demographic Variables Distribution

DEMOGRAPHIC VARIABLES	CATEGORY	FREQUENCY	PERCENTAGE
GENDER	Male	104	%92.9
	Female	8	%7.1
AGE	25- less than 30	0	0
	30 less than 35	12	%10.7
	35 less than 45	36	%32.1
	more than45	64	%57.2
EDUCATION LEVEL	High Diploma or less	4	%3.5
	Master	90	%80.4
	Bachelor	18	%16.1
	PHD	0	%0
JOB TITLE	Production managers	12	%10.7
	Marketing Managers	14	%12.5
	Operation Managers	19	%17.0
	Other SC Managers	67	%59.8
	Total	**112**	**%100.0**

Source: Own editing by researchers

To identify the levels GSCM and GM practices and the SP reality in the food industry, the means and standard deviations were computed. The use of ANOVA in this study supports the rationale for the emphasis of GSCM, Sustainable Performance, and Green Marketing variables. It illustrates that the ranking accurately represents statistically significant variations in the data, hence enhancing the strength and reliability in the research outcomes. The measurement scale was divided into three main levels (1 to 2.33: Low, 2.34 to 3.66 Moderate, and 3.67 to 5 High). Table 6. summarizes these levels.

Table 6.: Zöld ellátási lánc menedzsment, zöld marketing és fenntartható teljesítmény szintjei
Table 6.: Table VI: GSCM, GM, and SP Levels

RANK	#	GSCM DIMENSIONS	MEAN	STD. DEVIATION	DEGREE
1	1	Green Design	4.21	0.43	high
2	2	Green Purchasing	4.19	0.41	high
3	6	Green Warehousing and Building	4.18	0.38	high

4	4	Cooperation with Customers	4.16	0.41	high
5	3	Internal Environmental Management	4.14	0.43	high
6	5	Reverse Logistic	3.96	0.66	high
		TOTAL	**4.14**	**0.30**	**High**
RANK	**#**	**Sustainable Performance Dimensions**	**Mean**	**Std. Deviation**	**Degree**
3	1	Environmental Performance	4.13	0.33	High
2	2	Economics Performance	4.16	0.39	High
1	3	Social Performance	4.23	0.40	High
		TOTAL	**4.17**	**0.30**	**High**
RANK	**#**	**Green Marketing Dimensions**	**Mean**	**Std. Deviation**	**Degree**
2	1	Green product	4.09	0.38	High
1	2	Green Marketing Channels	4.13	0.46	High
3	3	Green Marketing Communication "Promotion"	4.03	0.50	High
4	4	Green Pricing	3.96	0.55	High
		TOTAL	**4.06**	**0.36**	**High**

Source: Own editing by researchers

Hypotheses Testing

Several regression and one-way ANOVA models have been used to test the research hypotheses. First, main hypotheses were tested using ANOVA analysis. Then, sub-hypotheses have been tested using regression model. Correlation's matrix was implemented to understand direction and strength of test relations.

4.1.1. Result of Testing the Main Hypotheses

Table 7. summarizes the ANOVA outcomes for the three main hypotheses.

Table 7.: Egyirányú ANOVA eredmények- Fő hipotézisek
Table 7.: One-way ANOVA Outcomes - Main Hypotheses

VARIABLE	MEAN SQUARE	F	SIG.	RESULT
GSCM	0.158	2.633	0.000	Accept
GM	0.161	2.284	0.003	Accept
GSCM*GM	0.098	7.191	0.002	Accept

***** Dependent Variable: Sustainable Performance (SP)
Source: Own editing by researchers

According to Table 7. there are significant relationships between the independent variable (GSCM), moderation variable (GM), and interaction variable (GSCM*GM) with the dependent variable (SP). Therefore, these significant relationships imply that the moderation effect of GM on the GSCM-SP relationship exist. To test the sub-hypotheses under each main one, the following analysis was applied (Table 8.).

Table 8.: Alhipotézisek vizsgálati eredményei
Table 8.: Sub-Hypotheses Testing Outcomes

INDEPENDENT VARIABLE**	T	SIG. T	βETA	R	R^2	F	SIG. F	RESULT
H1.1: GD	4.143	0.000	0.367	0.367	0.135	17.164	0.000	Accept
H1.2: GP	3.269	0.001	0.298	0.298	0.089	10.685	0.001	Accept
H1.3: IEM	4.564	0.000	0.399	0.399	0.159	20.827	0.000	Accept
H1.4: CWC	3.921	0.000	0.350	0.350	0.123	15.374	0.000	Accept
H1.5: RL	1.843	0.068	0.173	0.173	0.030	3.398	0.068	Reject
H1.6: GWB	7.451	0.000	0.579	0.579	0.335	55.512	0.000	Accept
H2.1: GPRD	3.032	0.003	0.278	0.278	0.077	9.194	0.003	Accept
H2.2: GMCH	3.958	0.000	0.353	0.353	0.125	15.668	0.000	Accept
H2.3: GPROM	3.831	0.000	0.343	0.343	0.118	14.673	0.000	Accept
H2.4: GPRIC	5.300	0.000	0.451	0.451	0.203	28.093	0.000	Accept

**Dependent Variable: Sustainable Performance (SP)
Source: Own editing by researchers

Finally, to have a better understanding about the aggregate moderating impact of GM on GSCM-SP relationship, the Hierarchal Linear Regression Test has been applied. Table 9. summarizes the outcomes of this test.

Table 9.: A hierarchikus lineáris regressziós eredmények
Table 9.: The Hierarchal Linear Regression Outcomes

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.520[a]	.270	.264	.25889	.270	40.717	1	110	.000
2	.540[b]	.292	.279	.25624	.021	3.290	1	109	.072

Source: Own editing by researchers

Model 1 summarize the impact of GSCM practice on the SP variables, while Model 2 summarizes the impact of introducing the GM as a moderating variable. According to the (R) and (R^2) values, there is a positive weak non-significant moderating impact of GM over the GSCM-SP relationship. These

results are supported by (Al-Majali & Tarabieh, 2020; Al-Khawaldah & Al Shoura, 2018) studies that suggest a direct relationship between GM and customer behavior and firms' effectiveness.

5. Discussion

This study aimed to analyze the GSCM, GM, and SP relationships in the Jordanian food industry. Moreover, it aimed to test the moderating impact of the GM on the GSCM-SP relationship. Several statistical tests have been used to achieve these aims. In terms of the descriptive statistics (Tables V & VI), the Jordanian food manufacturing firms have a high implementation of the GSCM practices, which is consistent with Diab et al., (2015); Al-Ghwayeen & Abdallah (2018); Al-Zu'bi et al. (2015) studies. Moreover, these results are consistent with Choi et al. (2018) that suggested competitive pressure encourages firms to adopt GSCM practices. These results also indicated that all GSCM Dimensions (except RL) have a positive relationship and were statistically significant with SP variables. These results are consistent with the Despoudi (2021), Sarwar et al. (2021), Diab et al., (2015), Al-Zu'bi et al. (2015) and Rao & Holt, (2005) studies that found a positive impact of the GSCM practices on the SP. Especially Despoudi (2021) that conducted on the food industry. But this result is inconsistent with Younis et al. (2016) study that did not found any impact of the independent variables on sustainable performance, and Kazancoglu et al. (2021) study that analyze the RL performance in the food SC. To elaborate more about GSCM dimensions; GD have a positive impact on the SP, especially ECO and SOC performance. This result is consistent with Wakulele et al., (2016) and Diab et al. (2015). The GP factor have a positive impact over all SP variables. This result is consistent with Sarwar et al. (2021) and Diab et al. (2015). But it is inconsistent with Çankaya & Sezen (2018). The IEM factor have a positive impact over all the SP variables. This result is consistent with Sarwar et al. (2021), Çankaya & Sezen (2018), and Diab et al. (2015). The CWC factor have a positive impact with all the SP variables, which was consistent with (Pakurar et al., 2020) and Diab et al. (2015). The most influential factor that impact all the SP variables is GWB. This result is consistent with (Diab et al., 2015). Finally, RL did not have a positive relationship with Sustainable performance, which was consistent with (Sundram et al., 2017) study and inconsistent with Kazancoglu et al. (2021). These some inconsistent results highlight the importance of these topics (GSCM, GM, and SP) in general and for food sector. More research is needed to clarify the reality of these relationships worldwide and across regions. So, the result concluded that while the GSCM practices have an aggregate positive impact relationship on the SP variables, individual practices are not the same. GSCM practices did not impact the SP variables equal, and it is not clear enough to identify how each practice was working. Therefore, firms need to be careful when applying the GSCM practices to ensure that the expected positive relationship with SP variables will be obtained. Toopgajank et al., (2019) stated that, regardless the number of studies conducted to investigate different GSCM dimensions, due to its wide applications, it is somewhat difficult to develop an extensive framework that could incorporate all GSCM dimensions together.

The (*R*) correlation values (Table VIII) provide better understanding of the strength and direction of the GSCM relationships with SP variables. All these values were positive but weak ones and range between (0.173 and 0.579). The highest value was between (GWB) and (ECO Performance), while the lowest value was between (RL) and (SOC Performance). Moreover, based on the (Sig. F) values, these relationships were statistically significant for all dimensions except RL (Reverse Logistic). Additionally, the (R^2) coefficient of determination values - which identify the amount of variance in the dependent variable that is explained by the independent variable – were range between (3%- 33.5 %). Due to the weak (*R*) values, all the (R^2) values will be weak too. So, it can be concluded that, all the GSCM dimensions (except Reverse Logistic) have a weak and significant positive impact on the SP variables.

All the GM variables have a positive weak impact on the SP variables. The (*R*) correlation values between the GM and SP variables range between (27.3%- 31.2 %). Moreover, when introducing GM variables to the GSCM-SP relationship, all their (*R)* values have been improved to range between (0.522- 0.559). Therefore, the GM variables have a positive weak moderate impact on the GSCM-SP relationship, which is consistent with Eneizan et al., (2016) study. These results are partially consistent with Liao et al (2020) and Gelderman et al. (2021) studies that support the moderating role of GM variables more.

6. Conclusion

The primary objective of this study identifies the relationship between GSCM, SP and GM in the Jordanian food manufacturing firms, and to test the moderating role of GM on the GSCM-SP relationship. Several implications, research limits and future research opportunities have been identified.

6.1. Theoretical Implications

Several important contributions to the GSCM, GM, and SP literature have been made. The results indicated that almost all GSCM Dimensions have a positive relationship and were statistically significant with SP variables. For GM variables, they have almost the same positive and weak relationship with the SP variables. Finally, the moderating impact of the GM variables on the GSCM-SP relationship is exist, but it is weak and insignificant. These results are consistent with some studies and conflict other. Therefore, this study opens the way for more valuable facts and highlights the importance of such topic to be conducted to fill the literature gaps.

6.2. Managerial Implications

Based on the literature review GSCM practices are directed toward boosting SP, given that GSCM makes chances to minimize greenhouse emissions and solid waste. Therefore, GSCM practices, their relationships with the SP variables are important for all firms. But the impact of these GSCM practices on the SP are not identical and it was not clear enough to identify how each practice was working, so the result concluded that while the total of GSCM practices have a positive impact relationship on SP, mangers need to be more careful when connecting these variables together.

6.3. Study Limitations and Future Research

In terms of limitations and in line with recent GSCM and GM research, this study takes the case of the Jordanian food sector. Therefore, the sector size, Jordan economy, and the state of COVID-19 lockdowns are the main study limitations. Additionally, the limited number of ‘green’ firms and the low level of firms’ cooperation are among these limitations, as some firms refused to participate in the survey, maybe it can be because of the time constraints, or for privacy concerns. This study concludes that GSCM-SP relationship and the moderating role of the GM on this relationship have not been understood well due to some inconsistences among relevant studies. Therefore, more research is needed to participate is solving this issue.

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