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MIDDLE EAST UNIVERSITY
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Impact of Green Supply Chain on Competitive Advantages of Jordanian Pharmaceutical Manufacturing Organizations

أثر سلسلة التوريد الخضراء على الميزات التنافسية في الشركات الاردنية للصناعة الدوائية

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Authorization

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This thesis has been prepared with the utmost care and deep routed.

Nada Mahmoud Almokdad

Dedication

words cannot express my gratitude and thanks to my lovely family, friends, and everyone who were a source of inspiration, who always provide me with support, love and strength.

Nada Mahmoud Almokdad

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Impact of Green Supply Chain on Competitive Advantages of Jordanian Pharmaceutical Manufacturing Organizations

Prepared by:
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Abstract

Purpose: The purpose of the study is to investigate how a green supply chain (green purchasing, green operation, and green selling) can impact competitive advantages in Jordanian pharmaceutical manufacturing organizations.

Design/Methodology/Approach: The survey unit of analysis is composed of 130 out of 285 managers, who are working at the Pharmaceutical Manufacturing Organizations and were available at the time of distributing the questionnaires. The normality, validity, and reliability of the study tool were confirmed, then a descriptive analysis was carried out, then the correlation between variables was calculated. Finally, t the impact of Green Supply Chain through multiple regressions was tested.

Findings: The result of the study shows that the Green Supply Chain has a positive impact on the competitive advantages of the Jordanian pharmaceutical manufacturing organizations. As well as, the study indicates that there is a medium impact of Green Supply Chain sub-variables on Competitive Advantages dimensions. The study shows that there is a positive impact of Green Supply Chain on the Competitive Advantages of Jordanian Pharmaceutical Manufacturing organizations, where Green Operations has the highest impact on Competitive Advantage, then Green Purchasing and Green Selling respectively.

Recommendations: The study recommends that the Jordanian Pharmaceutical Manufacturing Organizations have to integrate Green Supply Chain into the strategic plans of Supply Chain management.

Practical and Managerial Implications: Implementing the Green Supply Chain in the Jordanian pharmaceutical organizations proved to increase the competitive advantage. Therefore, integrating Green Supply Chain within the strategies of Supply Chain Management will enhance the Competitive Advantages.

Keywords: Green Supply Chain, Competitive Advantages, Jordanian Pharmaceuticals Manufacturing Organizations.

أثر سلسلة التوريد الخضراء على الميزات التنافسية في الشركات الاردنية للصناعة الدوائية

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الملخص

الغرض: تهدف هذه الدراسة إلى استكشاف وقياس أثر سلسلة التوريد الخضراء (الشراء الأخضر، التشغيل الأخضر، البيع الأخضر) على الميزات التنافسية في الصناعة الدوائية للمنظمات الاردنية.

التصميم / الإجراءات: تتكون عينة الدراسة من 130 من أصل 285 مديرًا ومشرفًا يعملون في صناعة المستحضرات الصيدلانية والذين كانوا متواجدين وقت توزيع الاستبيانات. تم التأكد من التوزيع للاستبانات وصدق وثبات أداة الدراسة، ثم قام الباحث بإجراء تحليل وصفي والتحقق من العلاقة والارتباط بين المتغيرات. وفي النهاية اختبار تأثير سلسلة التوريد الخضراء من خلال الانحدار المتعدد.

النتائج: أظهرت نتيجة الدراسة أن سلسلة التوريد الخضراء لها تأثير قوي وإيجابي على الميزة التنافسية في الصناعة الدوائية للمنظمات الأردنية. كما تشير نتائج الدراسة إلى وجود أثر إيجابي ذو دلالة إحصائية بدرجة متوسطة لسلسلة التوريد الخضراء والميزة التنافسية في الصناعة الدوائية للمنظمات الأردنية؛ حيث كان الأثر الأكبر للتشغيل الأخضر ثم الشراء الخضراء ومن ثم البيع الأخضر.

التوصيات: توصي هذه الدراسة شركات صناعة الادوية للمنظمات الأردنية بدمج سلسلة التوريد الخضراء في الخطط الاستراتيجية لإدارة سلسلة التوريد.

التطبيقات العملية والإدارية: أثبت العديد من الدراسات أن لتطبيق سلسلة التوريد الخضراء في الصناعة الدوائية للمنظمات الأردنية أثر إيجابي في تعزيز الميزة التنافسية ولذلك فإنّ دمج سلسلة التوريد الخضراء في استراتيجيات إدارة سلسلة التوريد سيعزز الميزات التنافسية.

الكلمات المفتاحية: سلسلة التوريد الخضراء، الميزات التنافسية، الشركات الأردنية للصناعة الدوائية

CHAPTER ONE

Introduction

1.1 Background:

Through the last decades, the environmental requirements have changed which need to balance between environmental issues and safety performance that lead to a quantum leap for the supply chain and converting the traditional one to be more green (Green Supply Chain) is one of the most important demand. As a result, the green supply chain concept appeared in the late 1990s. It consists of purchasing, operation, and selling functions with green characteristics innovations in each step, which make value creation through the whole supply chain. Competitive strategies through differentiation, cost leadership, and responsiveness make the supply chain more beneficial and reducing the negative effect on the environment, therefore, enhance the impression of local pharmaceutical production.

The same is true for the pharmaceutical industries, which have a sharp rise of pollution when medication and other chemicals are disposed of in sewage effluent or other harmful ways, so green supply chain kills two enemies with one bullet; the environmental pollution through the supply chains as well as their risks.

Van Hoek (1999) observed the companies which have adopted the green supply chain management to decrease ecological risks and increase environmental efficiency, hence market share expands. Srivastava (2007) stressed that green supply chain management can be described as the pursuit of improving the performance of the environment over the supply chain. Rao (2008) defines eco-design as the concept of an ecological program, that is associated with environmental safety and health during the

product's life cycle, in order to enhance the performance and the competitive advantage. Gopal and Thakkar (2012) detected that the practices of green supply chain management in healthcare enclose all efforts performed to make sure about the environmental confirmation of their services, which stipulated ecological requirements. Xie and Breen (2012) observed that environmental practices need entire participation and collaboration cross-sector from participants. Deshmukh and Vasudevan (2014) illustrated that the inconstant environmental requirements impact manufacturing operations and increase attention to develop effective environmental management strategies for the supply chain. Deshmukh and Vasudevan (2016) presented that the concept of supply chain management is becoming more complex and competitive. In this condition, it has become very important to analyze the whole life cycle effect on all processes and products and to be included with the product recovery mechanism as well. Sharabati (2018) noticed the organization's performance at local and international levels, which is responsible for support society, economy, and the environment will do better.

Rao and Holt (2005) balanced that the outbound part of the green supply chain during all processes (green marketing, environment-friendly packaging, and distribution) initiates the link between improvement of green supply chain performance and promotion of the competitiveness of the organization. KIOKO (2015) mentioned that green supply chain management usages help in the differentiation of products by positioning themselves in the customers' perception as environmentally friendly, then gaining reputation and strengthening the brand image in the market, which leads to increase competitiveness and competitive advantages. Tan and Shaharudin (2016) the main competitive model can give the best environmental resources and operations comparison

with other conditions, which integrate efficiency throughout the supply chain as the 3Rs concept (reduction, reuse, and recycling).

Hijuzaman, et. al. (2018) observed that the combination of supply chain management and practices of environmental management lead to green supply chain management and competitive advantage achievement by raising the profits and market share. Hartono, et. al. (2018) defines competitive advantage as a set of distinctive features processed by organizations to gain the market. Moreover, the ability or extra value own to produce environmentally responsible products. Jia and Wang (2019) introduced that overall, green supply chain management can increase competitive advantages and bring high performance. As a result, the delivery of products/services satisfy customers and gain their loyalty that will lead to improve the image of the organization and its competitive position.

The implementation of green practices can create an opportunity for the supply chain to enter the global distinctive competitions and accomplish the competitive advantages by enhancing the environmental protection in manufacturing industries. Therefore, this study aims to explore the impact of green supply chain element practices on competitive advantages in pharmaceutical manufacturing organizations.

1.2 Study Purpose and Objectives

The purpose of the current study is to investigate to what extent a green supply chain (Green purchasing, Green operations, and Green selling) can impact the competitive advantages of the Jordanian pharmaceutical manufacturing organizations.

Main Objectives of this Study are:

1. Provide a theoretical framework about the impact of Green Supply Chain on Competitive Advantages that will support academics researches line.
2. Provide sound recommendations to every part in the supply chain to apply environmental requirements to gain new customers' satisfaction, by making a difference in the traditional approaches of the supply chain which leads to expand the market share.
3. Building linkages between green supply chain in the pharmaceutical manufacturing industry by the initiative for environmental improvement and competitive advantages.
4. Increasing the organizations' awareness of environmental requirements by using awareness campaigns.
5. Developing a measurement scale for the present study.

1.3 Study Significance and Importance

There are very few researches addressing the green supply chain practices among Arab countries in general. It can advise the traditional supply chain in the Jordanian pharmaceutical manufacturing industry, in addition to other industries regarding the use of green practices to develop their organizations. The results may be useful for other sectors that have similarities in their targets. Besides the former, it can be a solid ground for other studies in the future.

Therefore, the significance of this thesis is:

1. There are few studies that discuss the impact of the green supply chain on competitive advantages in the Jordanian pharmaceutical manufacturing organizations. Therefore,

this study will have a small contribution to building further studies on the topic that can be used in other industries.

2. The researcher observed that ecologically sustainable practices have received an increasing interest through the firms to promote their application in the supply chain, which has witnessed some harmful activities in its' processes.
3. The results of this study can be used to provide a sound recommendation to pharmaceutical managers on the impact of the green supply chain, therefore, to gain customers by the enhancement of the organization's image, to develop suitable strategies for their organizations, and consider the final result of their practices in terms of competitive advantages.
4. Finally, the current study will add value to libraries to be used as a secondary source of data, as well as to help scholars and practitioners to make a debate about implementing the Green Supply Chain Practices.

1.4 Problem Statement

On one hand, the pharmaceutical manufacturing industry has developed fast, and their pollutants' rate has increased in the environment. On the other hand, the environmental requirements are rising in the last decades which imposing the organizations to improve their practices in the supply chain with green orientation. In addition to that, the result of some interviews of Jordanian pharmaceutical manufacturing industry's managers emphasizes that there is a big challenge to transfer the supply chain to be an environmental one and achieve competitive advantages that need capabilities' enhancement in the supply chain. At the same time, other industries tend to use green supply chain applications to enhance the operations through it, by using abilities that lead

to competitive advantages. Therefore, many studies mentioned the relationship between green supply chain and competitive advantages.

Several large corporations have started to promote, direct and even finance their suppliers to be green in order to address this problem (Rao, 2005). It is considered that managing the green supply chain will build a higher level of competitive advantage based on the resources and competences of companies (Liu, et. al., 2012).

The expansion of the traditional supply chain needs the foundation and implementation of new systems to measure performance. These new systems based on improvement continuously which will allow organizations to be more competitive, and reach sustainable operation and development (Deshmukh and Vasudevan, 2014). Scaling organizations based on their abilities to create a strategic green supply chain that can help practitioners manage their environmentally conscious initiatives strategically to achieve more competitive advantages (Masoumik, et. al., 2014). Decreasing the environmental effects in the practices of green procurement needs the organization to implement an evaluation of the products' environmental results in each level of their lifecycle. In other words, to take into consideration the costs during the supply chain processes and the way used to dispose of the products (Kioko, 2015). The government should make an operating environment in green supply chains for participants by rising exchanges between supply chain, between companies participating in the supply chain, and between local and foreign companies (Khuyen, et. al., 2017).

Finally, managers need to find a way to align their supply chain practices to be greener so as to achieve competitive advantages and to have an effective role in the business market.

Problem Questions

1. The current study is devoted to answer the following main question:

Do Green Supply Chain practice elements (Green purchasing, Green operations, and Green selling) impact competitive advantages elements of the Jordanian pharmaceutical manufacturing organizations?

Based on green supply chain elements the main question is divided into the following sub-questions:

2. Does Green purchasing impact the competitive advantages of the Jordanian pharmaceutical manufacturing organizations?

3. Does Green operation impact the competitive advantages of the Jordanian pharmaceutical manufacturing organizations?

4. Does Green selling impact competitive advantages of the Jordanian pharmaceutical manufacturing organizations?

1.5 Study Hypothesis

The above questions will be answered by testing the following hypothesis:

Sub-Hypothesis:

H_0: Green Supply Chain practices elements (Green purchasing, Green operations, and Green selling) do not impact competitive advantages elements of the pharmaceutical manufacturing organizations, at ($\alpha \leq 0.05$).

Based on green supply chain components the main hypothesis can be divided into the following main hypotheses:

H_{01}: Green purchasing does not impact the competitive advantage of the Jordanian pharmaceutical manufacturing organizations, at ($\alpha \leq 0.05$).

H_{02}: Green operation does not impact competitive advantage of the Jordanian pharmaceutical manufacturing organizations, at ($\alpha \leq 0.05$).

H_{03}: Green selling does not impact the competitive advantage of the Jordanian pharmaceutical manufacturing organizations, at ($\alpha \leq 0.05$).

1.6 Study Model

Based on the problem statement and its questions, the following model has been developed to study the impact of the green supply chain as an independent variable on competitive advantages of the pharmaceutical manufacturing organizations as the dependent variable, as shown in the model below (Figure 1).

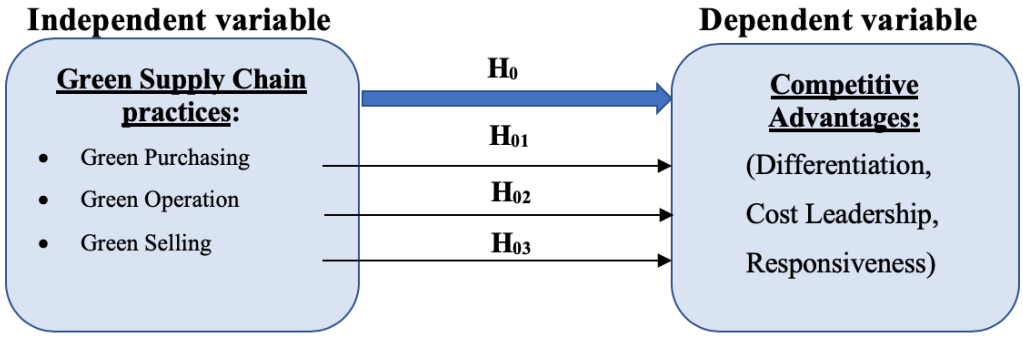

Figure 0(1.1): study model

Sources: This model proposed based on the following previous studies: Independent variable: (Rao and Holt, 2005; Xie and Breen, 2012; Lee, et. al., 2012; Chan, et.al., 2012; Kioko, 2015; Tan, et. al., 2016; Famiyeh, et.al., 2018; and Jia and Wang, 2019). Dependent variable: (Porter, 2008; Lee, et. al., 2012; Kioko 2015; Azizi, et. al., 2016; Tan, et. al., 2016; Famiyeh, et.al., 2018; and Jia and Wang, 2019).

1.7 Conceptual Definitions of Terms

Green Supply Chain: is the application of environmental management principles to the entire set of activities across the supply chain which includes sustainable design, procurement, manufacturing, packaging, selling and distribution. In this study, the green supply chain includes green purchasing, green operations, and green selling.

Green Purchasing: is the procurement of products' ingredients and raw materials that have a reduced effect on the environment. Along with collecting data about the suppliers who consider environmental standards to maximize value-added of sustainable (green) products.

Green Operation: is the environmental executions in operations that use good manufacturing practices standards to produce products and to reduce the manufacturing's waste, pollutions, and recyclable products.

Green Selling: is the outbound process that includes environmental awareness, ecofriendly packaging, green marketing activities, and adoption of suitable prices of green products.

Competitive Advantages: that is organizations' capabilities, which deliver valuable position comparison to competitors. In this study, competitive advantages consist of differentiation, cost leadership, and responsiveness.

Differentiation: is the company's ability to improve products' quality with innovative design and creative features, by using both flexible production program and long partnership with reliable suppliers.

Cost Leadership: is the company's ability to use processes as decreasing the cost of activities, design technique, and delivery system. In addition to utilizing available resources and using online promotion campaigns to achieve a lower cost.

Responsiveness: is the ability of responding quickly to the market inconstancies and being capable of delivering goods accurately on time when compared to competitors, by keeping suitable inventory along with providing online customers services.

1.8 Study Limitations and Delimitations

Limitations:

Human Limitation: This study was carried out on managers of the Jordanian pharmaceutical manufacturing organizations.

Place Limitation: This study carried out on the Jordanian Pharmaceutical Manufacturing organizations located in Amman-Jordan.

Time Limitation: This study was carried out within the period between the second semester of 2019 and the first semester of 2020.

Study Delimitation:

This study aims to investigate the impact of the green supply chain on competitive advantages in Jordanian pharmaceutical manufacturing organizations. Generalizing its results on other industries and/or countries is questionable, so this study is limited for the pharmaceutical manufacturing organizations. The study tried to cover the main dimensions of the green supply chain, but still, there are many other dimensions not used.

Limitations on data access refer to the fact that data collection is regulated by questionnaires for these questionnaires period, which may restrict the quality and quantity of data collection.

CHAPTER TWO

Theoretical and Conceptual Framework and Literature Review

2.1 Introduction

This chapter includes variables definitions of green supply chain and competitive advantages, the relationship between the variables, previous models, previous studies and finally what differentiates this study from previous studies.

2.2 Definitions and Components of Independent Variable (Green Supply Chain):

Green Supply Chain: green supply chain management is sustainable strategic management, which develops the organizations in rivalry workplace with a new innovative process so as to stimulate the financial and environmental advantages, besides, to decrease the risks and impact on the environment (Van Hoek, 1999). Adding the "green" element to supply chain which discusses the natural environment's effect and supply chain management relationships that GSCM consists as Green Purchasing, Green Manufacturing Management, Green Marketing, and Reverse Logistics. (Hervani et. al., 2005). The integration between supply chain with environmental thinking leads to green supply chain management, which consists of selected materials and their resources, designing of the products, processes of manufacturing, distribution, delivering to customers, and managing the end of the products' life (Srivastava, 2007). The green supply chain has roots in both environmental management and Supply Chain Management, by adding a green characteristic to the supply chain which includes handling the impact and the relationships between the environment and supply chain (Martusa, 2013). Adopting the green supply chain reduces environmental degradation,

costs of operations, and increasing the base of customers. The main factors of adoption green supply chain are resources, the desirable benefit of economic, government regulations and awareness of the customers (Kioko, 2015). by using green supply chain management, organizations tend to decrease the negative effect on the environment through their practices and eligible manner of the energy and recourses. All that with good quality, performance, and costs (Yahyazadehfar, et. al. 2017).

In summary, the green supply chain is the application of environmental management principles to the entire set of activities across the supply chain, which includes sustainable design, procurement, manufacturing, packaging, selling and distribution. In this study, the green supply chain includes green purchasing, green operations, and green selling.

Green Purchasing: sustainable companies could be responsible for their suppliers ' environmental accountability (Porter and Linde, 1995). Green procurement practices by certifying suppliers as well as purchasing environmentally sound materials and products (Hervani, et. al., 2005). Mix ecological criteria and matters into the decisions of organizational purchasing along with long-term suppliers' relationships so as to transfer an ecological technology and a reduction in both suppliers' operations' cost and waste (Nunes and Bennett, 2008). Green purchasing includes products with special characteristics (Baenasa, et. al., 2010). Green purchasing is facilitating the relationship between organizations and the suppliers to reduce the negative ecological effect as much as possible through the inbound logistics practices, which include an environmental design for purchased products (Zhu, et. al., 2011). Green purchasing can reach the requirements by choosing the supplier, which considers the environmental standards in

raw materials and environmental practices, internal suppliers, organizations' management, and ecological audit (Rostamzadeh, et. al., 2014).

In summary, green purchasing is the procurement of products' ingredients and raw materials, that have a reduced effect on the environment in addition to collecting data about suppliers, who consider environmental standards to maximize value-added of sustainable (green) products.

Green Operations: green operations are remanufacturing and recycling materials into new materials or products with the marketplace value whereas the idea is minimizing the waste of energy, hazardous chemical, and solid wastes (Hervani et. al., 2005). The growth in greenhouse emissions and environmental pollution by corporations has precipitated for organizations' need to reshape the operations of their supply chain to conserve scarce resources (Hervani et. al., 2005). The practices of green operations could be considered as contributive practices to enhance the performance of companies' environmental operations (Nunes and Bennett, 2008). The integration process of 4Rs in production (recycle, remanufacture, reuse and reduction) makes a good performance in the economic, environmental and social levels by reducing waste and increasing efficiency (Nunes and Bennett, 2008). Recycling, last longer, saved much money through waste management along with minimizing the resources through operations, which results in both saving energy and water, plus decreasing the amount of toxic sources usage (Baenasa, et. al., 2010). The operational activities of green supply chain management have promoted by environmental solutions; as decreasing risks and increasing innovation, enhance adoption, and improving alignment with suppliers to have better outcomes through the processes (Hijuzaman et. al., 2018). Transforming the input to output with

adding value in order to reach customers' demands, that process is an operation in the supply chain (Al-Atrash, 2018).

Finally, the green operations are the environmental executions in operations, which use good manufacturing practices standards to produce products and minimizing the waste of manufacturing, pollutions, and recyclable products.

Green Selling: Legarth (2001) discusses the information technology application on green purchasing, focusing on the communicational information of each step of the supply chain, along with discovering the importance of environmental awareness to the improvement of procurement efficiency. Hsu and Hu (2009) gives a new criterion of hazardous substance management by green coding materials and recording them, green design capabilities, inventory of hazardous substances, and managing them. Zhu, et. al. (2011) shows that the goal of green purchasing is to turn excess assets to incomes by selling them and minimizing storage area through increasing the active production. Zhu, et. al. (2011) describe outbound relationships of organization, which include the production of ecofriendly designs and their packaging to achieve final products with high environmental standards. Jia and Wang (2019) considered factors that a degree of the green marketing system, green consumption that displayed to consumers with standardization Guidance on Environmentally friendly product marketing activities, meeting the customers' demands of green consumption and after-sales service, and timely receipt of consumer feedback.

In summary, green selling is the outbound process that includes environmental awareness, ecofriendly packaging, green marketing activities and adoption of suitable prices of green products.

2.3 Definitions and Components of the Dependent Variable (Competitive Advantages):

Competitive Advantages: Chopra & Meindl (2001) claimed that the Competitive Advantage is the organizational capacity by its products and services to meet the collection of any customer needs to be compared to its offering to competitors. Competitive advantages are the high level of satisfaction achieved by the targeted market through its products and services (Ambe, 2010). Strategies can adapt for gaining a sustainable competitive capability (Goetsch and Davis, 2014). The unique position established by the company compared to its rivals (Al-Hawajreh and Attiany, 2014). Porter's Generic Competitive Strategies are essential to any business worldwide and he describes it as a company attempt to seek its position among competitors in the same industry and/or other industries (Kumlua, 2014). Competitive advantages are described as organizational skills that have been designed to deliver more value to consumers than competitors (Al-atrash, 2018). Competitive advantages give products to customers with high quality and better price, moreover, flexibility in the production of unique products to reach customers' demands and keep the strong position of competitiveness (Jia and Wang, 2019).

In summary, the competitive advantage is the organizations' capabilities that deliver valuable position comparison to competitors. In this study, competitive advantages include differentiation, cost leadership, and responsiveness.

Differentiation: businesses are increasingly dependent on external expertise to produce innovations products, the current and future customers of the business is a significant external source of knowledge regarding green product choice (Von Hipple, 1988). The distinction is achieved by focusing on innovation, and flexible responding to

market changes (Bharadwaj, 1993). Flexibility, knowledge, creativity, and organizational culture are the combination that ensures differentiation to achieve a sustainable competitive advantage (Kotze, 2002). The long term of suppliers' relationship to convey environmental technology and to reduce the waste of suppliers' operations, increases reliability in the relationship (Nunes and Bennett, 2008). Differentiation strategy is a unique offering that can go beyond both physical features and service attributes, to encompass everything that affects the customer's perception of value (Heizer, et. al., 2014). It is a unique feature in the firm's products/services that competitors do not have and bring superior value to customers (Yoo, et. al., 2015). Organizational creativity by introducing and redesigning their processes and features of the products to differentiate itself from rivals (Al-atrash, 2018).

In summary, the differentiation is the company’s ability to improve products' quality with innovative design and creative features, by using flexible production program and long partnership with reliable suppliers.

Cost Leadership: the cost as a competitive advantage when a company provides the same products as the competitors but at lower costs (Ambe, 2010). Cost advantage as the strategy that creates internal capabilities helps to achieve efficiencies and approach lower costs against competitors (Sirmon, et. al., 2011). The cost strategy by competing with other companies is through controlling operating costs along with the processes of the supply chain effectively, including management, transportation costs, and material (Council, 2012). The cost-competitive strategy focuses on a specific customer or regional market and attempts to utilize that niche (Wheelen and Hunger, 2017). The cost as competitive advantages can be defined as the organizational capability to offer a product with the lowest cost in the industry without compromising quality (Al-atrash, 2018).

Finally, the cost leadership is a company's ability to use processes as decreasing the cost of activities, design technique and delivery system. Besides, utilizing available resources and using online promotion campaigns to achieve lower cost.

Responsiveness: the ability of companies to satisfy shareholders and respond quickly to business requirements to gain competitive advantage (Gunasekaran, et. Al., 2008). Responsiveness is the integration of the processes, logistics and distributor functions (Thatte, et. al., 2013). Companies around the world have tried every possible solution to quickly respond to customer demand and rely on suppliers ' reaction time to make volume changes (Al-Hawajreh and Attiany, 2014). Responsiveness is based on two principles, one of these is the flexibility of the company to implement any demand's changes, as quantities or specifications. Secondly, is the speed of the organization to satisfy this demand (Al-Atrash, 2018). In other words, it is the ability to respond quickly to customers and the desire to assist customers and provide prompt services (Alhmarneh, 2019).

In summary, responsiveness is the ability to respond to market changes quickly and deliver goods on time compared to competitors, by keeping suitable inventory and offering online customer services.

2.4 Relationships between Independent and Dependent Variables:

Although an abundant number of research had been reviewed to find the correlation between variables, few studies are directly related to this topic. Consequently, the researcher has combined independent variables from several studies that indicate a possible effect on dependent variables. Properly designed environmental standards can create innovations which in turn would lower the total costs of a product or improve its

value (Porter and van der Linde, 1996). In addition, green supply chain management is a way to minimize the risk of potential losses stemming from poor environmental performance. For example, environmental incidents can intensify regulatory pressures (Reid and Toffel, 2009). To make sustainable competitiveness, several companies have made attempts to incorporate environmental management into their supply chain strategy. The Management of the green supply chain has thus become one of the key competitive elements in the 21st century, particularly for Chinese manufacturing firms (Liu, et. al., 2012). In the case of a single company, the development of a "green" supply chain gives a major competitive advantage in reducing costs to create new opportunities for businesses, more sustainable cooperation with suppliers, and stronger cooperation. Besides, green supply chains would help in changing the orientation of the market to become “greener” at the national level, along with creating incentives for small and medium-sized enterprises in order to implement good practices, so as to enhance environmental protection. (Amemba, 2013). "Greening" will reduce the company’s ecological impacts and maximize its efficiency, by providing a significant source of an innovative manner of the competitive advantages (Meythi and Martusa, 2013). Supply chain management is considered to be the most effective system technique used by contemporary businesses to combine different organizational stages to meet market needs and achieve benefit. However, with the increasing of governmental legislations and the public knowledge of environmental protections, today corporations cannot neglect environmental issues, so they are seeking ways to introduce a green strategy throughout the supply chain (García and Adame, 2013). The alignment of green supply chain management practices and competitive strategies are considered by managers, whereas collaboration relations with suppliers and monitoring the environmental issue is a source of competitive advantage and an important part of competitive strategy of organization

which depends on environmental sustainability and follows their members in the supply chain (Laari, et. al., 2016).

2.5 Previous Models

In the following section, a number of selected literature and models which analyze the sub-variables of green supply chain practices and the relationship with one or more organizational competitive advantages will be briefly discussed.

Chen & Paulraj (2004) Model

Chen & Paulraj (2004) Model presents a framework for supply chain management based on the critical supply chain management elements namely: strategic purchasing, supply management, logistics integration, and supply network coordination. The elements impact was investigated on the supply chain performance: Financial, Operational and Measuring supply chain performance

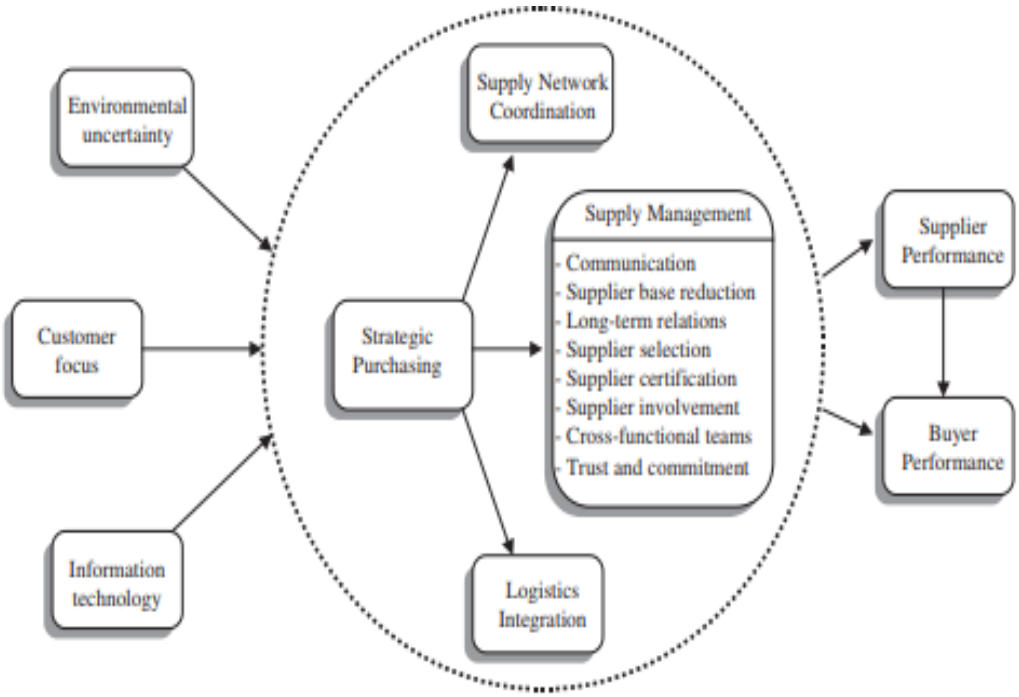

Figure (2.1): Chen & Paulraj (2004) model

Rao and Holt (2005) Model

Rao and Holt (2005) the model establishes the linkage between green supply chain management, competitiveness, and economic performance.

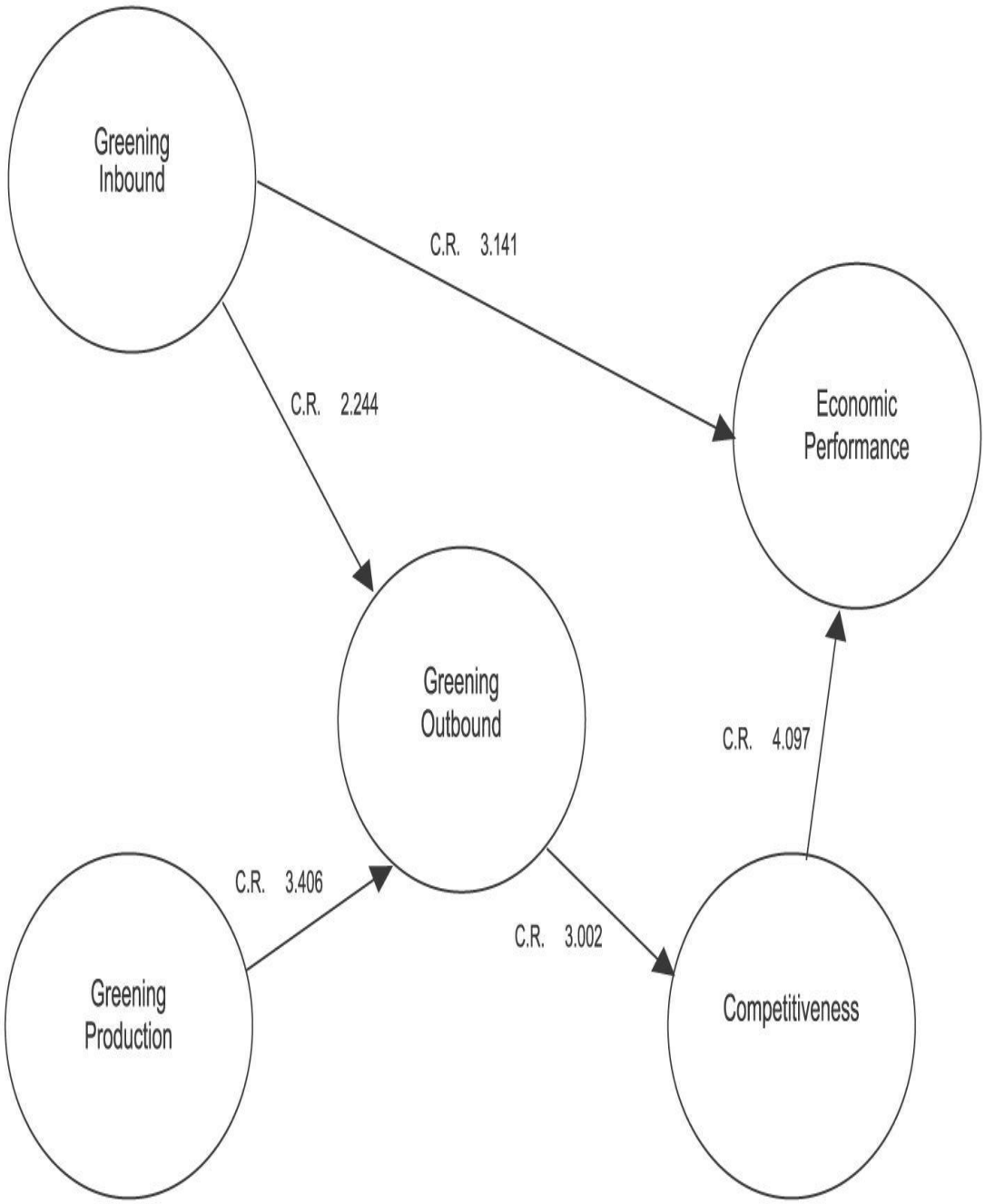

Figure 0(2.2): Rao and Holt (2005) Model

Hervani, et. al. (2005) Model

Hervani et al. (2005) model illustrate that GSCM equation is a graphic equation, where reverse logistics "closes the loop" of a typical forward supply chain including the reuse, reproduction and/or recycling of materials into new materials or other valuable products on the market. Below, figure (2.3) represents the internal supply chain of a single organization, its main organizational components, and the link with external organizations.

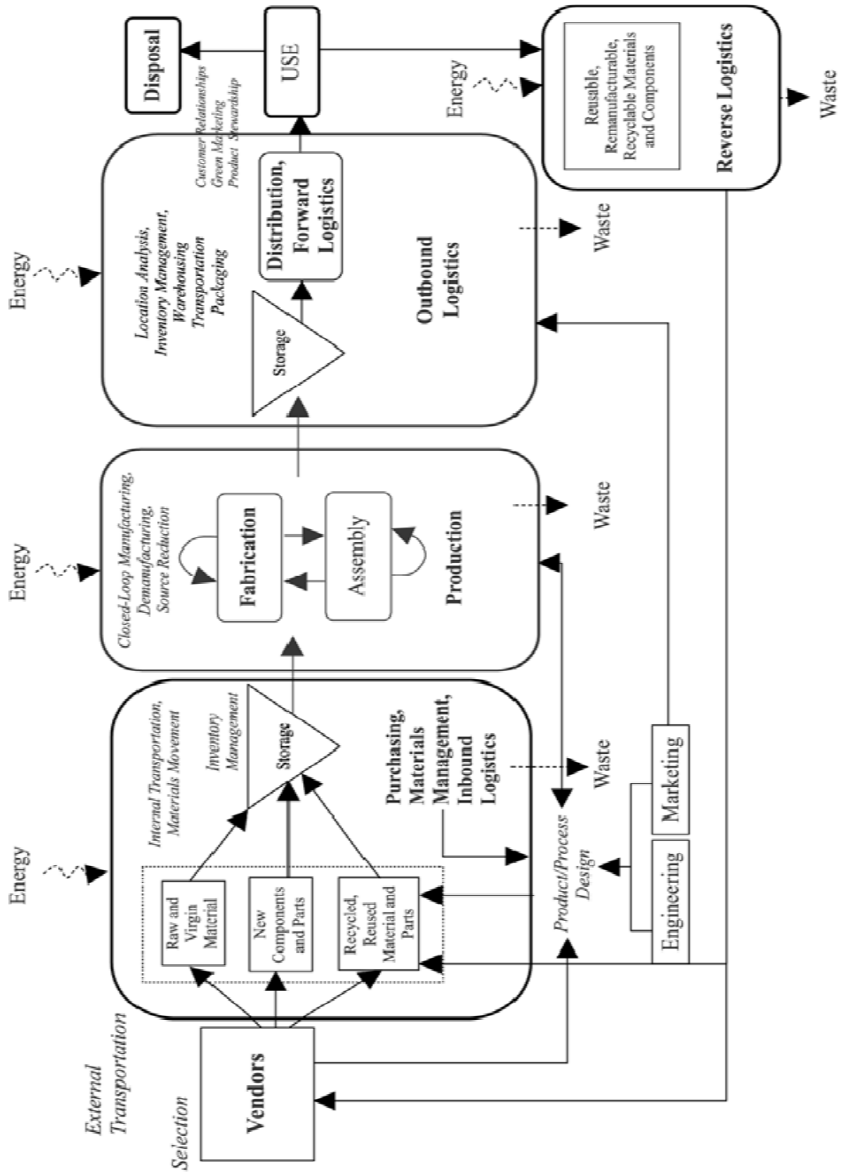

Figure 2. Graph of the GSCM (Hervani et al., 2005)

Figure 0(2.3): Hervani et al. (2005) Model

Srivastava (2007) Model

Srivastava (2007) model shows that classification is intended to facilitate the understanding of various GrSCM problem contexts – their interactions and relationships – to present a clear and well-defined picture for study and research.

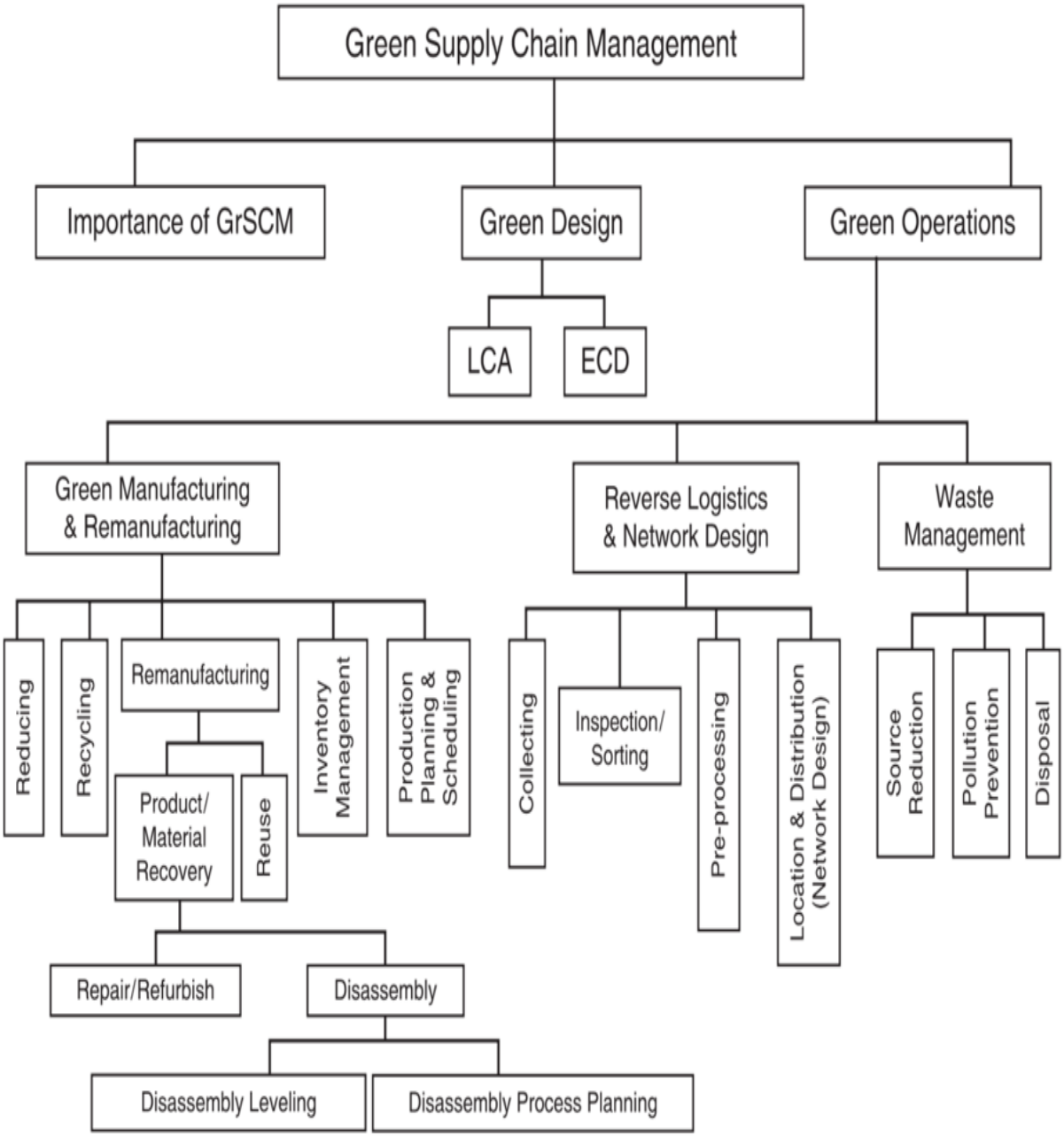

Figure (2.4): Srivastava (2007) Model

Xie and Breen (2012) Model

Xie and Breen (2012) model demonstrate the channels in the pharmaceutical supply chain and logistics, which make the recycling process of medicine easy.

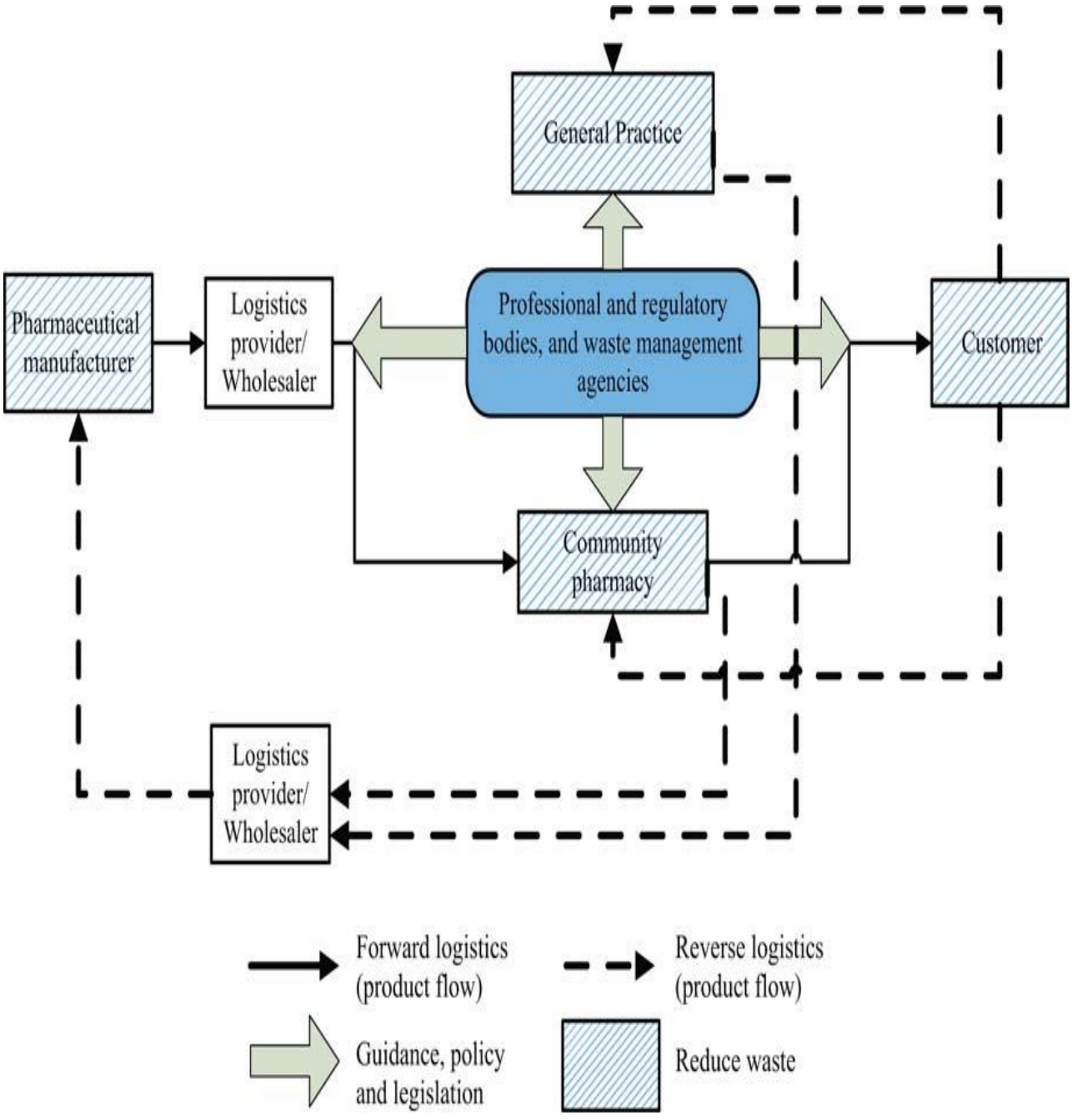

Figure (2.5): Xie and Breen (2012) Model

Lee, et. al. (2012) Model

Lee, et. al. (2012) model presents the results of two main variables, which are management actions of green supply chain and competitive advantage with their dimensions.

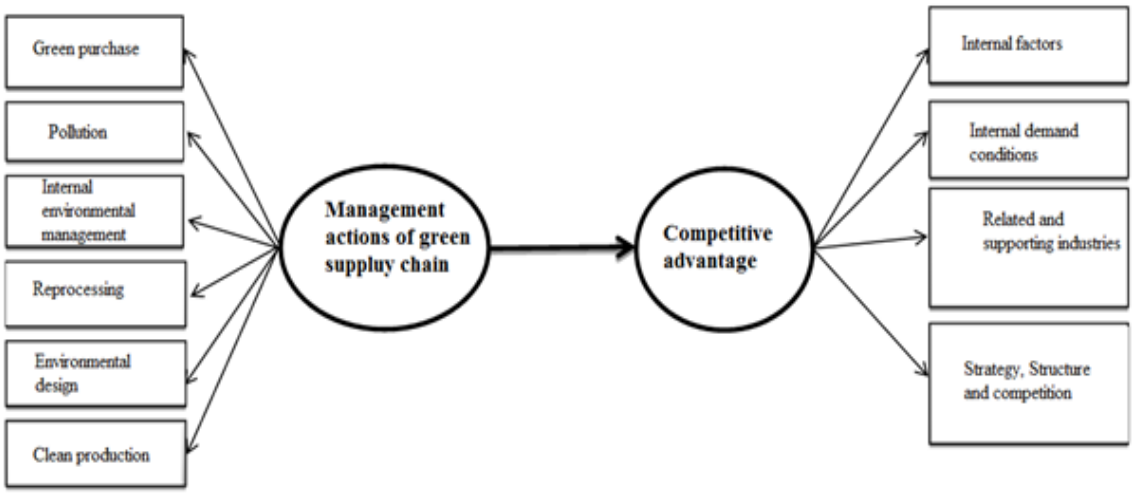

Figure (2.6): Lee, et. al. (2012) Model

Chan, et. al. (2012) Model

Chan, et. al. (2012) model observes the relationships of the environmental orientations in internal and external green supply chain management activities (green purchase, customer cooperation, and investment recovery) and performance of corporate.

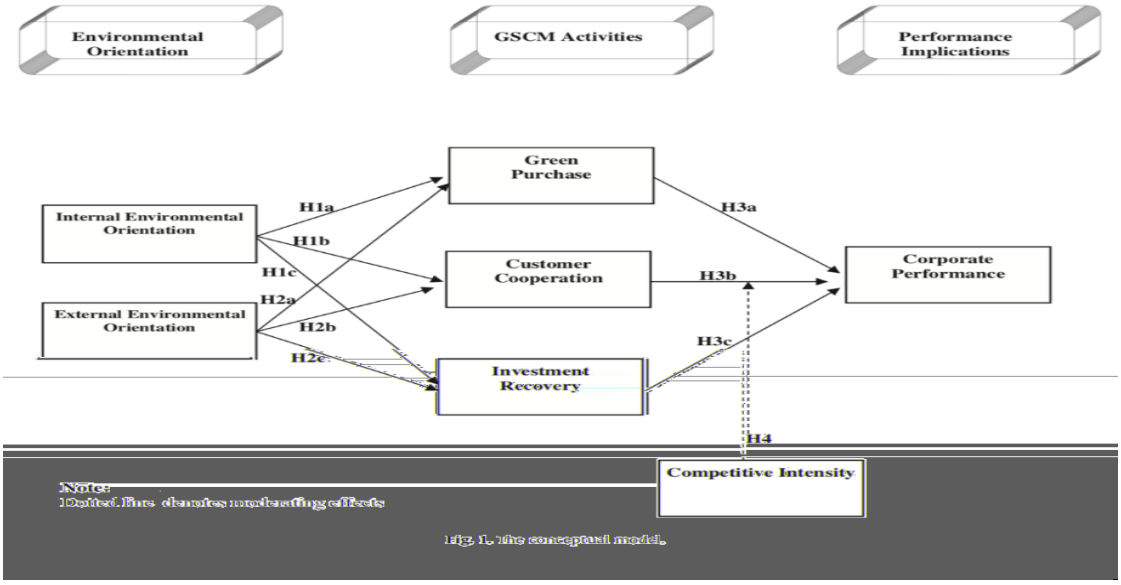

Figure (2.7): Chan, et. al. (2012) Model

Liu, el. al. (2012) Model

Liu, el. al. (2012) model brings to light the relationships between the latent variables in Hypotheses 1–4 which are shown in Fig 1 to summarize the study structure.

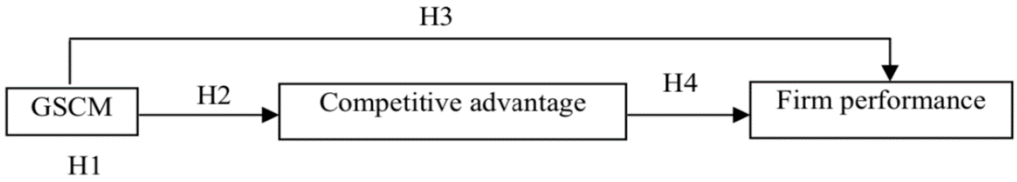

Figure (2.8): Liu, el. al. (2012) Model

Azfar, et. al. (2014) Model

Azfar, et. al. (2014) model proposes a method for measuring the supply chain performance based on the supply chain paradigm of LARG performance (Lean, Agile, Resilient and Green), and the critical performance measuring (Operational Performance, Economic Performance, and Environmental Performance).

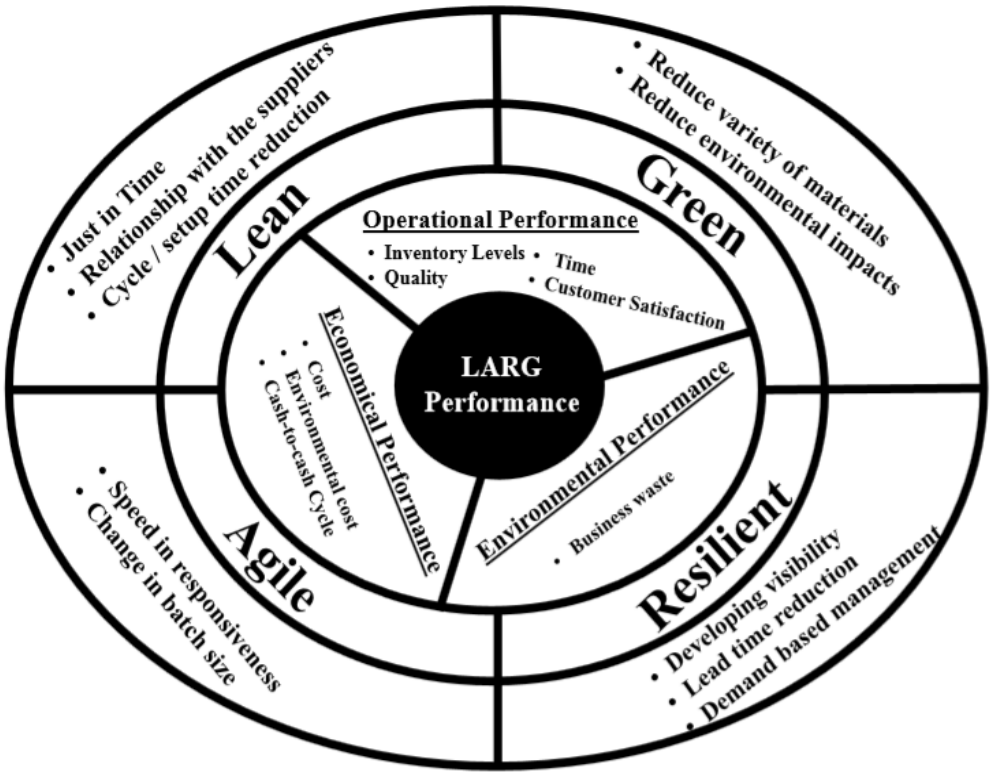

Figure (2.9): Azfar, et. al. (2014) Model

Kioko (2015) Model

Kioko (2015) model studies the relation between two variables, green supply chain practices (green logistics, green procurement, and reverse logistics) with competitiveness and control variables (age and size).

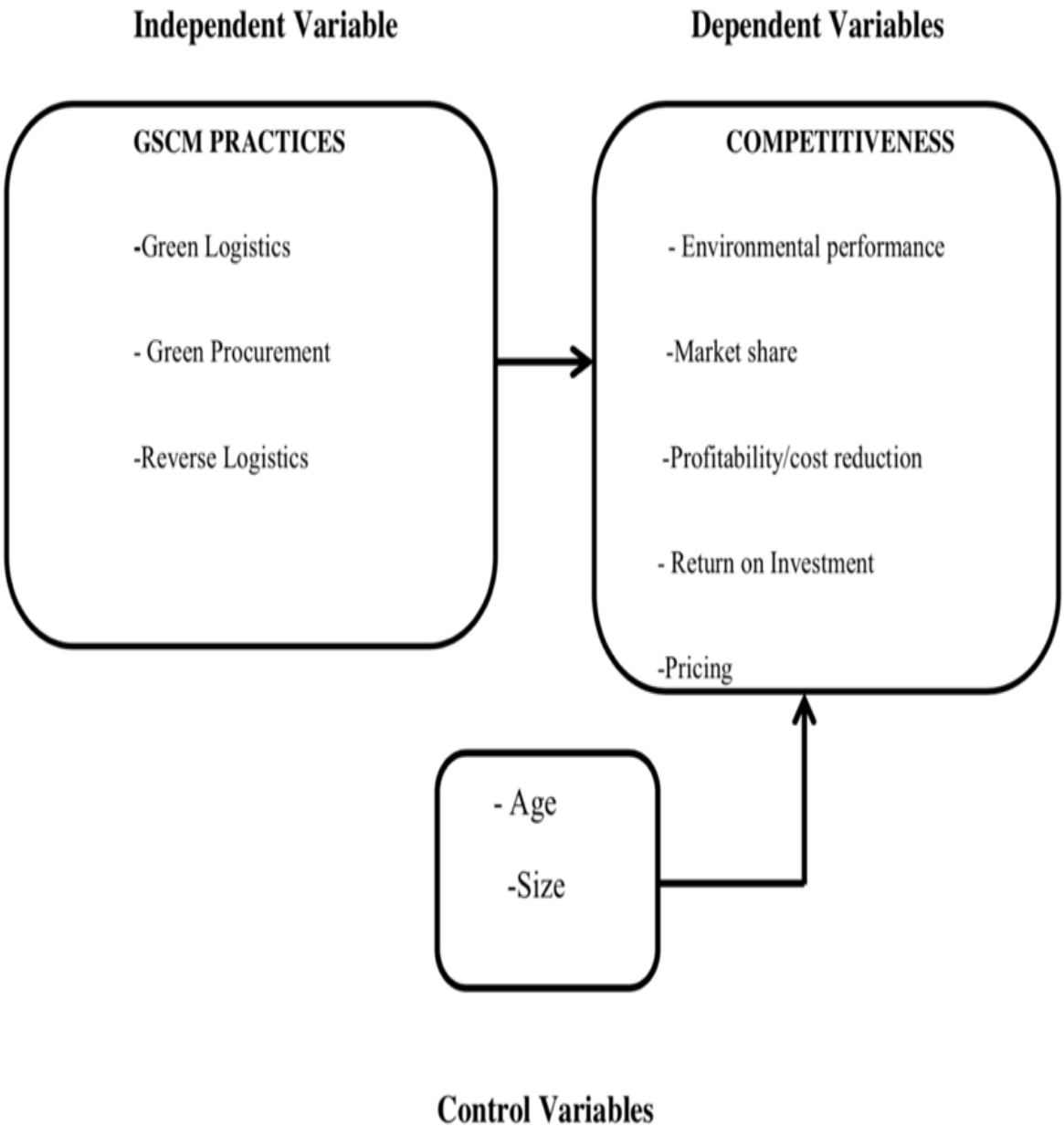

Figure (2.10): Kioko (2015) Model

Khaksar, et. al. (2015) Model

Khaksar, et. al (2015) research stud**ies** the development of the green supply chain management model, which includes competitive advantage in the environments, consumers' requirements, and satisfaction.

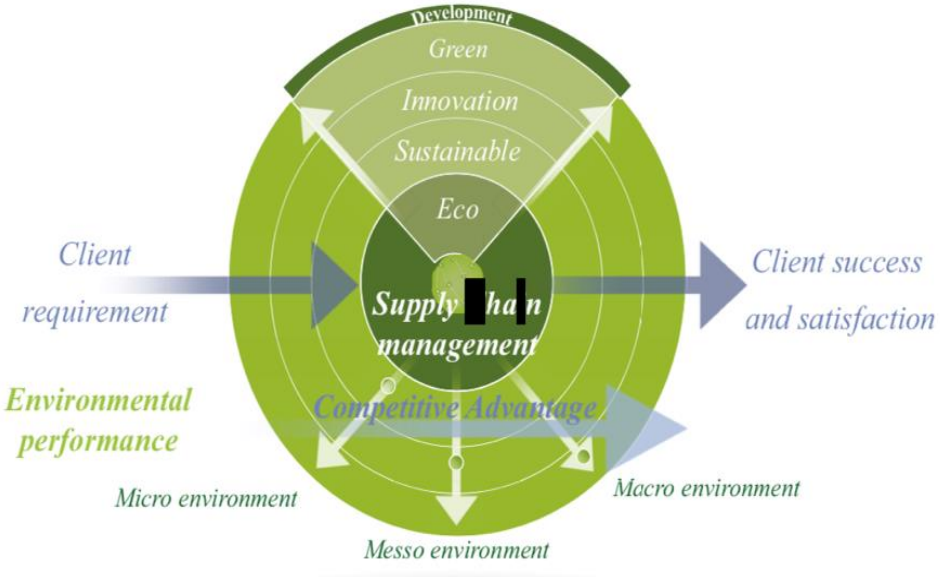

Figure (2.11): Khaksar, et. al. (2015) Model

Azizi, et. al. (2016) Model

Azizi, et. al (2016) model displays the relationship between supply chain quality management, stakeholder relationship management, and competitive advantage.

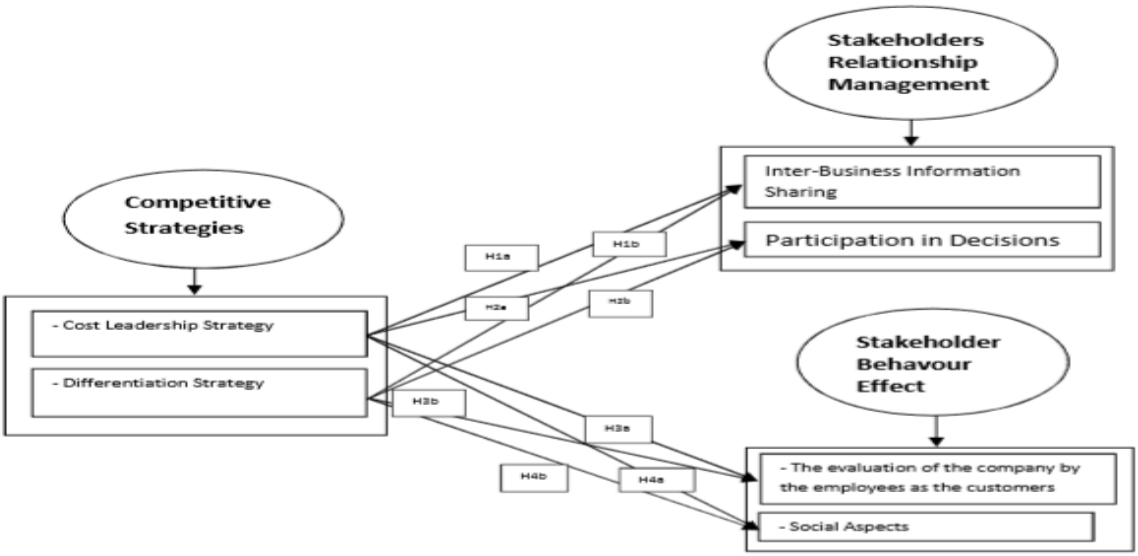

Figure (2.12): Azizi, et. al. (2016) Model

Tan, et. al. (2016) Model

Tan, et. al. (2016) measurement model emphasizes green production, green purchasing, investment recovery, and the impact on firm competitiveness.

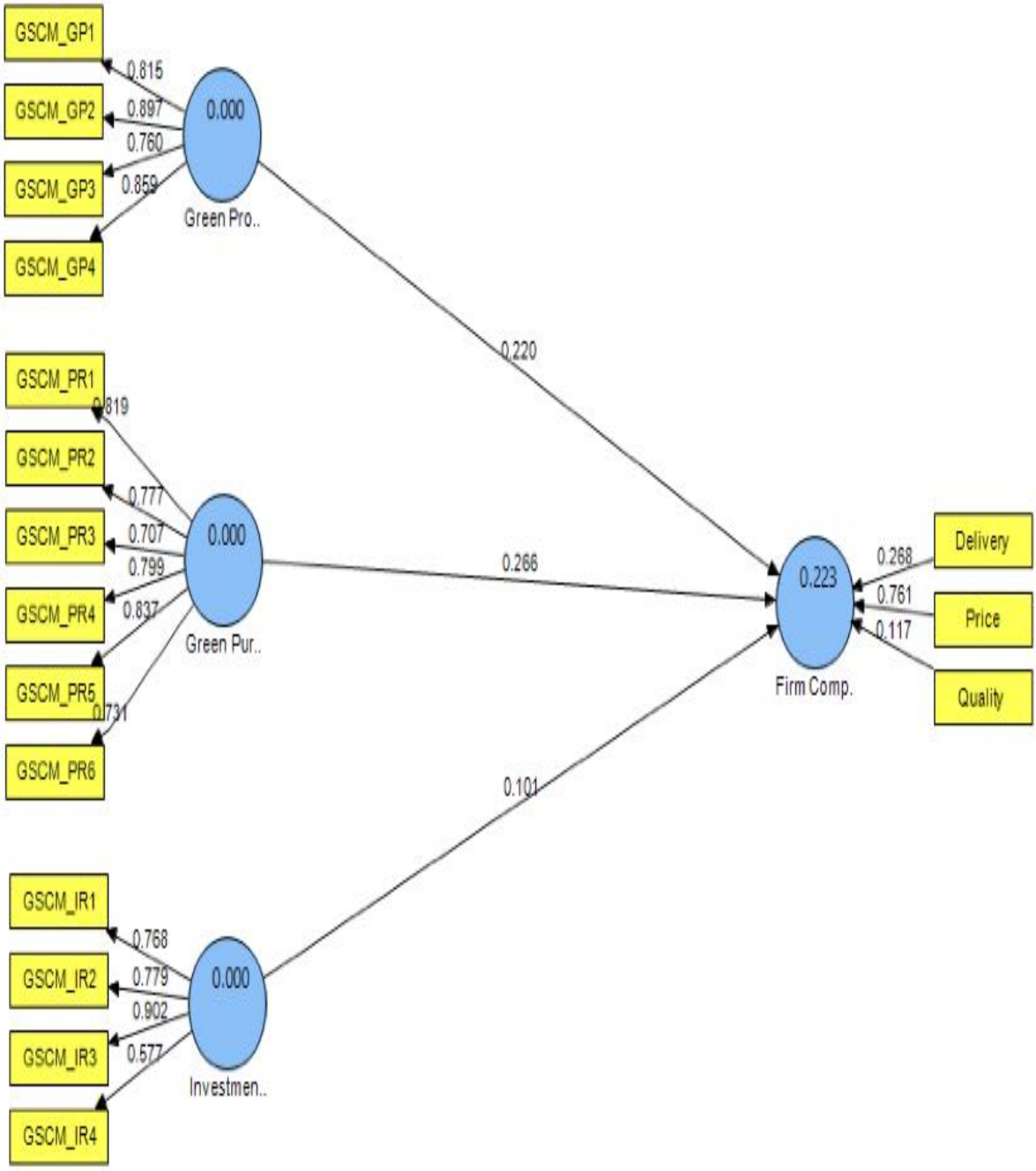

Figure (2.13): Tan, et. al. (2016) Model

Yunus and Michalisin (2016) Model

Yunus and Michalisin (2016) model demonstrates the relation between GSCM and sustained competitive advantage, using the NRBV principle which improves the competitive advantage of the organization in ways that conserve the finite resources of the world.

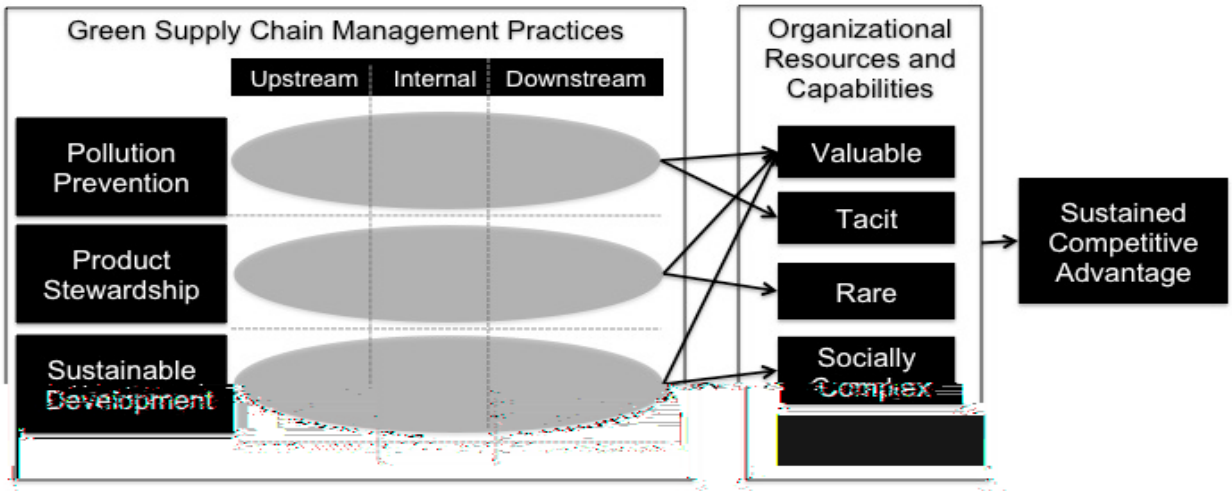

Figure (2.14): Yunus and Michalisin (2016) Model

Khan and Qianli (2017) Model

Khan and Qianli (2017) model study the relationship between green supply chain management practices (green manufacturing, green purchasing, eco-design, cooperation with customers, green information systems) and organizational performance positively.

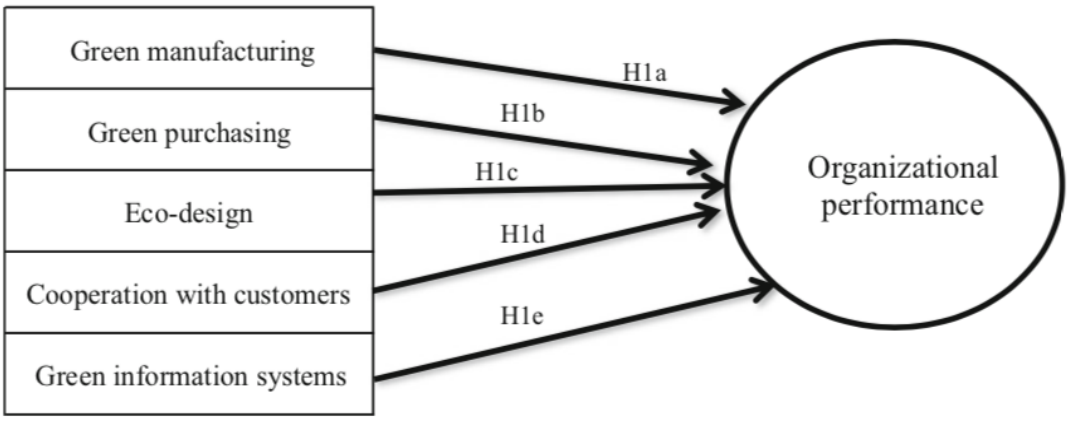

Figure (2.15): Khan and Qianli (2017) Model

Famiyeh, et. al. (2018) Model

Famiyeh, et. al. (2018) model investigates the relationship between green supply chain management practices (environmental management systems and green purchasing (GP) practices) and the performance of operational competitive (cost, quality, delivery time and flexibility) positively.

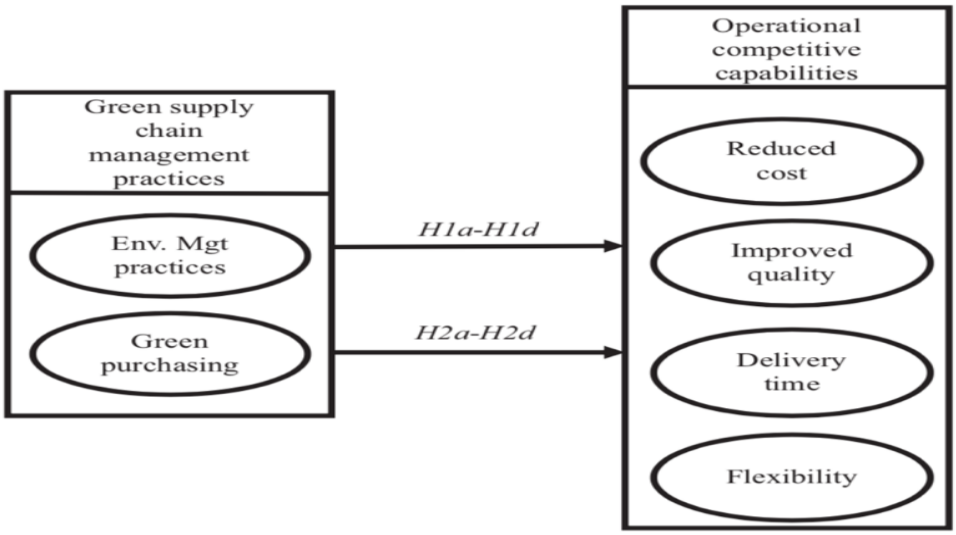

Figure (2.16): Famiyeh, et. al. (2018) Model

Jia and Wang (2019) Model

Jia and Wang (2019) model study the relationship between green supply chain management practices with competitive advantages and firm performance.

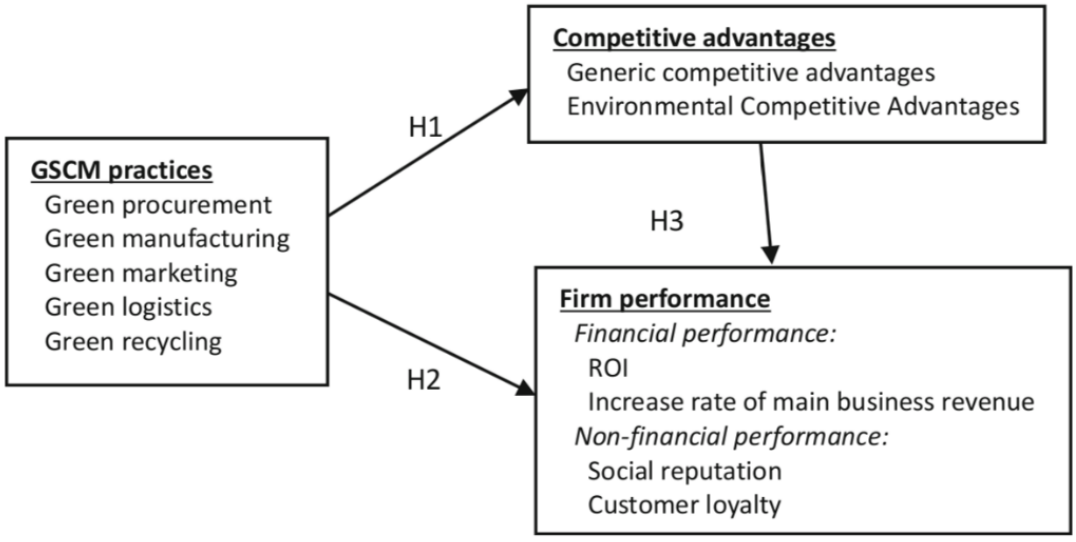

Figure 0(2.17): Jia and Wang (2019) Model

In summary, depending on previous models the researcher selects the model's dimensions of the current study and tries to investigate the impact of green supply chain practices elements (Green purchasing, Green operations, and Green selling) on competitive advantages elements (Differentiation, Cost leadership, and Responsiveness) of the Jordanian pharmaceutical manufacturing organizations.

2.6 Previous Studies

Srivastava (2007) study titled "**Green supply-chain management: A state-of-the-art literature review"** stresses the need for expanding the incorporate environmental choices in supply chain management into research and practice. Literature perusal reveals that a broad point of reference for the management of the green supply chain is not adequately established. It is also suffering from the absence of regulatory bodies that formulate regulations to meet societal and ecological concerns to facilitate business and economic growth. A concise definition is needed to help educators, researchers and practitioners understand integrated GrSCM from a broader perspective. Additionally, there is enough literature available to justify such a classification. This paper brings the GrSCM region to an integrated and fresh feel. From its conceptualization, the literature on GrSCM is studied exhaustively, mainly taking a ' reverse logistics perspective. The literature on GrSCM is categorized based on the background of the main prominent areas of the supply chain, by using the rich body of the available literature which includes earlier reviews that had relatively limited perspectives. It is also graded according to accepted methodologies and approaches.

Michelsen and de Boer (2009) study titled "**Green procurement in Norway; a survey of practices at the municipal and county level**" aims to show the major driver of ecologically friendly products which is a Consumer pressure that contributes to

focusing on procurement pressure in the last decade. This paper focuses on the function of Norwegian townships and counties in green procurement, which based on surveys to explore the capabilities for effective green procurement and ecological information, which uses in supplier selection. The comparison between the information, which collects from townships and counties, and from respectful suppliers to view the significance of demands of the environment in supplier selection.

Liu, el. al. (2012) study titled "**The Impact of Manufacturing Firms' Green Supply Chain Management on Competitive Advantage"** based on a survey of manufacturing firms in the regions of South and Central China, this paper explores the relationship between management of the green supply chain, competitive advantage, and firm efficiency. The size of the green supply chain management of the manufacturing company is achieved by factor analysis. The findings show that it is possible to conceptualize green supply chain management as a four-dimensional variable: Green development, green procurement, green distribution, and green logistics. Besides, after testing LISREL's research hypotheses, it is found that all these four buildings have important effects on the competitive advantage, plus that green production and green logistics have a major impact on firm results. The consequences are also discussed for the sake of the current study's results.

Chan, et. al. (2012) study titled **"Environmental Orientation and Corporate Performance: The Mediation Mechanism of Green Supply Chain Management and Moderating Effect of Competitive Intensity"** proposes and empirically tests a model that outlines the relationship between the activities of environmental orientation, green supply chain management (GSCM) (green purchase, customer cooperation, and investment recovery) and corporate performance. This study has produced many

important findings based on responses from 194 international investment companies operating in China. First, it shows that while internal and external environmental guidelines have a constructive and important impact on green purchasing and consumer cooperation activities, internal environmental orientation also serves as a significant driver for investment recovery practices. Second, it also demonstrates that the operation of these three main GSCM operations significantly enhances corporate efficiency. Finally, the study reveals that competitive pressure confirms the positive influence on corporate efficiency of customer cooperation. Overall, the findings explain how important it is for companies, particularly those operating in highly competitive market conditions, to develop a pro-environmental corporate culture and enhance their sensitivity to the outstanding environmental demands of external stakeholders to pursue greener supply chain management.

Katuta (2012) study titled **"Green Supply Chain Strategy and Sustainable Competitive Advantage of Large Manufacturing Firms in Nairobi, Kenya**" supposes to show that increased global warming has been of great concern to manufacturing firms, both internationally and locally, prompting businesses to control their carbon emissions and promote green or environmentally friendly practices. While this affects the whole business, as it were, it focuses more on the supply chain of the product. This study, therefore, attempts to establish the relationship between the green supply chain strategy employed by Nairobi's large manufacturing firms and their sustained competitive advantage. The study found that Nairobi's large manufacturing firms have achieved and retained greater competitive advantage, Goodwill, market share, return on investment and even profitability as a result of green supply chain strategies being implemented. Findings from this study may be useful in terms of how members of the Kenya Association of

Manufacturers should tailor their strategies to go green. This would allow them to take advantage of their environment's evolving ecological factors. This work adds to the body of knowledge about the relationship between strategy and supply chain, particularly concerning the contemporary green revolution. In addition, research can provide information to policymakers and practitioners of organizations such as NEMA, UNIDO, UNEP, and governments.

Verma and Gangele (2012) study titled **"An Empirical Study of the Investigation of Green Supply Chain Management Practices in the Pharmaceutical Industry and Their Relation Drivers, Practices and Performances"** aims to explain Green Supply Chain management of investigation strategy, that tend to adopted in pharmaceutical industry in India that facilitate social, economic, environmental, and national security practices. It restricts the harmful materials and wastes pharmaceutical materials by controlling the 3R (reduce, reuse and recycle) manufacturing manufacturers. Besides, it studies the relationship between green supply chain management actions and environmental, operational and financial performance. The analysis of the survey questionnaire responds to adopt green supply chain practices with international issues that generate environmental, operational and financial performances for the appropriate organization.

Xie and Breen (2012) study titled "**Greening community pharmaceutical supply chain in the UK: a cross-boundary approach**" aims to reduce pharmaceutical waste through the green pharmaceutical supply chain, which in turn involves main stakeholders to improve medication management, delivery, and promote environmental, economic and safety performance. It also develops green practices through the pharmaceutical supply chain with the collaboration of all involved participants. It is worth mentioning that, there

are practical and social implications that include customer relationship management, the commitment of the organization to decrease harmful wastes and recycle effectively, and process patterns through the chain.

Meythi and Martusa (2013) study titled **"Green Supply Chain Management: Strategy to Gain Competitive Advantage"** shows that Green Supply Chain Management (GSCM) has become a possibly significant method for verifying the upper hand as well as improving hierarchical execution. With the continuous expansion of the rivalry in the present worldwide market, the organizations need to consider the cutting-edge key habits, in order to increase reasonable association and the upper hand. GSCM as another inventive administrative apparatus can be utilized as a key weapon to pick up the intensity and to develop the organization's natural and monetary execution at the same time (Hajikhani et al., 2012). GSCM as a methodology to increase the upper hand implies the situating exact investigation, shows that there is a generous enthusiasm among the organizations to take a step forward to diminish their natural effect. The objective of enhancing the business and diminishing costs in all parts of the creation framework is distinguished as key drivers to build intensity. The organizations concur that the normal assembling destinations, for example, cost, quality, conveyance, and adaptability will not be sufficient to remain aggressive, when outer partners require an expanded spotlight on supportability. Thus, a requirement for examining how natural supportability can be incorporated to make an aggressive generation framework has been distinguished.

Deshmukh and Vasudevan (2014) study titled **"Emerging Supplier Selection Criteria in the Context of Traditional Vs Green Supply Chain Management"** aims to the enlargement of environmental protection issues, that leads the organization to be more responsible and sustainable for their products and integrated through supply chain

in the whole process from raw materials to final product then customer delivery. So it pursues to redefine the conventional supply chain and attempts to explore the criteria of green supply chain and green supplier selection to improve environmental performance.

Masoumik, et. al. (2014) study titled **"Gaining Competitive Advantage through Strategic Green Supply Chain Management: From a Literature Review towards a Conceptual Model"** shows that a topic of growing interest among academics and practitioners is the link between green supply chain practices (GSCPs) and competitive advantages (CAS). Despite the fact that the theoretical arguments in which environmentally-conscious practices would give companies competitive advantages, there is no consensus on the positive impact of GSCPs on CAs in empirical research. This research undertakes a comprehensive review to determine the circumstances required for GSCPs so as to achieve sustainable CAs as a result of this lack of clarity in the literature. Therefore, a conceptual model to expand on the causal relationship between GSCPs and CAs is subsequently proposed. Such a conceptual model proposes strategic capacity as a factor of mediation, mediating the connection between GSCPs and CAs. It introduces four moderating factors that positively impact the relationship between GSCPs and CAs, namely: internal management of the environment, environmental proactivity, strategic alignment, and management based on capacity. It is recommended that future research opportunities should build on the current conceptual model and resolve the limitations of the existing literature.

Dai, et. al. (2015) study titled **"How Environmental Management Competitive Pressure Affects a Focal Firm's Environmental Innovation Activities: A Green Supply Chain Perspective"** shows that environmental management has recently provided businesses with a mean of competitive advantage in the market. Environmental

innovation development is critical to today's firms ' success. Based on the Schumpeterian viewpoint of competition, this work explores how does the understanding of the green success of rival companies affects a company to seek and deliver environmental innovation through its integration activities in the green supply chain. After using survey data from 230 companies and applying structural equation modeling, a conceptual model is developed and tested. It is noted that the companies in our sample experience competition in environmental management practices from the performance of their rivals, and thus take supply chain measures to undertake integration activities. This study also shows the position of three dimensions of green supply chain integration (internal, manufacturer, and consumer integration of green product development) separately on incremental and radical environmental innovation by differentiating incremental and radical environmental innovation. In particular, results indicate that green supply chain integration has a positive effect on improving incremental innovation in the environment, while only consumer integration has a major positive impact on developing revolutionary innovation in the environment.

Kioko (2015) study titled "**Green Supply Chain Management Practices and Competitiveness of Logistics Firms in Mombasa County"** aims to emerge green supply chain management as an approach, which makes environmentally sustainable and globally competitive especially in a developing country as Kenya looking for to balance environmental and operational performance through the relationship between green supply chain management practices and competitiveness. The benefits of green supply chain management adoption are decreasing operational costs and environmental degradation in one hand, and on the other hand, it is increasing customer awareness. However, this led to a desire for economic benefits and governmental regulations. Finally,

the logistics organization should implement green supply chain management practices because of real benefits, which will result in the growth of sales.

Khaksar, et. al. (2015) study titled "**The Effect of Green Supply Chain Management Practices on Environmental Performance and Competitive Advantage: A Case Study of the Cement Industry"** aims to define green supply chain concept, which has inserted with sustainable development into operation and production management. The managers and practitioners have interested in applying the principles of green regulations and select suppliers with innovative practices. Therefore, the study intends to estimate the links between ecological performance, competitive advantages, green supplier and green innovation in the cement industry in Iran. A questionnaire was held as a research tool. Where it is found out that there is a positive relationship between indicators.

Muthaher (2015) study titled **"Effect of Green Supply Chain Management Practices on Supply Chain Performance and Competitive Advantage"** aims to examine how Green supply chain management is practically applied to the quality and competitive advantage of the supply chain. Green supply chain management methods approach with four independent variables, namely: Green Purchasing, Green Manufacturing, Green Packaging, and Reverse Logistics. The population in this analysis is Semarang's small and medium-sized enterprises, Central Java has 736 small and medium-sized enterprises involved in the production of processed foods. There were 80 executives in the respondents. By collecting data through questionnaires. In this analysis, the sampling methodology uses a simple random sampling process of probability sampling. The analysis method which is used to test the hypothesis was Structural Equation Modeling (SEM). Using Partial Least Square (PLS) this study proved the

existence of a significant relationship between Green Supply Chain Management to competitive advantage, Green Supply Chain Management to supply chain performance and Competitive Advantage to supply chain performance.

Lan Wei, et. al. (2016) study titled "**Implementing Green Supply Chain Management to Achieve Competitive Advantage";** shows that Companies had gradually started to appreciate the impact of environmental hazards on their operations. Environmental pressures have led to the emergence of green supply chain management (GSCM) as a major corporate environmental strategy for manufacturing companies. For manufacturers to fully realize GSCM's performance potential that could give any influence to their performance especially in competitive advantage, this study aims to explore the interaction patterns among the success factors of the GSCM implementation from a co-alignment perspective. In the current study, "consistency" is conceptualized among the factors, promoting the introduction of GSCM and analyzing them according to their positive effect on the achievement of competitive advantage.

Mbaabu (2016) study titled "**A Concept Paper of Green Supply Chain Management Practices in Kenya**", aims to explain green supply chain practices in healthcare in Kenya, whereas the healthcare sector is a main sector in the society. This paper supports the relationship between green supply chain and organizational performance. Furthermore, an organization in the supply chain is under high pressure to provide environmental and biodegradable products. The paper results show that the organizations should fulfill to serve the environment by suppliers and customers' requirements.

Yunus and Michalisin (2016) study titled "**Sustained Competitive Advantage Through Green Supply Chain Management Practices: A Natural-Resource-Based**

View Approach" shows that the environmental deterioration is escalating due to the impact of the companies' activities since stakeholders begin to put pressure on companies in order to conduct more environmentally friendly operations. Consequently, industries are constantly under pressure to integrate more environmentally sound practices into their supply chain operations. Using the rationale reflected in the company's view of natural resources (NRBV), This paper examines key resource types and capabilities of fundamental Green Supply Chain Management (GSCM) practices for the implementation of pollution prevention, product management and sustainability of development strategies and then demonstrates why they are capable, respectively, of possessing the characteristics of strategic assets and distinctive competencies and thus of providing a sustainable competitive advantage.

Alizadeh, et. al. (2017) study titled "**Explaining the Effect of Green Supply Chain Actions on Competitive Advantage of Pharmaceutical Companies Listed in Tehran Stock Exchange",** aims to describe the impact of green supply chain practices on the competitive advantage of pharmaceutical sectors listed in Tehran Stock Exchange, by promoting the environmental performance of organizations through achieving standards of environment, improving customers' knowledge about that and decreasing negative environmental impact. The data is collected using a questionnaire with standard parts validity, which has confirmation of experts' opinions. The result illustrates that green supply chain practices have an important practice on the competitive advantage of pharmaceutical organizations in the Tehran Stock Exchange. To sum up, the finding indicates that the green supply chain leads to speed delivery; decreases delay, reduced costs, and promote quality. Furthermore, creating a competitive advantage by making extra added value for customers because of presenting green products.

Çetin and Knouch (2018) study titled "**Sustainable Competitive Advantage in Green Supply Chain Management**". In this paper, the connection between two different concepts is analyzed. Namely: Sustainable Competitive Advantage (SCA) and Green Supply Chain Management (GSCM). In recent decades, SCA has gained great attention, as a result, companies tried to get SCA to be successful and to maintain their position in the future as well. When competition among businesses intensifies, each company seeks to investigate various ways of reducing costs and/or achieve excellence in comparison with market competitors. The supply chain is considered to be one of the places that businesses should leverage to achieve sustainable competitive advantage. The theory of supply chain management (SCM) focuses on each, a collaboration between vendors, manufacturers, and distributors. Sustainability has been playing a vital role in SCM in the last decades, and sustainability in SCM is associated with GSCM as this concept has also a wide range of practices from recycling and reverse logistics to green supplier management and other environmental practices. According to current literature, the connection between GSCM and performance results such as economic and environmental performance, competitive advantage and in particular with SCA is going to be analyzed.

Githinji and Naomi (2018) study titled **"Effect of Green Supply Chain Practices on Sustainable Competitive Advantage of Cement Manufacturing Companies, Kenya"** aims to control industrial impact on the environment, the relationship between green supply chain activities, and manufacturing firms which has attracted major attention. This study investigates cement manufacturing companies in Kenya and how their sustainable competitive advantage has been affected by green supply chain practices. The specific aim is to assess the effect of green technology, eco-packaging and green

logistics practices on the sustainable competitive advantage of cement manufacturing firms in Nairobi County, Kenya. This has been achieved by adopting a descriptive research design that enables the researcher to collect employee information in the country's five cement manufacturing firms. Subsequently, descriptive statistics and regression analysis have been conducted on the collected data and inferences have been made on the effect on the sustainable competitive advantage of the three selected green supply chain practices. Therefore, based on the study findings, the study concludes that the sustainable competitive advantage is positively affected by green supply chain activities of manufacturing firms in Nairobi County. In particular, the study finds out that a positive change in green technology practice leads to a positive increase in a cement manufacturing company's sustainable competitive advantage. Therefore, the study urges manufacturing companies to adopt environmentally friendly production methods as this strategy lifts a company to a favorable position on the county's competitive advantage scale.

Hijuzaman, et. al. (2018) study titled "**The effect of green supply chain management implementation to marketing performance through company competitiveness (study on paper industry in West Java)**" aims to determine and analyze the impact of direct and indirect implementation of green supply chain management on Competitiveness and Performance Marketing in West Java province which occurs in 30 firms about paper marketing industry performance based on the components of Competitiveness and green supply chain management variables. It leads to identify that Competitiveness has no effect on Marketing Performance.

Jia and wang (2019) study titled "**The Impact of Green Supply Chain Management Practices on Competitive Advantages and Firm Performance**" aims to

contribute the growing research on strategies of green supply chain management by depending on Potter's theory of competitive advantage, which explores the relationship through green supply chain management practices, firm performance, and competitive advantages, by using multiple linear regression analysis for data from the survey of Chinese manufacturers. The finding displays that green supply chain management practices are positively correlated to non-finance performance and competitive advantages related to firm performance positively.

Sadurdeen and Sutha (2019) study titled "**Impact of Green Supply Chain Management on Competitive Advantage of Business Organizations in Sri Lanka**" aims to gain competitive advantage, as well as many strategies that have been adopted by organizations. Green practices are an important strategy. Cost-benefit and enhancement of customer value are two additional strategies. Organizations can gain a superior competitive advantage by combining all of these elements. There are conflicting results about the application of the cost-benefit dimension on the management of the green supply chain (GSCM), though, no clear philosophy on how to incorporate these elements to gain a competitive advantage. The primary purpose of this study is to identify GSCM's impact on business organizations ' competitive advantage in Sri Lanka. The sampling method has been used is convenience. The data is collected from thirty organizations that adopt sustainable practices in Sri Lanka. The data has been analyzed using descriptive analysis, a coefficient of correlation and a basic model of regression has been calculated. The results show that there is a strong positive correlation between GSCM and competitive advantage, and to implement both cost-benefit and consumer value enhancement simultaneously is deemed to be more effective than to add only one component for gaining a competitive advantage.

Thummalapalli (2019) study titled "**The Influence of Green Supply Chain Management on the Competitive Advantage: Case of Japanese auto Manufacturing Company (Toyota)"** aims to describe the positive effects of integrating GSCM into the manufacturing industry, by explaining how it can lead to a competitive advantage and how greening a supply chain can impact overall productivity. To do so, attention has to be extended to one of Japan's leading car manufacturers–the case of Toyota. This paper will discuss the various initiatives that Toyota Motor Company (TMC) has taken to become a pro-environment and one of Japan's leading sustainable automotive manufacturers, as well as around the globe. The qualitative analysis approach is used in conducting the research, which includes a variety of papers that have been reported on GSCM, environmental management reports from Toyota, sustainability reports, financial statements have been considered. The various factors that play a crucial role in optimizing the process of the automotive supply chain to be green will be discussed towards the conclusion.

2.7 What Differentiates the Current Study from Previous Studies?

1. This study might be considered as the first of its kind which investigates the impact of the green supply chain on competitive advantages among the Jordanian pharmaceutical manufacturing industry. Therefore, the current study is dedicated to the pharmaceutical industry.

2. Most of the previous studies are conducted outside the Arab world in different countries. The current study is being performed in Jordan as one of the countries of the Arab World.

3. Green Supply Chain concept seems that the current study is one of the few studies, which considers Green Supply Chain elements. Therefore, it aims to increase

awareness about the role of the Green supply chain in improving organizations' performance.

4. Most of the previous study works are conducted to test the impact of supply chain practices from the traditional viewpoint (supplier, internal operations and customer's integrations) on Competitive Advantages; while the current study is carried out to investigate the impact of the Green Supply Chain practice elements on the Competitive Advantages.
5. The current study results are compared with previous studies results to highlight similarities and differences that might be there and why.

CHAPTER THREE

Study Methodology (Methods and Procedures)

3.1 Introduction

This chapter includes the study design, population and sampling, data collection methods, data collection analysis, study tool, and validity and reliability test. In addition to the respondent demographic description.

3.2 Study Design

The current study is considered as descriptive and cause/effect study. It aims to study the impact of Green Supply Chain practices: Green Purchasing, Green operations, and Green Selling on competitive advantages (differentiation, cost leadership, and responsiveness) at the Jordanian pharmaceutical manufacturing organizations. This study begins with a literature review, expert interviews to develop a questionnaire, which is used for the sake of data collection. The collected data checked and coded on SPSS. Then normality, validity, and reliability are tested and the correlation between variables is calculated, finally, multiple regressions are used to test the hypothesis.

3.3 Study Population, Sample and Unit of Analysis

Population and Sample: the population of the study is companies of Jordanian pharmaceutical manufacturing industries, that are registered in Jordanian Association of Pharmaceutical Manufacturers in 2019 in Jordan, which are 14 organizations (The Jordanian Association of Pharmaceutical Manufacturers (JAPM). The sample is selected from the population using a survey that covers all organizations.

Unit of Analysis: The survey unit of analysis composed of 285 managers who are working at the Pharmaceutical Manufacturing Organizations and were available at the time of distributing the questionnaires and ready to participate.

3.4 Data Collection Methods (Tools)

For this study, the data collected from two sources: secondary and primary data.

Secondary data collected from books, researches, articles, dissertations, thesis, working papers, journals, and the Internet.

Primary data collected from managers and supervisors who were working at the Pharmaceutical Manufacturing industry using a questionnaire, which has been developed based on previous literature and expert.

3.4.1 Study Instrument (Tool)

The Questionnaire:

The questionnaire developed based on previous studies, the panel of judges and research model, which includes two parts:

The first one contains the demographic dimensions related to gender, age, experience, education, position, division.

The second one includes both independent and dependent variables as follows:

Independent Variable (Green Supply Chain): includes the following sub-variables: Green Purchasing, Green operations, and Green Selling. Five items have been used to measure each sub-variable.

Dependent Variable (Competitive Advantages): includes the following dimensions: Differentiation, Cost Leadership, and Responsiveness. Five items have been used to measure each dimension.

All sub-variables have been measured by suitable questions rated by five Likert scales for the sake of measuring pharmaceutical managers' perception, ranging from value 1(strongly disagree) to value 5 (strongly agree) have been used all over the questionnaire.

3.4.2 Data Collection and Analysis

The data have been collected from 10 companies out of 14 companies, that are registered at the Jordanian Association of Pharmaceutical Manufacturers, during the period of October to November 2019. The total number of managers who work in the Jordanian manufacturing organizations is approximately 285, whereas 130 questionnaires collected out of 150 questionnaires distributed to supervisors and managers.

All collected questionnaires were complete and suitable and coded against SPSS 20.

3.4.2.1 Validity Test

Three methods are used to confirm the validity: content, face, and construct. The content validity has been confirmed through gathering the information from different types of resources such as researches, books, articles, journals, and Websites as a scholar. Where the face validity has been confirmed through the expert's opinions, which referee the questionnaire. Finally, Principal Component Factor Analysis with Kaiser Meyer Olkin (KMO) is used to confirm construct validity.

Construct Validity (Factor Analysis)

Principal Component Factor Analysis with Kaiser Meyer Olkin (KMO) is used to confirm the construct validity. Principal Factor Analysis has been used to examine explanatory and conformity. Factor loading that exceeds 0.50 is considered good and accepted if it is exceeding 0.40 (Hair, et. al. 2014). While, Kaiser Meyer Olkin (KMO) is used to measure sampling adequacy, inter-correlations, and harmony, KMO values

between 0.8 and 1 indicate that a high sampling is adequate and accepted if it is exceeding 0.6. The additional instrument is used to determine suitability: Bartlett's of Sphericity, in which less than 0.05 at 95% confidence level value is considered significant, that are indicated for useful factor analysis. Power of explanation of factor expressed by Variance percentage (Cerny & Kaiser, 1977).

Green Purchasing

Table (3.1) below, shows that the loading factor of Green Purchasing items scores between 0.696 and 0.833, which assumes the construct validity. KMO has rated 79.2%, which indicates good adequacy, and the Chi^2 is 286.147, which indicates the fitness of the model. Moreover, the variance percentage is 62.710, so it can explain 62.71% of the variation. Finally, the significance of Bartlett's Sphericity is less than 0.05, which indicates that the factor analysis is useful.

Table (03.1): Principal Component Analysis Green Purchasing

No.	Item	F1	KMO	Chi^2	BTS	Var%	Sig.
1	The company explains product ingredients on the label	0.696	0.792	286.147	10	62.710	0.000
2	The company uses raw materials based on environmental standards	0.770					
3	The company cooperates with suppliers on green innovation	0.829					
4	The company develops a green purchasing procedure	0.833					
5	The company develops a database about green supplier	0.823					

Green Operations

Table (3.2) below, shows that the loading factor of Green Operations items scores between 0.535 and 0.785, which assumes the construct validity. KMO has rated 77.4%, which indicates good adequacy, and the Chi^2 is 307.021, which indicates the fitness of the model. Moreover, the variance percentage is 64.214, so it can explain 64.21% of the variation. Finally, the significance of Bartlett's Sphericity is less than 0.05, which indicates that the factor analysis is useful.

Table (03.2): Principal Component Analysis Green Operations

No.	Item	F1	KMO	Chi^2	BTS	Var%	Sig.
1	The company reduces pollution during production	0.780	0.774	307.021	10	64.214	0.000
2	The company reduces the rate of scrap to a minimum level	0.727					
3	The company designs products to be recycled	0.695					
4	The company manages environmental production execution	0.535					
5	The company adopts GMP (Good Manufacturing Practice) standards	0.785					

Green Selling

Table (3.3) below, shows that the loading factor of Green Selling items scores between 0.658 and 0.856, which assumes the construct validity. KMO has rated 83.3%, which indicates good adequacy, and the Chi^2 is 200,980, which indicates the fitness of the model. Moreover, the variance percentage is 57.352, so it can explain 57.352 % of the variation. Finally, the significance of Bartlett's Sphericity is less than 0.05, which indicates that the factor analysis is useful.

Table (03.3): Principal Component Analysis Green Selling

No.	Item	F1	KMO	Chi^2	BTS	Var%	Sig.
1	The company improves the quality of products	0.856	0.833	200.980	10	57.352	0.000
2	The company provides the innovative design of products	0.777					
3	The company develops flexible production program to ensure quality	0.784					
4	The company's employees come up with creative features of the product	0.696					
5	The company makes long term partner with reliable suppliers	0.658					

Differentiation

Table (3.4) below, shows that the loading factor of Differentiation items scores between 0.657 and 0.764, which assumes the construct validity. KMO has rated 71.4 %, which indicates good adequacy, and the Chi^2 is 220.780, which indicates the fitness of the model. Moreover, the variance percentage is 51.049 Finally, the significance of Bartlett's Sphericity is less than 0.05, which indicates that the factor analysis is useful.

Table (03.4): Principal Component Analysis Differentiation

No.	Item	F1	KMO	Chi^2	BTS	Var%	Sig.
1	The company uses an online promotion campaign	0.702	0.714	220.780	10	51.049	0.000
2	The company reduces the cost of administration activities	0.657					
3	The company uses a technology-based delivery system	0.764					
4	The company utilizes available resources better than competitors	0.760					
5	The company economize in the cost of product design technique	0.683					

Cost Leadership

Table (3.5) below, shows that the loading factor of Cost Leadership items scores between 0.657 and 0.764, which assumes the construct validity. KMO has rated 71.4%, which indicates good adequacy, and the Chi^2 is 220.780, which indicates the fitness of the model. Moreover, the variance percentage is 51.049. Finally, the significance of Bartlett's Sphericity is less than 0.05, which indicates that the factor analysis is useful.

Table (03.5): Principal Component Analysis Cost Leadership

No.	Item	F1	KMO	Chi^2	BTS	Var%	Sig.
1	The company uses an online promotion campaign	0.702	0.714	220.780	10	51.049	0.000
2	The company reduces the cost of administration activities	0.657					
3	The company uses a technology-based delivery system	0.764					
4	The company utilizes available resources better than competitors	0.760					
5	The company economize in the cost of product design technique	0.683					

Responsiveness

Table (3.6) below, shows that the loading factor of Responsiveness items scores between 0.626 and 0.798, which assumes the construct validity. KMO has rated 79.1%, which indicates good adequacy, and the Chi^2 is 264.943, which indicates the fitness of the model. Moreover, the variance percentage is 53.358. Finally, the significance of Bartlett's Sphericity is less than 0.05, which indicates that the factor analysis is useful.

Table (3.6): Principal Component Analysis Responsiveness

No.	Item	F1	KMO	Chi^2	BTS	Var%	Sig.
1	The company delivers goods on time	0.766	0.791	264.943	10	53.358	0.000
2	The company responds to market changes in a suitable time	0.798					
3	The company reduces delivery time compared to competitors	0.774					
4	The company uses online responding to customer	0.675					
5	The company keeps a suitable inventory to respond in time	0.626					

Green Supply Chain

Table (3.7) below, shows that the loading factor of Green Supply Chain items scores between 0.852 and 0.867. Therefore, construct validity is assumed. KMO has rated 79.1%, which indicates good adequacy, and the Chi^{2}is 237.943, which indicates the fitness of the model. Moreover, the variance percentage is 72.178 % of the variation. Finally, the significance of Bartlett's Sphericity is less than 0.05, which indicates that the factor analysis is useful.

Table (03.7): Principal Component Analysis Green Supply Chain

No.	Item	F1	KMO	Chi^2	BTS	Var%	Sig.
1	Green Purchasing	0.852	0.791	237.943	10	72.178	0.000
2	Green Operations	0.829					
3	Green Selling	0.867					

Competitive Advantages

Table (3.8) below, shows that the loading factor of Competitive advantage items scores between 0.653 and 0.830. Therefore, construct validity is assumed. KMO has rated 78.9%, which indicates good adequacy, and the Chi^2 is 213.913, which indicates the fitness of the model. Moreover, the variance percentage is 76.902 % of the variation.

Finally, the significance of Bartlett's Sphericity is less than 0.05, which indicates that the factor analysis is useful.

Table (03.8): Principal Component Analysis Competitive Advantage

No.	Item	F1	KMO	Chi^2	BTS	Var%	Sig.
1	Differentiation	0.653	0.789	213.913	10	76.902	0.000
2	Cost Leadership	0.824					
3	Responsiveness	0.830					

3.4.2.2 Reliability Test

The data reliability has been examined through Cronbach's alpha, the reliable tools have a Cronbach's alpha above 0.70 and considered accepted if it is exceeding 0.60 (Hair, et. al. 2014). Table (3.13) below, shows that the reliability coefficient for Green Supply Chain sub-variables ranges between 0.611 and 0.846, and for Competitive Advantages, dimensions are between 0.751 and 0.811.

Table (03.9): Reliability Test for all Variables

Variable	Item/Sub-Variables	*Cronbach's Alpha*
Green Purchasing	5	0.846
Green Operations	5	0.611
Green Selling	5	0.664
Green Supply Chain	**3 Sub-Variables**	**0.865**
Differentiation	5	0.811
Cost Leadership	5	0.751
Responsiveness	5	0.778
Competitive Advantages	**3 Dimensions**	**0.896**

3.4.2.3 Demographic analysis:

The demographic analysis is presented in the following sections based on the characteristics of the valid responses i.e. frequency and percentage of the participants such as gender, age, experience, education, position, and division.

Gender: Table (3.10) below, shows that the majority of respondents are males, were 70 (53.7%), and 60 (46.2%) are females.

Table (3.10): Respondents Gender

		Frequency	Percent
Gender	Male	70	53.8
	Female	60	46.2
	Total	130	100.0

Age: Table (3.11) below, shows that the majority of respondents ages are less than 40 years 50 (38.5%) out of the total sample, then those ages less than 30 years 41 (31.5%), after that comes the percentage of the respondents who are less than 50 years 25 (19.2%), and finally the least percentage for those who are older than 50 years 14 (10.8%).

Table (03.11): Respondents Age (Years)

		Frequency	Percent
Age (Years)	Less than 30	41	31.5
	Less than 40	50	38.5
	Less than 50	25	19.2
	More than 50	14	10.8
	Total	130	100.0

Experience: Table (3.12) below, shows that the majority of respondents are having experience less than 10 years 56 (43.1%), then respondents experience between (10-20 years) 51 (39.2%), followed by those with experience between (21-30 years) 15 (11.5%). Finally, respondents have more than 30 years' experience were 8 (6.2%).

Table (3.12): Respondents Experience

		Frequency	Percent
Experience	Less than 10	56	43.1
	between 10-20	51	39.2
	between 21-30	15	11.5
	more than 30	8	6.2
	Total	130	100.0

Education: Table (3.13) below, shows that the majority of respondents who hold bachelor degree are 91 out of 130 (70.0%), then master degree holders are 31 (23.8%) followed by 7 (5.4%) have diploma degree, finally, 1 (0.8%) who have Ph.D. degree.

Table (3.13): Respondents Education

		Frequency	Percent
Education	Diploma	7	5.4
	Bachelor	91	70.0
	Master	31	23.8
	PhD	1	0.8
	Total	130	100.0

Position: Table (3.14) below, shows that the majority of respondents are supervisors 58 (44.6%) out of the total respondents followed by 42 (32.3%) who are senior managers, the third category is for directors 27 (20.8%), finally, the general managers position are 3 (2.3%) out of total respondents.

Table (03.14): Respondents Position

		Frequency	Percent
Position	Supervisor	58	44.6
	Director	27	20.8
	Senior Manager	42	32.3
	General Manager	3	2.3
	Total	130	100.0

Division: Table (3.15) below, shows that the majority of respondents are working in marketing and sales division with a number of 49 out of 130 (37.7%), followed by whose working in operations and quality division 38 (29.2%), after that supply chain 26 (20.0%), finally Finance position 17 (13.1%).

Table (3.15): Respondents Division

		Frequency	Percent
Division	Supply chain	26	20.0
	Finance	17	13.1
	Marketing & Sales	49	37.7
	Operations & Quality	38	29.2
	Total	130	100.0

CHAPTER FOUR

Data Analysis

4.1 Introduction

This chapter includes data descriptive statistical analysis of respondents' perception, Pearson Bivariate Correlation matrix to test the relationships among Green Supply Chain sub-variables with each other, Competitive Advantages dimensions with each other; and between Green Supply Chain variable and sub-variables with Competitive Advantages dimensions. Finally, multiple regressions are used to check the hypothesis: the impact of Green Supply Chain on Competitive Advantages.

4.2 Descriptive Statistical Analysis

The mean, standard deviation, t-value, ranking, and implementation level are used to describe the respondents' perception and the degree of implementing each variable, dimension, and items. The implementation level is divided into three categories based on the following formula: **5-1 / 3=1.33**.

Therefore, the implementation is considered to be high if it is within the range of 3.67-5.00 and medium if it is between 2.34 and 3.66 and low implementation if it is between 1.00 and 2.33.

Independent Variable (Green Supply Chain)

Table (4.1) below, shows that the means of Green Supply Chain variables range from 3.40 to 3.66 with a standard deviation between 0.67 and 0.92. This indicates that respondents agree on the medium implementation of green supply chain sub-variables that is supported by medium t-value compared to T-tabulated. The average mean is 3.54

with a standard deviation of 0.64, indicates that the respondents are highly aware and concern about Green Supply Chain, where the t-value is 9.60 > T-tabulated = 1.960.

Table (4.1): Mean, Standard Deviation, t-value, Ranking, and Implementation Level of Green Supply Chain

No.		M.	S.D.	t	Sig.	Rank	Impl.
1	Green Purchasing	3.56	0.92	7.02	0.00	2	Medium
2	Green Operations	3.66	0.67	11.30	0.00	1	Medium
3	Green Selling	3.40	0.68	6.71	0.00	3	Medium
	Green Supply Chain	**3.54**	**0.64**	**9.60**	**00**		**Medium**

T-tabulated=1.960

Green Purchasing

Table (4.2) below, shows that the means of Green purchasing items range from 3.35 to 3.92 with a standard deviation between 1.07 and 1.30. This indicates that respondents agree on the medium implementation of green purchasing items that are supported by medium t-value compared to T-tabulated. The average mean is 3.56 with a standard deviation of 0.92, indicates that the respondents are highly aware and concern about Green Supply Chain, where the t-value is 7.02 > T-tabulated = 1.960.

Table (04.2): Mean, Standard Deviation, t-value, Ranking, and Implementation Level of Green Purchasing

No.		M.	S.D.	T	Sig.	Rank	Impl.
1	The company explains product ingredients on the label	3.92	1.30	7.99	0.00	1	High
2	The company uses raw materials based on environmental standards	3.75	1.17	7.31	0.00	2	High
3	The company cooperates with suppliers on green innovation	3.44	1.17	4.25	0.00	3	Medium
4	The company develops a green purchasing procedure	3.39	1.07	4.16	0.00	4	Medium
5	The company develops database about green supplier	3.35	1.14	3.44	0.00	5	Medium
	Green Purchasing	**3.56**	**0.92**	**7.02**	**0.00**		**Medium**

T-tabulated value=1.960

Green Operations

Table (4.3) below, shows that the means of Green operations items range from 2.90 to 4.12 with a standard deviation between 0.89 and 1.25. This indicates that respondents agree on the medium implementation of green operations items that are supported by medium t-value compared to T-tabulated. The average mean is 3.66 with a standard deviation of 0.67, indicates that the respondents are highly aware and concern about Green operations, where the t-value is 11.30 > T-tabulated = 1.960.

Table (4.3): Mean, Standard Deviation, t-value, Ranking, and Implementation Level of Green Operations

No.		M.	S.D.	T	Sig.	Rank	Impl.
1	The company reduces pollution during production	3.75	1.25	6.78	0.00	5	High
2	The company reduces the rate of scrap to a minimum level	3.82	0.99	9.46	0.00	3	High
3	The company designs products to be recycled	2.90	1.05	10.80	0.00	2	Medium
4	The company manages environmental production execution	3.73	0.89	9.30	0.00	4	High
5	The company adopts GMP (Good Manufacturing Practice) standards	4.12	1.11	11.34	0.00	1	High
	Green Operations	**3.66**	**0.67**	**11.30**	**0.00**		**Medium**

T-tabulated value=1.960

Green Selling

Table (4.4) below, shows that the means of Green selling items range from 3.33 to 3.51 with a standard deviation between 0.98 and 1.17. This indicates that respondents agree on the medium implementation of green selling items that are supported by medium t-value compared to T-tabulated. The average mean is 3.40 with a standard deviation of

0.68, indicates that the respondents are highly aware and concern about Green operations, where the t-value is 6.71 > T-tabulated = 1.960.

Table (4.4): Mean, Standard Deviation, t-value, Ranking, and Implementation Level of Green Selling

No.		M.	S.D.	T	Sig.	Rank	Impl.
1	The company adopts suitable prices for green products	3.25	1.17	2.47	0.00	5	Medium
2	The company considers green packaging	3.48	0.99	5.53	0.00	3	Medium
3	The company considers environmental factors for market responding	3.44	0.98	5.09	0.00	3	Medium
4	The company uses green awareness campaigns	3.33	1.03	3.63	0.00	4	Medium
5	The company uses marketing efforts for green products	3.51	1.04	5.54	0.00	1	Medium
	Green Selling	**3.40**	**0.68**	**6.71**	**0.00**		**Medium**

T-tabulated value=1.960

Dependent Variable (Competitive Advantages):

Which includes the following dimensions namely: Differentiation, Cost Leadership, and Responsiveness.

Table (4.5) below, shows that the means of Competitive Advantage variables range from 3.47 to 3.89 with a standard deviation between 0.0.76 and 0.79. This indicates that respondents agree on the high implementation of Competitive Advantages sub-variables that is supported by high t-value compared to T-tabulated. The average mean is 3.67 with a standard deviation of 0.68, indicates that the respondents are highly aware and concern about Competitive Advantages, where the t-value is 11.17 > T-tabulated = 1.960.

Table (4.5): Mean, Standard Deviation, t-value, Ranking, and Implementation Level of Competitive Advantages

No.		M.	S.D.	T	Sig.	Rank	Impl.
1	Differentiation	3.89	0.79	12.91	0.00	1	High
2	Cost Leadership	3.47	0.79	6.67	0.00	3	Medium
3	Responsiveness	3.65	0.76	9.81	0.00	2	Medium
	Competitive Advantages	3.67	0.68	11.17	0.00		High

Tabulated value=1.960

Differentiation

Table (4.6) below, shows that the means of differentiation items range from 3.68 to 4.11 with a standard deviation between 0.97 and 1.14. This indicates that respondents agree on the high implementation of differentiation items that are supported by medium t-value compared to T-tabulated. The average mean is 3.89 with a standard deviation of 0.78, indicates that the respondents are highly aware and concern about Green operations, where the t-value is 12.91>T-tabulated = 1.960.

Table (04.6): Mean, Standard Deviation, t-value, Ranking, and Implementation Level of Differentiation

No.		M.	S.D.	T	Sig.	Rank	Impl.
1	The company improves the quality of products	4.11	1.14	11.05	0.00	1	High
2	The company provides the innovative design of products	3.92	0.97	10.85	0.00	2	High
3	The company develops flexible production program to ensure quality	3.85	1.01	9.50	0.00	4	High
4	The company's employees come up with creative features of the product	3.68	1.02	7.56	0.00	5	High
5	The company makes long term partner with reliable suppliers	3.91	1.06	9.76	0.00	3	High
	Differentiation	**3.89**	**0.78**	**12.91**	0.00		**High**

Tabulated value=1.960

Cost Leadership

Table (4.7) below, shows that the means of Cost Leadership items range from 3.02 to 3.78 with a standard deviation between 0.89 and 1.44. This indicates that respondents agree on the medium implementation of Cost Leadership items that are supported by medium t-value compared to T-tabulated. The average mean is 3.46 with a standard deviation of 0.79, indicates that the respondents are highly aware and concern about Green operations, where the t-value is 6.67>T-tabulated = 1.960.

Table (4.7): Mean, Standard Deviation, t-value, Ranking, and Implementation Level of Cost Leadership

No.		M.	S.D.	T	Sig.	Rank	Impl.
1	The company uses an online promotion campaign	3.02	1.44	0.182	0.00	5	Medium
2	The company reduces cost of administration activities	3.50	0.89	6.39	0.00	2	Medium
3	The company uses a technology-based delivery system	3.52	1.08	5.40	0.00	3	Medium
4	The company utilizes available resources better than competitors	3.52	1.15	5.15	0.00	4	Medium
5	The company economize in the cost of product design technique	3.78	0.98	9.01	0.00	1	High
	Cost Leadership	**3.46**	**0.79**	**6.67**	**0.00**		**Medium**

Tabulated value=1.960

Responsiveness

Table (4.8) below, shows that the means of Responsiveness items range from 3.50 to 3.83 with a standard deviation between 0.96 and 1.13. This indicates that respondents agree on the medium implementation of Responsiveness items that are supported by medium t-value compared to T-tabulated. The average mean is 3.65 with a standard

deviation of 0.76, indicates that the respondents are highly aware and concern about Green operations, where the t-value is 9.81 > T-tabulated = 1.960.

Table (4.8): Mean, Standard Deviation, t-value, Ranking, and Implementation Level of Responsiveness

No.		M.	S.D.	t	Sig.	Rank	Impl.
1	The company delivers goods on time	3.83	0.96	9.81	0.00	1	High
2	The company responds to market changes in a suitable time	3.68	1.13	6.88	0.00	3	High
3	The company reduces delivery time compared to competitors	3.52	1.02	5.71	0.00	4	Medium
4	The company uses online responding to customer	3.50	1.07	5.31	0.00	5	Medium
5	The company keeps a suitable inventory to respond in time	3.76	1.04	8.28	0.00	2	High
	Responsiveness	**3.65**	**0.76**	**9.81**	0.00		Medium

Tabulated value=1.960

Relationship between Independent and Dependent Variables:

Bivariate Pearson Correlation Test has been used to check the relationship between variables. Table (4.9) below, shows that the relationships among Green Supply Chain sub-variables are strong, where r ranges from 0.546 to 0.624. Moreover, the relationships among the dimensions of Competitive Advantages are strong, where the ranges are between 0.576 and 0.791. Finally, the relationship between independent and dependent variables is very strong, where r equals 0.786.

Table (04.9): Relationship between Independent and Dependent Variables

No		1	2	3	4	5	6	7	8
1	Green Purchasing								
2	Green Operations	.546**							
3	Green Selling	.624**	.578**						
4	Green Supply Chain	.885**	.808**	.849**					
5	Differentiation	.590**	.623**	.551**	.690**				
6	Cost Leadership	.616**	.489**	.611**	.678**	.576**			
7	Responsiveness	.624**	.511**	.638**	.698**	.585**	.791**		
8	Competitive Advantages	.696**	.618**	.685**	.786**	.823**	.902**	.902**	

. **Correlation is significant at the 0.01 level (2-tailed). Correlation is significant at the 0.05 level (2-tailed).

4.3 Hypothesis Testing

After confirming validity, reliability and the correlation between independent and dependent variables, the following tests should be carried out to ensure the validity of regression analysis. (Sekaran, 2003):

Normality: Figure (4.1) below, illustrates that the shape follows the normal distribution, so the model does not violate this assumption.

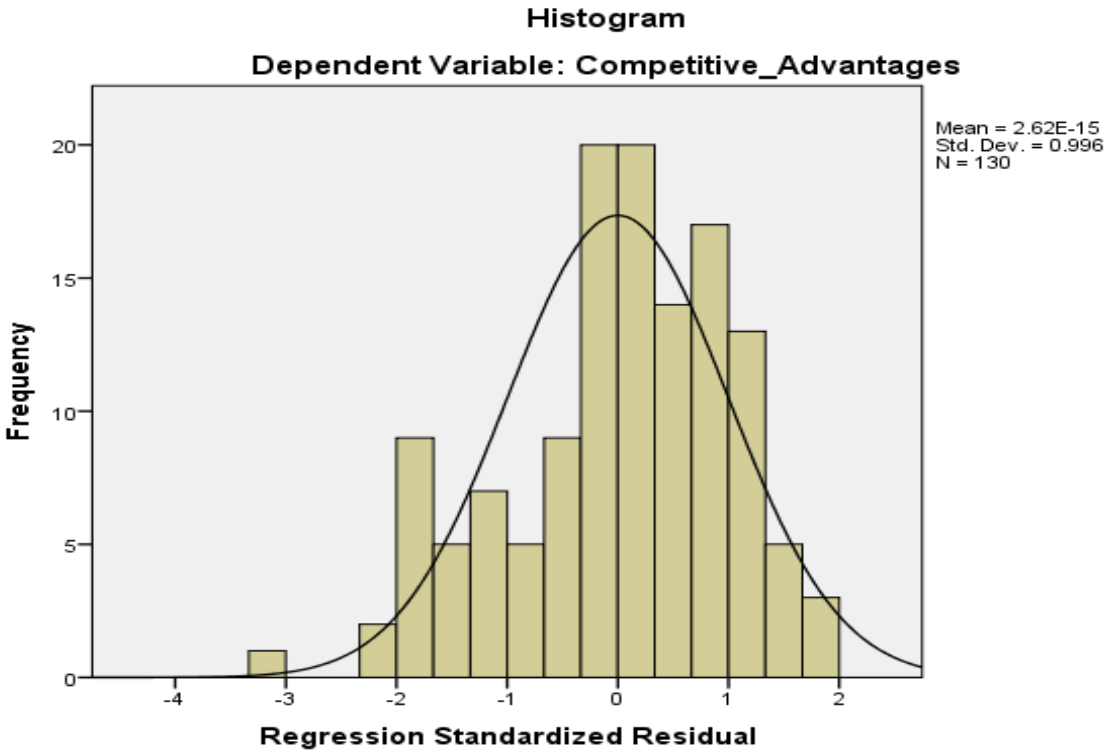

Figure 0(4.1): Normality test

Linearity test: figure (4.2) below, shows that there is a linear relationship between independent and dependent variables. In such a case, the model does not violate this assumption.

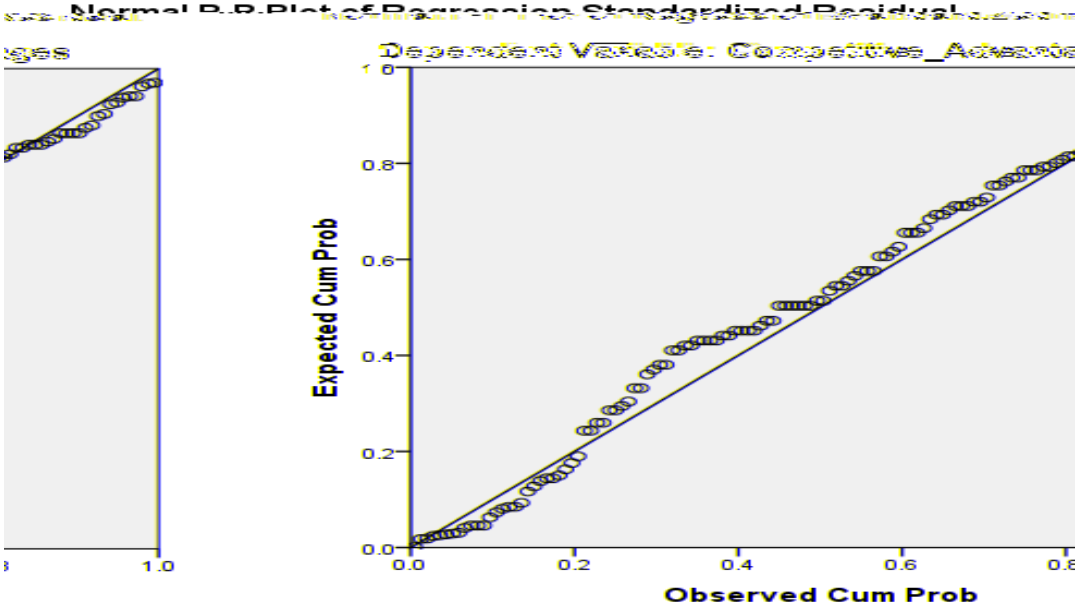

Figure 0(4.2): Linearity test

Equal variance (homoscedasticity): figure (4.3) shows that the errors are scattered around the mean, therefore there is no relation between errors and predicted values, in such case the model does not violate this assumption.

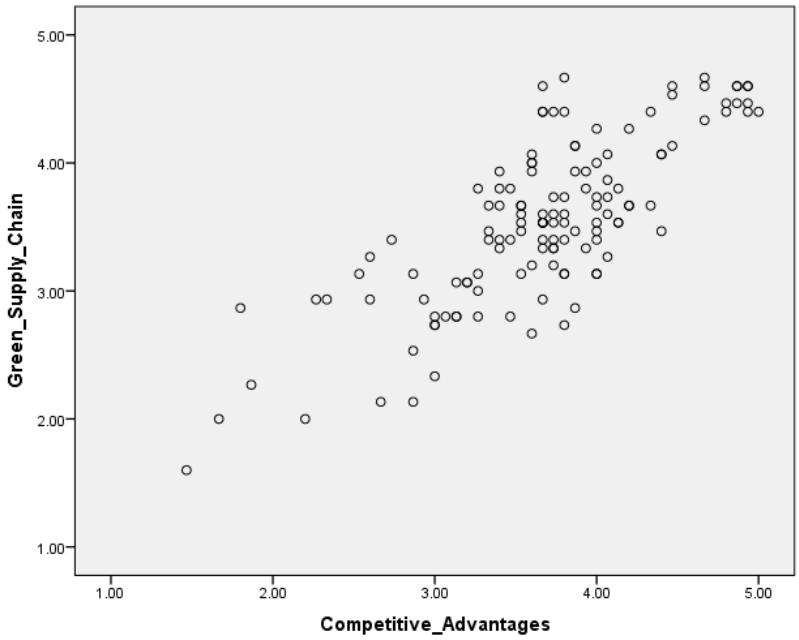

Figure (4.3): Linearity Test

Multi-Collinearity: the VIF (Variance Inflation Factor) value is less than 10, and tolerance is more than 10%, in such cases, the Collinearity model does not violate this assumption.

Table (4.10): Durbin-Watson value and Variance Inflation Factor

	Collinearity Statistics	
	Tolerance	**VIF**
Green Purchasing	0.559	1.788
Green Operations	0.610	1.639
Green Selling	0.531	1.885

Main Hypothesis:

H_0: Green Supply Chain practices elements (Green purchasing, Green operations, and Green selling) do not impact competitive advantages elements of the pharmaceutical manufacturing organizations, at ($\alpha \leq 0.05$).

Table (4.11) below, shows that when regressing the three sub-variables of Green Supply Chain against the total of Competitive Advantages, the model shows that Green Supply Chain can explain 62.0% of the variation of Competitive Advantages, where (R^2=0.620, F=68.442, Sig.=0.000). Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted, which states that Green Supply Chain sub-variables (Green purchasing, Green operations, and green selling) impact Competitive Advantages of the pharmaceutical manufacturing organizations, at $\alpha \leq 0.05$.

Table (4.11): Multiple Regressions of Green Supply Chain Sub-variables on Competitive Advantages.

Model	r	R^2	Adjusted R^2	f	Sig.
1	0.787[a]	0.620	0.611	68.442	000[b]

a. Predictors: (Constant), Green Selling, Green Operations, Green Purchasing. b, Dependent Variable: Competitive Advantages.

Based on the components of Green Supply Chain, table (4.12) below, shows the impact of each sub-variable on Competitive Advantages. These sub-variables impacted Competitive Advantages, the highest impact was for green purchasing with 37.0% of the total impact and followed by Green Selling with an impact of 32.1% on Competitive Advantages, and then Green Operations rated 23.0%.

Table (4.12): Multiple Regressions of Green Supply Chain sub-variables on Competitive Advantages (ANOVA).

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	β		
	(Constant)	0.734	0.226		3.252	0.001
H_{01}	Green Purchasing	0.274	0.054	0.370	5.034	0.000
H_{02}	Green Operations	0.236	0.072	0.230	3.274	0.001
H_{03}	Green Selling	0.322	0.076	0.321	4.260	0.000

a. Dependent Variable: Competitive Advantages, T-tabulated=1.960

In summary, the multiple regression analysis results show that the Green Supply Chain sub-variables together impact Competitive Advantages. Moreover, three sub-variables of Green Supply Chain affect Competitive Advantages. Green purchasing has the highest impact, followed by Green selling, and finally comes the Green operations. It seems that the respondents agree on the medium implementation of Green Supply Chain sub-variables that supported by medium t-value compared to Tabulated. Whereas, the first rank is green operations, then green purchasing, and finally green selling. While the respondents agree on the medium implementation of Competitive Advantages sub-variables that supported by high t-value compared to Tabulated whereas, the first rank is Differentiation, followed by Responsiveness, and finally Cost leadership.

CHAPTER FIVE

Results Discussion, Conclusion and Recommendations

5.1 Results Discussion

The results of the present study indicate a medium implementation of Green Supply Chain sub-variables in the Jordanian pharmaceutical manufacturing organizations. Green Operations have the highest implementation rate among the sub-variables, followed by Green Purchasing then comes Green Selling. The medium rate for Green Supply Chain sub-variables resulted from the pharmaceutical industry, is not using Green Supply Chain Technology and the managers do not realize the importance of implementing green practices among the supply chain.

Secondly, the findings show a high implementation of Competitive Advantage Dimensions since the Jordanian pharmaceutical industry always seeks for competitiveness and towards adopting high-quality standards. The highest implementation is the Differentiation dimension, followed by Responsiveness, and finally Cost Leadership. The medium implementation goes for Cost Leadership as not all companies tend to experiment with cost leadership or a combination approach. Finally, Responsiveness has the lowest implementation because the supply chain faces major challenges in response to market changes rapidly and reliably.

Table (5.1): Summary of Multiple Regressions of Green Purchasing Technology on Competitive Advantages sub-variables (Differentiation, Cost Leadership, and Responsiveness) (ANOVA)

	Green Supply Chain	Green Purchasing	Green Operations	Green Selling
Competitive advantage	+	+	+	+
Differentiation	+	+	+	
Cost leadership		+		+
Responsiveness	+	+		+

+ Significant Impact

1. Green Supply Chain has a significant impact on the total competitive advantage, and this is supported by the study of (Meythi and Martusa, 2013; Khaksar, et. al., 2015; Alizadeh, et. al., 2017)
2. The green Supply chain has a significant impact on the competitive advantage dimensions with a medium implementation rate.
3. Green Supply chain has a medium impact on the competitive advantage of sub-variable Differentiation, and this is supported by the study of (Azizi, et. al., 2016).
4. Green Supply chain has a medium impact on the competitive advantage sub-variable Cost Leadership, and this is supported by the study of (Azizi, et. al., 2016; Çetin and Knouch, 2018)
5. Green Supply chain has a medium impact on the competitive advantage sub-variable Responsiveness, and this is supported by the study of (Famiyeh, et. al., 2018).

5.2 Conclusion

The present study aims to estimate the impact of the Green supply chain on the competitive advantage of the Jordanian Pharmaceutical Manufacturing Organizations. In addition, it aims to answer the main question: Do Green Supply Chain elements (Green purchasing, Green operation, and Green selling) impact competitive advantages elements (Differentiation, Cost Leadership, and Responsiveness) of the Jordanian pharmaceutical manufacturing organizations?

The researcher has designed a questionnaire to collect the data. The validity and reliability of the questionnaire have been performed. To test the study hypothesis, the correlation and multiple regression have been operated.

The study results show that Green Supply Chain has a positive impact on the competitive advantage of the Jordanian Pharmaceutical Manufacturing Organizations. Green operations have the highest implementation rate, followed by the Green Purchasing, then finally the Green Selling.

Finally, the study results show that there is a positive medium impact of the Green supply chain on the competitive advantage of the Jordanian Pharmaceutical Manufacturing Organizations. As well as, Green Operations has the highest implementation rate followed by Green Purchasing and Green Selling respectively.

5.3 Recommendation

- The study recommends the Jordanian Pharmaceutical Manufacturing Organizations. have to integrate Green Supply Chain into the strategic plans of Supply Chain management.
- The study recommends the Jordanian Pharmaceutical Manufacturing Organizations to integrate the whole sub-variables of Green Supply Chain since together they achieve higher effects on the competitive advantage.
- The study recommends the Jordanian Pharmaceutical Manufacturing Organizations to have an independent office to observe the implementation and integration of Green Supply Chain into the strategic plans of Supply Chain management.
- The study recommends the Jordanian Pharmaceutical Manufacturing Organizations to concentrate on implementing the Green Operations, Green Purchasing, and Green Selling in the long term to reach the highest competitiveness.

- The Study recommends conducting further studies to explore the impact of the Green supply chain on the creativity and innovation of the Jordanian Pharmaceutical Manufacturing Organizations.
- The present study has been conducted in the Jordanian Pharmaceutical Manufacturing Organizations. The study recommends generalizing the results in the Jordanian Pharmaceutical Manufacturing Industry and all over the world.
- The study recommends expanding the analysis of other sectors and industries in futuristic researches, where including other industries within the same study will enable us to generalize the results on all industries.
- The study recommends to investigate the impact of the green supply chain on competitive advantages and environmental performance.

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Appendices

Appendix (1): Panel of Referees Committee

No.	Name	Qualification	Organization
1	Prof. Asaad Al-Ali	Professor	Al-Ahliyya Amman University
2	Prof. Ali Mohammad Aladaileh	Professor	A-Ahliyya Amman University
3	Dr. Mohialdeen Qutop	Associate Prof.	University of Petra
4	Dr. Nidal Alsalhi	Associate Prof.	University of Petra
5	Dr. Ahmad Saleh Alsukkar	Associate Prof.	University of Petra
6	Dr. Mohammad Aladaileh	Associate Prof.	Middle East University
7	Dr. Wasef Matar	Assistant Prof.	University of Petra
8	Dr. Nasim Abdalwahab Matar	Assistant Prof.	University of Petra
9	Dr. Trad Mohammad Almalahmeh	Assistant Prof.	University of Petra
10	Dr. Saed Zighan	Assistant Prof.	University of Petra
11	Dr. Firas Omar	Assistant Prof.	University of Petra
12	Dr. Fayez Albadri	Assistant Prof.	Middle East University
13	Dr. Saleh Alkhateb	Assistant Prof.	Al-Yarmouk University
14	Dr. Islam Azzam	Assistant Prof.	Al-Yarmouk University
15	Dr. Afnan Qudah	Manager	Jordan Food & Drug Administration
16	Ammar Obeidi	Manager	United pharmaceuticals company
17	Dr.Ruwa Abu Rumman	Manager	Alhikma pharmaceuticals company
18	Sharief Al-Atrash	Senior Supervisor	Tabuk pharmaceuticals company
19	Bashar Malkawi	Manager	Al-Far Importing Company

Appendix (2): Panel of Questionnaire distribution Committee:

No.	Qualification	Organization	Organization
1	Ahmad Altarifi	Marketing and sales manager	The Jordanian pharmaceuticals Manufacturing
2	Mohammad Mohsen	Marketing and sales manager	Hikma pharmaceuticals company
3	Yafa Khrais	Supply chain planning engineer	Dar Aldawa pharmaceuticals company
4	Anas Hiagneh	Supervisor	Dar Aldawa pharmaceuticals company
5	Ibrahim Alqasem	HR manager	Pharma International pharmaceuticals company
6	Dr. Rami Sabarli	General manager	Joriver pharmaceuticals company
7	Hussam Alabed	Pharmacist	United pharmaceuticals company
8	Mohammad Rawashdeh	Nutritionist	Nutridar company
9	Odai Saedeen	Quality control engineer	Joswe pharmaceutical company
10	Saif Melkawi	General manager	IBN HAYYAN DS
11	Sharif Alatrash	Senior Supervisor	Tabuk pharmaceuticals company

Appendix (3): Letter and Questionnaire of Respondents:

جامعة الشرق الأوسط
MIDDLE EAST UNIVERSITY

Questionnaire

Dear Mr./Dr. …….

I would like to request you to referee the attached questionnaire, which will be used for a thesis entitled:

Impact of Green Supply Chain on Competitive Advantages of Jordanian Pharmaceutical Manufacturing Organizations

أثر سلسلة التوريد الخضراء على الميزات التنافسية في الشركات الأردنية للصناعة الدوائية

You are requested to spare your precious time to fill up the questionnaire. Your views and answers are important to us, please answer all questions as we cannot use the questionnaire if it is incomplete.

Finally, the information given by you will be kept confidential and will be used for academic purposes only.

Thank you for your support and collaboration.

Prepared by: Nada Mahmoud Almokdad

Supervised by: Dr. Abdel-Aziz Ahmad Sharabati

Part I: Demographic Data

Gender: ☐ Male ☐ Female

Age (years): ☐ less than 30 ☐ less than 40 ☐ less than 50 ☐ More than 50

Experience: ☐ less than10 ☐ Bet.10-20 ☐ Bet.21-30 ☐ More than 30

Education: ☐ Diploma ☐ Bachelor ☐ Master ☐ PhD

Position: ☐ Supervisor. ☐ Director ☐ Senior Manager ☐ General Manager

Division: ☐ Supply Chain ☐ Finance ☐ Marketing & Sales ☐ Operations & Quality

Part 2: The following 30 questions test the perceptions of Jordanian pharmaceutical industry managers about the impact of the green supply chain practices and competitive advantage. Evaluate each question according to actual implementation and not your belief, as follows:

1 = strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = strongly agree

No	Item	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Green Supply Chain						
Green Purchasing						
1	The company explains product ingredients on the label	**1**	**2**	**3**	**4**	**5**
2	The company uses raw materials based on environmental standards	**1**	**2**	**3**	**4**	**5**
3	The company cooperates with suppliers on green innovation	**1**	**2**	**3**	**4**	**5**
4	The company develops a green purchasing procedure	**1**	**2**	**3**	**4**	**5**
5	The company develops a database about green supplier	**1**	**2**	**3**	**4**	**5**
Green Operations						
6	The company reduces pollution during production	**1**	**2**	**3**	**4**	**5**
7	The company reduces the rate of scrap to a minimum level	**1**	**2**	**3**	**4**	**5**
8	The company designs products to be recycled	**1**	**2**	**3**	**4**	**5**
9	The company manages environmental production execution	**1**	**2**	**3**	**4**	**5**
10	The company adopts GMP (Good Manufacturing Practice) standards	**1**	**2**	**3**	**4**	**5**
Green Selling						
11	The company adopts a suitable price for green products	**1**	**2**	**3**	**4**	**5**
12	The company considers green packaging	**1**	**2**	**3**	**4**	**5**
13	The company considers environmental factors for market responding	**1**	**2**	**3**	**4**	**5**
14	The company uses green awareness campaigns	**1**	**2**	**3**	**4**	**5**
15	The company uses marketing efforts for green products	**1**	**2**	**3**	**4**	**5**
Competitive Advantages						
Differentiation						
16	The company improves the quality of products	**1**	**2**	**3**	**4**	**5**
17	The company provides the innovative design of products	**1**	**2**	**3**	**4**	**5**
18	The company develops flexible production program to ensure quality	**1**	**2**	**3**	**4**	**5**
19	The company's employees come up with creative features of the	**1**	**2**	**3**	**4**	**5**
20	The company makes long term partner with reliable suppliers	**1**	**2**	**3**	**4**	**5**
Cost Leadership						
21	The company uses an online promotion campaign	**1**	**2**	**3**	**4**	**5**
22	The company reduces the cost of administration activities	**1**	**2**	**3**	**4**	**5**
23	The company uses a technology-based delivery system	**1**	**2**	**3**	**4**	**5**
24	The company utilizes available resources better than competitors	**1**	**2**	**3**	**4**	**5**
25	The company economize in the cost of product design technique	**1**	**2**	**3**	**4**	**5**
Responsiveness						
26	The company delivers goods on time	**1**	**2**	**3**	**4**	**5**
27	The company responds to market changes in a suitable time	**1**	**2**	**3**	**4**	**5**
28	The company reduces delivery time compared to competitors	**1**	**2**	**3**	**4**	**5**
29	The company uses online responding to customer	**1**	**2**	**3**	**4**	**5**
30	The company keeps suitable inventory to respond in time	**1**	**2**	**3**	**4**	**5**

Appendix (4): Letter and Questionnaire of Respondents: (Arabic version)

الإستبانة

عناية السيد / د. .....

أود الطلب من حضرتكم إبداء رأيكم وملاحظاتكم في الاستبانة المرفقة والتي سوف تستخدم في رسالة ماجستير بعنوان:

أثر سلسلة التوريد الخضراء على الميزات التنافسية في الشركات الاردنية للصناعة الدوائية

أرجو أن تمنحنا جزء من وقتكم الثمين لتعبئة هذه الاستبانة حيث أن وجهة نظركم وإجاباتكم مهمة جدا بالنسبة الينا، يرجى الاجابة على جميع الأسئلة حيث أنه لا يمكننا الاستفادة من هذه الاستبانة أو استخدامها في حالة عدم اكتمال الاجابات.

أخيرا أود أن أعلمكم بأن المعلومات التي ستقدمونها ستبقى سرية ولا تستخدم إلا لأغراض أكاديمية فقط.

شكرا لدعمكم وتعاونكم

إعداد الباحثة: ندى محمود المقداد

إشراف الدكتور: عبد العزيز احمد الشرباتي

الجزء الأول: الخصائص الديموغرافية

الجنس:	ذكر	☐	انثى	☐
العمر (بالسنوات)	أقل من 30 سنة	☐	أقل من 40 سنة	☐
	أقل من 50 سنة	☐	أكثر من 50 سنة	☐
الخبرة	أقل من 10 سنوات	☐	بين 10 – 20 سنة	☐
	بين 21 – 30 سنة	☐	أكثر من 30 سنة	☐
المؤهلات العلمية	دبلوم	☐	بكالوريوس	☐
	ماجستير	☐	دكتوراه	☐
الوظيفة	مشرف	☐	مدير	☐
	مدير أول	☐	مدير عام	☐
القسم	سلسلة التويد	☐	المالية	☐
	التسويق والمبيعات	☐	العمليات والجودة	☐

الجزء الثاني: الأسئلة الثلاثين التالية تختبر تصورات مديري الصناعة الدوائية الأردنية حول تأثير ممارسات سلسلة التوريد الخضراء والميزة التنافسية. الرجاء الإجابة على جميع الأسئلة وفقًا للتنفيذ الفعلي وليس وفقاً للتوقعات، على النحو التالي:

1 = لا أوافق بشدة، 2 = لا أوافق، 3 = محايد، 4 = أوافق، 5 = أوافق بشدة

الرقم	العبارة	غير موافق بشدة	غير موافق	محايد	موافق	موافق بشدة
سلسلة التوريد الخضراء						
الشراء الأخضر						
1	تشرح الشركة مكونات المنتج على الملصق	1	2	3	4	5
2	تستخدم الشركة المواد الخام بناءً على المعايير البيئية	1	2	3	4	5
3	تتعاون الشركة مع الموردين لإجراء الابتكار الأخضر	1	2	3	4	5
4	تقوم الشركة بتطوير إجراء شراء أخضر	1	2	3	4	5
5	تقوم الشركة بتطوير قاعدة بيانات حول المورد الأخضر	1	2	3	4	5
العمليات الخضراء						
6	تعمل الشركة على تقليل التلوث أثناء الإنتاج	1	2	3	4	5
7	تخفض الشركة من معدل الفضلات إلى الحد الأدنى	1	2	3	4	5
8	تقوم الشركة بتصميم منتجات قابلة للتدوير	1	2	3	4	5
9	تقوم الشركة بتنفيذ إجراءات الإنتاج البيئي	1	2	3	4	5
10	تعتمد الشركة معايير ممارسات التصنيع الجيدة	1	2	3	4	5
البيع الأخضر						
11	تعتمد الشركة أسعار مناسبة للمنتجات الخضراء	1	2	3	4	5
12	تقوم الشركة بعمليات التغليف الأخضر	1	2	3	4	5
13	تعتبر الشركة العوامل البيئية للاستجابة السوق	1	2	3	4	5
14	تجري الشركة حملات التوعية الخضراء	1	2	3	4	5
15	تقوم الشركة بالتسويق للمنتجات الخضراء	1	2	3	4	5
الميزة التنافسية						
التفاضلية						
16	تعمل الشركة على تحسين جودة المنتجات	1	2	3	4	5
17	توفر الشركة تصميم مبتكر للمنتجات	1	2	3	4	5
18	تقوم الشركة بتطوير برنامج إنتاج مرن لضمان الجودة	1	2	3	4	5
19	يأتي موظفو الشركة بميزات مبتكرة للمنتج	1	2	3	4	5
20	تجري الشركة عقود طويل الأجل مع الموردين الموثوق بهم	1	2	3	4	5

الرقم	العبارة	غير موافق بشدة	غير موافق	محايد	موافق	موافق بشدة
التكاليف الإدارية						
21	تجري الشركة حملات ترويجية عبر الإنترنت	1	2	3	4	5
22	تخفض الشركة تكاليف الأنشطة الإدارية	1	2	3	4	5
23	تستخدم الشركة نظام التسليم القائم على التكنولوجيا	1	2	3	4	5
24	تستخدم الشركة الموارد المتاحة بشكل أفضل من المنافسين	1	2	3	4	5
25	تعمل الشركة على ترشيد تكلفة تصميم المنتج	1	2	3	4	5
الاستجابة						
26	تقوم الشركة بتسليم البضائع في الوقت المحدد	1	2	3	4	5
27	تستجيب الشركة لتغيرات السوق في وقت مناسب	1	2	3	4	5
28	الشركة يقلل من وقت التسليم بالمقارنة مع المنافسين	1	2	3	4	5
29	تستخدم الشركة الاستجابة عبر الإنترنت للعميل	1	2	3	4	5
30	تحتفظ الشركة بمخزون مناسب للرد في الوقت المناسب	1	2	3	4	5

Appendix (5): Data Analysis

Frequencies

Statistics							
		Age (Years)	Division	Education	Experience	Gender	Position
N	Valid	130	130	130	130	130	130
	Missing	0	0	0	0	0	0

Age (Years)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 30	41	31.5	31.5	31.5
	Less than 40	50	38.5	38.5	70.0
	Less than 50	25	19.2	19.2	89.2
	More than 50	14	10.8	10.8	100.0
	Total	130	100.0	100.0	

Division					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Supply chain	26	20.0	20.0	20.0
	Finance	17	13.1	13.1	33.1
	Marketing & Sales	49	37.7	37.7	70.8
	Operations & Quality	38	29.2	29.2	100.0
	Total	130	100.0	100.0	

Education					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diploma	7	5.4	5.4	5.4
	Bachelor	91	70.0	70.0	75.4
	Master	31	23.8	23.8	99.2
	PhD	1	.8	.8	100.0
	Total	130	100.0	100.0	

Experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 10	56	43.1	43.1	43.1
	between 10-20	51	39.2	39.2	82.3
	between 21-30	15	11.5	11.5	93.8
	more than 30	8	6.2	6.2	100.0
	Total	130	100.0	100.0	

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	70	53.8	53.8	53.8
	Female	60	46.2	46.2	100.0
	Total	130	100.0	100.0	

Position					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Supervisor	58	44.6	44.6	44.6
	Director	27	20.8	20.8	65.4
	Senior Manager	42	32.3	32.3	97.7
	General Manager	3	2.3	2.3	100.0
	Total	130	100.0	100.0	

Factor Analysis

/VARIABLES q1 q2 q3 q4 q5

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.792
Bartlett's Test of Sphericity	Approx. Chi-Square	286.147
	Df	10
	Sig.	.000

Communalities		
	Initial	Extraction
The company explains product ingredients on the label	1.000	.485
The company uses raw materials based on environmental standards	1.000	.593
The company cooperates with suppliers on green innovation	1.000	.687
The company develops a green purchasing procedure	1.000	.694
The company develops a database about green supplier	1.000	.677
Extraction Method: Principal Component Analysis.		

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.136	62.710	62.710	3.136	62.710	62.710
2	.788	15.767	78.477			

3	.460	9.195	87.671			
4	.366	7.323	94.994			
5	.250	5.006	100.000			
Extraction Method: Principal Component Analysis.						

Component Matrix[a]	
	Component
	1
The company explains product ingredients on the label	.696
The company uses raw materials based on environmental standards	.770
The company cooperates with suppliers on green innovation	.829
The company develops a green purchasing procedure	.833
The company develops a database about green supplier	.823
Extraction Method: Principal Component Analysis.	
a. 1 component extracted.	

Factor Analysis
/VARIABLES q6 q7 q8 q9 q10

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.574
Bartlett's Test of Sphericity	Approx. Chi-Square	107.021
	Df	10
	Sig.	.000

Communalities		
	Initial	Extraction
The company reduces pollution during production	1.000	.719
The company reduces the rate of scrap to a minimum level	1.000	.706
The company designs products to be recycled	1.000	.305
The company manages environmental production execution	1.000	.716
The company adopts GMP (Good Manufacturing Practice) standards	1.000	.765
Extraction Method: Principal Component Analysis.		

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.006	40.115	40.115	2.006	40.115	40.115
2	1.205	24.099	64.214	1.205	24.099	64.214
3	.876	17.527	81.741			
4	.532	10.648	92.389			
5	.381	7.611	100.000			
Extraction Method: Principal Component Analysis.						

Component Matrix[a]		
	Component	
	1	2
The company reduces pollution during production	.780	-.333
The company reduces the rate of scrap to a minimum level	.727	.422
The company designs products to be recycled	.535	.138
The company manages environmental production execution	.316	.785
The company adopts GMP (Good Manufacturing Practice) standards	.695	-.530
Extraction Method: Principal Component Analysis.		
a. 2 components extracted.		

Factor Analysis
/VARIABLES q11 q12 q13 q14 q15

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.728
Bartlett's Test of Sphericity	Approx. Chi-Square	81.518
	Df	10
	Sig.	.000

Communalities		
	Initial	Extraction
The company adopts suitable prices for green products	1.000	.345
The company considers green packaging	1.000	.444
The company considers environmental factors for market responding	1.000	.434
The company uses green awareness campaigns	1.000	.475
The company uses marketing efforts for green products	1.000	.454
Extraction Method: Principal Component Analysis.		

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.152	43.035	43.035	2.152	43.035	43.035
2	.841	16.826	59.861			
3	.760	15.200	75.061			
4	.708	14.161	89.222			
5	.539	10.778	100.000			
Extraction Method: Principal Component Analysis.						

Component Matrix[a]	
	Component
	1

The company adopts suitable prices for green products	.587
The company considers green packaging	.666
The company considers environmental factors for market responding	.659
The company uses green awareness campaigns	.689
The company uses marketing efforts for green products	.674
Extraction Method: Principal Component Analysis.	
a. 1 component extracted.	

Factor Analysis
/VARIABLES q16 q17 q18 q19 q20

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.833
Bartlett's Test of Sphericity	Approx. Chi-Square	200.980
	Df	10
	Sig.	.000

Communalities		
	Initial	Extraction
The company improves the quality of products	1.000	.733
The company provides the innovative design of products	1.000	.604
The company develops flexible production program to ensure quality	1.000	.614
The company's employees come up with creative features of the product	1.000	.484
The company makes long term partner with reliable suppliers	1.000	.433
Extraction Method: Principal Component Analysis.		

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.868	57.352	57.352	2.868	57.352	57.352
2	.702	14.038	71.390			
3	.569	11.389	82.779			
4	.515	10.310	93.088			
5	.346	6.912	100.000			
Extraction Method: Principal Component Analysis.						

Component Matrix[a]	
	Component
	1
The company improves the quality of products	.856
The company provides the innovative design of products	.777
The company develops flexible production program to ensure quality	.784

The company's employees come up with creative features of the product	.696
The company makes long term partner with reliable suppliers	.658
Extraction Method: Principal Component Analysis.	
a. 1 component extracted.	

Factor Analysis
/VARIABLES q21 q22 q23 q24 q25

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.714
Bartlett's Test of Sphericity	Approx. Chi-Square	157.292
	Df	10
	Sig.	.000

Communalities		
	Initial	Extraction
The company uses an online promotion campaign	1.000	.493
The company reduces cost in administration activities	1.000	.431
The company uses the technology-based delivery system to lower cost	1.000	.583
The company utilizes available resources better than competitors	1.000	.578
The company economize in the cost of product design technique	1.000	.466
Extraction Method: Principal Component Analysis.		

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.552	51.049	51.049	2.552	51.049	51.049
2	.905	18.101	69.151			
3	.639	12.779	81.929			
4	.545	10.902	92.831			
5	.358	7.169	100.000			
Extraction Method: Principal Component Analysis.						

Component Matrix[a]	
	Component
	1
The company uses an online promotion campaign	.702
The company reduces cost in administration activities	.657
The company uses the technology-based delivery system to lower cost	.764
The company utilizes available resources better than competitors	.760

The company economize in the cost of product design technique	.683
Extraction Method: Principal Component Analysis.	
a. 1 component extracted.	

Factor Analysis
/VARIABLES q26 q27 q28 q29 q30

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.791
Bartlett's Test of Sphericity	Approx. Chi-Square	164.943
	Df	10
	Sig.	.000

Communalities		
	Initial	Extraction
The company delivers goods on time	1.000	.586
The company responds to market changes in a suitable time	1.000	.636
The company reduces delivery time compared to competitors	1.000	.598
The company uses online responding to customer	1.000	.456
The company keeps a suitable inventory to respond in time	1.000	.391
Extraction Method: Principal Component Analysis.		

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.668	53.358	53.358	2.668	53.358	53.358
2	.753	15.060	68.417			
3	.666	13.327	81.744			
4	.530	10.610	92.354			
5	.382	7.646	100.000			
Extraction Method: Principal Component Analysis.						

Component Matrix[a]	
	Component
	1
The company delivers goods on time	.766
The company responds to market changes in a suitable time	.798
The company reduces delivery time compared to competitors	.774
The company uses online responding to customer	.675
The company keeps a suitable inventory to respond in time	.626
Extraction Method: Principal Component Analysis.	
a. 1 component extracted.	

/VARIABLES=q1 q2 q3 q4 q5

Reliability Statistics	
Cronbach's Alpha	N of Items
.846	5

/VARIABLES=q6 q7 q8 q9 q10

Reliability Statistics	
Cronbach's Alpha	N of Items
.611	5

/VARIABLES=q11 q12 q13 q14 q15

Reliability Statistics	
Cronbach's Alpha	N of Items
.664	5

/VARIABLES=q16 q17 q18 q19 q20

Reliability Statistics	
Cronbach's Alpha	N of Items
.811	5

/VARIABLES=q21 q22 q23 q24 q25

Reliability Statistics	
Cronbach's Alpha	N of Items
.751	5

/VARIABLES=q26 q27 q28 q29 q30

Reliability Statistics	
Cronbach's Alpha	N of Items
.778	5

T-TEST

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean

The company explains product ingredients on the label	130	3.92	1.306	.115
The company uses raw materials based on environmental standards	130	3.75	1.175	.103
The company cooperates with suppliers on green innovation	130	3.44	1.175	.103
The company develops a green purchasing procedure	130	3.39	1.075	.094
The company develops a database about green supplier	130	3.35	1.146	.101
The company reduces pollution during production	130	3.75	1.253	.110
The company reduces the rate of scrap to a minimum level	130	3.82	.992	.087
The company designs products to be recycled	130	2.90	1.055	.093
The company manages environmental production execution	130	3.73	.896	.079
The company adopts GMP (Good Manufacturing Practice) standards	130	4.12	1.118	.098
The company adopts suitable prices for green products	130	3.25	1.170	.103
The company considers green packaging	130	3.48	.998	.088
The company considers environmental factors for market responding	130	3.44	.980	.086
The company uses green awareness campaigns	130	3.33	1.037	.091
The company uses marketing efforts for green products	130	3.51	1.044	.092
The company improves the quality of products	130	4.11	1.143	.100
The company provides innovative design of products	130	3.92	.969	.085
The company develops flexible production program to ensure quality	130	3.85	1.015	.089
The company’s employees come up with creative features of the product	130	3.68	1.021	.090

The company makes long term partner with reliable suppliers	130	3.91	1.060	.093
The company uses an online promotion campaign	130	3.02	1.444	.127
The company reduces cost in administration activities	130	3.50	.891	.078
The company uses the technology-based delivery system to lower cost	130	3.52	1.087	.095
The company utilizes available resources better than competitors	130	3.52	1.156	.101
The company economize in the cost of product design technique	130	3.78	.983	.086
The company delivers goods on time	130	3.83	.966	.085
The company responds to market changes in a suitable time	130	3.68	1.135	.100
The company reduces delivery time compared to competitors	130	3.52	1.029	.090
The company uses online responding to customer	130	3.50	1.073	.094
The company keeps a suitable inventory to respond in time	130	3.76	1.048	.092

One-Sample Test						
	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
The company explains product ingredients on label	34.179	129	.000	3.915	3.69	4.14
The company uses raw materials based on environmental standards	36.424	129	.000	3.754	3.55	3.96

The company cooperates with suppliers on green innovation	33.374	129	.000	3.438	3.23	3.64
The company develops a green purchasing procedure	35.990	129	.000	3.392	3.21	3.58
The company develops database about green supplier	33.291	129	.000	3.346	3.15	3.55
The company reduces the pollution during production	34.081	129	.000	3.746	3.53	3.96
The company reduces the rate of scrap to a minimum level	43.944	129	.000	3.823	3.65	4.00
The company designs products to be recycled	31.328	129	.000	2.900	2.72	3.08
The company manages environmental production execution	47.472	129	.000	3.731	3.58	3.89
The company adopts GMP (Good Manufacturing Practice) standards	41.966	129	.000	4.115	3.92	4.31
The company adopts suitable prices for green products	31.706	129	.000	3.254	3.05	3.46
The company considers green packaging	39.813	129	.000	3.485	3.31	3.66
The company considers environmental factors for market responding	39.986	129	.000	3.438	3.27	3.61
The company uses green awareness campaigns	36.614	129	.000	3.331	3.15	3.51

The company uses marketing efforts for green products	38.323	129	.000	3.508	3.33	3.69
The company improves the quality of products	40.980	129	.000	4.108	3.91	4.31
The company provides innovative design of products	46.141	129	.000	3.923	3.75	4.09
The company develops flexible production program to ensure quality	43.201	129	.000	3.846	3.67	4.02
The company's employees come up with creative features of the product	41.068	129	.000	3.677	3.50	3.85
The company makes long term partner with reliable suppliers	42.040	129	.000	3.908	3.72	4.09
The company uses online promotion campaign	23.872	129	.000	3.023	2.77	3.27
The company reduces cost in administration activities	44.769	129	.000	3.500	3.35	3.65
The company uses technology-based delivery system to lower cost	36.868	129	.000	3.515	3.33	3.70
The company utilizes available resources better than competitors	34.744	129	.000	3.523	3.32	3.72
The company economize in the cost of product design technique	43.829	129	.000	3.777	3.61	3.95
The company delivers goods on time	45.234	129	.000	3.831	3.66	4.00

The company responds to market changes in a suitable time	37.027	129	.000	3.685	3.49	3.88
The company reduces delivery time compared to competitors	38.969	129	.000	3.515	3.34	3.69
The company uses online responding to customer	37.194	129	.000	3.500	3.31	3.69
The company keeps a suitable inventory to respond in time	40.934	129	.000	3.762	3.58	3.94

Correlations

		Green Purchasing	Green Operations	Green Selling	Green Supply Chain	Differentiation	Cost Leadership	Responsiveness	Competitive Advantages
Green Purchasing	Pearson Correlation	**1**	**.546****	**.624****	**.885****	**.590****	**.616****	**.624****	**.696****
	Sig. (2-tailed)		**.000**	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**
	N	**130**	**130**	**130**	**130**	**130**	**130**	**130**	**130**
Green Operations	Pearson Correlation	**.546****	**1**	**.578****	**.808****	**.623****	**.489****	**.511****	**.618****
	Sig. (2-tailed)	**.000**		**.000**	**.000**	**.000**	**.000**	**.000**	**.000**
	N	**130**	**130**	**130**	**130**	**130**	**130**	**130**	**130**
Green Selling	Pearson Correlation	**.624****	**.578****	**1**	**.849****	**.551****	**.611****	**.638****	**.685****
	Sig. (2-tailed)	**.000**	**.000**		**.000**	**.000**	**.000**	**.000**	**.000**
	N	**130**	**130**	**130**	**130**	**130**	**130**	**130**	**130**
Green Supply Chain	Pearson Correlation	**.885****	**.808****	**.849****	**1**	**.690****	**.678****	**.698****	**.786****
	Sig. (2-tailed)	**.000**	**.000**	**.000**		**.000**	**.000**	**.000**	**.000**
	N	**130**	**130**	**130**	**130**	**130**	**130**	**130**	**130**
Differentiation	Pearson Correlation	**.590****	**.623****	**.551****	**.690****	**1**	**.576****	**.585****	**.823****
	Sig. (2-tailed)	**.000**	**.000**	**.000**	**.000**		**.000**	**.000**	**.000**
	N	**130**	**130**	**130**	**130**	**130**	**130**	**130**	**130**
Cost Leadership	Pearson Correlation	**.616****	**.489****	**.611****	**.678****	**.576****	**1**	**.791****	**.902****
	Sig. (2-tailed)	**.000**	**.000**	**.000**	**.000**	**.000**		**.000**	**.000**
	N	**130**	**130**	**130**	**130**	**130**	**130**	**130**	**130**
Responsiveness	Pearson Correlation	**.624****	**.511****	**.638****	**.698****	**.585****	**.791****	**1**	**.902****
	Sig. (2-tailed)	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**		**.000**

	N	**130**	**130**	**130**	**130**	**130**	**130**	**130**	**130**
Competitive Advantages	Pearson Correlation	**.696****	**.618****	**.685****	**.786****	**.823****	**.902****	**.902****	**1**
	Sig. (2-tailed)	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**	**.000**	
	N	**130**	**130**	**130**	**130**	**130**	**130**	**130**	**130**
**. Correlation is significant at the 0.01 level (2-tailed).									

Regression

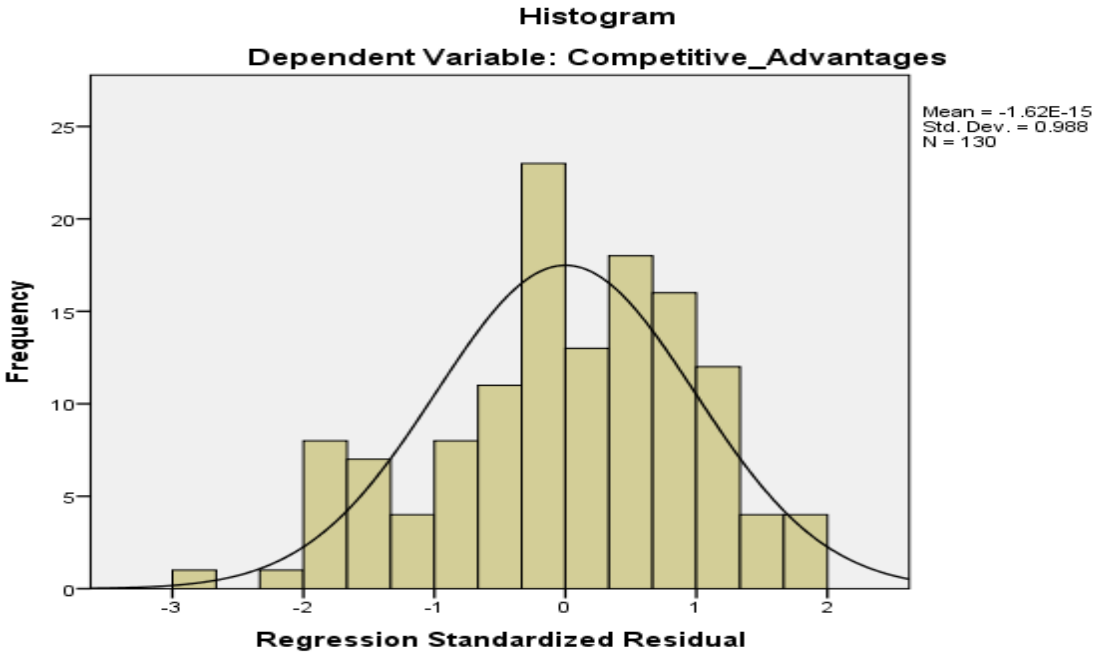
Variables Entered/Removed[a]			
Model	Variables Entered	Variables Removed	Method
1	**Green_Selling, Green_Operations, Green_Purchasing[b]**	**.**	**Enter**
a. Dependent Variable: Competitive_Advantages			
b. All requested variables entered.			

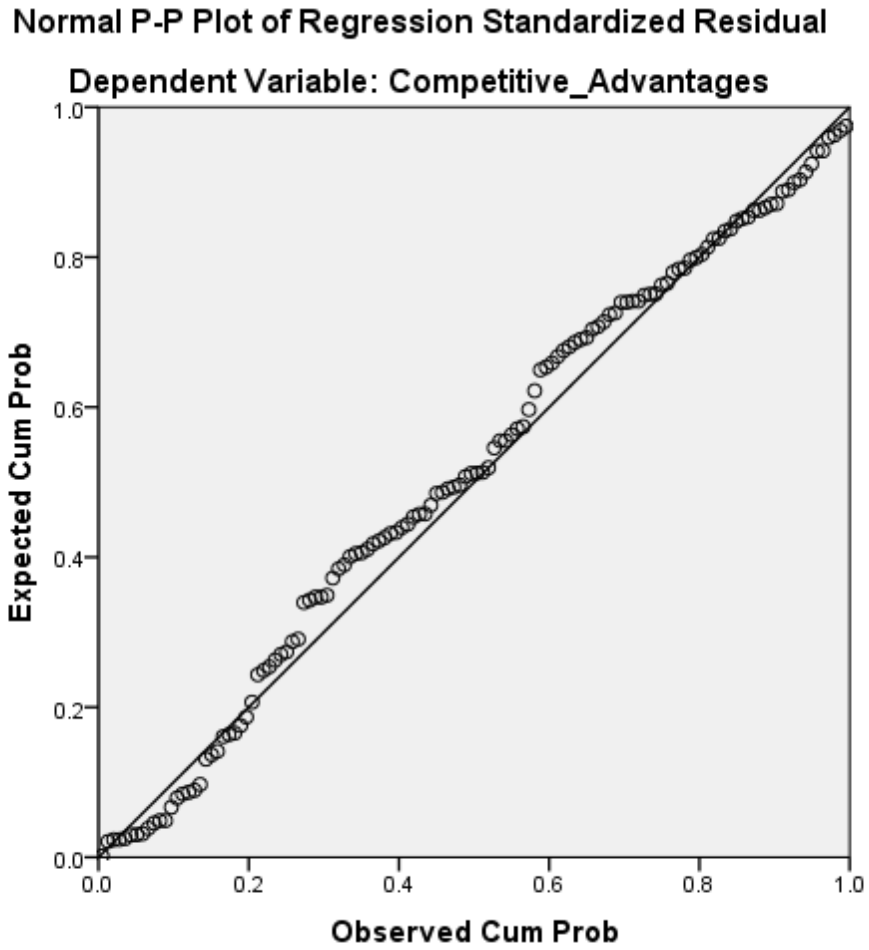
Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	**.787[a]**	**.620**	**.611**	**.42826**
a. Predictors: (Constant), Green_Selling, Green_Operations, Green_Purchasing				

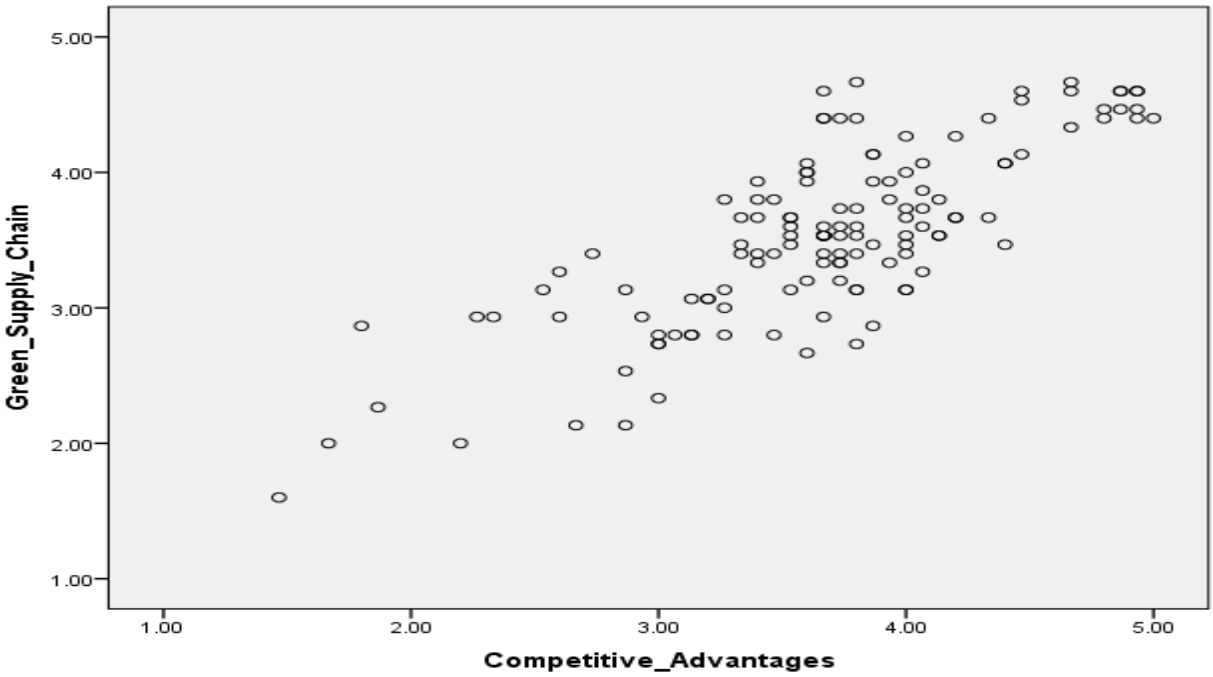
ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	**37.659**	**3**	**12.553**	**68.442**	**.000[b]**
	Residual	**23.110**	**126**	**.183**		
	Total	**60.768**	**129**			
a. Dependent Variable: Competitive_Advantages						
b. Predictors: (Constant), Green_Selling, Green_Operations, Green_Purchasing						

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	**.734**	**.226**		**3.252**	**.001**
	Green_Purchasing	**.274**	**.054**	**.370**	**5.034**	**.000**
	Green_Operations	**.236**	**.072**	**.230**	**3.274**	**.001**
	Green_Selling	**.322**	**.076**	**.321**	**4.260**	**.000**
a. Dependent Variable: Competitive_Advantages						

Charts


Histogram
Dependent Variable: Competitive_Advantages
Mean = -1.62E-15
Std. Dev. = 0.988
N = 130
Frequency
Regression Standardized Residual


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Competitive_Advantages
Expected Cum Prob
Observed Cum Prob


Green_Supply_Chain
5.00
4.00
3.00
2.00
1.00
1.00
2.00
3.00
4.00
5.00
Competitive_Advantages