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THE CONTRIBUTION OF WAREHOUSING TO SUPPLY CHAIN RESILIENCE AND FIRM PERFORMANCE

By

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DECLARATION

I hereby declare that this submission is my own work towards the MSc and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgment has been made in the text.

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DEDICATION

This work is dedicated to the Almighty God for giving me the strength to complete this thesis.

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ABSTRACT

In the current competitive business environment, it has become crucial for businesses to meet client demands within a shorter time constraint. Warehousing has been identified as principal tool to make it easier for goods to move from suppliers to customers, satisfying demand quickly and efficiently. Thus, the study used the Resource Based View (RBV) and the Viable System Model (VSM) to explain how warehousing influences financial performance, supply chain resilience, and economic performance. A quantitative approach and an explanatory design were utilised to provide answers to the research questions. With respect to the time horizon, a cross-sectional design was adopted to gather data from the respondents. The population of the study was made up of employees working in production, warehouse, procurement, and supply chain departments. A sample of 200 participants was selected through the convenience sampling technique. A regression analysis was conducted to test the relationships. Furthermore, correlation tests revealed that there was a positive but very weak relationship between warehousing and financial performance, supply chain resilience, and economic performance. The regression results showed that warehousing significantly predicted the financial performance of the selected organisations. However, the results revealed that warehousing has an insignificant influence on supply chain resilience and economic of the selected organisations. The study helps to improve managerial insight for warehouse management and supply chain resilience. It also contributes to the existing studies about warehousing, supply chain resilience and firm performance by explaining and analysing their relationships.

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LIST OF ABBREVIATIONS

EP	Economic Performance
RBV	Resource Based View
SCR	Supply Chain Resilience
SD	Standard Deviation
WMS	Warehousing Management System
WS	Warehouse System

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

In the current competitive business environment, it has become crucial for businesses to meet client demands within a shorter time constraint. The competition is ever-increasing owing to the fact that customers are becoming well-informed and sophisticated, coupled with the rapid introduction of new products. In order to compete successfully, it is critical to pay special attention to logistics and supply chain management (Kherbach & Mocan, 2016). Accordingly, contemporary supply chains are anticipated to respond timely, efficiently, and effectively to changes in a market so as to sustain and develop competitive advantages (Thatte et al., 2013). However, the design, location, and management of warehouses are inevitable in supply chain management (De Koster et al., 2017). Warehouses are therefore indispensable in the quest to match product demand with supply at various levels of the supply chain.

According to Schieweck et al. (2018), a warehouse system (WS) is the strategic effort of choosing the size, operations, technologies, composition, and management of a warehouse with respect to predetermined needs. The goal of an optimal warehouse is to decrease barriers and congestion while ensuring that products flow in a predefined order throughout the warehouse (Fernando, 2016). As well, a number of other departments, including production, sales, and finance, are also significantly impacted by warehouse management, in addition to productivity (Ali et al., 2020). For instance, in the same way that the production department cannot start work on a project until raw materials are available in the warehouse, sales departments cannot also sell a product until it is present in a finished goods warehouse. Supply networks must be quick to respond to continuously fluctuating market conditions. Owing to that, many

organisations place a high priority on improving resilience in the warehousing processes because doing so enables companies to quickly react to unforeseen changes in the market (Singh et al., 2019).

Furthermore, in an environment where consumers expect quick responses from both online and traditional retailers, manufacturers and third-party logistics providers (3PLs) that serve these retailers must rebalance their strategies and increase the accuracy of their operations while also enhancing operational efficiency, resilience, and flexibility (Laosirihongthong, 2018). In order to respond swiftly to market developments, firms must make their procedures more resilient and flexible. According to Richey et al. (2022), supply chain resilience is the result of organisational changes made by respective organisations within a supply chain to change behaviours, policies, or standards in order to position the supply chain and its participants to achieve customer value in a dynamic environment.

Supply Chain Resilience (SCR) is defined as the capacity of a firm to consistently and promptly respond to customer demands or variations in the market through its supply chain, as well as to create or maintain a competitive advantage (Rajagopal et al., 2016). SCR is grouped into three categories, namely, operations systems resilience (OSR), logistics process resilience (LPR), and supplier network resilience (SNR) (Thatte, 2007). OSR denotes the capability of a firm to quickly examine its resources and operational framework to respond to variations in the volume and composition of the products that consumers demand, in addition to emergency orders (Thatte et al., 2013). It also refers to how quickly the supply chain of an organization serves the various customer categories (Asamoah et al., 2021). Lastly, SCR refers to the capability of an

organization to react to and meet changes in its customers' demands (Al-Hawajreh and Attiany, 2014).

Finally, Mourtzis et al. (2019) contended that warehousing is a never-ending problem that has a significant effect on financial performance, supply chain resilience, and economic performance (EP). To be precise, the dilemma facing firms is how to design a warehouse that can at any given time meet the changing market forces such as technology and consumer tastes in order to reap financial performance, supply chain resilience, and economic performance. Consequently, it is necessary for practitioners and academics to seek a deeper understanding of the effect of warehousing on financial performance, supply chain resilience, and economic performance.

1.2 Problem statement

The principal function of a warehouse is to make it easier for commodities to move from suppliers to customers, satisfying demand quickly and efficiently (Richards, 2017). Ali et al. (2020) indicated that warehouses are essential components of modern enterprises and that every type of organisation has warehouses, ranging from distributors, manufacturers, and retailers from all industries. Warehouses are therefore critical components of material flow because they alter materials based on, place, time, and form (storage, picking, consolidation, deconsolidation, sorting, among others) in the manufacturing sector (Kłodawski et al., 2017). The main duties and responsibilities of a warehouse are to keep the proper supplies on hand, manage new stock entering the location, pack and ship orders, monitor and enhance overall storage, and arrange for delivery of finished goods to final consumers (Kamali, 2019). The right warehouse can improve the efficiency and convenience of a firm's entire production and distribution strategy. Warehouse, inventory management, and distribution processes that are

efficient can increase output while decreasing costs (Changarampat, 2022). Clearly, warehouses serve as vital nodes in the supply chain within their operation.

Despite the crucial role that warehousing plays, studies that expressly explores the essential role of warehousing in supply chain resilience are scarce especially during the significant interruption caused by COVID-19 (Fardan and Al Rebh, 2022). According to Rai et al. (2021), supply chain resilience is not given enough attention in the academic space. Similarly, Ali et al. (2020) asserted that, despite the fact that warehouse management is a major driver of financial performance of a firm, researchers tend to overlook this area of organization, and it has thus received less attention. A review of literature points out that there are a few studies (e.g., De Koster et al., 2017; Gu et al., 2010; Koster et al., 2007) that thoroughly examined WS (da Cunha Reis et al., 2017). In addition, literature on the effect of warehousing on economic performance is limited. Therefore, more research is required in these areas to bridge the literature gaps.

Furthermore, the issue of sustainability has recently surfaced as a key concern in the manufacturing industries across the globe. As a result, firms that were primarily concerned with financial gain are gradually understanding how important it is to safeguard and maintain the environment through the use of supply chain management (SCM) techniques (Mallak et al., 2018, as cited in Seman, 2022) such as SCR. Hence, SCR has been identified as one of the primary SCM initiatives on the plan of strategists, practitioners, and researchers (Asamoah et al., 2021). This means that an SCR study is critical, especially at a time when green procurement is at the forefront of global organisations.

Last but not least, due to rising customer demand and fierce global competition, there is an urgent need to meet customer requirements in terms of timeliness and cost effectiveness. However, studies have shown that the secret to attracting customers from around the world is supply chain resilience (Sundram et al., 2018). According to Bartholdi and Hackman (2014), a good warehouse system helps organisations to respond swiftly when demand changes. Finally, Azar and Alam (n.d) called on researchers to conduct more studies to learn more about the factors that influence SCR. Therefore, this study is intended to ascertain how warehousing influences financial performance, supply chain resilience, and economic performance.

1.3 Research objectives

The objectives of the study are divided into general and specific.

1.3.1 General objective

The main objective of the study is to assess the effects of warehousing on financial performance, supply chain resilience, and economic performance.

1.3.2 Specific objectives

The specific objectives are:

1. To assess the relationship between warehousing and financial performance
2. To examine the relationship between warehousing and supply chain resilience
3. To determine the relationship between warehousing and economic performance.
4. To study the mediating role of supply chain resilience on the relationship between warehousing and financial performance.

1.4 Research questions

1. How does warehousing influence financial performance?
2. To what extent does warehousing impact supply chain resilience?
3. What is the relationship between warehousing and economic performance?
4. How does supply chain resilience mediate the relationship between warehousing and financial performance.

1.5 Significance of the study

The study contributes to industry, research, and economic development. First, the study will help the supply chain industry to improve their warehouse management activities and build a more resilient supply chain. The study's findings and recommendations will also assist the industry players to be informed by the role played by warehousing in enhancing flexibility in their supply chains, as well as boosting financial and EP.

The study will also contribute to academia by adding to the literature on warehousing, financial performance, SCP, and EP. That is, it will contribute to the current knowledge of how warehousing influences financial performance, SCR, and EP. The study explains the relationships that exist among warehousing, SCP, and firm performance (financial and EP).

Finally, the study will play a pivotal role in the development of the economy in the sense that warehouses offer economies of scale due to efficient operations, ample storage space, and a central position. Consolidation and accumulation procedures, for example, generate economic advantages, and outbound delivery expenses are reduced for both the company and its customers through consolidation activities which affects the development of the economy.

1.6 Summary of methodology

The research methodology of this study is informed by the research objectives. As a result, to address the research questions, a quantitative technique and an explanatory design were used. With respect to the time horizon, a cross-sectional design was adopted to gather data from the respondents. The population of the study was made up of employees of selected organisations working in production, warehouse, procurement and supply chain, and finance departments. A questionnaire survey technique was used to gather data from respondents. The Statistical Package for Social Sciences (SPSS) version 25 was used to analyse the data.

1.7 Scope of the study

This study assesses the impact of warehousing on financial performance, supply chain resilience, and economic performance. The conceptual scope encompasses the working definitions of the aforementioned concepts. First, warehousing is defined as the strategic effort of choosing a size, operations, technologies, and structure of a warehouse with respect to predetermined needs. Second, financial performance is defined as financial situation that exists in an organisation at a certain moment or time frame in attaining financial objectives at the lowest possible cost. Third, SCR is the ability of a supply chain to respond promptly and to a level that takes into account the shifting demands of consumers along with other variations in the fast-paced business environment. Geographically, the study was conducted in the second capital of Ghana, Kumasi. The production, warehouse, procurement and supply chain, and finance departments are the focus of attention of the researcher in relation to the population.

1.8 Limitation of the study

The limitations of the study and future research directions are discussed simultaneously. One of the limitations is the use of a cross-sectional design and a structured questionnaire for data collection. The use of a cross-sectional design means that variations in the warehousing of the selected organisations over time that might have an impact on the results are not estimated. In addition, when using a structured questionnaire, a respondent's ability to give a detailed picture of the issue at stake is usually limited. As a result, to fully appreciate the subject, future research should use a longitudinal and mixed-methods methodology.

Moreover, the study is limited by the sample size. That is, considering the number of organisations with warehouses in the country, a sample size of 200 from a few selected organisations is not adequate to come to a conclusion on warehousing issues. Thus, it is suggested that future studies use a larger sample size selected from several organisations from different geographical areas of the country in order to lend credence to the results. Finally, the study found that warehousing has an insignificant effect on financial and performance, thus, future research could examine the impact of warehousing on other antecedents of firm performance other than financial performance, supply chain resilience and economic performance.

1.9 Organization of the thesis

The study is organised into five chapters. The first chapter is the introduction, which encompasses the background, problem statement, objectives, research questions, significance, scope, an overview of methodology, and the organisation of the study. The second chapter centres on reviewing extant literature on the subject matter and providing a framework for explaining the interactions between variables. The third

chapter describes the research approaches adopted for the study. The fourth chapter is concerned with the presentation and analysis of data, as well as the discussion of findings. The fifth chapter summarises major findings, conclusions, and recommendations, as well as limits and future study directions.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter is a review of relevant literature on warehouse systems, financial performance, supply chain resilience, and economic performance. Theories are reviewed to support the relationships among the variables. Also, prior studies relating to the study are empirically reviewed. Finally, a conceptual framework is presented to show the relationships between the independent variable, warehouse system, and the dependent variables: financial performance, supply chain resilience, and EP.

2.2 Conceptual Review

The main variables: warehousing, financial performance, supply chain resilience, and EP are reviewed extensively in this section.

2.2.1 Warehousing

In a complete logistics network, a warehouse system is a place where raw materials, semi-products, or finished goods are gathered and kept before being used in other processes. It also symbolises a system that ensures timely transformation of goods; they are further distributed to various locations where a demand for them has been identified (Stević et al., 2018). Warehouse systems are used in a variety of settings, including manufacturing, product distribution centres, and testing centres (Miralam, 2017). All warehouse management systems fulfil the core duties of warehousing, such as the receiving, storage, and retrieval of commodities. The primary objective of WS is to control the flow of goods through a warehouse and to manage all associated tasks, including shipping, putting things away, receiving, and picking (Ramaa et al., 2012). A

basic idea behind the warehouse system is to give specific information so that the movement of materials within the warehouse can be efficiently monitored (Vatumalae et al., 2022).

The notion of warehousing is to ensure that everything operates as efficiently as possible by planning, monitoring, and managing everything inside the warehouse (Kamali, 2019). Warehousing has been defined as the strategic effort of choosing a size, operations, technologies, and structure of a warehouse with respect to predetermined needs (Schieweck et al., 2018). Therefore, Khan et al. (2022) stated that the entire operation of a business revolves around warehousing. Specifically, the operation of a warehouse starts with the receiving of inbound items that must be stored within the warehouse. This is followed by receipt and shipment of customers' orders. As a result, the entire warehouse activity might be classified as storage and handling. According to Schieweck et al. (2018), warehouses are locations in a SC where goods are stored and handled. Also, De Oliveira et al. (2022) described warehouses as a hub for supply chains, marketplaces, clients, and other business stakeholders. It is a unit in a company's supply chain that serves the purpose for material planning, receiving, and keeping stocks needed for further production of goods and services (Udeh & Karaduman, 2015). In general, warehousing entails the administrative functions related to the storage of goods and materials (De Oliveira et al., 2022).

Warehouses are broadly classified into two types: production and distribution warehouses. A production warehouse is used in a manufacturing plant to store raw materials, semi-finished products, and final products. A distribution warehouse is a facility where products from many suppliers are received (and sometimes assembled) for delivery to a variety of clients (Saderova et al., 2021). In contrast, Frazelle (2016)

categorised warehouses into: work-in-process warehouses, raw material warehouses, finished-goods warehouses, distribution centre warehouses, overflow warehouses, bonded warehouses, and contract warehouses, public warehouses. Frazelle further explained these warehouses as follows: First, raw material warehouses keep inventory close to or in plants where meeting production and assembly schedules on time is crucial to success. Second, work-in-process warehouses store inventories in or around facilities and function largely as buffers between production schedules and demand. Third, finished-goods warehouses (also known as plant warehouses) often store huge amounts of finished goods that are pending transportation to distribution centres. Fourth, overflow warehouses are commonly placed near plants, keep seasonal inventories, and are often managed by a third party. Fifth, distribution centre warehouses often accept merchandise from several plant warehouses and provide same-day or next-day delivery to clients. Sixth, plant warehouses are substantially further away from the customer base than distribution centre warehouses. The name of the distribution centre is determined by the place of delivery. For instance, home delivery distribution hubs make deliveries to individuals' homes. Retail distribution centres distribute goods to retail establishments. Seventh, bonded warehouses are generally located within free-trade zones and aid in the payment of delayed duties. Third-party operators run public warehouses that are accessible to the public for short-term storage arrangements. Last, contract warehouses are run by third parties and are often allocated to single users over extended periods of time.

2.2.2 Financial Performance

It is defined as the level of contribution made by the activities of a firm to the creation of value through the utilisation of the available financial resources and attaining

financial objectives at the lowest possible cost (Hawash & Stephen, 2019). Okoro et al. (2017) also define financial performance as the financial situation that exists in an organisation at a certain moment or time frame for a particular component of the organisation's performance or the enterprise's overall performance. The degree to which a company's financial health over time is assessed is its financial performance. In other words, it refers to actions taken to manage a business entity's current and noncurrent assets, financing, equity, revenues, and costs in order to maximise sales, profitability, and worth for its shareholders. Financial performance is usually evaluated based on production capacity, profit growth, volume of sales, and capital and financial resource utilisation.

According to Aliona (2016), firms use financial performance metrics such as profitability, rates of return, financial risk, and liquidity to analyse and interpret their accounts assessing performance and stating financial position in comparison with other entities in the same industry. Firms can improve their financial performances by constantly supporting their whole supply chain processes with the dynamism of their environment (Ivanov, 2020). Financial performance is inextricably linked to supply chain effectiveness, and critical supply chain strategies such as sourcing strategy, technology, system integration, and external partnerships all play vital roles in improving financial results (Kauppi, Salmi & You, 2018). Its fundamental goal is to deliver complete, up-to-date information to shareholders and stakeholders to persuade them to make decisions.. It can be used to analyse similar companies in the same industry or to compare industries in aggregate.

2.2.3 Supply Chain Resilience (SCR)

First and foremost, resilience denotes how a firm is able to adapt to immediate changes in the marketplace and at the same time to respond to client demands in a dependable and timely manner (Ghosh et al., 2014). In the context of the SCR refers to the capacity to consistently and expeditiously respond to customer demands or changes in the market, as well as to maintain a competitive advantage (Rajagopal et al., 2016). It is also the capability of a firm to respond quickly to market demands by utilising the supply chain's capabilities (Naqvi et al., 2020). Therefore, SCR is the ability of a SC to respond promptly and to a level that takes into account the shifting demands of consumers along with other variations in the fast-paced business environment (Danese et al., 2013). It also denotes a supply chain's capacity to quickly and effectively adapt to market demand (Christopher, 2016). According to Yu et al. (2018), SCR refers to the extent to which an organisation and its SC partners react to variations in the business environment. This implies that the responsibility to reach the maximum stability of resilience for the market being served rests on diverse supply chain actors (Seman, 2022) and how well these actors collaborate in a changing environment (Saeed et al., 2022). Clearly, SCR is not only about the swiftness of a firm's supply chain but also how the firm addresses the changing trends in the market.

As a result, an organisation is said to be resilient when it has a supply chain that can react to quick changes in client needs (Christopher, 2016). It therefore ensures optimal service quality and quantity, as well as reasonable lead periods (Singh et al., 2015). In addition, SCR culminates in customer satisfaction since timely delivery of operations in the supply chain strengthens the customer relationship with the firm (Naqvi et al., 2020). This means that customers will be more satisfied with a firm if it responds to their needs more quickly. In order to achieve the best resilience and efficiency for the

market being served, supply chain participants must coordinate their production, locations, inventories, and transportation (Al-Hawajreh & Attiany, 2014).

2.3 Theoretical Review

To support this study, the Resource Based View (RBV) and the Viable System Model (VSM) were employed.

2.3.1 Resource Based View (RBV)

Penrose (1959) proposed the RBV theory, which defines the firm as a "bundle of resources that are unevenly distributed across firms" (Barney, 1991). Resources are the characteristics of physical, human, and organisational capital that can enable a firm to use strategies that increase resilience to produce a competitive advantage (Barney, 1991). According to the RBV theoretical framework, an organisation's resources that are "valuable, rare, inimitable, and non-substitutable" are its main sources of competitive advantage (Penrose, 2009). One of these essential resources for manufacturing companies is physical property, like warehouses (König et al., 2019).

RBV has been applied in logistics studies to assess how resources such as warehouse contribute to the performance of the company (e.g. Chou et al., 2018; Liu & Lee, 2018), and it is particularly helpful to assess the resilience of supply chain to adjust to market changes and respond quickly to disruptions (Liu & Lee, 2018) via warehouse system. The RBV, with its emphasis on the potential for resources to enable a firm to achieve a sustained competitive advantage and subsequently improve performance, is a pertinent lens through which to consider the potential relationship between warehouse system and supply chain resilience. Specifically, warehouses can provide a competitive edge because they are substantial huge capital assets (Mattarocci & Pekdemir, 2017).

Also, warehouses are unique because they can help to respond to particular operational needs of a firm (Baker, 2007), and are rare since it is difficult to locate a suitable warehouse (Prologis, 2019). Additionally, resource limitations are more difficult to overcome due to the two-way relationships between suppliers and customers (Halldórsson & Skjtt-Larsen, 2004). Finally, considering the greater cost of switching, potential service interruptions and social impact on employees, warehouses are difficult to replace (Melachrinoudis & Min, 2007). From this presentation, a warehouse is clearly a unique resource for firms.

Also, RBV holds that firms will have a range of resources and levels of resource exploitation capability. The ability to create new resources, improve current capabilities, and make those capabilities more unique is critical for the survival of businesses (Peteraf, 1993). Therefore, the RBV is adopted to buttress the thesis that the warehouse system impacts the resilience of the supply chain.

2.3.2 Viable System Model (VSM)

VSM was propounded by Stafford Beer. Beer was looking for features that would make any system viable (Beer, 1984). Viability is the capacity of a system to exist, have a distinct identity, and endure under adverse conditions (Hildbrand & Bodhanya, 2015). The VSM provides the opportunity to scientifically design an organisation as a system with the regulatory, learning, and resilience required to assure its survivability (viability) when faced with changes in its environment that were not anticipated in its design (Beer, 1989). The VSM suggests an invariant systemic structure to achieve this viability based on the definition of five functions, referred to as Systems One to Five, which are thought to be necessary and sufficient conditions to deal with the complexity of the environment the system operates in (Puche et al., 2016). The operational

(autonomous) units in charge of the various production components are represented by System One. Due to potential conflicts between the procedures and duties of these operational units, System Two, which plays a crucial role in coordination, is crucial.

In addition to defining policies, allocating resources, and assigning accountability to each operational unit, System Three is also responsible for accurately detecting any potential synergies. It also assumes control over the performance level of the operational units. System Three is in charge of carrying out auditing procedures on operational units. A structural function is needed to address this issue at this stage because it is not capable of anticipating the future and identifying impending risks. System Four is a representation of this function. Changes in the environment are identified and examined in light of the system's primary goals, potentially resulting in actionable recommendations. System Five creates the system's guiding principles and objectives that are crucial to maintaining its identity.

The VSM then makes it possible to analyse the connections between an enterprise's internal parts along with those between an enterprise and other institutionalised organisations in its environment. The model states that identifying external entities is crucial for business development because they may be able to provide input, obtain the desired output, and establish relationships between the parts of the actual structure and other entities in a variety of different kinds of relationships (Polese et al., 2009). In this view, the VSM can be used to explain how firms build and maintain sustained business relationships with other SC partners to help achieve SCR.

Both RBV and VSM help to illustrate how warehousing gives organisations a competitive edge, which results in improved firm financial performance, supply chain resilience, and economic performance.

2.4 Empirical Review

Previous studies on the contribution of warehousing to supply resilience and firm performance.

2.4.1 Warehousing System

Supply chain management is incomplete without significant analysis of the location, design, and management of warehouses; thus, through all stages of the supply chain, WS is key for coordinating product demand and supply (De Koster et al., 2017). The design of a warehouse is intended to minimise time lost through inconvenient material and human mobility (Kamali, 2019). Warehouses contribute to transportation and production efficiencies, as well as to the firm's customer service policies and in bridging time and location barriers between producers and customers (Viskup & Gálová, 2019). The primary function of a warehouse is to safely store and care for items until they need to be delivered. Likewise, one principal function of a warehouse is to act as a trans-consignment location where every item received is dispatched as quickly as possible (Changarampat, 2022). It also provides value-added procedures and reduces response time in delivering materials on schedule (Udeh & Karaduman, 2015). Besides, a warehouse needs to meet customer demands and requirements while efficiently utilising available space, resources, and personnel (Noor et al., 2022).

A well-planned warehouse system should allow for rapid and easy access to the items, make efficient use of the storage space to find the shortest path, and finally deliver the goods on time. Warehouses increase production efficiencies, improve factory utilisation through seasonal inventory builds, and reduce supply-chain and business risk by stockpiling contingency and disaster inventory (Frazelle, 2016). Warehousing, like inventory, adds value to the business and supply chain. A warehouse also makes it

possible for generic products to be configured nearby the customer, delaying opportunities for product differentiation (Bartholdi & Hackman, 2014).

Although warehouses vary in size, type, function, ownership, and location, the basic processes stay the same (Richards, 2017). Warehousing processes encompasses the temporary receipt, storage, picking, transportation, maintenance, monitoring, and dispatch of material products (inventory). The basic warehousing process consists of four primary stages: reception, storage, picking, and transportation of stored inventories (Niemczyk, 2016). These procedures should be organized and optimised to increase efficiency and, accordingly, save costs in the warehouse operation (Richards, 2017).

A firm needs to make sure that the supplier delivers the products to the warehouse in the fastest and most efficient manner possible. Due to the fact that the buyer normally selects the product, he or she may be unaccustomed with the goods-receiving procedure (2017, Richards). This is followed by the first process, receipt, which involves primary duties undertaken as a component of the first stage which comprise unloading, identification, sorting, quantity and quality inspection, preparing products for storage, and conveying the delivery to storage (Niemczyk, 2016). The next stage is the storage stage which includes receiving items from the reception zone, storing them in a storage zone, interim inspection, and transferring the goods to the picking zone or the transportation zone (Abideen & Mohamad, 2021). The most important aspect of storage is putting the inventory of goods away.

Once unit loads are delivered in the same condition in which they were accepted at the warehouse, they are moved immediately from the storage zone to the shipment zone. They may also choose to bypass the storage zone (cross-docking). When accepted components are disassembled, the selection process begins. Inhomogeneous unit loads

are generated during the picking stage (Niemczyk, 2016). They can be made up of either homogeneous or inhomogeneous collective packages (which contain different unit packages). Preparing unit loads for picking, picking orders, quantity inspection, packaging and constructing transport units, and transferring them to the shipment zone are all part of the picking stage (Niemczyk, 2016).

2.4.2 Supply Chain Resilience

A SC is a collection of tasks and organisations that goods pass through on their way from the source suppliers before they get to final consumers (Waters, 2021). Netro et al. (2018) defined SC as a network of organisations and suppliers in charge of managing the supply and manufacture of raw materials, along with the distribution of finished goods from the point of origin to the end consumer. In the same way, Sayed (2013) described SC as a group of producers and service providers who work together to transform and transport goods from the raw material stage all the way to the final consumer. Also, it consists of a group of companies that take part in the various operations and procedures that lead to the value being transferred to the final consumer in the form of products and services through upstream and downstream links (Christopher, 2016). In the movement of a good or service from a supplier to a customer, SC undoubtedly consists of organisations, people, activities, information, and resources.

According to Singh and Verma (2018), the operations of the supply chain involve the transition of natural resources, raw materials, and components into an end-product that is delivered to the final consumer. A SC includes the various stages in satisfying a client request, whether directly or indirectly. It consists of the following entities: warehouses, supplier, manufacturer, transporters, third-party logistics provider, retailer,

and client (Sukati et al., 2012). Thus, Janvier-James (2012) described SC as a collection of producers, suppliers, distributors, retailers, and service providers in the transportation, information, and other logistics management sectors that are involved in delivering items to customers. An organisation's supply chain consists of both internal and external partners. Similarly, SC is a collaborative effort among partners that converts an unfinished product desired by consumers from a basic commodity (upstream) into an end-product (downstream), while controlling returns along the route (Harrison et al., 2019). In essence, SC includes all organisations and individuals involved in meeting client needs directly or indirectly (Doan, 2020). Thatte (2007) groups SCR into three categories: SNR, OSR, and LPR. These categories are used in the current study and are discussed in the preceding section.

SNR denotes a capacity of a firm to adapt to and satisfy demand fluctuations from its primary suppliers (Al-Hawajreh & Attiany, 2014). It is also the ability of suppliers to adapt to shifts in demand within their organisations. SNR is the reaction of suppliers to manufacturers. The manufacturer expects resilience from suppliers in sourcing, procurement, and support activities (Glavee-Geo, 2019). Depending on how quickly suppliers can adjust their volume, businesses' capacity to respond quickly to customer demand is affected (Seman, 2022). A firm can use the resilience of its supplier network as an extra capability to improve its capacity to respond to the needs of customers so as to attract prospective clients and serve them better in addition to retaining current ones (Saenz et al., 2018).

Also, suppliers who are less responsive and efficient frequently hinder the movement of goods via the SC to the customer, which results in abysmal performance of the delivery team and coupled with poor customer service (Chavez et al., 2017). The ability of a

firm to meet customer demand, which is increasingly moving beyond the capabilities of the logistics processes alone, now depends critically on the resilience of key SC partners, particularly suppliers (Chu and Wang, 2012). Additionally, responsive raw material and component part suppliers can give the business the resources and inputs required for production and prompt shipment of finished goods to clients (Giannakis et al., 2019). Being responsive requires having adaptable and receptive partners both on and off the focal point (Thatte et al., 2013). Organisations must be able to quickly supply products, taking into account any changes in demand for product mix, volume, variations, and new product introductions, in order to meet changing customer needs and gain a competitive edge. Response time across the supply chain, from raw materials to finished goods to distribution and delivery, is necessary to meet these needs. Thus, to be responsive, businesses should be able to select suppliers who can quickly add new products and request that they make the changes they desire (Thatte, 2007).

On the other hand, the capability of a company's manufacturing system to adapt to changing consumer demand denotes OSP (Omai et al., 2018). It entails the capacity to quickly organise and reconfigure manufacturing system equipment and procedures in order to respond to client requests (Lummus et al., 2003). Manufacturing and service operations are both impacted by the resilience of the operations system (Al-Hawajreh & Attiany, 2014). The constituent companies in a supply chain may need to switch quickly from producing one product to another or quickly alter production levels for a specific product as the chain responds to customer demand. From the perspective of manufacturing, an operations system's resilience would be measured by how quickly the manufacturing or production function could react to unforeseen events and how quickly it could satisfy unique or unusual customer requests (Thatte, 2007; Woreta,

2021). To operationalize OSR, some measures have been identified, such as the ability of the system to: quickly adjust capacity; quickly change manufacturing processes; quickly reallocate people; quickly reconfigure equipment; quickly expedite emergency customer orders; and quickly change product mix decisions all in the bid to address customer demand (Thatte, 2007).

Conversely, LPR is described as the capacity of a firm's warehousing system, outward transportation, distribution, and to respond to changes in consumer demand (Al-Hawajreh & Attiany, 2014; Omai et al., 2018). It encompasses the factors that are critical for the movement of items from one location to another (Kain & Verma, 2018). Resilience in logistic processes is critical to the success of SCR. The operations of transportation of commodities from suppliers to manufacturers to distribution centres to final site of consumption are included in logistics and distribution management (Omai et al., 2018). LPR considers how quickly the supply chain serves the various customer segments (Asamoah et al., 2021). The components LPR include choosing logistical elements that can accommodate and react to sharp fluctuations in demand over short periods, modify warehouse capacity to respond to demand changes, handle a variety of products, use different transportation carriers, be able to pack products while they are in transit to meet specific customer needs, and be able to customise products close to the customer (Thatte, 2007).

2.5 Conceptual Framework and hypothesis

This section is a review of current literature on the correlation among the study variables via the RBV and VSM. Specifically, the RBV asserts that the most important source of organisational performance and competitiveness is internal resources. Thus,

in this study, a warehouse serves as a unique resource that has the potential to influence financial performance, supply chain resilience, and economic performance.

2.5.1 Warehousing and Financial Performance

Warehousing is essential for inventory management in order to maintain stock handling efficiency and successful cost savings. Wambua et al. (2015) found out that the financial performance of an organisation was directly impacted by warehousing systems, and thus argued that effective material handling will result in efficient warehousing management systems that ultimately guarantee reduced cost and quality. Also, Anantadjaya et al. (2021) discovered that efficient warehouse management among manufacturing firms in Indonesia substantially impacts the financial performance of the firms. A similar finding was established by Ahmed et al. (2016) in a study conducted to determine the effect of warehouse management on financial performance among selected conglomerate listed firms in the Nigerian stock exchange market. Warehouse management was discovered to be highly related to a firm's profitability.

According to Roots (2016), warehouses could help achieve minor financial gains for organisations. However, Torabizadeh et al. (2020) pointed out that implementing green warehousing activities increases financial performance by reducing costs while creating and providing eco-friendly items to meet the different needs of clients. In this regard, it is right to say that warehousing has a slight impact on financial performance, but green warehousing activities pave the path for improved financial performance. Likewise, Diab, Al-Bourini and Abu-Rumman (2015) stated that green supply chain management practices such as warehousing positively affect the financial performance of organisations. It can thus be concluded that warehouse systems are important to the

success of any organisation looking to increase sales. From the above presentation, it is hypothesised that:

H1: There is a positive and significant correlation between Warehousing and financial performance.

2.5.2 Warehousing and SCR

In the manufacturing industry, one of the top three drivers of supply chain resilience is smart warehousing (Chauhan et al., 2021). SCR is the ability of a company's manufacturing system to respond to changes in customer demand. It includes both production and service operations. Sukati (2011) and Thatte et al. (2013) emphasise in a conceptual survey that resilience operations at each chain node are an important part of SCR. It also contends that each SC entity must deliver the product or service on a timely and dependable basis in order to meet the needs of the end customer.

The ability of a company to exit its customer demand, transportation, distribution, and warehousing systems defines its ability to respond to logistical processes. Response in the logistics process is critical to the success of a supply chain resilience strategy (Thatte et al., 2013). The transportation of goods from suppliers to distributors is included in logistics and distribution management (Sundram et al., 2018). Warehousing, transportation, packaging, transportation planning and administration, inventory management, reverse logistics, and order tracking and delivery are all examples of these activities.

Resilient warehousing has a significant effect on the way organisations address the demands of customers in the shortest time (Martin and Grabc, 2003). When it comes to manufacturing companies, suppliers of raw materials and components who are highly

responsive are capable of providing the target company with the inputs and resources required for production and subsequent delivery to customers quickly and reliably (Giannakis et al., 2019). However, the objectives for precision, promptness, resilience, and customer requests are being raised by the warehouse management (Maltz & DeHoratius, 2004). Warehouse managers and executives have identified critical success factors in warehousing, which include setting clear performance metrics for dependability, flexibility, cost, and supplier resilience. These have emerged as important success factors in warehouse operations. This implies that Warehousing has a significant relationship with SCR. Thus, it is hypothesised that:

H2: There is a positive and significant correlation between Warehousing and SCR.

2.5.3 Warehousing and Economic Performance

Finally, the study determined the effect of warehousing on the economic performance of the selected organisations. The result showed that warehousing significantly impacted on the economic performance. Lang and Bressolles (2013) asserted that investments in sustainable warehousing have the potential to generate good economic performance while also assisting in the fulfilment of social and environmental duties. However, the results contradict the findings of a study that found that warehousing negatively influences economic performance (Agyabeng-Mensah et al., 2020). The authors found that warehousing only enhances EP via supply chain sustainability. According to Ali, Kaur and Khan (2022), incorporation of green features into warehousing operations positively influences on EP. From the above presentation, it is hypothesised that:

H3: There is a positive and significant correlation between Warehousing and Economic performance.

Based on the theoretical and empirical reviews above, it is inferred that warehouse operations influence SCR. Therefore, the study presents a conceptual framework showing the influential role of WS on SCR. Specifically, it depicts the relationship between WS and the three types of SCR- SNR, OSR and LPR. The conceptual framework (Figure 2.1) explains that WS is a unique resource that can ensure that the SCs of firms become more responsive.

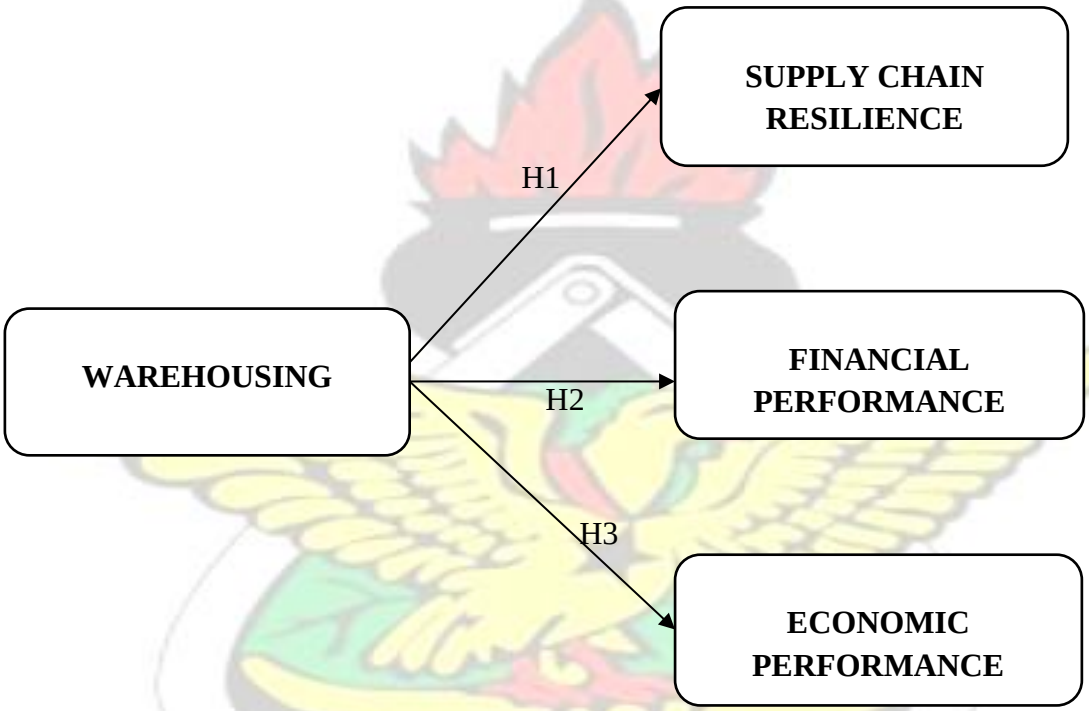

Figure 2.1: Conceptual framework showing the relationship between warehousing and financial performance, resilience, and economic performance

Source: Author's own construct (2023)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter presents the methodology used to provide answers to the research questions of the study. Specifically, the research approach, research design, population for the study, sampling technique and sample size, research instrument, the collection data technique, reliability and validity tests, descriptive, correlation, and regression analyses are presented. Finally, ethical considerations, and chapter summary are presented.

3.2 Research Design

Research design has been described by Akhtar (2016) as the glue that unites all the sections of a research. A research design determines the types of analysis that need to be performed in order to provide the desired results. Also, it outlines the types of data that are necessary, the procedures that were followed to gather and evaluate the data, and how the data were used to address the research questions (Asenahabi, 2019). Exploratory, descriptive, and explanatory are the most common types of designs in research. An explanatory design is chosen for the purpose of this study. This type of design examines data critically in order to identify the underlying reasons of social occurrences (Rwegoshora, 2016). Explanatory research helps identify problems and crucial variables within a study problem by explaining causal correlations between variables (Rahi, 2017). Therefore, an explanatory design was chosen because the study intends to explain causal relationships between warehouse system and financial performance, SCR, and economic performance.

Furthermore, in the current study, the quantitative method is employed to assess the influence of the warehouse system on supply chain resilience. The quantitative research technique is concerned with quantifying social issues as well as collecting and evaluating numerical data, with an emphasis on the correlations between a limited number of qualities over numerous cases (Antwi & Hamza, 2015). According to Leavy (2022), quantitative approach entails measuring and testing relationships between variables to ascertain causal relationships. Goertzen (2017) highlighted four main advantages of quantitative research: data sets are large, and findings are representative of a population; findings can be generalised to a specific population; allows a study to be replicated over time; and documentation regarding the research framework and methods can be shared and replicated. As a result, the rationale for choosing a quantitative approach is that the study aims at assessing the correlation between the warehouse system and financial performance, SCR, and economic performance.

3.4 Population of the Study

The whole set of instances from which a researcher sample is selected is referred to as the population (Taherdoost, 2016). It also refers to all individuals or objects that one desires to understand collectively (Rahi, 2017). In this study, the population consisted of all employees of selected organisations working in the production, warehouse, procurement, and marketing departments.

3.5 Sampling Technique and Sample Size

Sampling is the act of choosing a subset of the population for study (Rahi, 2017). It also refers to the process of choosing a statistically representative sample of people from the target population (Majid, 2018). Because the population of interest typically

consists of too many people for any research work to involve as participants, sampling is a crucial tool for research investigations (Majid, 2018). There are two categories of sampling techniques: probability sampling and non-probability sampling (Taherdoost, 2016). Probability sampling is a method of selection that ensures that every component of the population has an equal chance of being included in the sample (Etikan & Bala, 2017). This type of sampling includes: simple random sampling systematic sampling, stratified sampling, cluster sampling, and stage or multistage sampling (Pace, 2021). On the other hand, non-probability sampling denotes in which the probability of a subject being chosen is unknown, resulting in study selection bias (Acharya et al., 2013). Examples of non-probability sampling techniques are convenience sampling, judgmental sampling or purposive sampling, quota sampling, and snowball sampling (Rahi, 2017). A purposive sampling was adopted for this study. The rationale for adopting this technique is to get the best responses from the right persons within the population.

Sample size is an important aspect of any empirical study that needs to be representative of a particular population in order to draw conclusions about the population based on sample characteristics (Ahmad & Halim, 2017). For this study, 200 respondents were sampled from the population.

3.6 Data Collection Method

This encompasses the various procedures adopted or used in collecting data for the study. The sources of data, collection instrument, measures and collection technique are discussed in this section.

3.6.1 Sources of Data

In research, data and information sources are classified into three categories: primary, secondary, and tertiary (Rahi, 2017). A primary data source was used for this study. According to McDaniel and Gates (2020), primary data collection is the method of collecting data through surveys, questionnaires, interviews, or experiments. In quantitative methods, primary data is by far the most influential technique (Rahi, 2017), since it is the first-hand information gathered by the researcher or analyst in the field.

3.6.2 Collection Instrument

In this study, a structured questionnaire was the main instrument for data collection. A questionnaire is a tool for gathering data that consists of a series of written questions sent to respondents in order to receive written responses (Udriyah et al., 2019). With the exception of the respondents' demographics, all of the questions are modified, with minor changes meant to fulfil the study's objectives. Items were measured with a Likert scale ranging from 1 to 7: The variables are warehousing, financial performance, economic performance, and supply chain resilience. Warehousing is measured on a scale of 1= ‘‘never’’ to 7= ‘‘always.’’ Financial performance is measured on a scale of 1= ‘‘far below industry average’’ to 7= ‘‘far above industry average’’. Economic performance and supply chain resilience are measured on a scale of 1= ‘‘strongly disagree’’ to 7= ‘‘strongly agree.’’

3.6.3 Measures

The items used to assess the various constructs were adapted from previous research. Items used to measure Resilience were adapted from Lummus et al. (2003) and Duclos et al. (2003). This is made of 15-item scale. Examples of the items are; “Our operations

system responds rapidly to changes in product volume demanded by customers" and 'Our logistics system rapidly adjusts warehouse capacity to address demand changes'. On the other hand, warehouse operations were adapted from de Koster (2012) and Bartholdi and Hackman, (2011). It is a 15-item scale. Examples of the items are; "The facility is clean and has a good work atmosphere" and 'Material is moved over the shortest/best possible distances'.

3.6.4 Collection technique

In this study, a survey technique was used to collect data from the sampled population. Self-administered questionnaires were utilised to collect information from respondents. A survey questionnaire is used to determine what respondents like, how they feel, and what they do in a group or individually (Rahi, 2017). The survey questionnaire method was chosen for this study since it is widely used in the social sciences and is associated with the deductive research method.

3.7 Data Analysis

In order to test the proposed research model in this study, ANOVA technique was employed to analyse the data aided by SPSS version 25.0. Also, the validity and reliability, descriptive statistics, and correlation of the constructs were tested.

3.7.1 Reliability test

The reliability or internal consistency of items, measurements, or ratings is measured by Cronbach's alpha (Bujang, Omar & Baharum, 2018). As indicated by Garson (2013), a Cronbach's alpha coefficient value of 0.70 or more is used to confirm the

research measure's actual reliability. This has been the widely accepted value for all scales. In the current study, all items that met this accepted cut off-point.

3.7.2 Descriptive analysis

Descriptive statistics was performed using simple analysis of means and standard deviations for the variables of interest for each group in the study. That is, central tendencies such minimum, maximum, means, and standard deviation will be used. These are the most widely used descriptive tools, and they can be quite effective for describing data (Loeb et al., 2017).

3.7.3 Correlation analysis

Correlation refers to the degree of association between two variables under study. The correlation coefficient is a statistic used to determine the level of association between variables (Senthilnathan, 2019). When using quantitative data analysis software, a P-value of less than 0.05 is required for a relation between different independent variables, or a predictor variable and an outcome variable, to be considered significant (Senthilnathan, 2019). Any association with a P-value greater than 0.05 is considered non-significant. A correlation with a coefficient of -1 indicates that the variables have a perfect inverse or negative relationship. A coefficient of +1 in a relationship, on the other hand, indicates that the variables have a perfect positive relationship. Similarly, a coefficient of zero (0) indicates that there is no relation between the correlated variables.

3.7.4 Multiple regression analysis

Multiple regression analysis is a collection of statistical techniques used to investigate the relationship between a dependent variable and a set of predictor variables (Jeon, 2015). Regression analysis is a coefficient of determination that demonstrates the link between each independent variable dimension and the dependent variable. It enables the researcher to describe how a multiple predictor variable influences the outcome variable. In this study, the influence of warehouse operations was tested on financial performance, SCR, and economic performance.

3.8 Ethical Considerations

The principles that must guide the work of researchers are known as research ethics (Hammersley, 2017). This study considers four major ethical issues. These are as follows: providing a consent form (respecting respondents' rights); ensuring anonymity (protecting respondents' identities); information confidentiality (concealing the information provided); and, finally, avoiding the use of deception during data collection, as Gray (2019) recommends. Thus, respondents' rights will be protected by seeking their consent before administering questionnaires. Also, the names of the respondents will be anonymous, and the data gathered is intended solely for academic purposes and not for public distribution. Finally, participants will be made aware that they could opt out of the study at any time, and there is no consequence for doing so.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Introduction

The chapter is a presentation and analyses of data, as well as a discussion of the findings. It has been presented in the following subsections: respondent demographics, validity and reliability testing, descriptive, correlation, regression, and a discussion of conclusions.

4.2 Demographic Characteristics of Respondents

The demographic characteristics of respondents included position and experience, whereas the demographic characteristics of the respondents' organisations encompassed product type, ownership type, number of employees, and firm age.

4.2.1 Position of respondents

The positions held by respondents in this study included (1) Chief Executive Officer (CEO), (2) General Manager, (3) Marketing/Sales Manager, (4) Operations/Production Manager, (5) Accountant/Finance Manager, (6) Logistics/Supply Chain Manager, (7) Senior Manager, and (10) those respondents who did not specify. Table 4.1 below presents a breakdown of the various positions occupied by the respondents.

Table 4.1: Respondent's Position

Positions	Frequency	Percent
CEO	13	6.5
General Manager	29	14.5
Marketing/Sales Manager	60	30.0
Operations/Production Manager	60	30.0
Accountant/Finance Manager	18	9.0
Logistics/Supply Chain Manager	16	8.0
Senior Manager	3	1.5
Not specify	1	.5
Total	**200**	**100.0**

Source: Field work (2023)

From Table 4.1 above, Operations/Production and Marketing/Sales managerial positions represented 30.0% each of the total respondents. Twenty-nine (29) of the respondents, representing 14.5%, were General Managers. Also, respondents who held positions as Accountant/Finance Managers were 18, which represented 9.0%. This was followed by Logistics/Supply Chain Managers (8.0%), CEOs (6.5%), and Senior Managers (1.5%) in that order. Finally, 0.5% of the respondents did not specify their positions.

4.2.2 Experience

The experiences of the respondents were also recorded. They have been categorised into ranges: 1-3, 4-7, 8-10, and 11-20 years.

Table 4.2: Respondents' experiences

Years	Frequency	Percentage %
1-3	4	2.0
4-7	95	47.5
8-10	52	28.0
Above 10	49	22.5
Total	**200**	**100**

Source: Field work (2023)

From Table 4.2, it was revealed that the majority of the respondents (47.5%) had 4 to 7 years of experience in their positions. This is followed by respondents who had 8 to 10 years of experience, which represented 28.0%. Also, 22.5% of the respondents had more than 10 years of experience, and 2.0% represented those who had 1 to 3 years of experience. The findings show that 98.0% of the respondents had more than 3 years of experience, which indicates that the majority of the respondents were well versed in their positions.

4.2.3 Product type

The product type selected for this study were industrial machinery, chemicals, plastics and rubber, food, beverages and drinks, metals and metalworking, pharmaceuticals, paper and packaging materials, engineering and construction, textiles and clothing, among others. Table 4.3 shows the type of product the organisations deal in.

Table 4.3: Product type

Product type	Frequency	Percent
Industrial machinery	12	6.0
Chemicals	14	7.0
Plastics and rubber	10	5.0
Food, beverages and drinks	96	48.0
Metals and metalworking	12	6.0
Pharmaceuticals	10	5.0
Paper and packaging materials	3	1.5
Engineering and construction	19	9.5
Textiles and clothing	6	3.0
Others	18	9.0
Total	**200**	**100.0**

Source: Field work (2023)

Table 4.3 shows that 96 (48.0%) of respondents' organisations were into food, beverage, and drinks; 19 (9.5%) were into engineering and construction; 14 (7.0%) were into chemicals; 12 (6.0%) were into industrial machinery; 12 (6.0%) were into metals and metal working; 10 (5.0%) were into plastics and rubber; 10 (5.0%) were into pharmaceuticals; 6 (3.0%) were into textiles and clothing; 3 (1.5%) were into paper and packaging; and 18 (9.0%) were into other businesses.

4.2.4 Ownership type

The ownership included local private company, subsidiary of a foreign multinational and local public company. Table 4.4 displays the ownership type of the organisations.

Table 4.4: Ownership type of respondents' organisations

Ownership type	Frequency	Percent
Local private company	173	86.5
Subsidiary of a foreign multinational	5	2.5
Local public company	22	11.0
Total	**200**	**100.0**

Source: Field work (2023)

With respect to the ownership type of the organisations, the majority of them were local private companies. Specifically, 173 representing 86.5% were local private companies. Also, 22 representing 11.0% were local public companies, while 5 or 2.5% were subsidiaries of foreign multinationals. This implies that the majority of the respondents for this study worked in local private companies.

4.2.5 Number of employees

The number of employees was categorized into micro, small, medium, and large enterprise. Table 4.5 shows the number of organisations employed by the respondents' organisations.

Table 4.5: Number of employees in the organisation

Type of Enterprise	Number of employees	Frequency	Percentage %
Micro	1 – 5	3	1.5
Small	6 – 30	138	69.0
Medium	31 – 100	48	24.0
Large	more than 100	11	5.5
	Total	**200**	**100**

Source: Field work (2023)

The results indicate that more than half of the respondents are employed in small enterprises. Specifically, 138 of the respondents, representing 69.0%, were employed by organisations that employ from 6 to 30 employees. Also, 48 (24.0%) of the respondents worked in medium enterprises, while the remaining 7.0% were employed in large organisations (5.5%) and micro enterprises (1.5%).

4.2.6 Firm age

The ages of the organisations in which the respondents were working are presented below.

Table 4.6: Ages of the organisations

	Frequency	Percentage
1-10	40	20.0
11-20	149	74.5
Above 20	51	5.5
Total	**200**	**100**

Source: Field work (2023)

The results show that (149) 74.5% of the respondents indicated that their organisations were in the age range of 11 to 20 years. 40 (20.0%) of the respondents also pointed out that their organisations were below 11 years or the range of 1 to 10. Finally, 51 (5.5%) of the respondents' organisations were above 20 years.

4.3 Descriptive Analysis

The descriptive statistics were conducted using minimum, maximum, mean, and standard deviation. Items were measured with a Likert scale ranging from 1 to 7: The variables are warehousing, financial performance, economic performance, and supply chain resilience. Warehousing is measured on a scale of 1= ''never'' to 7= ''always.'' Financial performance is measured on a scale of 1= ''far below industry average'' to 7= ''far above industry average''. Economic performance and supply chain resilience are measured on a scale of 1= ''strongly disagree'' to 7= ''strongly agree.''

Table 4.7: Descriptive of variables

Variables	Minimum	Maximum	Mean	SD
Warehousing	1.29	6.57	4.92	± 0.76
Financial Performance	1.83	6.17	4.55	± 0.90
Supply chain resilience	2.67	7.00	5.04	± 0.71
Economic Performance	1.00	6.67	2.67	± 1.15

Source: Field work (2023)

The results show that warehousing has a mean of 4.9 and a SD of 0.76. This means that the overall majority of the respondents were neutral in their responses to the items under this variable. The items include: 'In our warehouse, there are guidelines on how to receive items properly', 'Our warehouse facility is clean', 'All items are properly inspected on receipt and dispatch', 'We optimise the movement of materials in the warehouse', 'Warehouse personnel are trained on their roles', 'We have key

performance indicators to measure warehouse performance', and 'There are clear documentation procedures for warehouse operations'.

Also, financial performance has a mean score of 4.55 and a SD of 0.90. This indicates that a significant number of respondents provided neutral responses to the items in this variable. The variable, supply chain resilience, has a mean of 5.04 and a SD of 0.71, suggesting that the majority of the respondents somewhat agreed with the items under this variable. Finally, a mean of 2.67 and a SD of 1.15 imply that the majority of the respondents disagree with the statements on economic performance. The items include: reduced material purchasing costs, reduced energy consumption costs, and reduced waste discharge and treatment fees.

4.4 Reliability Test

A reliability test encompasses testing the accuracy or internal consistency of a measuring instrument (Heale and Twycross, 2015). According to Taherdoost (2016), the Cronbach's Alpha coefficient is the most frequently used internal consistency measure. Robinson (2010) described Cronbach's Alpha as the most appropriate measure of reliability when making use of Likert scales. Cronbach's alpha is a number between 0 and 1, and a reliability score of 0.7 or more is regarded as adequate (Shuttleworth, 2015). In this study, a reliability score of 0.7 or higher is recommended. Table 4.7 shows the reliability test scores of the variables used in the study.

Table 4.8: Reliability Test Scores of variables

Variables	Cronbach's Alpha	Number of Items
Warehousing	0.758	7
Financial Performance	0.836	6
Supply chain resilience	0.715	3
Economic Performance	0.830	3

Source: Field work (2023)

The results show that all variables in the study had a reliability score greater than 0.7. Precisely, the financial performance variable had the highest score of 0.836. Economic performance, warehousing, and supply chain resilience scored 0.830, 0.758, and 0.715 in that order. This implies that the accuracy or internal consistency of the variables is assured.

4.5 Correlation Analysis

Correlation refers to the degree of association between two variables under study. The correlation coefficient is a statistic used to determine the level of association between variables (Senthilnathan, 2019). The coefficient of correlation R ranges between -1 and +1. A coefficient of +1 indicates a perfect and positive relationship between two variables, whereas -1 shows that the two variables are perfect and negatively related. And a correlation coefficient of zero implies that no correlation exists between the two variables under consideration (Gogtay & Thatte, 2017). According to Senthilnathan (2019), a relationship is said to be very weak or negligible when the correlation coefficient ranges between $-0.20 \geq R \leq +0.20$; weak correlation when the correlation coefficient ranges between $\pm 0.20 > R > \pm 0.35$; fair or moderate correlation when the correlation coefficient ranges between $\pm 0.35 \geq R > \pm 0.50$; strongly considerable high correlation when the correlation coefficient ranges between $\pm 0.50 \geq R > \pm 0.70$; and very strongly considerable correlation when the correlation coefficient ranges between

±0.70 ≥ R > ±1.00. Table 4.9 shows the results of the correlation aided by Spearman ranking.

Table 4.9: Correlation coefficients of variables

Variables	Warehousing	Financial Performance	Supply chain resilience	Economic Performance
Warehousing	1	0.161*	0.060	0.026
Financial Performance	0.161*	1	0.015	0.224**
Supply chain resilience	0.060	0.015	1	-0.064
Economic Performance	0.026	0.224**	-0.064	1

*Correlation is significant at the 0.05 level

** Correlation is significant at the 0.01 level

Source: Field work (2023)

In this study, the analysis is conducted to determine the direction and degree of association between the independent variable, warehousing, and the dependent variables: financial performance, supply chain resilience, and economic performance.

4.5.1 Relationship between Warehousing and Financial Performance

The results show a correlation coefficient of 0.161 between warehousing and financial performance. The implication is that there is a positive but very weak relationship between warehousing and financial performance.

4.5.2 Relationship between Warehousing and Supply Chain Resilience

The results show a correlation coefficient of 0.060 between warehousing and supply chain resilience. This suggests that there is a positive but negligible correlation between warehousing and supply chain resilience.

4.5.3 Relationship between Warehousing and Economic Performance

According to the findings, there is a 0.026 correlation coefficient between warehousing and economic performance. This shows that warehousing has a positive but very weak relationship with economic performance.

All in all, the independent variable, warehousing, has a positive and very weak association with all the dependent variables: financial performance, supply chain resilience, and economic performance.

4.6 Regression Analysis

In regression analysis, the value of a dependent variable can be predicted using if at least one independent variable is known. The coefficient of determination, R^2, explains the proportion of the total variation in the dependent variable that can be explained by variations in the independent variable(s) (Kumari and Yadav, 2018). Regression analysis is applied to explain the relationship between the independent variable, warehousing, and the dependent variables: financial performance, supply chain resilience, and economic performance.

4.6.1 Effect of Warehousing on Financial Performance

The first objective of the study was to determine the effect of warehousing on financial performance. Table 4.10 shows the regression results.

Table 4.10: Regression results

Coefficients[a]						
Model		Unstandardized Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	30.844	1.928		15.999	.000
	SUM_OF_WS	.131	.069	.133	1.893	.040
a. Dependent Variable: SUM_OF_FPERF						

Source: Fieldwork (2023)

From the results, *p*–value = .040. The p-value is less than 0.05 which means that the independent variable significantly predicts the dependent variable. The results show that warehousing significantly predicted financial performance of the selected organisations. Thus, H1 was supported.

Table 4.11: Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.139[a]	.019	.014	.75297
a. Predictors: (Constant), FP_mean				

Source: Fieldwork (2023)

From the results, R^2 =.019, which implies that 0.19% of the total variation in financial performance is explained by the variations in the warehousing system. This shows that there is a weaker linear relationship between warehousing and financial performance.

4.6.2 Effect of Warehousing on Supply Chain Resilience

The study also sought to examine the influence of warehousing on supply chain resilience. Table 4.12 provides the regression results of the association.

Table 4.12: Regression results of Warehousing and SCR

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	32.109	2.713		11.833	.000
	_ WS	.153	.178	.061	.862	.390
a. Dependent Variable: _ RESP						

Source: Fieldwork (2023)

The results show a *p*–value = .390. The implication is that warehousing has an insignificant influence on supply chain resilience of the selected organisations. It also means that H2 was not supported.

Table 4.13: Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.061[a]	.004	-.001	.75892
a. Predictors: (Constant), RES_mean				

Source: Fieldwork (2023)

The coefficient of determination is .004, which means that 0.04% of the total variation in supply chain resilience is explained by the variations in the warehousing system. Like financial performance, resilience also has a weaker linear relationship with warehousing.

4.6.3 Effect of Warehousing on Economic Performance

Finally, the study determined the effect of warehousing on the economic performance of the selected organisations.

Table 4.14: Regression results of Warehousing and Economic Performance

Coefficients						
Model		Unstandardized Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	33.428	.951		35.136	.000
	ECP	.124	.109	.081	1.140	.256
a. Dependent Variable: WS						

Source: Fieldwork (2023)

The findings show that the beta coefficient is 0.081 and the p-value is 0.256. The conclusion to draw is that warehousing impacts on the economic performance of the selected firms insignificantly. Therefore, H3 was not supported.

Table 4.15: Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.081[a]	.007	.002	.75786
a. Predictors: (Constant), EP_mean				

Source: Fieldwork (2023)

From the results, R^2 =.007, which implies that 0.07% of the total variation in economic performance is explained by the variations in the warehousing system. This shows that there is a weaker linear relationship between warehousing and economic performance.

4.6.4 Mediation Effect of Supply Chain Resilience on Warehousing and Financial Performance

The results of the mediation effects of SCR on the relationship between warehousing and financial performance has been presented in Table 4.12.

Table 4.16: Regression analysis of SCR and Warehousing on Financial Performance

Coefficients

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardised Coefficients Beta	t	Sig.
1	(Constant)	4.208	.594		7.082	.000
	Warehousing	.179	.083	.181	2.038	.043
	SCR	-.098	.099	.431	-1.095	.275

a. Dependent Variable: Financial performance

Source: Fieldwork (2023)

Table 4.17: Summary of mediation results

Relationship	Total Effect	Direct Effect	Indirect Effect	Confidence Interval		Conclusion
				Lower bound	Upper bound	
Warehousing SCR Financial performance	0.1643	0.1699	-0.0056	-0.0283	0.0111	No mediation
p-value	0.051	0.043	0.061			

****** The indirect effect is not significant hence there is no mediating effect of the responsiveness on the warehouse system and the financial performance*.**

Source: Author's own construct (2023)

From Table 4.17, the indirect effect (0.061) is not significant; hence there is no mediating effect of the SCR on the warehousing and the financial performance.

4.7 Discussion of results

Warehousing operations are essential in any supply chain because they separate demand and supply in terms of location, time, and quantity. Thus, the current study, via the Resource Based View (RBV) and the Viable System Model (VSM), sought to ascertain how warehousing affects financial performance, supply chain resilience, and EP. Thus, the study proposed three hypotheses, and to test the hypotheses, data was collected and analysed using the questionnaire and SPSS version 26, respectively. The results from the correlation analysis indicated that the independent variable, warehousing, has a positive but very weak association with the dependent variables: financial performance, supply chain resilience, and economic performance. Also, the regression results found that warehousing significantly influenced financial performance. In contrast, warehousing was found to influence supply chain resilience and economic performance insignificantly. The findings are extensively discussed below in accordance with the objectives of the study.

4.7.1 Warehousing and Financial Performance

The first objective of the study was to determine the effect of warehousing on financial performance, and the results showed that warehousing significantly predicted the financial performance of the selected organisations. Hypothesis 1 was therefore supported. This finding is consistent with a study conducted by Wambua et al. (2015) in Kenya. The authors found out that the financial performance of an organisation directly impacted warehousing, and thus argued that effective material handling will result in efficient warehousing systems that ultimately lead to cost reduction and quality. Also, Anantadjaya et al. (2021) discovered that efficient warehouse management among manufacturing firms in Indonesia substantially impacts the

financial performance of the firms. A similar finding was established by Ahmed et al. (2016) in a study conducted to determine the effect of warehouse management on financial performance.

However, Roots (2016) revealed that warehouses could only help achieve minor financial gains for organisations. Thus, Torabizadeh et al. (2020) pointed out that implementing green warehousing activities increases financial performance by reducing costs while creating and providing eco-friendly items to meet the different needs of clients. Likewise, Diab, Al-Bourini and Abu-Rumman (2015) stated that green supply chain management practices such as green warehousing affect the financial performance of organisations. In this regard, it is right to say that warehousing has a slight impact on financial performance, but green warehousing activities pave the path for improved financial performance.

4.7.2 Warehousing and Supply Chain Resilience

The study also sought to examine the influence of warehousing on supply chain resilience. The results show that warehousing insignificantly affected supply chain resilience of the selected organisations. The finding did not support hypothesis 2. The result is in agreement with Fardan and Al Rebh (2022). The authors highlighted the critical role played by warehousing in ensuring greater supply chain resilience especially during the pandemic. The warehousing function is an essential component of supply chain resilience since it addresses reducing risks related to material and product availability while also facilitating procurement economies of scale (Schuhmayer, 2022). The rapid rise of the e-commerce sector pushed businesses to establish a dynamic warehouse network to cope with shorter lead times, variable order quantities, a

wide range of products, uncertain demand, and real-time response (Kumar, Narkhede and Jain, 2021).

4.7.3 Warehousing and Economic Performance

Finally, the study determined the effect of warehousing on the economic performance of the selected organisations. The findings show that warehousing has an insignificant impact on the economic performance of the selected firms. The result is in congruence with a study that asserted that investments in sustainable warehousing have the potential to generate good economic performance while also assisting in the fulfilment of social and environmental duties (Lang and Bressolles 2013). However, the results contradict the findings of a study that found that warehousing negatively influences economic performance (Agyabeng-Mensah et al., 2020). The authors found that warehousing only improves economic performance through supply chain sustainability. Thus, firms should apply green technologies in warehouses in order to reduce waste management and enhance process quality, allowing enterprises to respond to changes in client demand, leading to increased sales and profitability.

Table 4.18: Summary of hypotheses test results

Hypotheses	***Relationship***	***p-value***	***Decision***
H1	Warehousing → Financial Performance	0.040	Supported
H2	Warehousing → Resilience	0.390	Not Supported
H3	Warehousing → Economic Performance	0.256	Not Supported
H4	Warehousing → Supply Chain Resilience → Financial Performance → Economic Performance	0.061	Supported

Source: Author's own construct (2023)

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This final chapter encompasses a summary of the findings, a conclusion, recommendations, as well as limitations and directions for future studies.

5.2 Summary of findings

As stated earlier, the study intended to achieve three key objectives: to assess the effect of WS on financial performance; to assess the effect of WS on supply chain resilience; to determine the relationship between WS and economic performance, and the mediation effect of SCR on the relationship between warehousing and financial performance.

5.2.1 Warehousing and Financial Performance

The first objective of the study was to determine the effect of warehousing on financial performance, and the results showed that warehousing significantly predicted the financial performance of the selected organisations. Hypothesis 1 was therefore supported. Specifically, correlation tests revealed that there was a positive but very weak relationship between warehousing and financial performance. The regression results showed that warehousing significantly predicted the financial performance of the selected organisations.

5.2.2 Warehousing and Supply Chain Resilience

The study also sought to examine the influence of warehousing on supply chain resilience. The results show that warehousing insignificantly affected supply chain resilience of the selected organisations. The finding did not support hypothesis 2.

5.2.3 Warehousing and Economic Performance

The third objective of the study determined the effect of warehousing on the economic performance of the selected organisations. The findings show that warehousing has an insignificant impact on the economic performance of the selected firms. Ultimately, the mediation effect of SCR on the relationship between warehousing and financial performance was found to be insignificant.

5.3 Conclusion

The study used the Resource Based View (RBV) and the Viable System Model (VSM) to determine how warehousing influences financial performance, SCR, and economic performance. Thus, the study proposed three hypotheses. As a result, to address the research questions, a quantitative technique and an explanatory design were used. With respect to the time horizon, a cross-sectional design was adopted to gather data from the respondents. The population of the study was made up of employees working in production, warehouse, procurement, and supply chain departments. A sample of 200 participants was selected through the convenience sampling technique. A questionnaire-survey technique was employed to gather data from respondents. The data were analysed using Statistical Package for Social Sciences (SPSS) version 26.

The findings of both correlation and regression analyses did not support all of the stated hypotheses. To be precise, the independent variable, warehousing, has a positive but very weak association with financial performance. On the other hand, regression results showed that warehousing had an insignificant effect on supply chain resilience, and economic performance. There was no mediation found of SCR on the relationship between warehousing and financial performance. Based on these findings, the study concluded that, though warehousing is an essential component of supply chain resilience since it addresses reducing risks related to material and product availability, it influences supply chain resilience and economic performance insignificantly. Also, it can be concluded that an efficient warehousing system culminates in increasing the financial performances of organisations.

5.4 Recommendations

Based on the findings of the study, the following recommendations are offered.

5.4.1 Practising an efficient warehousing system

The results showed that warehousing has a positive influence on supply chain resilience. This means that warehousing has the capability of ensuring a resilient supply chain, which is key taking into consideration the degree of supply chain disruptions brought about by the COVID-19 pandemic. According to Fardan and Al Rebh (2022), warehousing plays a crucial role in ensuring greater supply chain resilience, especially during the pandemic. It is therefore recommended that the management of organisations put measures in place to ensure an efficient warehousing system. When this is done, it will make the warehousing system more robust to withstand any disruptions in the future.

5.4.2 Adopting of a Warehousing Management System (WMS)

The results of the correlation showed that although warehousing has a significant and positive association with financial performance, this relationship was very weak. Andiyappillai (2020) labelled WMS as one of the most significant and critical IT systems that assist the logistics business in being visible and transparent to all stakeholders, hence earning an edge. WMSs are designed to regulate the storage and flow of commodities within a warehouse, allowing for the detection and control of stock aided by real-time information after performing activities such as transportation, picking, and putaway (Komarova, 2016). In addition, Wambua et al. (2015) found that efficient inventory management systems directly impacted the financial performance of organisations. Clearly, implementing a WMS at a warehouse can significantly lower overall warehouse costs, mostly by optimising numerous processes. Therefore, it is recommended that organisations adopt warehousing management systems in their operations. This will help organisations efficiently meet client expectations and objectives, and consequently deliver better customer service, which in turn results in a strong correlation with financial performance, supply chain resilience, and economic performance.

5.4.3 Transitioning to Green Warehousing

Finally, the regression analysis results showed that the warehousing systems of the selected organisations have insignificant effect on financial performance and EP. This suggests that the warehousing systems of these organisations are not contributing to their performances. Research has, however, shown that green warehousing positively and significantly affects firm performance. Torabizadeh et al. (2020) pointed out that implementing green activities into warehousing increases firm performance by

reducing costs while creating and providing eco-friendly items to meet the different needs of clients. Thus, it is recommended that organisations adopt green practices in their warehousing operations. This will help reduce costs and waste in the warehousing operations and thereby increase financial and economic performance.

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