

**SUPPLY CHAIN RESILIENCE AND ORGANIZATIONAL
PERFORMANCE OF PHARMACEUTICAL
MANUFACTURING COMPANIES IN NAIROBI**

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**A Research Project Submitted in Partial Fulfilment of the Requirements for the
Award of Master of Business Administration, School of Business University of
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DECLARATION

I, the undersigned, declare that this research project is my original work and has not been submitted to any other college, institution or university for academic credit.

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This research project has been submitted for presentation with an approval as the appointed supervisors.

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DEDICATION

I dedicate this project to my Dear wife Agnes Kambale and my sons, Wayne, Joe and Gilbert.

Their patience, understanding and moral support during this study enabled me complete my study successfully

ACKNOWLEDGEMENT

I wish to express my sincere gratitude first and foremost to my supervisor Onserio Nyamwange for his guidance and support during the Project.

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My special thanks go to my classmates particularly in the supply chain specialization. They made this endeavor a very enjoyable experience.

Finally, I appreciate all the respondents for creating time to complete the questionnaire making this study a success.

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ABSTRACT

The study endeavored to establish the influence of supply chain resilience on organizational performance of manufacturing pharmaceutical companies in Nairobi. specific objectives of the study were; to identify supply chain resilience practices in Kenya's pharmaceutical manufacturing firms and to establish the effect of supply chain resilience on organizational performance of Kenya's pharmaceutical manufacturing firms . descriptive design was used and the targeted population for the study was 23 pharmaceutical manufacturing firms in Nairobi. The study used a census and questionnaires were used in collection of data. The analysis was done by SPSS and the presentation of findings was by Tables and Figures. The study found out that the most adopted supply chain resilience practice was supply chain collaboration (94.7%) followed by risk management culture (89.5%), agile supply chain (84.2) and lastly supply chain reengineering (78.9%). The study further established that supply chain re engineering ($\beta=0.150$, $p=0.012<0.05$), supply chain collaboration ($\beta=0.475$, $p=0.000<0.05$), agile supply chain ($\beta=0.182$, $p=0.034<0.05$) and risk management culture ($\beta=0.108$, $p=0.000<0.05$) all positively and significantly effected organizational performance. The study concludes that supply chain resilience has a positive and significant effect on organizational performance. The study recommended that the top management team of all companies that manufacture pharmaceuticals in Kenya should increase investment in supply chain re engineering, supply chain collaboration, agile supply chain and risk management culture to positively and significantly influence performance of their organizations.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Due to globalization, changes in technology, intense competition, high complexities in the demand market and dynamic economic environment, there is high probability of risks and interruptions that present uncertainties for organizations, supply chain partners and the market in general. The intensity of supply chain disruptions can be magnified by reconfiguring the functions of the supply chain to mitigate the risks emerging from the dynamic and volatile business environment (Carvalho, Azevedo & Cruz-Machado,2017). Identifying and quantifying the risks brought by supply chain requires a high complexity risk management approaches that will result in effective responses to disruptions in the market place (Fawcett &Waller, 2014).

The study will be informed by the Strategic Choice Theory and Resource Based Theory. According to Strategic Choice Theory, there exists a link between choices undertaken by the top management and performance of the business. Actions of identifying, evaluating, mitigating and monitoring unexpected events or conditions determine the overall performance of an organization. For example, choices such as where to invest the company resources e.g. new business lines have an impact on the performance of the business. One of these actions that management of organizations undertakes entails supply chain resilience (Child, 1972). Resource Based Theory argues that firms use resources to gain competitiveness and thus performance (Rumelt, 1984). For example, the key skills set and competence of staff in an organization have a bearing on the performance of the organization.

Risk identification, evaluation, mitigation and monitoring requires an organization to have certain resources in terms of best practices, technology and concept to easily curb the risks in the organization which are best explained by the Resource Based Theory.

Manufacturing pharmaceutical companies are important in ensuring an efficient supply of drugs in the market thus supporting the overall health care sector. Although the sector is strictly regulated by the Pharmacy and Poisson Board in Kenya, the flaws and loopholes in the regulatory system have adversely affected the supply chain operations of the pharmaceutical manufacturing companies. The increased proliferation of substandard drugs into the country that is lowly priced means that most consumers rush for the substandard drugs at the expense of the genuine drugs manufactured by the companies. Additionally, there is a rise in traditional and herbal products that are unregulated. These traditional and herbal products have shifted the demand pattern of most consumers from the genuine products produced by the companies to cheap and lowly priced herbal medicinal products. To remain competitive and enhance their performance in this challenging business environment, manufacturing pharmaceutical companies need to critically examine their levels of risks in their supply chain and unpredictable consequences through the adoption of supply chain resilience techniques and approaches.

1.1.1 Supply Chain Resilience

Supply chain resilience is a major item in the study of supply chain management today. An understanding of this concept and where it lies on supply chain management study means a difference in terms of supply chain response to market needs and overall organizational competitiveness. The resilience of Supply chain involves the understanding of a reactive capability, post disruption actions.

It also involves the proactive efforts to prepare for the unprecedented events or conditions in the organization (Kamal Ahmadi and Parast, 2016). Supply chain resilience is also defined as the risk mitigation strategy for the supply chain through anticipation, resistance, recovery and responses to the foreseen and unforeseen risks in the supply chain (Christopher & Packs, 2014).

Supply chain resilience requires the reengineering of the supply chain functions and activities, collaboration of the stakeholders in the value chain, creation of supply chain agility, velocity in the supply chain function and development of risk mitigation culture in the organization (Scholten, Sharkey and Fynes, 2004). According to Forkmann, Varzandeh, Henneberg, Naude, Mitrega (2016), organizations are becoming increasingly fore warned on disruptions caused by supply chain. Supply chain has is today a key component of the global firms and economies. Firms are therefore developing chain resilience practices to manage the risks facing firms as a result of technology, uncertain global customers and complexity in the supply chain function in so as to remain competitive in the current dynamic marketplace. Fiksel (2015) avers that mitigating supply chain risk using traditional methods of mitigating risk is based on statistical data. Un expected natural events like natural disasters can therefore challenge risk management strategies based on these traditional methods of mitigating risk. Consequently, managing risk through the traditional methods should be supported by building capacity through implementation of resilience capability practices. Melnyk (2014) reiterates that the framework of supply chain management (SCM) must be anchored in is resilience practices to ensure continuity in the operations of firms and sustainability in the competitive environment.

It is important that stakeholders in the supply chain develop proper insights with a mutual understanding which is growth based on trust, sharing information and joint improvement to gain enhanced supply chain resilience that include having a common design. Joint planning and scheduling will ensure the risks are mitigated plus having a disrupted recovery in the organization (Matsuo, 2015). The supply chain resilience technique that will be adopted are the agility based on the high response time and good visibility in the supply chain, collaboration with the value chain players to develop tiers which they will rely on about disruption events plus development of risk mitigation culture in the downstream and upstream supply chain.

1.1.2 Organizational Performance

Performance measurement means the collection, analysis and reporting data about the of an organization. It is essential for every organization because it enables the organization to gauge their how efficient and effective their external and internal processes are by the use of the specific metric of measurement (Henri, 2011). Different researchers and scholars have defined performance differently, which have identified different parameters of metrics on performance. Performance means how well an organization has achieved its set objectives and goals for a given period. It is a powerful mechanism for prioritizing organizational goals and attaining them (Kirkendall, 2010). Performance measurement acts as a surrogate for organizational phenomena, for it indicates the level of the efficiency and effectiveness in the organization operations, functions and processes.

According to Richard, Handfield and Ragatz (2009) organizational performance entails the financial performance (return on assets, profitability, return on equity), Shareholder returns (economic value addition, retained earnings) and product market performance (responsive on demand, market share, sales index).

Organizational performance is achieved through implementation of the practices that it will ensure sound management, good governance, focus on the customer value, efficiency and effectiveness in the processes, activities and functions (Mahapatro, 2009). Performance measurement usually informs the implementers, policy makers and the management on the position of the organization and some of the elements that require attention. It allows progressive evaluation and monitoring of how efficient and effective the organization is.

Organizational performance helps the organization to strengthen the practices that ensures they are highly efficient and effective, high profitability and ensures the accomplishment of the firms' objectives and goals. At the same time organization performance indicates the processes, functions and activities that need improvement in the organization (Abdifatah,2012). This research will adopt customer satisfaction and operational efficiency as the organizational performance metric. The customer satisfaction will indicate the level of the demand responsiveness and customer relationship while the operational efficiency will indicate the level of the efficiency and effectiveness of the internal operations, flexibility of the production processes and continuous improvement in the firms' operations.

1.1.3 Pharmaceutical Industry in Kenya

Manufacturing pharmaceutical companies perform an important role in ensuring an efficient supply of drugs thus supporting the overall health care sector. Although the sector is strictly governed by the Pharmacy and Poisons Board, the flaws and loopholes in the regulatory system have adversely affected the supply chain operations of these companies.

The increased proliferation of substandard drugs into the country that is lowly priced means that most consumers rush for the substandard drugs at the expense of the genuine drugs manufactured by the companies. Additionally, there is a rise in traditional and herbal products that are unregulated and these have shifted the demand pattern of most consumers from the genuine products produced by the companies to cheap and lowly priced herbal medicinal products.

To remain competitive and enhance their performance in this challenging business environment, manufacturing pharmaceutical companies need to critically examine the supply chain risk levels and unpredictable consequences through the adoption of the supply chain resilience techniques and approaches (Scholten, Sharkey and Fynes, 2004).

The Pharmacy and Poisons Act 244 of Kenyan laws regulates the Pharmaceutical industry in Kenya. The Act regulates manufacturing, transportation and trading of drugs. Regulation of drugs is meant to ensure quality, safety and efficacy of drugs in Kenya.

Within Nairobi County in Kenya, there exists 23 leading pharmaceutical companies manufacturing different medicines. This information has been obtained from the latest Ministry of Health records (Ministry of Health 2016). The pharmaceutical industry in Kenya is divided into three categories, namely: manufacturing, distribution and retailing.

The players in the industry have been forced to use different marketing and supply chain strategies to survive the hostile competition prevailing in the industry today (Kemsa, 2018).

1.2 Research Problem

For the pharmaceutical manufacturing companies in Kenya, supply chain performs an important role on their performance given their role and contribution to the public and country at large.

A study on supply chain resilience have been adopted therefore to be a source of anticipation, resistance, recovery and responding to the foreseen and unforeseen disruption in the supply chain of the pharmaceutical organization which eventually affects the organizational performance of the firm. A firm's operation is incomplete without effective supply chain resilience measures which will ensure sustainability and competitive advantage. The adoption of supply chain resilience techniques will maximize the operations and the firms' efficiency and effectiveness (Cho and Pucick, 2005).

Despite the acknowledgement of the Pharmaceutical companies in the economy, the institutions have been facing a lot of challenges. For example, inadequate funding, litigations, corruption, substandard products and abrupt demand and service delivery in the market place. There is need to urgently solve these problems by adopting appropriate supply chain resilience techniques that will save these manufacturing pharmaceutical companies in Kenya from these risky situations. Besides, the organization requires realizing its value for money and ensuring high customer satisfaction. Consequently, this makes supply chain resilience an inevitable practice as it ensures customer satisfaction, mitigations of risks, fair competitive environment and cost reduction in the operations of the organization.

The study will help unearth the positive influence of supply chain resilience on the performance of organizations in pharmaceutical manufacturing in Nairobi, Kenya. Globally, Frohlik and Wesbrook (2001) studied the result of integrating consumer and supplier practices on the performance of the organization. The study recognized customer-facing, supplier facing, inward facing, outward facing and periphery-facing as the supply chain management practices signifying the efficient and effective operations of the firm.

The study further showed that the greater level supplier and consumer supply chain management practices, the higher the performance of the firm. Osaro, Zulkipli and Radzuan (2014) studied on a framework to enhance the resilience of supply chains: A case of the Malaysian Pharmaceutical industry. The study indicated that agility, system integration, collaborative process and information sharing impacts positively on reducing the risks in the pharmaceutical industry in Malaysia. Awwad (2018) studied on supply chain resilience theory and application review: A case of Toyota. The study established that agility, stakeholder collaboration, mitigating risk and reengineering are enablers of supply chain resilience in Toyota.

Locally, Aluda (2015) studied on the management practices of managing risks in supply chain among telecommunication equipment vendors in Kenya. The study revealed that despite the use of the firms using management of risk in the supply chain, quite a number of Supply Chain Risk mitigation practices had not been implemented in the company. Cheng'e (2014) in Kenya studied the supply chain risk factors on the performance of petroleum industry. The study revealed that procurement, transport and distribution risks as the main risk factors in the organization which when managed effectively, have a correlation on the outcome of organizational performance. Munywoki (2016) studied on

the supply chain risk management practices on competitiveness in automotive tyre retailers in Nairobi City County.

The study established a positive correlation between supply chain risk mitigation practice and competitiveness of the firms. The studies have discussed different ways in which supply chain resilience techniques impact on performance and competitiveness of the firm.

However, it is evident, that none of the studies in the opinion of the researcher has addressed the effect of supply chain resilience on organizational performance of Pharmaceutical manufacturing companies in Kenya. This research is therefore intended to fill ‘the gap portrayed from the past studies by addressing the following questions; What are supply chain resilience practices adopted in pharmaceutical manufacturing firms in Kenya? What is the effect of supply chain resilience on organizational performance of pharmaceutical manufacturing companies in Nairobi?

1.3 Research Objectives

The study was guided by the following objectives;

- i.) To identify supply chain resilience practices in pharmaceutical manufacturing companies in Kenya
- ii.) To establish the effects of supply chain resilience on organizational performance of pharmaceutical manufacturing companies in Kenya

1.4 Value of the Study

This study would be important to the pharmaceutical manufacturing companies in Kenya in identifying the supply chain resilience practices, which can be used to enhance organizational performance. It would also help the organization to recognize the gaps in

the operations of the organization especially regarding some risk activities, which leads to poor operational efficiency.

This study would be essential to other organizations to enable them to gauge the importance of supply chain resilience practices, which will help them to identify the risks and mitigate them particularly those relating to cost reduction and improved performance.

The scholars and researchers would benefit from the study, as the findings will provide comprehensive insights and create new knowledge on the resilience of the supply chain and the impact it has on organizational performance. The study would also expand the literature about body of supply chain resilience and firms 'performance.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter entails the theoretical framework on which supply chain resilience is based. The chapter reviews literature of organizational performance, supply chain resilience and organizational performance. A review of empirical research studies is discussed alongside a conceptual framework linking supply chain resilience and organizational performance.

2.2 Theoretical Literature Review

There are various theories that explain the rationale on supply chain resilience. The study will be informed by the Strategic Choice Theory and Resource Based Theory. According to Strategic Choice Theory, there exists a link between choices undertaken by the top management team and performance of the business. Actions of identifying, evaluating mitigating and monitoring unexpected events or conditions determine the overall performance of an organization. One of these actions that management of organizations undertaken entails supply chain resilience (Child, 1972). Resource Based Theory argues that firms use resources to gain competitive advantage and thus performance (Rumelt, 1984). Risk identification, evaluation, mitigation and monitoring requires an organization to have certain resources in terms of best practices, technology and concept in order to easily curb the risks in the organization which are best explained by this Resource Based Theory.

2.2.1 Strategic Choice Theory

The theory looks at the interaction of the actions of an organization and events (De Rond & Thietart, 2007). An integrative approach of the Strategic Choice Theory is important in risk management. For example, by emphasizing on cross-functional integration in organizations (Jemison, 1981). The Strategic choice theory represents the relationship between risk management, choices and organizational performance and the environmental/, organizational interaction. It stresses the importance of managerial risk management options and practices (Child, 1972). It views organizations as partly influenced by their environment and affected by the choices they make to control environmental the disturbances (Miles et al., 1978).

Strategic choice theory has an integrative approach and views businesses entity adaptability, which learn over time. their strategic options therefore lead to actions that management direct (Child, 1997). Strategic type of organizations, Analyzers, Defenders or Prospector therefore determine the way managers and organizations operate in unpredictable events and situations. According to the strategic choice theory prospectors, proactivity and innovation is the guiding principle (Nollet et al., 2005). They produce internally sometime, they alter their product range. The defenders pursue procurement of the items through established suppliers so as to ensure efficiency in the production while developing a stable mix of products (Shook et al.,2009).

2.2.2 Resource Based View

The focus on this theory is on the firm's competitive advantages generated by its unique set of resources. Resources of an organization are divided into tangible and intangible. Tangible assets are made up of bundles of resources in an organization that one can feel

and touch. Intangible resources can neither be touched nor felt, they are created by managers and staffs of an organization. They include things like reputation, brand names, knowledge base of employees gained through experience, intellectual property of the company like trademarks, copyrights and patents (Montgomery, 2011).

The most important characteristic of the RBV is the focus in the internal forces of firm which gives the firm a competitive edge over its competitors. The resources of the firm can be classified according to the following categories: capabilities, location resources, tangible and intangible resources, strategic resources, assets, human resources, technological resources, risk management resources, social resources and organizational resources.

This theory noted that firms compete on the basis of their uniqueness in terms of corporate resources available to them and how they manage the turbulence of the risk in the environment. These corporate resources should be rare to be found and difficult to imitate or substitute. This is a clear way of gaining competitive advantage and influence the performance of the firm (Holland, 2004). One of the assumptions of resource-based theory is that resources are distributed in a heterogeneous manner. The theory also assumes that resources are not perfectly mobile. The theory leverages on resources that are within an organization for formulation of strategies especially those mitigating the risks in the organization. Through this, competitiveness and high performance is achieved. For a firm to achieve competitive edge, the resources should be rare and valuable (Barney, 1991).

2.3 Supply Chain Resilience

A supply chain comprises of the suppliers, organization and consumers and other partners engaged in the operations of the firm. In supply chain resilience therefore exist functions and practices that it will ensure anticipation, resistance, recovery and the response techniques to the foreseen and unforeseen risks in the operations of the upstream, downstream and the producing firms. Reengineering, collaboration, agility and risk mitigation culture in the supply chain are the key elements of supply chain resilience (Christoper et.al, 2004). They are facilitated by organizational relationship linkages and information integration (Lee, 2012).

Supply chain resilience results to high responsive to customers' demands, reduction in cycle time, transaction visibility, reduction in the operational costs and increased customer service levels (Bargchi& Larsen, 2002). All these results into high operational and firms' performance of the supply chain players. Supply chain resilience aims at unifying the firms' skills, ideas and culture, thus enhances decision making and reduces the conflict of interest, risks and cost implications imposed to the firm while at the same time enhances greater customer value through systematic and frequent measurement of customer satisfaction and monitor the commitment of customers' needs (Li et al., 2017).

Supply chain reengineering refers to the integrated prospective in the process of supply chain design with the traditional constraints, cost optimization and customer service in order to enhance flexibility through customization in different situation (Santos et al., 2014). Supply chain reengineering involves the clear understanding of the supply chain partners and their functions, flexible supply chain base through identification of supplier

risk sources and assessment of the current strategies and re-evaluate the redundancy and efficiency trade-offs (Liker, 2004).

Collaboration refers to a continuous relationship between suppliers and an organization. It helps organizations to influence their planned and operational efficiencies and capabilities. It emphasizes on long term direct relationships between firms and their suppliers with shared problem solving and planning capabilities (Li *et al.*, 2006). Partnering describes numerous relationships. Lambert & Gardner (1996) identifies three forms and types of collaboration; one with low interactivity, one with relationships taking long time horizons and one where organizations share a significant strategic and operational combination.

Collaboration results into mutual benefits with continuous participation in key areas of an organization for example technological use, management of materials, risk identification and customer satisfaction. Collaboration increase efficiency of an organization in transacting with limited number of suppliers. Allowing suppliers to take part in design process of new products at initial stages indicates that an organization would benefit in terms of cost reduction, identification of risks involved and assistance during assessment of the design process (Tan *et al.*, 2002). collaborating is an approach of supply chain resilience in the organization that involves the engagement with suppliers in a such a way that reflect that the needs of the customers are factored in product design, risk assessment and operations of an organization (Lappelt, Forest, Reuter & Hatmann, 2012).

Agility refers to the response time to unpredictable changes in supply and demand (Christopher *et al.*, 2004). Agility implies use of knowledge of the market and a virtual corporation to harness profitable opportunities in volatile markets (Mason, Naylor & Towill, 2000).

It is a business-wide capacity which works with organizational structures, information systems, logistical processes and risk mitigation practices (Christopher & Towill, 2001). The effectiveness of any ability to respond quickly to the market dynamics will be to a large extent be determined by the capabilities of trading parties. The concept of agility therefore has to be extended beyond the individual organizations to include the operations of the supply chain in which the firm operates (Power, Sohal& Rahman, 2001). The rationale of an agile supply chain is the ability to respond quickly and efficiently to a dynamic marketplace.

Development of a culture of risk mitigation for the supply chain means the organization management employing the risk management culture and nurturing it downstream the organization and beyond (Shimizu, 2012). The Management can employ the various techniques to entrench a risk mitigation culture in the supply chain resilience, assign a dedicated team in the all organizational levels to-do risk/ opportunities assessment in the upstream and downstream supply chain and to update the risk register and communicate with the management through a clear channel.

2.4 Organizational Performance Measurement

Performance measurement is the process of collection, analysis and reporting data about the of an organization. It is essential for every organization for it enables the organization to gauge their efficiency and effectiveness of the external and internal processes by the use of the specific metric of measurement (Henri, 2011). Different researchers and scholars have defined performance differently, which have identified different parameters of metrics on performance.

Performance refers to how well an organization has achieved its set objectives and goals for a given period. It is a powerful mechanism for prioritizing organizational goals and attaining them (Kirkendall, 2010). Performance measurement acts as a surrogate for organizational phenomena, for it indicates the level of the efficiency and effectiveness in the organization operations, functions and processes.

Financial measures of performance include indicators like returns asset, return on equity, return on investment and share prices. Financial measures of performance are the underlying objective guiding existence of organization especially for-profit business entities. This is because most body corporates exist with a sole purpose of making profits from its operations. Financial measures of performance are usually expressed in quantitative terms.

This study will focus on the organizational financial and non-financial measures of performance. The financial measures will entail profitability and non-financial measures will entail customer satisfaction, quality products and services and flexibility of the operation. The environmental aspect of performance includes the cost of operations of an organization towards its environment for example environmental pollution.

2.5 Supply Chain Resilience and Organizational Performance

Christopher & Lee (2001), and Finch (2004), identified various factors that hinder risk mitigation. These include; lack of trust among supply chain members which makes it difficult for them to share information.

It also includes lack of a clear revenue sharing arrangement hence there is no incentive to work towards a common goal. Another factor identified was adversarial competitive relationships; this type of relationship seeks to reduce the prices for goods and services. In past studies, organizations like GE lighting, HP, ZARA minimized their risks of exposure to themselves and their supply chain stakeholders through transforming their supply chains to be agile entities (Prater et al, 2001).

2.6 Empirical Studies

According to researchers Yusuf, Gunaskrane, et al., (2004); Christopher & Lee (2001) there are four characteristics that distinguish an agile supply chain which include; market responsiveness, this is concerned with understanding and capturing fast customers' needs in order to create the competitiveness of the organizations. It also means that the whole supply chain should quickly adopt to the dynamics of market requirements. The researcher also identified network integration as agile characteristics and proposes that supply chains should utilize the capabilities of its partners in fulfilling the customer requirements.

Park (2011) examined the effect of the practices of flexibility and redundancy related to resilience of supply chain SMEs. The main objective of carrying out the study was to set up the degree companies are able to mitigate the risks through flexibility in their operations and redundancy practices. The researcher employed a correlation research design which is quantitative.

The researcher analyzed the relationship between flexibility and redundancy as the supply chain resilience elements and organizational performance with the aim of establishing whether there was positive or negative correlation and subsequently calculated the effects

on organization performance in conditions of productivity, efficiency and cost effectiveness.

The targeted population comprised of US and South Korea SMEs with response rates of 4.7% and 22.8% respectively. The researcher collected data from the population using questionnaires and interviews. The results showed that flexibility and redundancy practices are related to supply chain resilience and were positively correlated with the performance of the SMEs. It was however found that return on equity was the only indicator to worsen between variables of business performance.

Kanyanya (2013) examined lean operations and performance of organizations trading at the Nairobi Securities Exchange. The study was done using primary data. The primary data was obtained using questionnaires. The collected data was analyzed using descriptive statistics. From the findings, lean production results into performance of an organization and long-term growth. Among the benefits associated with lean production include reduced cycle time, lead times and an increase in understanding of processes of an organization.

Wafula and George (2015) evaluated how strategic supplier collaborations affected organizational performance. The study used a case of Kenya Pipe Line. The study used a sample size of fifty procurement employees. Data was collected using questionnaires. Descriptive statistics were used to obtain the findings.

From the findings, networking and communication channels have improved between firm and its suppliers due to strategic supplier partnerships. It has also improved on delivery time of the products to consumers.

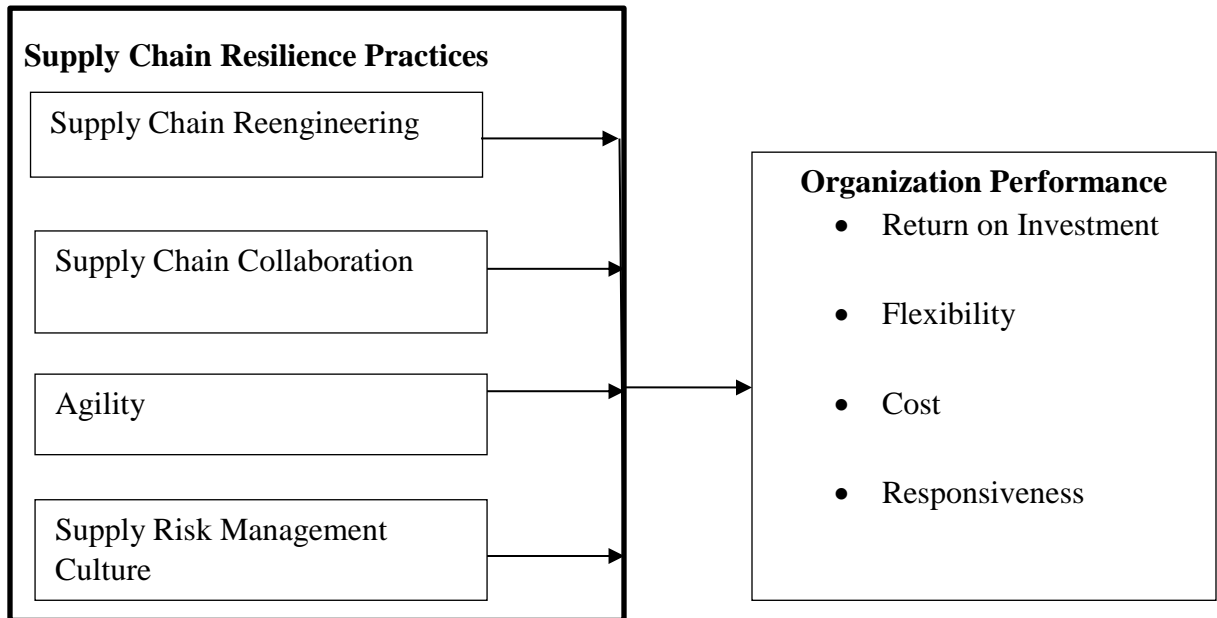
2.7 Conceptual Framework

The conceptual framework outlined below illustrates how supply chain resilience practices influence organizational performance.

Independent Variables

Dependent Variable

Figure 2.1: Conceptual Model



Source: Christopher and Peck (2004)

Figure 2.1: Conceptual Framework

A conceptual framework is a tool that depicts how the dependent and the independent variable (Kombo and Tromp, 2009) relate. Thus, providing the understanding of the subsequent findings by showing the relationship between variable. The conceptual framework in this study show how the various practices of supply chain resilience has an effect in the organizational performance.

Reengineering, collaboration, agility and supply risk management culture are the basis of supply chain resilience, which are developed through the linkages by various supply chain

players that results to return on investment, flexibility, cost reduction and responsiveness to customer needs.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter entails the methodology used when carrying out the research study. It explains the research design employed, target population of the study, data collection instrument, data collection procedure and methods and data analysis tools used.

3.2 Research Design

The research is quantitative in nature hence descriptive research design was used because it lends itself easy for both descriptive and inferential statistical analysis and provides data for an in-depth analysis. The main shortcomings however are that participants may not be truthful or may fail to behave naturally when they realize they are under observation. The best way to manage this is to win the respondents' cooperation. The aim of a descriptive research design in this study will be to get information that explains how supply chain resilience affects the organizational performance. According to Crswell (2013), a descriptive research design is used where data is collected to describe persons organizations, practices and developments.

3.3 Population of the Study

Cooper and Schindler (2006) said that a target population should be clear and precise. This made statements made concerning the findings after the analysis for credibility. The study targeted 23 pharmaceutical manufacturing companies in Nairobi as attached in appendix II. The study adopted a census approach due to relatively low population size.

3.4 Data Collection

Primary data collected using structured questionnaire related to the precise intentions of the study was used.

The data was collected from supply chain managers, operations managers or their equivalents since they are deemed to be well versed with supply chain resilience adopted in the organization and hence good understanding of issues related to supply chain management practices and to save time due to the limited time to carry the research study.

The questions were distributed on a drop and pick later basis. This ensured that respondents get enough time to respond to research questions without interfering with their daily operations. At the point of dropping questionnaires, the contact information of respondents was noted. A register was created identifying the questionnaires that were administered and collected to improve on accountability of questionnaires. The researcher contacted respondents using the noted contact details from time to time reminding them to fill and return the questionnaires.

3.5 Analysis of Data

The data collected was arranged in a way to facilitate addressing of the objectives of the study. Both descriptive and regression analysis were used. For descriptive statistics, the minimum, maximum, mean, standard deviation, were determined with every variable. In inferential statistics, regression analysis was done. Regression analysis was used to determine the cause and effect correlation between the association between the supply chain resilience practices and performance of the pharmaceutical manufacturing companies in Kenya.

The multi-linear regression equation of the following form:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where **Y** = Organizational Performance,

β₀= Constant i.e. the value of Y when X=0,

X₁= Reengineering the Supply Chains

X₂ =Supply chains Collaboration

X₃= Agile Supply Chain

X₄= Risk mitigation Culture

β₁, β₂, β₃ and **β₄** were the coefficient of determination and **ε** was the error term.

This supported the operationalization of the findings of this research.

Summary of Methodology

<u>Objective</u>	<u>Data Collection</u>	<u>Data Analysis</u>
To identify supply chain resilience practices	Primary Data – Through a Questionnaire	Descriptive Statistics
To establish the effect of supply chain resilience on organizational performance	Primary Data – Through a Questionnaire	Regression Analysis

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

The chapter details the findings of the analysis on the data that collected. The study relied on primary data that was collected. The collected data was analyzed using the SPSS software. The results were presented using Tables and Figures.

4.2 Response Rate and General Information

A total number of 23 questionnaires were used to collect data from 23 pharmaceutical manufacturing companies in Nairobi. 19 of them were completed and returned. This was equivalent to a response rate of 82.6% which was sufficient and concurred with Mugenda and Mugenda (2003).

The study sought to determine the highest level of education of respondents as shown in Table 4.1.

Table 4.1: Highest Level of Education

	Frequency	Percentage
Secondary	2	10.5
College	7	36.9
University	10	52.6
Total	19	100

From Table 4.1, most of the respondents 52.6% had university education, 36.9% had college education and 10.5% had secondary level of education. It can therefore be concluded that respondents who took part in the study were educated and thus could read and interpret research questions sought by the study.

Table 4.2 shows that number of years that respondents had worked in their organization.

Table 4.2: Years of Experience of Respondents

	Frequency	Percentage
Less than one year	1	5.3
1-3 years	4	21.1
4-7 years	8	42.1
Over 8 years	6	31.5
Total		100

The findings in Table 4.2 show that that most of the respondents 42.1% had been working for 4-7 years, 31.5% for over 8 years, 21.1 for 1-3 years and 5.3% for less than one year. This finding is relevant to the study because it shows that most of the respondents had worked for a long period in their organization and thus were knowledgeable as sought by the study.

The findings on the positions of respondents are shown in Table 4.3.

Table 4.3: Position Held

	Frequency	Percentage
Top Management	4	21.1
Middle Management	8	42.1
Operation/Support Staff	7	36.8
Total	19	100

As per Table 4.3, majority of the respondents 42.1% were middle managers, 36.8% were support/operational staff while 21.1% were top managers. This shows that respondents who took part in the study were generally in managerial position and thus directly took part in supply chain decisions. Thus, they were knowledgeable. The researcher sought to establish the supply chain resilience practice adopted as shown in Table 4.4.

Table 4.4: Adopted Supply Chain Resilience Practice

	Frequency	Percentage
Supply Chain reengineering	15	78.9
Supply Chain Collaboration	18	94.7
Agility Supply Chain	16	84.2
Risk Management Culture	17	89.5

From Table 4.4, the most adopted supply chain resilience practice was supply chain collaboration (94.7%), risk management culture (89.5%), agility supply chain (84.2) and lastly supplies chains reengineering (78.9%). This shows that the studied organizations generally practiced supply chain resilience. These results are consisted with Forkmann et al. (2016) who noted that companies are trying to establish supply chain resilience to mitigate the complex risks emerging in the revolutionary age of technology, uncertain global customers and complexity in the supply chain function in order to be able to compete in the current dynamic marketplaces.

4.3 Supply Chain Resilience Practices

The study sought to establish the resilience practices of supply chain resilience among manufacturing pharmaceutical. In a scale of 1-5 in the questionnaire, table 4.5 presents the findings on supply chain reengineering practices.

Table 4.5: Supply Chain Reengineering Practices

Statement	Mean	Std. Dev
We are capable of dealing with the risks that affects our operations	3.82	.851
Through supply chain engineering, my organization is specialized on creating sustainability	3.74	.427
Considerable costs are saved due to supply chain reengineering in my organization	4.03	.966
Supply chain reengineering has helped my organization to gain competitive edge	3.63	.636
Supply chain reengineering decisions follow clear procedures	3.62	.517
Supply chain reengineering has resulted into improved expertise in my organization	3.45	.813
Managerial risk work load has lessened due to adoption of supply chain reengineering	3.53	.814

The findings in Table 4.5 indicate that considerable costs are saved due to supply chain reengineering in the organization, the organization is able to deal with the risks that affects its operations and through supply chain resilience, most organizations have specialized in creating sustainability with means of 4.03, 3.82 and 3.74 respectively.

The standard deviations on these means are less than 1 showing strong convergence of ideas expressed by respondents. The study further revealed that supply chain reengineering has helped most organizations to gain competitive edge, supply chain reengineering decisions follow clear procedures and managerial risk work load has slightly lessened due to adoption of supply chain reengineering. The means of 3.63, 3.62 and 3.53 were obtained respectively. Respondents however were not sure whether supply chain reengineering has resulted into improved expertise in their organization with a mean of 3.45. The standard deviations on all these statements are all less than 1. This shows there was convergence in the views expressed by respondents on supply chain reengineering practice.

In the past study (Santos et al.,) supply chain re- engineering is viewed as an integrated prospective in the process of supply chain design with the traditional constraints, cost optimization and customer service in order to enhance flexibility through customization in different situation. The findings by (Santos et al.,) mirrors the research findings in the project under Table 4.5 that highlight the positive impact on supply chain re- engineering on organizational performance in pharmaceutical manufacturing companies in Nairobi, Kenya.

The findings on agility practices are shown in Table 4.6. The findings in Table 4.6 indicate that most organizations are able to respond to the changes in the operations of the firm. There are robust systems that accurately track the levels of the inventory in most organizations and Agility in most organizations reduce risks level with consistent with objectives set by management as shown by means of 3.89, 3.84, 3.77 and 3.71 respectively.

These statements are supported by lower values of standard deviation that point out strong convergence in the level of agreement of respondents on these statements.

Table 4.6: Agility Practices

Statement	Mean	Std. Dev
My organization is able to react to dynamisms in the operations of the firm	3.89	1.00
Agility in my organization maintains operational levels that minimizes the costs	3.64	.857
Agility in my organization reduces risks level with consistent with objectives set by management	3.71	.928
Agility in my organization involves recording and monitoring the levels of risk and to respond on it	3.68	.928
Our procurement staff effectively anticipate the future risks in the organization	3.51	1.29
The adoption of agility practices has been able to determine when and how to respond to the risks level	3.40	.584
We have a robust system that accurately tracks the levels of the inventory in the organization	3.77	.775
Through agility the organization was able to attain an optimal level of operations	3.54	1.28
The adoption of the agility practices has enabled a continuous production flow	3.66	1.12
The adoption of the agility technique has led to improved customer service levels	3.84	1.00

The study further revealed that agility in most organizations involves recording and monitoring the levels of risk and then responding to the risk.

The adoption of the agility practices has enabled continuous production flow and agility in most organization maintains operational levels that minimizes the costs with means of 3.68, 3.66 and 3.64 respectively. The statements were supported by low values of standard deviations. Respondents slightly agreed that through agility, their organization has been able to attain an optimal level of operations and that the procurement staff effectively anticipate the future risks in the organization with means of 3.54 and 3.51 respectively.

Respondents however were neutral on whether the adoption of agility practices has been able to determine when and how to respond to the risks level with a mean of 3.40.

In a past study, Park (2011) examined the effect and flexible related to supply chain resilience in the SMEs. The result of this research showed that flexible and redundant practices are related to the resilience of supply chain and were positively co related with the performance of the SMEs. The result of Park’s study is similar to the results of the finding in the current research project.

The findings on the risk management culture are shown in Table 4.7.

Table 4.7: Risk Management Culture Practices

Statement	Mean	Std. Dev
Risk management culture result into products that are in line with the needs and wants of our customers	3.76	1.02
Risk management culture in the organization has led to minimal risks that affects the operations	4.16	.749
Risk management culture has greatly improved the identification and reduction of risks in the organization	3.75	1.45
Risk management culture aims at reduction of all risky activities in the production systems and processes of our organization	4.27	.799
Risk management culture has reduced the risk level in my organization	4.13	.718
Risk management culture in my organization has led to continuous improvement initiatives	3.46	1.08
My organization is continuously committed towards risk management culture in all employees	3.80	.862

The findings in Table 4.7 indicate that risk management culture aims at reduction of all risky activities in the production systems and processes of most organizations, it has led to minimal risks that affects the operations while at the same time it has reduced the risk level in most organizations with means of 4.27, 4.16 and 4.13 respectively. The study further

indicated that most organizations are continuously committed towards risk management culture from all employees.

The risk management culture has resulted into products that are in line with the needs and wants of customers and it has also greatly improved the identification and reduction of risks in most organizations with means of 3.80, 3.76 and 3.75 respectively. However, respondents were not sure whether risk management culture in their organization has led to continuous improvement initiatives with a mean of 3.46. All the statements are supported by low values of standard deviations.

The findings on collaboration practices are indicated in Table 4.8.

(Shiminzu, 2012), Management can implement the following techniques to enforce the risk mitigation culture in the supply chain resilience which is not limited to incorporating the risk dimension in the decisions making of the supplies chains. This finding tie with the findings in this research as shown in Table 4.7 which shows that risk management as a practice of resilience of supply chain has an influence on the organizational performance.

Table 4.8 indicates that early supplier involvement in product design ensures that the needs and wants of customers are captured in the design, most organizations have cultivated long term direct relationships with suppliers in order to manage the risks and that early supplier engagement and collaborations insures against risks in the supply chain in most organizations as shown by means of 4.16, 4.15 and 4.08 respectively. The study further established that strategic supplier partnerships in most organizations has increased networking and communication channels with suppliers, suppliers are involved in initial stages of product design in most organizations and there is shared problem solving with

suppliers in most organizations with means of 3.83, 3.75 and 3.71 respectively. Strategic partnerships increase efficiency of most organizations in transacting its suppliers with a mean of 3.67.

In a past study, Wafula and George (2015), the researchers evaluated how strategic supplier collaborations affected organizational performance. From the findings, networking and communication channels have improved between firm and its suppliers due to strategic supplier partnerships. It also improved on delivery time and products to consumers. These findings agree with the research findings in table 4.8 which highlights the positive effects of strategic collaboration on organization performance

Table 4.8: Collaboration Practices

Statement	Mean	Std. Dev
My organization has cultivated long term direct relationships with suppliers in order to manage the risks	4.15	.765
Suppliers are engaged in preliminary product design stages in my organization	3.75	.709
Early supplier engagement in design of products ensures that the needs and wants of customers are captured in the design	4.16	.486
Early supplier engagement and collaborations insures against risks in the supply chain in my organization	4.08	.689
Strategic partnerships increase efficiency of my organization in transacting its suppliers	3.67	.976
Strategic supplier partnerships in my organization has increased networking and communication channels with suppliers	3.83	.802
There is shared problem solving with suppliers in my organization	3.71	.697

4.4 Organizational Performance

The dependent variable of the study was organizational performance. The findings are indicated in Table 4.9.

Table 4.9 shows that due to supply chain resilience, most of the studied organizations have improved quality of products and services, efficient and effective operations while at the reducing customer complaints with means of 4.38, 4.14 and 4.05 respectively.

There has also been an increased customer satisfaction and reduced costs of operations with means of 3.94 and 3.64 respectively. However, market share has not significantly increased with a mean of 3.09.

Table 4. 9: Organizational Performance

Statement	Mean	Std. Dev
Reduction in costs of operations	3.64	1.21
Increased customer satisfaction	3.94	.632
Improved quality of products and services	4.38	.497
Increased market share	3.09	1.75
Reduced customer complaints	4.05	.662
Efficiency and effectiveness in operations	4.14	.978

4.5 Resilience of Supply Chain and Organizational Performance

to determine the effect of supply chain resilience on organizational performance, the researcher employed regression analysis. Table 4.10 shows the findings of the model summary.

Table 4.10: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.847 ^a	.717	.706	1.57292

As shown in Table 4.10, the coefficient of determination R squared is 0.717. This infers that 71.7% change in organizational performance of the studied firms is explained by the supply chain management resilience in place.

In order to determine the overall significance of the regression model, it was important to carry out an Analysis of Variance at 5% level of significance as indicated in Table 4.11.

Table 4.11: ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	645.837	4	161.459	8.870	.000 ^b
Residual	254.830	14	18.202		
Total	900.667	18			

From Table 4.11, the value of F calculated is 8.870 while F critical (obtained from F Distribution Tables at degrees of freedom 4 and 14) is 3.112. Therefore, the value of F calculated is greater than F critical. the overall regression model was therefore fit.

The significance of the individual variables of the study were determined by their p values. The interpretation of significance was conducted at 5% level of significance as shown in Table 4.12.

Table 4.12: Coefficients

	Unstandardized		Standardized	t	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	2.732	1.246		2.193	.031
Reengineering of Supply Chains	.150	.058	.206	2.568	.012
Supply chain Collaboration	.475	.086	.487	5.506	.000
Agile Supply Chain	.182	.084	.170	2.151	.034
Risk mitigation Culture	.108	.033	.091	3.273	.000

The resultant equation becomes;

$$Y = 2.732 + 0.150 X_1 + 0.475 X_2 + 0.182 X_3 + 0.108 X_4$$

X_1 = Reengineering of Supply Chain

X_2 = Supply chains Collaboration

X_3 = Agile Supply Chain

X_4 = Risk mitigation Culture

Thus, at 5% level of significance, supply chain reengineering ($\beta=0.150$, $p=0.012 < 0.05$) positively and significantly affected on organizational performance. Supply chain collaboration ($\beta=0.475$, $p=0.000 < 0.05$) positively and significantly affected organizational performance.

Agile supply chain ($\beta=0.182$, $p=0.034 < 0.05$) positively and significantly affected organizational performance. Risk management culture ($\beta=0.108$, $p=0.000 < 0.05$) positively and significantly affected on organizational performance. Thus, it can be deduced the supply chain resilience has a positive and significant impact on organizational

performance. Munywoki (2016) studied on the supplier chain risk management practices on competitiveness in automotive tyre retailers in Nairobi City County and established a positive correlation of supply chain risk management practices and competitiveness of the firms.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter provides a summary of the analyzed findings. The conclusions arising from the findings of the study are also presented. The recommendations for policy and practice are also clearly shown. The researcher suggests need for further studies for future scholars

5.2 Summary of the Findings

the study aimed to determine the effect of supply chain resilience on organizational performance. The study was guided by the following specific objectives; to identify supply chain resilience practices in Kenya's pharmaceutical manufacturing firms and to establish the effect of supply chain resilience on organizational performance of pharmaceutical manufacturers in Kenya.

On the first objective which was to identify supply chain resilience practices in pharmaceutical manufacturers in Kenya, the study established that the most adopted supply chain resilience practice was supply chain collaboration, risk management culture, agility supply chain and lastly supplier chain reengineering. On supply chain resilience practice, the study established that considerable costs are saved due to supplier chain reengineering in the organization, the organization is able to deal with the risks that affect its operations and through supply chain resilience, most organizations have specialized in creating sustainability.

In view of agile practices, the study found out that most organizations are able to respond to the changes in the operations of the firm. The adoption of the agility technique has led to improved customer service levels. There are also robust systems that accurately track the levels of the inventory in most organizations. Agility in most organizations reduce risk level which is consistent with objectives set by management.

On risk management, the study found out that risk management culture aims at reduction of all risky activities in the production systems and processes of most organizations, it has led to minimal risks that affects the operations while at the same time it has reduced the risk level in most organizations. In respect to collaboration practices, the study revealed that early supplier involvement in product design ensures that the needs and wants of customers are captured in the design, most organizations have cultivated long term direct relationships with suppliers in order to manage the risks and that early supplier engagement and collaborations insures against risks in the supply chain in most organizations.

On the second objective which was to determine the effect of supply chain resilience on organizational performance of pharmaceutical manufacturers in Nairobi, Kenya, the coefficient of determination R squared was 0.711 showing that 71.1% change in organizational performance can be accounted for by supply chains resilience. The value F calculated was 8.870 compared to F critical of 3. 112. The consideration of significance level of individual variables indicated that supply chain reengineering ($\beta=0.150$, $p=0.012<0.05$) positively and significantly affected organizational performance. Supply chain collaboration ($\beta=0.475$, $p=0.000<0.05$) positively and significantly affected organizational performance. Agility supply chains ($\beta=0.182$, $p=0.034<0.05$) positively and

significantly affected organizational performance. Risk management culture ($\beta=0.108$, $p=0.000<0.05$) positively and significantly affected organizational performance.

5.3 Conclusions

The study concludes that the most adopted supply chain resilience practice was supply chain collaboration, risk mitigation culture, agility supply chain and reengineering of supply chain. Considerable costs are saved due to engineering the supply chain in the organization. Most organizations are able to react to the changes in the operations of the firm. Risk management culture aims at reduction of all risky activities in the production systems and processes of most organizations. Early supplier involvement in product design ensures that the customers' needs are captured in the design.

The study further concludes that supply chain reengineering positively and significantly affected organizational performances. Supply chain collaboration positively and significantly affected on organizational performances. Agile supply chain positively and significantly affected organizational performances. Risk mitigation culture positively and significantly affected on organizational performances.

5.4 Recommendations of the Study

The study recommends that the top management of all pharmaceutical manufacturers in Kenya should increase investment in the identified supply chain management practices to positively and significantly influence performance of their organizations.

The study further recommends to that the government through the Pharmacy and Poisson Board should formulate effective policies and regulations that support pharmaceutical

manufacturing companies to adopt supply chain resilience and thus positively influencing performances.

5.5 Limitations of the Study

The current study was limited to primary data alone. Questionnaires were used in collection of primary data. Although it represents the first-hand source of information, collection of primary however faces a number of challenges including the possibility of respondents to refuse answering them. Questionnaires are also time consuming and relatively costly to administer.

5.6 Suggestions for Further Studies

The value of R square was 0.711 indicating that 71.1% change in organizational performance is attributed to supply chain resilience. Therefore, there are other factors apart from supply chain resilience that influence organizational performance which future studies should focus on. The study was limited to dependent and the independent variables. Future studies should incorporate the intervening, controlling or moderating variables.

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APPENDICES

Appendix I: Questionnaire

SECTION A: GENERAL INFORMATION

1. Kindly indicate the highest level of education that you have attained?

Primary [] Secondary []
 College [] University []

2. How many years have you worked in your organization?

Less than one year [] 1-3 years []
 4-7 years [] Over 8 years []

3. What position do you hold in your organization

Top management []
 Middle management []
 Operation/Support Staff []

4. Tick the supply chain resilience practices that are adopted in your organization.

Supply Chain reengineering []
 Supply Chain Collaboration []
 Agility Supply Chain []
 Risk Management Culture []
 Other []

SECTION B: SUPPLY CHAIN RESILIENCE PRACTICES

On the scale provided below, rate each statement that describes supply chain reengineering practices in your organization that could have on effect performance. Using the Likert scale of 1-5 where 1= strongly disagree, 2= disagree, 3= moderately agree, 4= agree, and 5= strongly agree.

Statement	1	2	3	4	5
We are capable of dealing with the risks that affects our operations					
Through supply chain engineering, my organization is specialized on creating sustainability					
Considerable costs are saved due to supply chain reengineering in my organization					
Supply chain reengineering has helped my organization to gain competitive edge					
Supply chain reengineering decisions follow clear procedures					

Supply chain reengineering has resulted into improved expertise in my organization					
Managerial risk work load has lessened due to adoption of supply chain reengineering					

On the scale provided below, rate each statement that describes agility practices in your organization that could have influenced on performance. Using the Likert scale of 1-5 where 1= strongly disagree, 2= disagree, 3= moderately agree, 4= agree, and 5= strongly agree.

Statement	1	2	3	4	5
My organization is able to respond to the changes in the operations of the firm					
Agility in my organization maintains operational levels that minimizes the costs					
Agility in my organization reduces risks level with consistent with objectives set by management					
Agility in my organization involves recording and monitoring the levels of risk and to respond on it					
Our procurement staff effectively anticipate the future risks in the organization					
The adoption of agility practices has been able to determine when and how to respond to the risks level					
We have a robust system that accurately tracks the levels of the inventory in the organization					
Through agility the organization has able to attain an optimal level of operations					
The adoption of the agility practices has enabled a continuous production flow					
The adoption of the agility technique has led to improved customer service levels					

On the scale provided below, rate each statement that describes risk management culture practices in your organization that could have influenced performance. Using the Likert scale of 1-5 where 1= strongly disagree, 2= disagree, 3= moderately agree, 4= agree, and 5= strongly agree.

Statement	1	2	3	4	5
Risk management culture result into products that are in line with the needs and wants of our customers					
Risk management culture in the organization has led to minimal risks that affects the operations					
Risk management culture has greatly improved the identification and reduction of risks in the organization					

Risk management culture aims at reduction of all risky activities in the production systems and processes of our organization					
Risk management culture has reduced the risk level in my organization					
Risk management culture in my organization has led to continuous improvement initiatives					
My organization is continuously committed towards risk management culture in all employees					

On the scale provided below, rate each statement that describes the collaboration practices in your organization that could have influenced performance. Using the Likert scale of 1-5 where 1= strongly disagree, 2= disagree, 3= moderately agree, 4= agree, and 5= strongly agree.

Statement	1	2	3	4	5
My organization has cultivated long term direct relationships with suppliers in order to manage the risks					
Suppliers are involved in initial stages of product design in my organization					
Early supplier involvement in product design ensures that the needs and wants of customers are captured in the design					
Early supplier engagement and collaborations insures against risks in the supply chain in my organization					
Strategic partnerships increase efficiency of my organization in transacting its suppliers					
Strategic supplier partnerships in my organization has increased networking and communication channels with suppliers					
There is shared problem solving with suppliers in my organization					

SECTION C: ORGANIZATIONAL PERFORMANCE

Below are several effects of supply chain resilience on the organizational performance of pharmaceutical manufacturing companies. Kindly indicate how supply chain resilience has affected the performance of your organization. Using the Likert scale of 1-5 where 1= strongly disagree, 2= disagree, 3= moderately agree, 4= agree, and 5= strongly agree.

Statement	1	2	3	4	5
Reduction in costs of operations					
Increased customer satisfaction					
Improved quality of products and services					
Increased market share					
Reduced customer complaints					
Efficiency and effectiveness in operations					

THANK YOU FOR TAKING PART IN THE STUDY

Appendix II: List of Leading Manufacturing Pharmaceutical Companies

1. Alpha Medical Manufacturers – Nairobi
2. Aventis Pasteur SA East Africa – Nairobi
3. Bayer East Africa Limited – Nairobi
4. Beta Healthcare (Shelys Pharmaceuticals) – Nairobi
5. Cosmos Limited – Nairobi
6. Dawa Pharmaceuticals Limited – Nairobi
7. Didy Pharmaceutical – Nairobi
8. Diversey Lever – Nairobi
9. Eli-Lilly (Suisse) SA – Nairobi
10. Elys Chemical Industries Ltd – Nairobi
11. Glaxo SmithKline – Nairobi
12. High Chem East Africa Ltd – Nairobi
13. Ivey Aqua EPZ Limited – Athi River
14. Mac's Pharmaceutical Ltd – Nairobi
15. Manhar Brothers (Kenya) Ltd – Nairobi
16. Novartis Rhone Poulenc Ltd – Nairobi
17. Novelty Manufacturers Ltd – Nairobi
18. Pfizer Corp (Agency) – Nairobi
19. Pharmaceutical Manufacturing Co (K) Ltd – Nairobi
20. Pharmaceutical Products Limited – Nairobi
21. Phillips Pharmaceuticals Limited – Nairobi
22. Regal Pharmaceutical Ltd – Nairobi
23. Universal Pharmaceutical Limited – Nairobi

Source: Ministry of Health (2016)