



**ROLE OF SUPPLY CHAIN RISK MANAGEMENT TECHNIQUES ON THE PERFORMANCE OF MANUFACTURING FIRMS IN KENYA. A CASE OF UNGA GROUP LIMITED**

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**ABSTRACT**

*The main objective of this study was to establish the role of supply chain risk management techniques on the performance of manufacturing firms in Kenya. A Case of Unga Group Ltd. Particularly, the study sought to find out the role of lean management technique on the performance of manufacturing firms in Kenya; to establish the role of just-in-time delivery technique on the performance of manufacturing firms in Kenya; to determine the role that single sourcing technique has on the performance of manufacturing firms in Kenya; and to ascertain the role of supplier rating technique on the performance of manufacturing firms in Kenya. The study adopted descriptive research design and targeted employees at Unga Group Ltd, with a base sample size of 124 respondents. Further, the study used structured questionnaires as the main instruments for collecting primary data from respondents. Data collected was first edited, formatted and organized for coding into the Statistical Package for Social Sciences (SPSS Version 25) Program. Based on the statistical findings the researcher was able to draw conclusions from the responses. From the findings, 61.1% (R Square = .611) of the total variability in the dependent variable (Performance) could be explained by Lean Management Technique, Just-In-Time Technique, Single Sourcing Technique, and Supplier Rating Technique. However, Supplier Rating Technique was found to be statistically insignificant meaning. The implication was that Lean Management Technique, Just-In-Time Technique, and Single Sourcing Technique play major roles as supply chain risk management techniques and as such they have an impact on the performance of manufacturing firms in Kenya. This study therefore recommended that policy makers and other major actors in the manufacturing sector employ these techniques in their day to day operations so as to increase the performance of manufacturing firms in Kenya.*

**Key Words:** Lean Management, Just-In-Time, Single Sourcing, Supplier Rating, Manufacturing Firms in Kenya

## INTRODUCTION

In the recent past, globalization has been more intense. Companies now focus on their core function and outsource the rest of the production (Sturgeon & Gereffi, 2009). Thus, the supply chain has become more complex and wider. It can pass thorough many different countries and cultures, dispersed around the world and working in widely different conditions. Because of the increasing size and complexity of the supply chains, companies have started to realize the necessity to have a broader view of the movement through all the related organizations that constitute the supply chain and to manage this chain as one integrated organization. Supply chain management is a very complex set of operations and functions with an enormous range of inherent risks. These can be a minor irritation as a small delay and doesn't cause a relevant consequence or could be a major problem as a fire in a supplier and cause the disruption of the entire chain (Heckmann, Comes & Nickel, 2015).

According to Sodhi and Tang (2012) risk occurs because it is not possible to forecast exactly what is going to be the outcome in future events. Even if a company uses the best analyses approaches and software to predict what is going to happen, there is always uncertainty in the future and this bring risks. Although risk can be connected to positive results or good outcomes, it is usually associated with negative results and outcomes. Most of the times, managers talk about risk when they discuss the percentage or likelihood of some negative output, such as delayed delivery, accident on the production, some product doesn't sell as expected or other negative outputs (Misra, Khan & Singh, 2010). Risks come from various causes. Some of them could not be prevented, but most of them can. Some risks are extremely rare to occur but when they do occur, the damage to the company

can be so intense that no recovery will be possible (Baghalian, Rezapour & Farahani, 2013).

Vilko and Hallikas (2012) noted that the ability to understand the risks that surround the company operations and environment (natural, political and others) has fundamental importance. Risk management is about identifying operations which involve risk, trying to prevent the failure before it happens, stopping them when they do happen, reducing the negative consequences in these events and trying to recover the operations as planned (Aboutalebi, 2016). After the risks have been identified, they should be monitored and controlled in order to reduce their negative impact in unfortunate events or to maximize the realization of opportunities. The risk management's objective is to assure the flow of the planned operations and to protect the company against supply chain disruptions (Stadtler, 2015). Even though most managers and investors recognize the importance of risk management, they still face many difficulties to use it in practical situations. According to Hoyt and Liebenberg (2011), one of the reasons is the difficulty to quantify or measure the risk within many other reasons. Disruptions in companies are becoming more frequent since managers are not completely aware of the full risk and consequences of their decisions. Although some risks cannot be eradicated, they can be identified, assessed, quantified and mitigated. Risk on the supply chain consists in every factor that might affect the planned flow of material (Arena & Arnaboldi, 2014). Although many of these risks can be common and well known such as supplier delays or excess stock, others could be more complex and unusual, such as wars or outbreak of disease. The risk with the greatest concern on the supply chain is related to quality. A long and complex supply chain makes it very difficult to recover from quality issues (Giannakis & Papadopoulos, 2016).

According to Khanlari (2015), firm performance comprises the actual output or results of an organization as measured against its intended outputs (or goals and objectives). Performance involves the ability of an organization to fulfill its mission through sound management, strong governance and a persistent rededication to achieving results. Performance measures can be financial or nonfinancial. Both measures are used for competitive firms in the dynamic business environment. In a well-defined organization, performance indicators of an effective supply chain management and practices results in outcomes (Profitability, market share (customers), growth in assets, shareholder value, increased supplier relationships and increased customer satisfaction). All in all, the foundation of long-term performance is lifetime customer value; the revenue customers generate over their lives, less the cost of acquiring, converting, and retaining them. In Kenya, manufacturing accounts for 10.6 % of the GDP, which is low compared to most middle-income countries, yet it is the most manufacturing-intensive economy in eastern Africa (Nyang'au, 2016). According to Republic of Kenya (2014), the manufacturing sector in Kenya is a potential major source of growth.

### **Statement of the Problem**

Risk management has been widely studied in various disciplines from finance to engineering. However, supply chain risk management is a relatively recent undertaking (Aven, 2016). Supported by advanced information technologies and faster and cheaper transportation, firms are expanding their supply networks. Supply chains are geographically scattered all around the world. Scheibe and Blackhurst (2018) reported that this worldwide presence substantially increases the exposure of the supply chain to inherent risks. The very structure of a supply chain results in exceptional far-reaching, global exposure. Such an

exposure amplifies its vulnerability to traditional risks. Furthermore, the common business practices implemented in supply chains aggravate the impact of risks. For example, the just-in-time approach that characterizes the supply systems in most supply chains makes them vulnerable to stockouts, traditionally managed by inventory buffers (Blackhurst *et al.*, 2017). Manufacturing firms in Kenya have come to realize that effectiveness and efficiency of employing the supply chain improvement approaches leads to competitive advantage and meeting customer needs. According to Magutu, Aduda and Nyaoga (2015), firms are focusing on becoming efficient and flexible in their manufacturing methods. Due to competition, organizations need different strategies to manage the flow of goods from the source to the end user. However, they have not been able to formulate the right strategies required to achieve best practices in SCM. Exceptional performance in Supply Chain requires several strategies including use of models and analytical tools then skilled manpower to interpret and then use the information for decision making (Memia, Odhiambo & Ngugi, 2018). Globalization is forcing companies to look for better and more inter-linked systems to coordinate the efficient flow of materials into and out of the firm. All operations no matter how well managed still need improvement (Slack, Chambers & Johnston, 2010). There is need to manage the total distribution activities as a complete system, having regard for the effects of decisions taken in one cost area upon other cost areas, thus having implications for the cost accounting system of the firm. Supply chain risk management techniques, minimizes setbacks in the supply chain, reduces costs, improves customer satisfaction through timely delivery, increases productivity through the use of best practices in the field and improves information flow (Victoria, Nyamwange & Harley, 2017). It is for this reasons that this study sought to find the role that supply chain risk management techniques had

on the performance of manufacturing firms in Kenya.

### **Objectives of the Study**

The main objective of this study was to establish the role of supply chain risk management techniques on the performance of manufacturing firms in Kenya. A Case of Unga Group Ltd. The specific objectives were:-

- To find out the role of lean management technique on the performance of manufacturing firms in Kenya
- To establish the role of just-in-time delivery technique on the performance of manufacturing firms in Kenya
- To determine the role that single sourcing technique has on the performance of manufacturing firms in Kenya
- To ascertain the role of supplier rating technique on the performance of manufacturing firms in Kenya.

## **LITERATURE REVIEW**

### **Theoretical Review**

#### **Agency theory**

The current view of agency theory lays to the fore the practice of allocation of tasks and operation, through an open system outlook towards the atmosphere. Agency theory has been applied to various activities connected to supply chain including, outsourcing and supply chain collaboration (Fayezi, O'Loughlin & Zutshi, 2012). Porter developed the five-force model that defines the attractiveness and profitability of an industry or market. These forces are; bargaining power of customers, bargaining power of suppliers, power of existing competitive rivalry, threat of new entrants and threat of alternate products. This framework is generally used for the analysis of business and development of business plan. According to this model, the objective of corporate strategy should

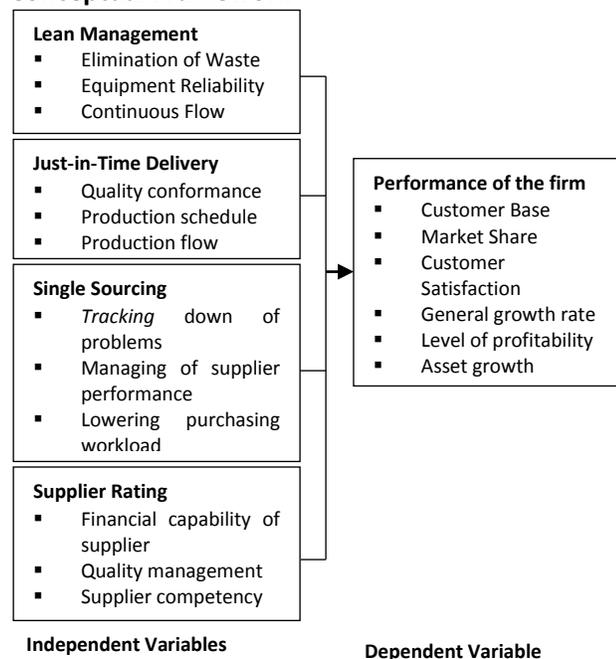
be to manage these competitive forces in a way that improves the position of the organization and achieve spirited advantage. Zu and Kaynak (2012) also identified the competitive generic strategies that can be useful after successful aggressive investigation that is, cost leadership and differentiation strategy, and focus strategy. Based on the separation of ownership and control of economic activities between the agent and the principal, various agency problems may arise, such as asymmetric information between the principal and the agent, conflicting objectives, differences in risk aversion, outcome uncertainty, behavior based on self-interest, and bounded rationality (Belzer & Swan, 2011). The contract between the principal and the agent governs the relationship between the two parties, and the aim of the theory is to design a contract that can mitigate potential agency problems (Tate *et al.*, 2010). According to the theory, the "most efficient contract" includes the right mix of behavioral and outcome-based incentives to motivate the agent to act in the interests of the principal (Vanany, Zailani & Pujawan, 2009). The alignment of incentives is an important issue in supply chain risk management. Misalignment often stems from hidden actions or hidden information. However, by creating contracts with supply chain partners that balance rewards and penalties, misalignment can be mitigated (Kroes & Ghosh, 2010).

#### **Resource Based View**

The resource-based view (RBV) of the firm combines two perspectives: the internal analysis of phenomena within a company, and an external analysis of the industry and its competitive environment. Specifically, the RBV considers the firm as a bundle of resources: tangible resources, intangible resources, and organizational capabilities. Competitive advantages that are sustainable over time generally arise from the creation of bundles of resources and capabilities.

For advantages to be sustainable, four criteria must be satisfied: rareness, valuable, difficulty in imitation, and difficulty in substitution. Such an evaluation requires a sound knowledge of the competitive context in which the firm exists (Wernerfelt, 2014). Lockett, Thompson and Morgenstern (2009) argues that it is possible to find the optimal product-market activities by specifying a resource profile for a firm. According to the resource based view as used in supply chain denotes the channel of firms and intermediaries through which a product moves from the original sources of its basic raw materials through conversion/manufacture and then distribution in its finished form to the ultimate consumers. Hence a given firm must result in a resource based value before considering other actions as managers understand that all the suppliers should react to the changes from the supply chain. The supply chain is compressed to be very flexible to changes from the market (Wernerfelt, 2011).

### Conceptual Framework



**Figure 1: Conceptual Framework**

### Empirical Review Lean Management

Lean, also referred to as Lean Management, Lean Manufacturing, Lean Enterprise, or Lean Production, is a powerful set of tools and techniques that many companies choose to implement and sustain as a way of increasing the efficiency of production and the overall customer value while at the same time eliminating waste (Myerson, 2012). According to Packowski (2013) waste is anything that does not add value but adds costs to a company. Typically, seven wastes have been identified in lean management: waiting, transportation, over-production, inventory, movement, over-processing, and re-work. Applied Lean methods are a series of scientific, objective techniques that cause work tasks in a process to be performed with a minimum of non-value-adding activities, resulting in greatly reduced wait time, queue time, move time, administrative time, and other delays. Lean operating systems seek to identify and eliminate all non-value adding activities in design, production, supply chain management, and other activities used to satisfy customer requirements. A lean facility is capable of producing a product or service in only the sum of the value-added work content time required to change its form, fit, or function (Anholon & Sano, 2016).

Lean thinking has its origins in Japanese production operations (Singh *et al.*, 2010). Toyota practiced the principles of lean management as early as the 1950s forming the basis of strategic inventory management which today is envisaged as an essential core principle of almost any production system in all industries worldwide (Stentoft, Vagn & de Haas, 2011). Lean production is 'lean' because it uses less of everything compared with mass production: half the human effort in the factory, half the factory space, half the investment in tools, half the engineering hours to develop a new product in half the time and it requires far less half

of the needed inventory on site. The expected results are fewer defects while producing a greater and ever growing variety of products (Agus & Shukri, 2012).

### **Just-in-Time Delivery**

Just-in-time (JIT) is described as the way of delivering the right items, in the right amount and at the right time. To be able to be responsive to customer demand, JIT is an essential part and it is applicable both internally and externally. Customers can be external but also internal inside the company and should be provided with the same services as the external ones (Pheng & Shang, 2011). According to Monden (2011), JIT is a method of inventory control that brings material into the production process, warehouse or to the customer just in time to be used, which reduces the need to store excessive levels of material in the warehouse. JIT is a production strategy that strives to improve a business' return on investment by reducing in-process inventory and associated carrying costs.

### **Single Sourcing**

Single-Sourcing involves the idea of reducing the number of suppliers a firm does business with. In this approach the good relationship between the buyer and the supplier is critical. There are advantages for the buyer and for supplier by adopting this strategy: improved communication, cooperation in the design and in the quality process, stability and cost reductions and the order handling (Yu, Zeng & Zhao, 2009). Disadvantages are all connected to the possibility that this relationship will not reduce the competition. In single-sourcing strategy the bargaining power of the buyer is very low because he deals with only one source and he depends very much on the seller performance. When this strategy is deployed the relationship between the two parties must be genuine and a great care during the negotiation of the contract is necessary. Often partnerships take

the form of single-sourcing, where the buyer focuses solely on single source. The same is not true on the supplier side, which leaves the buyer vulnerable. This risk is not easily handled by smaller companies (Christopher *et al.*, 2011).

### **Supplier Rating**

According to Le *et al.* (2013) supplier measurement is necessary to get a picture of overall performance, pinpoint the roots of problems and identify the improvement opportunities. It is the sole way to understand the process performance particularly whether it is improving or declining, and whether action is required. To assess supplier performance, more subjective and non-financial measures are considered, consisting of information sharing, responsiveness in problem solving, collaboration level, vendor satisfaction, certified supplier and supply base characteristics. These activities are also closely associated with developing supplier's performance and capabilities, like recognition and awarding, training and education, as well as financial assistance among others (Cousins *et al.*, 2008).

### **Firm Performance**

Ahmad (2012) defined firm performance as a "strategic and integrated approach to increase the effectiveness of companies by improving the performance of the people who work in them and by developing the capabilities of teams and individual contributors". Managing employee performance and aligning their objectives facilitates the effective delivery of strategic and operational goals and hence improve a firm's competitiveness. According to Bhagat and Bolton (2008) direct financial gains that may be associated with a firm's performance include; growth of sales, reduced costs in the organization and reduced project overruns among others. To achieve these there is need to have Key Performance Indicators (KPIs) which are a

vital means by which firms can judge how well they are performing.

### RESEARCH METHODOLOGY

The study adopted descriptive research design. According to Creswell and Creswell (2017), this design is applied in preliminary and exploratory studies to allow researchers gather information, summarize, present and interpret for the purpose of clarifications. The study targeted all the 412 employees at Unga Group Ltd. Since the target population was small, this study used 30% of the target population as advised by Mugenda and Mugenda (2012). The study was guided by a model of the form:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$$

Where:

$Y$  = Represents the dependent variable (Performance of the firm)

$\beta_0$  = The Constant, the value of  $Y$  when all  $X$  values are zero.

$\beta_i$  = The regression coefficients ( $i = 1, 2, 3$  and  $4$ ). The regression coefficients indicate the relative importance of each of the independent variables in prediction of the dependent variable.

$X_i$  = The independent variables ( $i = 1, 2, 3$  and  $4$ ), explained the variation in Performance of the firm.

In this case:

$X_1$  = Lean Management Technique

$X_2$  = Just-In-Time Technique

$X_3$  = Single Sourcing Technique

$X_4$  = Supplier Rating Technique

$\varepsilon$  = the error term (To account for all other Variables not considered in the study), assumed to be normally distributed with mean zero and constant variance.

### FINDINGS

#### Correlation between the variables

The study generated a correlation matrix between the variables and presented the findings in Table 1. From the table all the independent variables (Lean Management Technique, Just-In-Time Technique, Single Sourcing Technique, and Supplier Rating Technique) had a positive and statistically significant (p-values less than 5%) correlation with the dependent variable (Performance of Unga Group Limited). This implied that there was positive and statistically significant linear relationship between Lean Management Technique, Just-In-Time Technique, Single Sourcing Technique, and Supplier Rating Technique and Performance of Unga Group Limited.

**Table 1: Correlation between the variables**

		Correlations				
		Performance of Unga Group Ltd	Lean Management Technique	Just-In-Time Technique	Single Sourcing Technique	Supplier Rating Technique
Performance of Unga Group Limited	Pearson Correlation	1	.697**	.740**	.696**	.655**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	107	107	107	107	107
Lean Management Technique	Pearson Correlation	.697**	1	.749**	.724**	.778**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	107	107	107	107	107

Just-In-Time Technique	Pearson	.740**	.749**	1	.776**	.775**
	Correlation					
	Sig. (2-tailed)	.000	.000		.000	.000
	N	107	107	107	107	107
Single Sourcing Technique	Pearson	.696**	.724**	.776**	1	.762**
	Correlation					
	Sig. (2-tailed)	.000	.000	.000		.000
	N	107	107	107	107	107
Supplier Rating Technique	Pearson	.655**	.778**	.775**	.762**	1
	Correlation					
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	107	107	107	107	107

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

### Descriptive Statistics for the Variables

#### Descriptive statistics for Lean Management Technique

The study carried out a descriptive analysis of Lean Management Technique using SPSS software and the findings were summarized in Table 2. From the table, 32.7% agreed that lean management had enabled the company to improve service quality,

33.6% agreed that lean management had enhanced the company competitiveness, 42.1% agreed that through lean management the company had been able to reduce cost, 34.6% agreed that as a result of lean management, the company had enhanced customer satisfaction, while 34.6% agreed that lean management had helped the company to improve efficiency and effectiveness of business processes.

**Table 2: Descriptive statistics for Lean Management Technique**

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Lean management has enabled the company to improve service quality	0.9%	14.0%	24.3%	32.7%	28.0%
Lean management has enhanced the company competitiveness	0.0%	14.0%	29.0%	33.6%	23.4%
Through lean management the company has been able to reduce cost	2.8%	11.2%	17.8%	42.1%	26.2%
As a result of lean management, the company has enhanced customer satisfaction	5.6%	21.5%	22.4%	34.6%	15.9%
Lean management has helped the company to improve efficiency and effectiveness of business processes	2.8%	14.0%	26.2%	34.6%	22.4%

#### Descriptive statistics for Just-In-Time Technique

The study generated a descriptive statistics table of Just-In-Time Technique using SPSS and presented

the results in Table 3. From the table, 35.5% agreed that Just-In-Time technique directly improves quality conformance in their company, 40.2% agreed that they usually meet the production

schedule each day, 41.1% agreed that they have located their machines to support Just-In-Time production flow, 32.7% agreed that they can

depend upon on-time deliveries from their suppliers, while 37.4% agreed that their workers are trained to reduce setup time.

**Table 3: Descriptive statistics for Just-In-Time Technique**

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Just-In-Time technique directly improves quality conformance in our company	3.7%	15.0%	21.5%	35.5%	24.3%
We usually meet the production schedule each day	1.9%	8.4%	24.3%	40.2%	25.2%
We have located our machines to support Just-In-Time production flow	0.0%	10.3%	29.0%	41.1%	19.6%
We can depend upon on-time deliveries from our suppliers	0.0%	10.3%	26.2%	32.7%	30.8%
Our workers are trained to reduce setup time	1.9%	11.2%	22.4%	37.4%	27.1%

**Descriptive statistics for Single Sourcing Technique**

The study generated descriptive statistics table of Single Sourcing Technique and the results were tabulated in Table 4. From the table, 40.2% of the respondents agreed that they use single sourcing because it is easier to track down the source of problems as well as affected products in the event of a quality investigation/recall, 34.6% agreed that

single sourcing guarantees them more consistent quality, 33.6% agreed that with single sourcing it is easier to manage supplier performance, 41.1% agreed that single sourcing results in lower purchasing workload due to dealing with fewer suppliers, and 39.3% agreed that single sourcing results in lower pricing due to consolidation of all requirements with one supplier.

**Table 4: Descriptive statistics for Single Sourcing Technique**

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
We use single sourcing because it is easier to track down the source of problems as well as affected products in the event of a quality investigation/recall	1.9%	5.6%	34.6%	40.2%	17.8%
Single sourcing guarantees us more consistent quality	0.9%	14.0%	30.8%	34.6%	19.6%
With single sourcing it is easier to manage supplier performance	1.9%	12.1%	26.2%	33.6%	26.2%
Single sourcing results in lower purchasing workload due to dealing with fewer suppliers	1.9%	7.5%	28.0%	41.1%	21.5%
Single sourcing results in lower pricing due to consolidation of all requirements with one supplier	4.7%	9.3%	20.6%	39.3%	26.2%

**Descriptive statistics for Supplier Rating Technique**

The study generated a descriptive statistics table of Supplier Rating Technique and presented the

results in Table 5. From the table, a majority of the respondents (40.2%) agreed that supplier rating enables them to establish relationships with suppliers who have the financial capability to

deliver supplies, 35.5% strongly agreed that supplier rating enables them to manage the quality of product and services delivered, 43.0% strongly agreed that through supplier rating they are able to contract the best suppliers in terms of lead times, 45.8% agreed that supplier rating gives them a

chance to get into relationships with the most competent suppliers, while 43.0% agreed that supplier rating provides decision makers with the requisite information to disqualify and blacklist poorly performing suppliers.

**Table 5: Descriptive Statistics for Supplier Rating Technique**

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Supplier rating enables us to establish relationships with suppliers who have the financial capability to deliver supplies	2.8%	7.5%	17.8%	40.2%	31.8%
Supplier rating enables us to manage the quality of product and services delivered	1.9%	7.5%	26.2%	29.0%	35.5%
Through supplier rating, we are able to contract the best suppliers in terms of lead times	0.9%	11.2%	17.8%	27.1%	43.0%
Supplier rating gives a chance to get into relationships with the most competent suppliers	1.9%	8.4%	15.9%	45.8%	28.0%
Supplier rating provides decision makers with the requisite information to disqualify and blacklist poorly performing suppliers	2.8%	4.7%	23.4%	43.0%	26.2%

**Performance of Unga Group Limited**

The study generated a descriptive statistics table for Performance of Unga Group Limited from SPSS and presented the findings in Table 6. From the table, 41.1% said rated customer base performance

at good, 41.1% rated market share at good, 46.7% rated customer satisfaction at good, 40.2% rated general growth rate at good, 53.3% rated level of profitability at good, while 39.3% rated asset growth at good.

**Table 6: Descriptive Statistics for Performance of Unga Group Limited**

	Very Poor	Poor	Average	Good	Very Good
Customer Base	0.0%	6.5%	34.6%	41.1%	17.8%
Market Share	0.9%	9.3%	22.4%	41.1%	26.2%
Customer Satisfaction	0.0%	7.5%	23.4%	46.7%	22.4%
General growth rate	0.0%	6.5%	31.8%	40.2%	21.5%
Level of profitability	0.0%	3.7%	23.4%	53.3%	19.6%
Asset growth	0.0%	3.7%	37.4%	39.3%	19.6%

**CONCLUSION AND RECOMMENDATIONS**

In the first objective, the study sought to find out the role of lean management technique on the performance of manufacturing firms in Kenya. The

findings revealed that 32.7% agreed that lean management had enabled the company to improve service quality, 33.6% agreed that lean management had enhanced the company

competitiveness, 42.1% agreed that through lean management the company had been able to reduce cost, 34.6% agreed that as a result of lean management, the company had enhanced customer satisfaction, while 34.6% agreed that lean management had helped the company to improve efficiency and effectiveness of business processes. Correlation analysis results showed that lean management technique had .697 correlation coefficient with the dependent variable (Performance) and that coefficient was statistically significant (p-values less than 5%). Additionally, regression output revealed that 48.6% of the total variability in the dependent variable (Performance) can be explained by the independent variable (lean management technique). In the second objective the study sought to establish the role of just-in-time delivery technique on the performance of manufacturing firms in Kenya. From the findings, 35.5% agreed that Just-In-Time technique directly improves quality conformance in their company, 40.2% agreed that they usually meet the production schedule each day, 41.1% agreed that they have located their machines to support Just-In-Time production flow, 32.7% agreed that they can depend upon on-time deliveries from their suppliers, while 37.4% agreed that their workers are trained to reduce setup time. From correlation results, just-in-time delivery technique had a .740 correlation coefficient with the dependent variable (Performance) which was statistically significant (p-values less than 5%). Furthermore, from the regression analysis 54.8% (R Square = .548) of the total variability in Performance could be explained by just-in-time delivery technique. In the third objective the study sought to establish the role that single sourcing technique has on the performance of manufacturing firms in Kenya. The findings showed that 40.2% of the respondents agreed that they use single sourcing because it is easier to track down the source of problems as well as affected products in the event of a quality

investigation/recall, 34.6% agreed that single sourcing guarantees them more consistent quality, 33.6% agreed that with single sourcing it is easier to manage supplier performance, 41.1% agreed that single sourcing results in lower purchasing workload due to dealing with fewer suppliers, and 39.3% agreed that single sourcing results in lower pricing due to consolidation of all requirements with one supplier. Correlation analysis table revealed that single sourcing technique had a correlation coefficient of .696 against the dependent variable (Performance) and that the coefficient was statistically significant (p-values less than 5%). In addition, regression results revealed that 48.4% (R Square = .484) of the total variability in Performance can be explained by single sourcing technique. In the fourth objective the study sought to ascertain the role of supplier rating technique on the performance of manufacturing firms in Kenya. The findings revealed that a majority of the respondents (40.2%) agreed that supplier rating enabled them to establish relationships with suppliers who have the financial capability to deliver supplies, 35.5% strongly agreed that supplier rating enables them to manage the quality of product and services delivered, 43.0% strongly agreed that through supplier rating they are able to contract the best suppliers in terms of lead times, 45.8% agreed that supplier rating gives them a chance to get into relationships with the most competent suppliers, while 43.0% agreed that supplier rating provides decision makers with the requisite information to disqualify and blacklist poorly performing suppliers. From correlation analysis, the study established that supplier rating technique had .655 correlation coefficient with the dependent variable (Performance) that was statistically significant (p-values less than 5%). Further, regression analysis showed that shows that 42.9% (R Square = .429) of the total variability in the dependent variable (Performance) could be

explained by the independent variable (supplier rating technique).

### **Conclusions of the Study**

In the first objective, the study sought to find out the role of lean management technique on the performance of manufacturing firms in Kenya. The findings led the study to conclude that there was a resultant positive and statistically significant influence of lean management technique on performance of manufacturing firms in Kenya. In the second objective the study sought to establish the role of just-in-time delivery technique on the performance of manufacturing firms in Kenya. From the findings, the study concluded that just-in-time delivery technique had a positive and statistically significant influence on Performance. In the third objective the study sought to determine the role that single sourcing technique has on the performance of manufacturing firms in Kenya. The findings led the study to conclude that single sourcing technique a significant influence on performance of manufacturing firms in Kenya. In the fourth objective the study sought to ascertain the role of supplier rating technique on the performance of manufacturing firms in Kenya. From the findings, the study concluded that supplier rating technique had a positive and statistically significant influence on Performance of manufacturing firms in Kenya.

### **Policy Recommendations**

From the combined regression output, 61.1% (R Square = .611) of the total variability in the

dependent variable (Performance) could be explained by Lean Management Technique, Just-In-Time Technique, Single Sourcing Technique, and Supplier Rating Technique. However, Supplier Rating Technique was found to be statistically insignificant meaning. The implication was that Lean Management Technique, Just-In-Time Technique, and Single Sourcing Technique play major roles as supply chain risk management techniques and as such they have an impact on the performance of manufacturing firms in Kenya. This study therefore recommended that policy makers and other major actors in the manufacturing sector employ these techniques in their day to day operations so as to increase the performance of manufacturing firms in Kenya.

### **Recommendations for further studies**

The main objective of this study was to establish the role of supply chain risk management techniques on the performance of manufacturing firms in Kenya using a Case of Unga Group Ltd. Therefore, a similar study can be carried out using a different case study. This study used Lean Management Technique, Just-In-Time Technique, Single Sourcing Technique, and Supplier Rating Technique as its variables. Therefore, a study can be carried out using different variables from the ones used in this study. Besides, Supplier Rating Technique was found to be statistically insignificant and therefore, a confirmatory study could be done on the same or using a different combination of variables.

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