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Influence of Supply Base Rationalisation Strategies on Performance of Food and Beverage Manufacturing Firms in Kenya

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Abstract: *The food and beverage industry accounts for over half of the manufacturing production turn over in Kenya. Despite of this contribution, the sector faces a lot of SC risks which hinder its potential growth. Adopting proactive strategies becomes necessary for dealing with supply chain risks and vulnerabilities for securing supply chain systems to be responsive and effective. This study focused on finding out the influence of supply base rationalisation strategies on supply chain performance of food and beverage manufacturing firms in Kenya. The target population was all food and beverage manufacturing firms in Kenya. The accessible population was 187 food and manufacturing firms drawn from a KAM directory using a census survey method.A five-point Likert scale questionnaire was administered to senior-level managers with the knowledge of supply-chain and logistics functions. Both descriptive and inferential analysis was done using SPSS 17 and structural equation modelling (SEM) R-Lavaan 0.5-20 to find out the influence of supply chain risk control strategies on supply chain performance of food and beverage manufacturing firms in Kenya.*
Keywords*: Supply base rationalisation, strategy, SC Performance, SC resilience, SC vulnerability*

I. Introduction

The food and beverage manufacturing industries account for approximately 50% of manufacturing production turnover which is about 2.8% of Kenya's GDP (KAM, 2015[1]). Despite this huge influence, the food and beverage supply chain is increasingly in the spotlight for safety concerns, recalls and disruptions. Public focus on these issues has also grown following increasing consumer concerns. Supply chain risks are resulting in increased variations in capacity constraints, increased costs of operations or from breakdowns, quality problems, delays in delivery or even natural disasters at the supplier end (Blackhurst, Scheibe, & Johnson, 2008 [2]; Vaaland and Heide 2007[3]). It has been shown that firms that were affected by supply chain risks suffered from poorer supply chain performance (Wilson 2007[4], Wagner and Bode 2008[5]). Furthermore, supply chain risks can hurt the firm's financial performance and lead to lower sales, asset utilisation, or profitability (Hendricks & Singhal, 2005[6]). Supply chain disruptions cause a sales fall of 7 %, a down of an operating income of 42 % and a fall of return on assets of 35 % and an announcement of supply chain disruptions causes a shareholder return between 7 and 8 % (Hendricks & Singhal, 2005[6]).

In the context of the Kenya food and beverage industry, the challenges are diverse: short shelf life and perishability, competition from imports, increased consumer safety and health concerns (RoK, 2014[7]). The short shelf life and perishability of food and beverage products along with the challenges of infrastructure pose a serious threat to F& B manufacturing firms. Secondly, consumer concerns on environmental and welfare issues have put further pressure on manufacturers to ensure food products are produced sensitively and safely. The other problem is the slow growth in the overall food and beverage industry due to major increase in Kenyan imports of consumer-ready foods (KAM, 2015[1]). The value of food and beverage imports is projected to continue increasing over the next five years to over $ 400 million (World Bank, 2014[8]). Local food and beverage manufacturers are no longer the dominant source of supply to consumers. A number of F & B manufacturing firms are closing down creating massive loss of jobs resulted in slower economic growth (KAM, 2015[1]). According to Samir and Aman (2010[9]), management of food and beverage supply chains requires speed, accurate and intelligent decision making to cope with the complex dynamic competition and uncertainty from external demands and variables. In order to attain that, several strategies exist towards supply chain risk management (Tang & Musa, 2011[10]).

II. Literature Review

2.1: Introduction

The complexity of business transactions, technological advances, globalization, speed of product cycles, and the overall pace of change have increased uncertainty, fragility, vulnerability and disruptions facing

organizations (Wagner & Bode 2008[5]; Coleman 2006[11]). For these reasons, supply chain risk management (SCRM) is becoming an integral part of risk management in most organisations (Tomlin, 2006[12]; Ghagde, Dani, & Kalawsky, 2013[13]). A supply chain consists of all parties involved, directly or indirectly in fulfilling a customer request. The supply chain includes not only the manufacturer and suppliers, but also transporters, warehouses, retailers, and even customers themselves (Chopra, Meiindl & Kalra, 2007[14]). According to Mentzer, Min and Bobbitt, (2004[15]), supply chain is a set of three or more entities- organisations or individuals- directly involved in the upstream and downstream flows of products, services, finances and /or information from a source to a customer.

2.1: Supply chain risk management

Supply chain risk management is assumed to either proactively mitigate or reactively respond to risks (Tomlin, 2006[12]; Ghagde, *et al.*,, 2013 [13]). The conceptualisation of supply chain risk management incorporates supply chain resilience and supply chain vulnerability (Sorensen, 2005[16]). According to Ponomarov & Holcomb (2009[17]) supply chain resilience is an important part of SCRM. Supply chain resilience means the capability of companies to anticipate, identify, react and learn from incidents (Craighead, Blackhurst, Rungtusanatham, & Handfield, 2007[18]; Sheffi, 2006[19]). Christopher (2005[20]) stated that resilient processes are agile and are able to change quickly. The adaptivenature ofcapability allows the supply chain to recover after being disrupted, returning to itsoriginal state or achieving a more desirable state of supply chain operations. Christopher's conceptualization of a resilient supply chain includes elements such a supply base strategy, collaborative planning, visibility, and developing supply chain resilient culture considerations into decisions.

Peck (2005[21]) defined supply chain vulnerability as exposure to serious disturbance arising from risks within and external to the chain. According to Waters (2007[22]), vulnerability reflects the susceptibility of a supply chain to disruption, and is a consequence of risks in it. Juttner and Maklan (2011[23]) further refer to supply chain vulnerability as the propensity of risk sources and drivers to outweigh risk-mitigating strategies, thus causing adverse consequences in the chain and jeopardising its ability to effectively serve the end customer market. Therefore, companies may reduce their vulnerability by reducing the probability of a disruption or by increasing the company's resilience, i.e. its ability to recover from a disruption (Sheffi, 2006[19]). Supply chain risk management, therefore, aims to identify the potential sources of risk, and to implement appropriate actions to avoid or contain supply chain vulnerability (Manuj & Mentzer, 2008[24]; Ghagde *et al*., 2013[13]).

2.2: Supply chain performance measurements

Supply chain performance measurement is the process of qualifying the efficiency and effectiveness of the supply chain (Wong & Wong, 2008[25]). Supply chain performance measurement includes multiple dimensions including financial and non-financial metrics describing costs, capacity, lead times and service levels (Bigliardi & Bottani, 2014[26]). SCM could be measured at various management or operation levels. Strategic level measures influence top management decisions and also very often reflects investigation of broad based policies and level of adherence to organisational goals (Chopra *et al*., 2007[14]. The main metrics of a firm's operation performance are based (1) cost; (2) quality; (3) flexibility; and (4) delivery. Recent studies on supply chain management have suggested that these priorities can be categorised into two fundamental dimensions: efficiency and responsiveness (Chopra *et al*., 2007[14]).

2.3: Supply base rationalisation strategies

SC network theory

Previous empirical research into real-world networks has recognised seemingly universal network properties (Bullmore & Sporns, 2009[27]). These properties are: a short characteristic path length, a high clustering coefficient and the presence of a power law connectivity distribution (Baraba´si, 2009 [28]). According to Hearnshaw and Wilson (2011[29]), a supply chain can be modelled as a network by a set of "nodes" that represent autonomous business units as firms who are able to exercise sovereign choices, and a set of "connections" that link these firms together for the purposes of creating products or services. The linkages between firms represent exchange relationships and the underlying contract if present. The critical connection types are the presence of contracts and various flow types such as material flows, information flows and financial flows. Network theory is descriptive in nature and has primarily been applied in SCM to map activities, actors, and resources in a supply chain. The focus has been on developing long-term, trust-based relationships between the supply chain members. Examples of issues include buyer-supplier relationships, third party logistics, and management roles in supply networks (Gunasekaran, Lai & Cheng, 2008[30]).

Supply management is widely acknowledged as strategic for companies, because they contribute to build and to maintain a competitive advantage (Hsu, Kannan, Leong & Tan, 2006[31]; Chopra *et al*., 2007[14]). Supply management has become more critical because there is an increasing dependence on suppliers. The

dependence makes companies highly exposed to supply risks. According to Tang (2006[32]) supply management should have a positive impact on the mitigation of the supply chain risks. Many researchers have posited several supply base strategies that can be used to reduce supply chain risks. These include an extended usage of flexible contract agreements, inspections to qualify suppliers and may be even combined with make and buy strategies to split production across different factories (Sheffi, 2006[19]), selecting dual rather than single sourcing (Wieland, 2013[33]), building trust in relationships (Srinivasan, Mukherjee & Gaur, 2011[34]), managing risk in a proactive manner and finding a balance and alignment between benefits gained from and costs of risk management (Paik & Bagchi, 2007[35]), risk sharing through sourcing relationships (Hsu *et al.,* 2006[31]) by establishing a close relationship with single source suppliers and instituting less close relationships with a number of different suppliers in order to spread risks (Sheffi , 2006 [19]), and determining a number of technological methods to discover, recover and redesign the supply chain (Blackhurst *et al*., 2011[36]).

It has been recognized that the diversification of suppliers is a strategy to handle disruptions. The access to a wider supply base enables firms to inject in supply chains additional production lines and quickly shift volumes and production in case of a disruption (Sheffi, 2006[19]; Tang, 2006[37]; Tomlin, 2006[12]). By diversifying the portfolio of suppliers, risk is spread across multiple players, therefore decreasing the impact any single player can have on the supply stream (Manuj & Mentzer, 2008[24]). Adding another supplier decreases the expected return, but in turn lowers the risk variance and deviation from the mean (Musa & Tang, 2012[10]).

Supplier selection strategy becomes one of the most important practices in supply chain risk mitigation (Hsu *et al*., 2006[31]) Supplier selection is done after the firm has decided on either single sourcing or multiple sourcing. Supplier selection should be based not only on the price of the acquisition, but also on a wide range of criteria such as quality, organizational factors and capabilities with a view to reducing supply chain risk (Micheli, Cagno & Zorzini, 2008[38]). Supplier selection based on quality, pricing, delivery and performance of products have significant relationship with four elements of customer satisfaction -product quality, product variety, delivery service and competitive pricing- and firm performance (Ponomarov, 2012[39]).

Building collaborative supply base with supplier is the key element in supplier strategy. Chopra *et al.,* (2007[14]) referred to trust, mutuality, information exchange, openness and communication as important ingredients in buyer-supplier partnership. Chopra *et al.,* (2007[14]) claimed that buyer- supplier relationships were becoming more popular in supply chain because of their ability to reduce fraction and uncertainty. According to Zailani and Rajagopal (2005[40]) long-run collaborative relationships with key supplier contribute to firm's financial performance.

According to Chopra *et al*., (2007[14]) a supply contract specifies what governs the buyer-supplier relationship as it guides the behavior and performance of all the parties. In addition to volume or capacity, lead time, price and liabilities, penalties are part of the contracts. Contracts are structured to increase profitability, reduce risks by giving accurate information and enhancing flexibility. Dekker, Sakaguchi and Kawai (2013[41]) also stated that well-specified contracts might actually promote more cooperative, long-term, trusting exchange relationships. Well-specified contracts narrow the domain and severity of risk to which an exchange is exposed, and thereby encourage cooperation and trust. Dekker *et al.,* (2013[41]) also argue that contracts and relationships are complementary. Using structured contractual mechanisms organizations can improve and coordinate better with suppliers and secure different supply options (Chopra *et al*., 2007[14]).

Micheli *et al*., (2008[38]) have said that suppliers are vital to the success of a firm, in terms of their reliability in availability and on the competitive edge of the final product, impact the level of risk. Supplier selection, diversification, supplier partnership and interaction, contract agreement, are some of the strategies used to manage supply chain risks. Hence the study hypothesized the relationship between supply base strategies and supply chain performance in food and beverage manufacturing firms.

Hypothesis: Supplier base rationalisation risk strategies have positive influence on performance of food and beverage manufacturing firms.

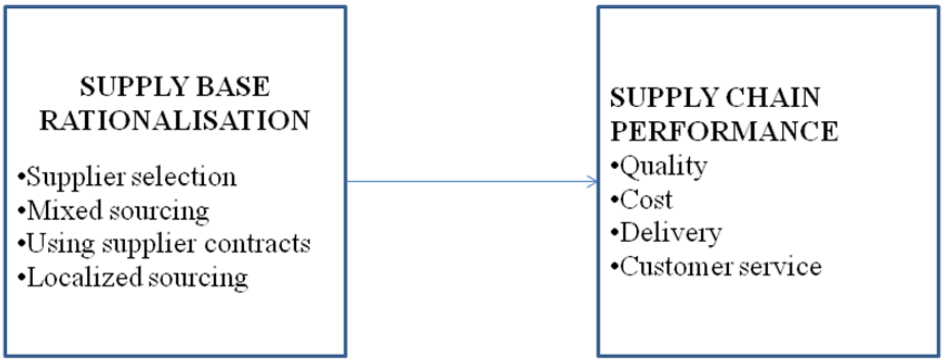

Figure 1: Conceptual Framework

III. Research Methodology

3.1. Data Collection Instrument

The study administered a questionnaire to obtain primary data –the unit of analysis was the individual firm and the population was all 187 KAM membership food and beverage manufacturing firms in Kenya. Target respondents were senior-level managers with the knowledge of supply-chain and logistics functions and direct involvement in strategic and operational decision-making. Such respondents were chosen as key organizational informants due to their set of skills, business responsibilities and SC expertise.

3.2 Sample and Sampling technique

This research collected data form I87 firms using the census survey technique. A census survey is the procedure of getting information from each member of the population (Saunders *et al.,* 2009[42]). Census survey is the appropriate data collection design for a small heterogeneous population. Since the sample frame for the study was small and heterogeneous, census survey was adopted. According to Saunders, *et al.,* 2009[42]) the larger the sample size for a small population, the more accurate the results are likely to be and hence the choice of the census technique in this study.

3.3 Data Collection

This study used questionnaire with both closed questions to collect information. The decision to use a questionnaire approach to data collection was consistent with the exploratory aspects of the research question, and the complexity of the issues involved (Wieland & Wallenbug, 2012[43]]; Xiao-Feng Shao, 2013[44]). The study sought to find out the influence of supply chain risk avoidance strategies on supply chain performance in food and beverage manufacturing firms. Since the study was concerned mainly with variables that could not be directly observed, questionnaires were used. A five-point Likert scale was used to measure practitioners' perceptions of the extent to which different types of resources and activities achieve supply chain risk management. The end points were labelled 'Strongly disagree' (1) to 'Strongly agree' (5). The mid-point (3) was labelled 'Neutral'. Avoidance strategies include delaying entry to certain markets, avoiding some suppliers and participating in low uncertainty markets. The items were generated by reviewing relevant research literature in supply chain risk management

IV. Data Analysis, Results And Discussions

The data was analyzed using both descriptive measures and exploratory factor analysis to identify and validate the items contributing to each component in the model. Structural equation modeling (SEM)-R, Lavaan 20 has been commonly used in recent years as a basis for theory development and testing in supply chain management, and other related disciplines (Wallenburg & Weber, 2005[45]; Kihyun, 2011[46]; Wieland & Wallenbug, 2012[43]; Xiao-Feng Shao, 2013[44]). One of the advantages of structural equation modeling is the possibility to also look at indirect effects between latent constructs. It means that all hypothesized relationships could be tested simultaneously while indirect and direct effects on the endogenous variables could be separated.

The questionnaire was pilot tested on 10% of the members of the sampling frame. A total of 19 firms responded during the pilot survey. After recording all the completed responses, the data was into SPSS 17 software for further analysis. At the preliminary stage the survey responses were examined for errors and missing data. Surveys completed in their entirety accounted for 100% of all collected. Reliability is the extent to which the items are consistently measuring the intended latent construct. To satisfy the reliability criterion, a Cronbach's alpha value of more than or equal to 0.7 is required (Hair *et al.,* 2013[47]). The constructs used in the study have more than 0.7 alpha Cronbach (Table 1).

Table 1: Summary of the Constructs

SUPPLY BASE RATIONALISATION	**3.55**	**1.22**	**0.880**
Mixed sourcing			
SBR1:Sourcing from multiple local suppliers to			
SBR2 Sourcing from multiple foreign suppliers			
Localised sourcing			
SBR3 Sourcing from a few local and foreign su			
SBR4 Sourcing from a few local suppliers only			
Supplier selection			
SBR5 Sourcing from suppliers who have been e			
DEPENDENT VARIABLE			
SC PERFORMANCE		**1.13**	**0.899**
SCP1 The ability to achieve the lowest possible			
SCP2 The ability to reduce the time between or			
SCP3 The ability to meet quoted or anticipated			
SCP4 The extent to which perceived supply cha			

4.2: Descriptive Statistics

4.2.1. Response Rate

Out of the administered 187 questionnaires, 165 were returned fully completed. The response rate is shown in Table 2. This represents a significant 87.3 percent response rate. The response was adequate for further analysis.

Table 2: Case Processing Summary

Valid Active Cases	165		
Active Cases of with Missing Values	0		
Supplementary Cases	22		
Total	187		
Cases Used in Analysis	165		

4.2.2 Gender of the Respondents

The study sought to establish the gender of respondents in the study. The following information (Table 3) was obtained from the respondents.

Table 3: Gender of the Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	95	57.6	57.6	57.6
	Female	70	42.4	42.4	100.0
	Total	165	100.0	100.0	

The majority of the respondents were male (57.6 per cent) compared to 42.4 percent female. This shows that the gender parity food and beverage manufacturing firms in Kenya is narrow.

4.2.3: Categories of Manufacturing Firms

The study also sought to establish the types of food and manufacturing firms that the respondents worked for. The information in Table 4 was obtained.

Table 4: Categories of Firms

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Alcoholic beverages and spirits	7	4.2	4.2	4.2
	Cocoa, chocolate and sugar confectionaries	35	21.2	21.2	25.4
	Dairy products	39	23.6	23.6	49
	Juices, water and carbonated soft drinks	57	34.5	34.5	83.5
	Meat and meat products	13	7.9	7.9	91.4
	Vegetable oils.	9	8.6	8.6	100
	Total	165	100.0	100.0	

The breakdown of the main test survey respondents by industry is presented in Table 4. Results indicate that the majority of the main test survey participants were from Juices, water and carbonated soft drink (34.5 percent). The dairy sub sector and confectionaries contributed 23.6 percent and 21.2 percent of participants respectively. Participants from the vegetable oil accounted for an additional 8.6 percent. The rest (7.9 percent) were from the

meat and meat products. The results suggest that there are more firms in the juices, water and carbonated drinks as well as in the dairy and confectionaries sub sector.

4.2.4: Influence of Supply Base Rationalisation Strategies on Supply Chain Performance

The study sought to establish whether supply base rationalisation influence performance. The indicator of sourcing form multiple local suppliers had the highest mean score of 3.66 as 33% of the respondents strongly agreed and 27% agreed with the practice. A total of 23% of the respondents however disagreed with the same. The study revealed that sourcing from multiple foreign suppliers does influence performance. The indicator had a mean score of 3.55. Fifty five percent (55%) of the respondents agreed with the sentiments as only 23% disagreed with the same. When the respondents were asked to indicate whether sourcing from few local and few foreign suppliers influenced SC performance, 26% of the respondents strongly agreed, and 32% agreed while 15% of the respondents disagreed with 6% strongly disagreed.

The study sought to find out how sourcing from few local suppliers influence SC performance. With mean of 3.49, 26% of the respondents strongly agreed with 29% agreeing. However, 22% of the respondents disagreed with 5% strongly disagreeing. Sourcing from suppliers who have been evaluated and selected had high influence (mean=3.55). Twenty six percent (26%) strongly agreed as 32% agreed that the practice had influence on performance. A total of 27% of the respondents however disagreed with the practice as illustrated in Table 4.

These findings are in line with those of Ponomarov(2012[39]) that supplier rationalisation based on quality, pricing, delivery and performance of product have significant relationship with four elements of customer satisfaction -product quality, product variety, delivery service and competitive pricing- and firm performance. Musa & Tang, (2012[10]) also stated that supplier base rationalization narrow the domain and severity of risk to which an exchange is exposed, and thereby encourage cooperation and trust. Thus the study concludes that supplier base rationalisation risk strategies have positive influence on performance of food and beverage manufacturing firms.

Table 4: SBR Influence SC Performance

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	S D
SBR1:Sourcing from multiple local suppliers to minimize the likelihood of supply chain risks	4	19	17	27	33	3.66	1.222
SBR2 Sourcing from multiple foreign suppliers to minimize losses	4	19	22	27	27	3.55	1.186
SBR3 Sourcing from a few local and foreign suppliers	6.	15	21	32	26	3.56	1.196
SBR4 Sourcing from a few local suppliers only to minimize risks	5	22	19	29	26	3.49	1.228
SBR5 Sourcing from suppliers who have been evaluated and selected to reduce supply risks	6	21	16	32	26	3.55	1.386

4.2.5: Supply Chain Performance

Supply chain performance measurement is the process of qualifying the efficiency and effectiveness of the supply chain (Wong & Wong, 2008[25]). Supply chain performance measurement includes multiple dimensions including financial and non-financial metrics describing costs, capacity, lead times and service levels (Bigliardi & Bottani, 2014[26]). SCM could be measured at various management or operation levels. Strategic level measures influence top management decisions and also very often reflects investigation of broad based policies and level of adherence to organisational goals (Chopra *et al*., 2007[14]). The tactical level deals with resource allocation and measuring performance against targets to be met in order to achieve results specified at the strategic level. At the operational level, metrics are relevant for day to day business. The main metrics of a firm's operation performance are based (1) cost; (2) quality; (3) flexibility; (4) delivery; (5) customer service level. Recent studies on supply chain management have suggested that these priorities can be categorised into two fundamental dimensions: efficiency and responsiveness (Chopra *et al*., 2007).

The term efficiency refers to the ability of a supply chain to compete on costs. It is usually best suited to serve markets with predictable demands and for which the products have a long life cycle. The term responsiveness refers to the ability of a supply chain to respond quickly to market movements. In designing a responsive supply chain, the emphasis will be on quick and fast deliveries (Chopra *et al.,* 2007[14]). Based on the operational priorities, this study adopted three metrics: cost, quality, delivery and customer service levels as proposed by researchers (Wong & Wong, 2008[25]; Bigliardi & Bottani, 2014[26])

Respondents were asked whether their firms' supply chain operations achieved the lowest possible costs. Thirty seven percent (54%) of the respondents agreed while 17% disagreed. On whether the firms had the ability to reduce time between order and delivery, 53% of the respondents agreed while 23% disagreed. The study also revealed that SC strategies influenced the ability of the firms to meet quoted qualities and quantities consistently. Nineteen percent (19%) strongly agreed, 33% agreed while 16 % disagreed and 7% strongly

disagreed. It was also established that SC performance measured up to customer service levels. Twenty eight percent (28%) strongly agreed, 33% agreed but 16% disagreed as 6% strongly disagreed as shown in Table 5.

Table 5: SC Performance

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	S D
SCP1 The ability to achieve the lowest possible cost of logistics through efficient operations and/or scale economies	2	15	20	33	21	3.51	1.281
SCP2 The ability to reduce the time between order receipt and customer delivery to as close to zero as possible	5	18	24	34	19	3.45	1.134
SCP3 The ability to meet quoted or anticipated quality and quantities on a consistent basis	7	19	19	36	19	3.41	1.199
SCP4 The extent to which perceived supply chain performance matches customer expectations	6	16	18	33	28	3.62	1.201

4.3: Structural Equation Modelling (SEM)

This study used structural equation modelling for inferential statistics. Structural equation modelling (SEM) is a statistical technique used to explain the covariance among a set of variables (Hair *et al.,* 2013[47]). SEMs are most appropriately used in a confirmatory to test a theory that explains the relationships among a group of variables. These relationships are specified prior to theory testing and inform data collection (Hair *et al.,* 2013[47]).

4.3.1: Confirmatory Factor Analysis Model Estimation

The weighted least squares mean and variance adjusted (WLSMV) estimator was used to estimate all models (Table 6). WLSMV is robust estimation technique is useful when data are coarsely categorized or follow nonnormal distributions (Sass, Schmitt, & Marsh, 2014[48]). The robust techniques apply rescaling corrections or use alternative calculation procedures to other estimation methods to overcome shortcomings .WLSMV estimator has been found to perform better than with small sample sizes with categorical responses. WLSMV based parameter estimates have show little bias, even when nonnormally distributed ordinal data with few categories are analyzed (Rhemtulla, Brosseau-Liard, & Savalei, 2012[49]).

Table 6: Parameter Estimates

SBR =~						
SBR1	0.818	0.035	23.215	0.000	0.818	0.818
SBR2	0.816	0.032	25.615	0.000	0.816	0.816
SBR3	0.802	0.035	23.085	0.000	0.802	0.802
SBR4	0.748	0.040	18.547	0.000	0.748	0.748
SBR5	0.769	0.037	20.676	0.000	0.769	0.769
SCP =~						
SCP1	0.408	0.084	4.865	0.000	0.804	0.804
SCP2	0.435	0.089	4.877	0.000	0.858	0.858
SCP3	0.452	0.091	4.956	0.000	0.890	0.890
SCP4	0.472	0.094	4.998	0.000	0.930	0.930

Model Evaluation Criteria: Goodness of Fit

The model fitting process in SEM involves determining the goodness-of fit between the hypothesized model and the sample data (Sass, *et al.,* 2014[50]). Goodness of fit shows how well the specified model reproduces the observed covariance matrix among the indicator items. Chi-square and p-value-- the higher the probability level (p value) associated with chi square, the better the fit. SRMR (standardized RMR, root mean square residual). SRMR < = .05 means good fit. The smaller the SRMR, the better the model fit. SRMR = 0 indicates perfect fit. A value less than .08 is considered good fit. The GFI should by equal to or greater than .90 to indicate good fit. A value of 1 indicates a perfect fit. CFI (comparative fix index), close to 1 indicates a very good fit, > 0.9 or close to 0.95 indicates good fit, by convention, CFI should be equal to or greater than .90 to accept the model. CFI is independent of sample size (Rhemtulla, *et al.,* 2012[51]).

NNFI close to 1 indicates a good fit. TLI greater than or equal to 0.9 indicates acceptable model fit. By convention, NNFI values below .90 indicate a need to re-specify the model. TLI less than 0.9 can usually be improved substantially. RMSEA (root mean square error of approximation), there is good model fit if RMSEA less than or equal to .05. There is adequate fit if RMSEA is less than or equal to .08. The developed model has been proven to meet all the requirements and the results are shown in Table 7.

Table 7: Summary of Goodness of Fit

Name of index	Index value	Comment
CFI (≥ 0.9)	1.000	CFI > 0.95
GFI (≥ 0.90)	0.993	GFI > 0.95
TLI (≥ 0.9)	1.002	TLI > 0.95
NNFI (≥ 0.9)	1.002	NNFI > 0.90
RMSEA (≤ 0.08)	0.000	RMSEA < 0.05
WRMR	0.762	
CHISQ/DF	302.919/ 362.000	
P VALUE (□ 0.5)	0.989	p-value > 0.05

Hypothesis Testing Results

H1: Supply base risk rationalisation strategies have positive influence on performance of food and beverage manufacturing firms in Kenya.

Supply chain risk rationalisation strategies have standardized loading of 1.727 and Z value o 8.49 with performance as shown in Table 8. The relation is positive and significant at 1% level as the p-value associated with the critical ratio is less than 0.01. Therefore, Supply chain risk rationalisation strategies have positive influence on performance of food and beverage manufacturing firms in Kenya.

Table 8: SBR Strategies

CHISQ	DF	PVALUE	CFI	TLI	RMSEA	NNFI	GFI	WRMR
315.870	366.000	0.973	1.000	1.002	0.000	1.002	0.992	0.778

LHS OP RHS	EST	SE	Z	PVALUE	CI.LOWER	CI.UPPER
SCP ~ SBR	1.727	0.203	8.49	0	1.328	2.126

The study concludes that supply base risk rationalisation strategies have positive influence on performance of food and beverage manufacturing firms in Kenya ($\beta = 1.73$, p-value < 0.0001, $R^2 = 0.749$).

V. Conclusion

The objective of this study was to evaluate the influence of supply chain risk control strategies on F&B manufacturing industries in Kenya .From managerial standpoint, the study shows that food and beverage manufacturing firms in Kenya should have a clearly defined sourcing strategy which will significantly improve both the quality and the speed required to achieve a firm's objectives. Strategic Sourcing is the process of evaluating, selecting and aligning with suppliers to achieve SC improvements in line with a firm's strategy. A portfolio analysis technique (Kraljic) which analyses the supply base according to supplier risk factors: risk relates to exposure to supply failure and supply market complexity should be used to as a proactive supply chain risk management process. . This study is, however, subject to some limitations. First, our sample is geographically limited to Kenya and focuses on the food and beverage industry. Secondly, the study has used non financial performance metrics. Future researchers may consider carrying out similar studies in different countries as well as different sectors such as automobile, electronic, textile and service industry. These sectors are sensitive to costs, time, turbulence and competitiveness. Investigating for differences among SC resilience, organizational capability and business performance within and across organizations and across cultures would offer exciting research.

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