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Vertical Integration Strategies and Effectiveness of Beverage Firms in South East Nigeria

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Abstract: This study investigated the relationship between vertical integration strategies and the effectiveness of beverage firms in South-East Nigeria. Four research questions and corresponding hypotheses guided the study. A survey research design was adopted, and data were collected through a structured questionnaire administered to employees of beverage firms, with a sample size of 322 determined using Freund and William's statistic. The instrument employed a four-point Likert-type scale and was distributed using the drop-and-pick method to ensure adequate response time. Reliability was established using Cronbach's coefficient alpha (α), which yielded values of 0.924 for backward integration, 0.910 for forward integration, 0.923 for organizational resilience, and 0.938 for organizational adaptability, confirming high internal consistency. The data collected were analyzed using both descriptive and inferential statistics. Descriptive statistics, particularly the mean, summarized responses, while inferential statistics tested the hypotheses. Normality tests using three statistics (Anderson-Darling, Ryan-Joiner and Kolmogorov-Smirnov) conducted on the four variables (backward integration, forward integration, organizational resilience and organizational adaptability) consistently indicated significant departures from normality. Also, linearity assumption was tested using visual inspection by creating scatter plots for each of the dependent variables against each of the independent variables, and the assumption was not satisfied. The failure of the two assumptions led to the use of non-parametric Spearman rank correlation technique.Hypotheses were examined using the Spearman Rank rho Correlation Coefficient at a 0.05 level of significance. Findings revealed strong and statistically significant positive relationships between backward integration and organizational resilience, and adaptability. Similarly, forward integration showed strong and significant associations with these dimensions of organizational effectiveness. The study concluded that adopting well-structured vertical integration strategies enhances the resilience and adaptability of beverage firms in South-East Nigeria. It is therefore recommended that firms integrate sustainability objectives into their vertical integration efforts, including reducing carbon emissions, enhancing resource efficiency, and promoting local sourcing, in order to strengthen competitiveness and ensure long-term growth.

Keywords: Vertical integration, organizational effectiveness, backward integration, forward integration, resilience, adaptability, South-East Nigeria.

1. Introduction

The beverage industry is one of the fastest-growing sectors in Nigeria, contributing significantly to economic growth, employment, and revenue generation[1]. In South East Nigeria, beverage firms face intense competition driven by globalization, shifting consumer preferences, and government regulations. To remain competitive and efficient, many firms in this industry explore diverse strategies including vertical integration strategies with the intent of expanding operations across multiple stages of the supply chain, either backward (towards raw material procurement) or forward (towards distribution and retail). Vertical integration is a strategic approach that firms adopt to gain control over their supply chains, reduce costs, ensure consistent product quality, and enhance overall profitability [2]. This strategy is particularly crucial for beverage firms, as they rely heavily on a steady supply of raw materials such as sugar, water, and packaging materials. Additionally, effective distribution networks are necessary to ensure product availability and market penetration.

Vertical integration is broadly classified into two categories: backward integration and forward integration. Backward integration occurs when a firm controls or acquires its raw material sources or suppliers. For instance, a beverage firm investing in its own sugarcane plantation or water purification plant is engaging in backward integration [3]. This strategy could help the organization to reduce over dependency on external suppliers, mitigate supply chain disruptions, and ensure cost efficiency. Conversely, forward integration involves firms gaining control over distribution and retail networks, such as establishing company-owned retail outlets, distribution centers, or e-commerce platforms [4]. Vertical integration is particularly relevant in the beverage industry, where supply chain efficiency plays a critical role in product availability, pricing, and customer satisfaction. According to [5], beverage firms that effectively integrate backward can reduce production costs, maintain product quality standards, and improve profitability. Similarly, firms that engage in forward integration can increase their market reach, reduce reliance on intermediaries, and enhance customer relationships

Despite its advantages, vertical integration presents several challenges. High capital investment is required to acquire and manage additional stages of the supply chain, which may pose financial constraints for some firms [6]. Additionally, firms that over-diversify their operations may experience inefficiencies due to managerial complexities and resource misallocation. Regulatory constraints also play a significant role in the success of vertical integration strategies. The Nigerian beverage industry is subject to various government policies and regulations related to production, pricing, and distribution. Companies that fail to comply with these regulations may face legal challenges, fines, or operational disruptions. Furthermore, vertical integration may limit a firm's flexibility in responding to market changes in an ecosystem that is highly volatile,

uncertain, complex and ambiguous, thereby increasing the risk of ineffectiveness in the organization. For instance, firms that invest heavily in backward integration may struggle to switch suppliers or raw material sources if better options become available [3]. Similarly, forward integration may require significant logistical and managerial expertise to establish and maintain an efficient distribution network.

However, some researchers argue that the effectiveness of vertical integration depends on factors such as firm size, financial capability, and market conditions [7]. While large beverage firms with substantial financial resources may successfully navigate the crucibles of implementing vertical integration strategies, smaller firms may struggle with the associated costs and operational complexities.Hence;In South East Nigeria, some beverage firms have successfully implemented vertical integration strategies to streamline operations and gain a competitive advantage. For example, companies like Nigerian Breweries and Coca-Cola have invested in backward integration by acquiring local raw material sources and setting up independent distribution networks. These efforts have contributed to cost efficiency and improved product distribution, leading to increased market share and profitability[8].

Organizational effectiveness is a critical factor for the sustainability and competitiveness of businesses, particularly in the beverage industry, which is characterized by intense competition and dynamic consumer preferences. The beverage industry in South-East Nigeria comprises multinational corporations, local manufacturers, and small-scale enterprises. These companies face several operational challenges, including supply chain inefficiencies, regulatory compliance issues, market fluctuations, and changing consumer preferences [3]. To remain competitive, organizations must adopt effective management practices, innovative marketing strategies, and robust operational frameworks that enhance efficiency and productivity [9]. Organizational effectiveness is a fundamental concept in management and organizational studies, encompassing the ability of an organization to achieve its goals, maximize resource utilization, and maintain sustainability in a competitive environment. It is a multidimensional construct that includes factors such as leadership, strategy, structure, culture, and performance measurement. Effective organizations are those that continuously adapt to environmental changes while ensuring efficiency and innovation in their operations. Leadership and corporate governance play a crucial role in driving organizational effectiveness. Strong leadership fosters a culture of innovation, enhances employee motivation, and improves decision-making processes. Organizations that implement strategic management practices, clear performance metrics, and sound operational frameworks tend to achieve higher levels of efficiency and competitiveness [3].

1.1 Statement of the Problems

A key determinant of organizational effectiveness in beverage companies is operational efficiency. In order to optimize their production processes, reduce waste, maintain quality standards, and perform better in competitive markets, beverage companies tend to either control the source of their input or take control of their distribution networks. This may require a well-structured leadership and corporate governance aimed at shaping organizational culture, decision-making, and employee performance. Effective leadership fosters innovation, enhances employee engagement, and improves overall organizational outcomes. Many beverage companies in South-East Nigeria struggle with internal inefficiencies, poor management practices, and external economic pressures which at the long-term may have a negative impact on their competitiveness and sustainability. Studies have shown that firms with well-structured management systems, strategic planning, and strong market positioning achieve higher levels of organizational effectiveness. Therefore, understanding the factors that influence effectiveness and identifying best practices can help beverage companies improve performance and sustainability in the competitive business environment of South-East Nigeria.

This study aims to examine how vertical integration strategies catalyze effectiveness of beverage companies in South-East Nigeria by evaluating key performance indicators, management strategies, and market dynamics. The findings will provide insights into how these companies can enhance efficiency, adapt to market changes, and achieve long-term success.

1.2 Objectives of the Study

The main objective of this study was to examine the relationship between vertical integration strategies and the effectiveness of beverage firms in South-East, Nigeria. The study however investigated the following specific objectives;

i. examine the association between backward integration and organizational resilience,
ii. ascertain the relationship between backward integration and organizational adaptability,
iii. investigate the relationship between forward integration and organizational resilience, and
iv. determinethe association between forward integration and organizational adaptability.

1.3 Research Questions

i. What is the extent of association between backward integration and organizational resilience?
ii. To what extent is the relationship betweenbackward integration and organizational adaptability?
iii. To what extent is the relationship between forward integration and organizational resilience?
iv. What is the extent of association between forward integration and organizational adaptability?

1.4 Research Hypotheses

At 5% level of significance, these null hypotheses were tested

H_{01}: There is no significant association between backward integration and organizational resilience.

H_{02}: There is no significant relationship between backward integration and organizational adaptability.

H_{03}: Forward integration does not have significant relationship with organizational resilience.

H_{04}: Forward integration does not have significant association with organizational adaptability.

2. Related Work/Literature Review

2.1 Conceptual Review

This conceptual review aims to explore the relationship between vertical integration strategies and organizational effectiveness of beverage firms in South-East, Nigeria. Specifically, it discussed key concepts such as vertical integration, and concept of organizational effectiveness. By synthesizing existing literature, this review seeks to identify the mechanisms through which organizational effectiveness influences vertical integration and highlight the implications for beverage firms in South-East, Nigeria.

2.1.1 Operational Conceptual Framework

According to [10], a conceptual framework is a logical tool in the form of a diagram that a researcher uses to thoroughly visually illustrate the interaction between markers of the independent variables (which were examined) and the dependent variables. The conceptual framework diagram is used by researchers to better understand the connections between the study's predictor elements and the response variable [11]. In this study, the independent variable is vertical integration strategies, measured by backward

integration and forward integration while the dependent variable is Firm Effectiveness; measured by organizational resilience and organizational adaptability as shown in Fig. 1.

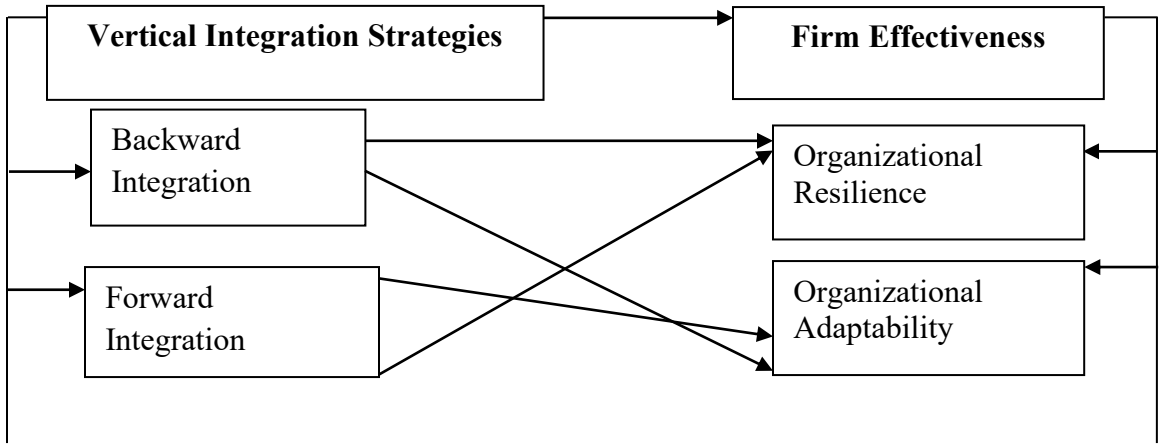

Figure 1: Operational Conceptual Framework Showing Vertical Integration Strategies and Beverage Firms Effectiveness in South-East Nigeria.

2.1.2 Concept of Vertical Integration

Vertical integration can best be understood as the degree to which a company owns parts of its value chain both upstream and downstream. Thus, it can be considered both a structural type and a strategy since vertical integration refers to how a firm structures its control and involvement in its value chain but is also a strategic approach to maximizing profitability and gaining competitive advantage[12]. Vertical integration goes far beyond a simplistic view of all activities being either collected in-house or outsourced. Within the organization, it can be described by several characteristics such as the breadth of integrated activities, the number of stages of activities, the degree of internal transfers, and the ownership form of activities. Nowadays, there is hardly any multi-business or multinational company that would be completely integrated, as most of these companies are enjoying the benefits of integrating separate stages of value creation or pursuing alternative integration strategies [13].

Integration can allow the firm to gain more oversight or control of its operations during a volatile time and, to some extent, avoid the risks of incomplete contracts with suppliers under strain and potentially opportunistic behavior of competitors[14]. However, these benefits do not come without costs that a firm can likely also not want to incur regardless of the previously detailed, potential advantages. For example, vertical integration raises administrative costs since it is likely that expensive adjustments like bringing in new employees who have the skill and know-how to steer a newly integrated function, among others, are necessary. In addition, if integrating a function is a reactive strategy to address

the issue of the semiconductor shortage short-term, the costs may very well outweigh the benefits. Vertical integration is a strategic approach in business where a company expands its operations within its supply chain. This expansion may involve acquiring suppliers (backward integration) or distributors (forward integration) to gain more control over production, distribution, and sales processes. By implementing vertical integration, firms aim to enhance efficiency, reduce costs, and improve market competitiveness. This paper discusses two dimensions of vertical integration: backward integration and forward integration.

Backward Integration: Backward integration is a strategy of seeking ownership or increased control of a firm's suppliers. This strategy can be especially appropriate when a firm's current suppliers are unreliable, too costly, or cannot meet the firm's needs [15]. Backward integration takes place when a firm supplies or engages in manufacturing operations within its activities. A backward vertical integration strategy involves a firm moving back along the value chain and entering a supplier's business. It is related with a manufacturer's decision to integrate with its components or equipment towards taking over supplies, whether to produce or purchase an input [16] and it can be adopted by firms. Some firms use this strategy when executives are concerned that a supplier has too much power over their firms different firms use backward vertical integration strategies for different reasons. It is in fact the preferential access to raw materials. Security of supply is one of the advantages of backward integration confers to a firm. Besides, backward integration enables the manufacturer to make a better prediction of the input price, thereby making a more profitable investment decision. Within manufacturing firms, Suppliers provide inputs that are needed to create the goods and services that the firms in turn sell to their buyers. A variety of supplies are important to these firms, including raw materials, financial resources, and labor [15]. Clearly, if a firm is not able to regain its profits due to cost increases by its suppliers through using its pricing structure, then it incurs losses because of the supplier's action

Forward Integration: Forward integration occurs when a firm acquires or takes full or partial control of its middlemen or marketing channels [17]. In other words, if a business integrates by moving into an area that serves as a customer or user of its products, the process is referred to as forward vertical integration. Forward integration as a business strategy is defined as a situation whereby a manufacturing firm decides to enter into the business of distributing or selling its products directly to customers instead of selling only to middlemen or distributors. It is a kind of forward movement in the production and distribution functions where the manufacturing firm moves closer to the end user of its products. Forward integration is a good business strategy that involves expanding a company's business operations along its supply chain to gain control of its distribution

network. [18]stated that forward integration occurs when a firm moves closer to the end users in the supply chain by establishing its own distribution outlets to sell its own products directly to consumers

2.1.3 Concept of Organizational Effectiveness

Organizational effectiveness refers to the ability of firm to choose the right targets and the means to achieve them. It means doing the right things at the right time [19]. [19]further stated that an organization is considered to be effective if it finds the balance between the demands of owners, employees, customers, community and the employer. [20]defined organizational effectiveness as the relationship between the organization's outcomes achieved and its planned objectives. It was explained that the higher the productive outcomes, the more effective the organization becomes. Organizational effectiveness is one of the most important achievements for determining the progress and development of today's organizations. It is seen as a necessity for organizations to deal with the environmental change along with increased certainty about the requirements they need and thus achieve organizational success. The essence of organization's theory is to achieve organizational effectiveness. Achieving organizational effectiveness is difficult to quantify and this is why certain criteria are given to managers to measure the degree of organization's effectiveness [20].

The concept of organizational effectiveness (OE) is multidimensional and extends beyond the traditional predictors for success. Few empirical studies have introduced different kinds of OE models that describe the concept clearly. Beyond tangible financial (profit) performance, the principle of the triple bottom line now includes value created from societal (people), environmental (planet), technological (innovation) and cultural (well-being) indicators. The new indicators are deemed critical in monitoring OE [21]. Therefore, the study of organizational effectiveness is fundamentally influenced by the context and timeframe in which the study is conducted. This study therefore discusses two dimensions of organizational effectiveness: organizational resilience and organizational adaptability.

Organizational Resilience: With organizational environments becoming increasingly complex and volatile, the concept of "organizational resilience" has become the "new normal". Organizational resilience is a complex and multidimensional concept which builds on the myriad of capabilities that an organization develops during its lifecycle. As learning is an inherent and essential part of these developments, it has become a central theme in literature on organizational resilience. Organizational resilience (OR) is understood as the organization's "ability to anticipate potential threats, to cope effectively with adverse events, and to adapt to changing conditions" [22]. Thus, anticipation,

coping, and adaptation represent three stages of OR. Organizational resilience is an essential organizational meta-capability for the success of modern organizations [23]. OR has indeed, become the "new normal" regarding organizational survival as well as recovery and successful re-emergence after disruptions. Understanding OR is therefore more important than ever. However, OR is still an emerging field and a key question that remains unanswered is how to achieve it [24].

Organizational Adaptability: adaptation as a process emphasizes a situation where a system moves from being preoccupied with transition to integrating the transition into operations. Organizational adaptation is the renewal at the organizational level. This concept closely corresponds to the idea that an organization develops its characteristics and behaviour patterns as a response to changes in its stakeholder environment [25]; Organizational adaptation as a change by an organization in response to external changes. Successful organizational adaptation may result in a more effective organizational structure and process, replacement of outmoded and a better fit with emerging environmental conditions. Adaptive organizations with subjective initiative, organizations face multiple complexities from internal conditions, external demands, and objective environments. Organizations make decisions to meet external demands by perceiving the environment, within the constraints of their own resources and capabilities. Organizational adaptability depends on the relative position of the extent of environmental dynamism and the level of organizational competence, rather than on the absolute [26].

2.2 Theoretical Framework (Anchored Theory)

Resource-Based View (RBV) Theory

The Resource-based View (RBV) Theory, which was proposed by Barney in 1991, emphasizes the importance of internal firm resources and capabilities as key drivers of competitive advantage and superior performance[27]. The RBV provides a theoretical lens through which vertical integration strategies both backward and forward can be assessed for their contribution to organizational effectiveness, particularly in areas of resilience, adaptability, and sustainability.

Anchored Theory: The RBV is considered the anchored theory for this study because:

1. Empirical Evidence: It is supported by extensive research demonstrating that unique internal resources such as proprietary supply chains, production processes, and distribution networks can lead to sustained competitive advantage when effectively managed.

2. Theoretical Integration: RBV integrates with strategic management principles, highlighting how tangible and intangible assets can be orchestrated to achieve superior operational and strategic outcomes.
3. Contextual Relevance: The theory is particularly relevant to the beverage sector in South-East Nigeria, where controlling upstream and downstream activities through vertical integration can improve responsiveness to market changes, ensure supply reliability, and enhance long-term sustainability.

Benefits:

1. Enhanced Organizational Resilience: Vertical integration allows firms to secure critical inputs and manage supply chain risks, thereby strengthening the ability to withstand disruptions.
2. Improved Adaptability: By controlling upstream suppliers and downstream distribution channels, firms can respond more quickly and effectively to shifts in consumer demand, regulations, or competitive pressures.

The Resource-Based View (RBV) provides a robust framework for beverage firms in South-East Nigeria seeking to leverage vertical integration strategies for enhanced effectiveness. Anchored in both theory and practice, it supports managerial decision-making aimed at achieving resilience, and adaptability in a highly dynamic business environment.

2.3 Empirical Review

A number of related studies have been conducted on vertical integration and organizational effectiveness, but few are listed here.

The study of [18] explored the impact of vertical integration and outsourcing decision on firm performance. The researcher adopted the descriptive survey research design and the qualitative research approach. Their data were collected from different procurement managers and operational managers of companies working in the KPK. The researchers used a structured interview questions to elicit data from the respondents. The result of the interview conducted among procurement managers and operational managers of companies working in the KPK showed that outsourcing is the best strategy to improve organizational performance rather than vertical integration strategies.

The study of [28] examined the effect of vertical integration on transaction cost minimization in smallholder tea commercial farming in Tanzania. A structured questionnaire was used to collect quantitative data, in a cross sectional survey, which involved 393 smallholder tea growers from three districts in the Mbeya and Njombe regions. IBM Statistics Version 26 was used for descriptive and causal-effect data analysis. A multiple linear regression analysis was conducted to test the null hypothesis that

vertical integration and select farmer characteristics does not minimize transaction cost. The results showed that, vertical integration significantly negatively affected transaction cost (β = -0.002; p =0.000). Similarly, gender significantly, negatively influenced transaction cost (β = -1.81; p =0.017). Additionally, education (β = -1.81) and farm size (β = 0.142) negatively influenced transaction cost but not statistically significant at p =0.05. Conversely, age (β = 0.061), and household size (β = 0.349) positively influenced transaction costs, implying that, one unit increase in the variables, led to increased transaction cost amongst smallholder commercial farmers in Tanzania. The findings entailed that, improved vertical integration's reduced transaction costs in smallholder farmer commercialization.Therefore, vertical integration promotion could enhance efficiency, lower transaction costs, and improve profitability.

The study of [15] in their study sought to determine the influence of backward vertical integration strategies on the competitiveness of firms in the Export Processing Zones (EPZ), Kenya. Both quantitative and qualitative approaches were used in the study, meaning that both descriptive statistics and inferential statistics were employed. Descriptive technique, specifically survey was used in the research design. The target population was all the 137 EPZ firms within Kenya and the sample was drawn from this population. The stratified random sampling technique was used. The EPZ firms are situated within the 74 gazetted zones, out of which 69 were privately owned and operated while 5 are public zones. The quantitative dataset that was collected was analyzed using the Statistical Package for Social Scientists. Further, the significance level of each independent variable was tested against the dependent variable at 95% level of confidence using ANOVA, regression and correlation techniques. The findings showed that backward vertical integration strategies had a positive and significant influence on the competitiveness of firms in EPZ, Kenya, at 0.151, $p<0.05$ and 0.432, $p<0.05$ when the moderating variable firm size is included.

The study of [29] investigated the impact of backward integration policy on manufacturing firms' value added in Nigeria. It complemented the existing literature and extended the frontier of knowledge by evaluating the impact of backward integration policy (local raw materials as proxy) on manufacturing firms' value added in Nigeria. Firm-level data were sourced from the annual reports and statement of accounts of 49 sampled manufacturing firms, Central Bank of Nigeria statistical bulletin, National Bureau of Statistics annual abstract and Nigeria Customs Service tariff books for the period (2002-2020). The Fisher-type Augmented Dickey-Fuller (ADF) unit root test procedure was employed to examine the stationarity properties of each of the variables used in the study. The test was necessary to verify the time series property of the panel data employed. Thereafter, the Pooled Ordinary Least Squares (OLS) method was

employed for the regression. The findings showed that backward integration policy through the use of local raw materials in production significantly led to an increase in manufacturing firms' value added in Nigeria. An increase in the use of local raw materials in production led to an increase in value added by all sampled firms across manufacturing industries in Nigeria. The findings also revealed that fixed assets, employment, energy cost and exchange rate had a significant positive influence on the value added of all sampled manufacturing firms, while the tax has a significant negative coefficient, implying that as tax paid by firms' increases, the value added of manufacturing firms' declined in Nigeria.

3. Materials and Methods

3.1 Research Design

The study on "Vertical Integration Strategies and Effectiveness of Beverage Firms in South East Nigeria" adopted a Survey research design. This design is suitable for this study as it aims to collect data from a sample of beverage firms in South East Nigeria, using a structured questionnaire. According to [30], survey research design is ideal for studies that aim to collect data from a large sample, using self-report measures such as questionnaires. This design allows for the collection of data from a representative sample, which can be generalized to the population.

3.2 Population of the Study

This Table 1 presents a breakdown of the total workforce across eight beverage manufacturing companies selected for the study in South-East Nigeria. These companies, located in Anambra, Enugu, Abia, and Imo states, represent both alcoholic and non-alcoholic beverage plants. They were chosen due to their long-standing presence in the region. The study examines the management and staff of these firms to explore the relationship between vertical integration strategies and organizational effectiveness.The companies listed include prominent beverage manufacturers such as Nigerian Breweries Plc, Seven-Up Bottling Company, and Tiger Beverages, with workforce sizes ranging from 104 employees at Canon Distilleries International Ltd to 384 employees at International Breweries Plc. The total workforce across the eight companies is 1,988 employees. Ebonyi State is excluded from the study because there are no beverage manufacturing firms located in the state, which limits the geographic scope to Anambra, Enugu, Abia, and Imo states only.Two branches from the same company, such as Nigerian Breweries Plc in Abia and Enugu, are included in the study. While this ensures consistency in data due to similar corporate strategies, it may reduce the study's diversity. The findings from these branches may reflect the company's overall practices, potentially limiting the ability to compare with other firms in the region that operate under different organizational

structures or strategies. The total workforce drew from these firms amounts to 1,988 employees. A detailed breakdown of the population distribution across the selected companies is presented in Table 1.

Table 1: Targeted Population of the Study

S/N	**Name**	**State**	**Population**
1	Tiger Beverages Ltd, Onitsha (TBLO)	Anambra	140
2	International Breweries Plc, Onitsha (IBPO)	Anambra	384
3	Nigerian Breweries Plc, AmaekeNgwo (NBPAG)	Enugu	230
4	Seven-Up Bottling Company Ltd, AmaekeNgwo (SBCLAN)	Enugu	240
5	Nigerian Breweries Plc Aba (NBPA)	Abia	352
6	Golden Guinea Breweries PlcUmuahia (GGBPU)	Abia	213
7	Canon Distilleries International Ltd, Owerri (CDILO)	Imo	104
8	Nigerian Bottling Company Ltd, Owerri (NBCLO)	Imo	325
	Total		**1988**

Source: [31], [32], [33].

3.3 Sampling Design

The sampling design is a crucial aspect of research methodology, encompassing the various techniques employed to select a representative subset of individuals or units from a larger population [34]. This study's sampling design consists of two primary components: sample size determination and sampling procedure. The sample size determination involves calculating the optimal number of participants required to achieve reliable and generalizable results, while the sampling procedure outlines the systematic method used to select participants from the target population.

3.3.1 Sample Size Determination

Sampling is a systematic process of selecting a representative subset of individuals or units from a larger target population, ensuring that the sample accurately mirrors the characteristics, attributes, and dynamics of the entire population [30]. Due to the impracticality of surveying every member of the target group, sampling techniques are employed in research to achieve a reliable representation. To determine the adequate sample size, the study employed Freund and William's statistic formula as quoted by [32].

$$n = \frac{Z^2 N(pq)}{N(e)^2 + Z^2(pq)}$$

Where: n = Sample Size, N = The population = 1988, p = Probability of success/proportion = 0.5

q = Probability of failure/proportion = 1- 0.5 = 0.5, Z = Standard error of the mean = 95 percent = 1.96, e = Limit of tolerable error of 0.05 (or level of significance)

$$n = \frac{(1.96)^2 \times 1988 \times 0.5 \times 0.5}{1988(0.05)^2 + (1.96)^2 \times 0.5 \times 0.5} = \frac{3.8416 \times 497}{1988(0.0025) + 3.8416 \times 0.25}$$

$$= \frac{1909.2752}{4.97 + 0.9604} = \frac{1909.2752}{5.9304} = 321.947$$

Using Freund and William's statistic, a sample size of 322 employees was determined to be representative of the target population of 1988 employees, with a 5% margin of error. This sample size is deemed sufficient to provide reliable insights into the research questions and hypotheses. A stratification procedure is employed to ensure subjects are drawn from the targeted beverage firms of the four states. Proportionate sampling was employed when determining the number of employees from each State. This was computed using Bowley's formula as shown below and the results was computed as shown below: TBLO (23), IBPO (62), NBPAG (37), SBCLAN (39), NBPA (57), GGBPU (34), CDILO (17), and NBCLO (53):

$$n_h = \frac{nN_h}{N}$$

where N_h = number allotted to each stratum (state), n = Sample size, N = Population

For TBLO, $n_h = \frac{322(140)}{1988} \approx 23$; For IBPO, $n_h = \frac{322(384)}{1988} \approx 62$

For NBPAG, $n_h = \frac{322(230)}{1988} \approx 37$;For SBCLAN, $n_h = \frac{322(240)}{1988} \approx 39$

For NBPA, $n_h = \frac{322(352)}{1988} \approx 57$;For GGBPU, $n_h = \frac{322(213)}{1988} \approx 34$

For CDILO, $n_h = \frac{322(104)}{1988} \approx 17$;For NBCLO, $n_h = \frac{322(325)}{1988} \approx 53$

3.4 Data Collection

To gather data for this study, a structured questionnaire was employed as the primary data collection instrument. The questionnaire incorporated a four-point Likert-type scale, comprising response options such as 'strongly agree (4)', 'agree (3)', 'disagree (2)', and 'strongly disagree (1)'. This scale is particularly suited for perception-based studies, as it enables respondents to express their level of agreement or disagreement with the statements presented. To facilitate data collection, a drop-and-pick method was utilized, wherein research assistants distributed the questionnaires to respondents and retrieve them at a later date, at the respondents' convenience. This approach ensures that

respondents have sufficient time to complete the questionnaire thoughtfully, minimizing the likelihood of rushed or incomplete responses.

3.5 Sources of Data Collection

The data required for this study were obtained through primary data collection methods, specifically through the administration of a structured questionnaire to the targeted respondents. This approach enables the collection of original, firsthand data that is tailored to the research objectives, thereby providing rich, contextual insights into the phenomenon under investigation. The questionnaire was designed to elicit relevant information from the respondents, who are knowledgeable about the research topic, and served as the primary source of data for this study.

3.6 Validity of Instrument

Validity is a critical aspect of research instrumentation, denoting the extent to which a procedure, instrument, or tool accurately measures what it purports to measure. In essence, validity ensures that the research instrument yields meaningful and reliable data. As noted by [35], content validity is a vital type of validity that assesses the degree to which an instrument measures the intended construct or concept. To establish content validity, this study employed a rigorous process. The research instrument was subjected to expert review, wherein the supervisor will assess its content, clarity, and adequacy in capturing the requisite data. Furthermore, a pilot study was conducted to test the instrument's validity, with feedback from participants informing revisions to ensure the collection of valid and reliable data.

3.7 Reliability of Instrument

The reliability of a research instrument is a critical aspect of empirical research, as it refers to the consistency of measurements obtained from the same participants under similar conditions [36]. In this study, the reliability of the data was assessed using the Cronbach coefficient alpha (α) statistic via IBM SPSS software package, which measures the internal consistency of items within each variable. Thus, reliability of yielded coefficients of 0.924 (backward integration), 0.910 (forward integration), 0.923 (organizational resilience), and 0.938 (organizational adaptability), indicating highly internal consistency.

3.8 Methods of Data Analysis

The data analysis techniques applied in this study were the descriptive statistics such as mean and inferential statistics such as Spearman Rank rho Correlation coefficient (ρ). The mean was used to analyze the responses received to the questionnaire items on the

study variables. Before the analysis, a criterion mean of 2.50 was set for any item to be accepted. This implies that any item that scores 2.50 or above is accepted while those that score a mean value of less than 2.50 are rejected. The research questions and hypotheses formulated in this study were tested using ρ. and it is given as:

$$\rho = 1 - \frac{6\sum d_i^2}{n(n^2 - 1)}$$

ρ = Spearman rank correlation

d_i = the difference between the ranks of corresponding variables& n = number of observations

Table 2: Correlation Decision Rule

Coefficient Range	Strength of Association
0.81 – 1.00	Very high extent
0.61 - 0.80	High extent
0.41 - 0.60	Moderate extent
0.21 - 0.40	Low extent
0.00 - 0.20	Very low extent

Source: [37]

The correlation coefficients were computed using IBM SPSS version 28.0, and the null hypothesis was rejected when the calculated p-value was less than the 0.05 level of significance; otherwise, it was retained.

4. Data Presentation, Results and Discussion of Findings

4.1 Data Presentation

The data collected in the questionnaire were presented in this section. The questionnaire administration and the collection/rejection rate according to states were presented in the table 3 below:

Table 3: Return of Questionnaire

FIRMS	Questionnaire Distributed	% Distributed	Questionnaire Rejected	Questionnaire Collected	% Rejected	% Collected
TBLO	23	7.1	1	22	0.3	6.8
IBPO	62	19.3	4	58	1.2	18.0
NBPAG	37	11.5	2	35	0.6	10.9

SBCLAN	39	12.1	4	35	1.2	10.9
NBPA	57	17.7	3	54	0.9	16.8
GGBPU	34	10.6	1	33	0.3	10.2
CDILO	17	5.3	1	16	0.3	5.0
NBCLO	53	16.5	2	51	0.6	15.8
TOTAL	**322**	**100**	**18**	**304**	**5.6**	**94.4**

Source: Field Survey, 2025

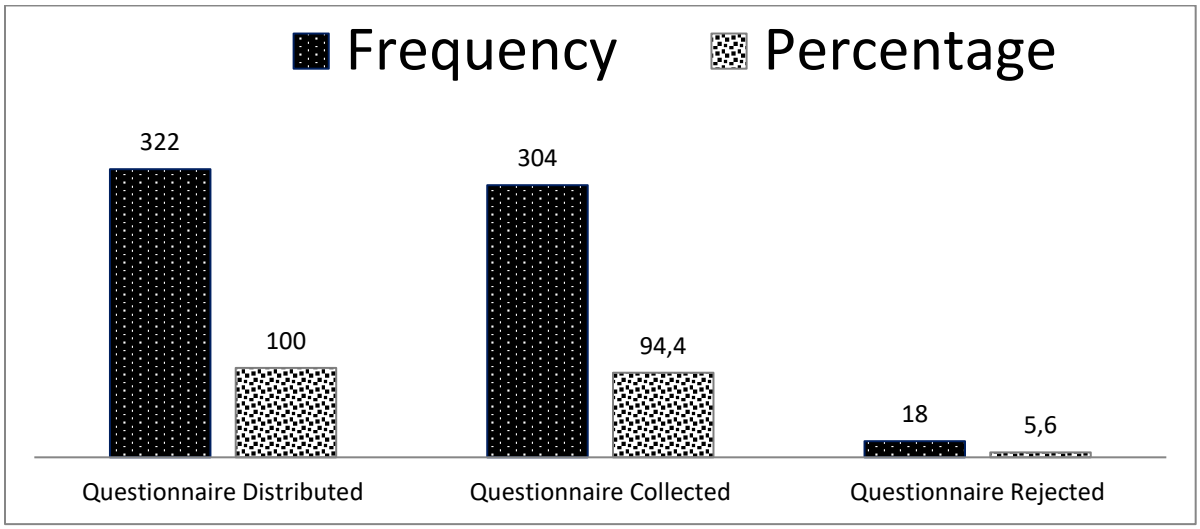

Figure 2: Analysis of Questionnaire Distributed, Collected and Rejected

Table 3 and Figure 2 indicated that a total number of three hundred and twenty two (322) questionnaires were administered to the respondents; eighteen (18) questionnaires were rejected with the percentage ratio of 5.6%, while three hundred and four (304) questionnaires were collected with the percentage ratio of 94.4% which was suitable for the study to carry out the analysis.

4.2 Result

4.2.1 Bivariate Analysis

Bivariate analysis was conducted to examine the relationships between the independent and dependent variables as specified in each hypothesis. Since the parametric statistics of correlation assumes that each variable follows a normal distribution, and also the satisfaction of the linearity assumption,it was necessary to first perform normality and linearitydiagnostics. This step ensures that the dataset meets the assumptions required

for accurate interpretation, as violations of normality/linearity would lead to biased or misleading results using parametric statistics. In cases where the normality and linearityassumptions are not satisfied, the non-parametric equivalent, which is assumption-free, namely the Spearman rank correlation coefficient, would be employed to assess the relationships.

4.2.1.1 Tests for Normality Assumption for Each Variable

Table 4: Summary Statistics of the Variables

		Name/Variable			
		Backward integration	**Forward integration**	**Organizational resilience**	**Organizational adaptability**
Anderson-Darling (AD)	**Statistic**	6.408	5.082	3.802	5.765
	p-value	< 0.005**	< 0.005**	< 0.005**	< 0.005**
Ryan-Joiner (RJ)	**Statistic**	0.980	0.990	0.992	0.977
	p-value	< 0.010**	< 0.010**	< 0.010**	< 0.010**
Kolmogorov-Smirnov (KS)	**Statistic**	0.152	0.115	0.128	0.137
	p-value	< 0.010**	< 0.010**	< 0.010**	< 0.010**

Footnote: **=Sig. at 5%

Table 4 shows results of the normality tests using three statistics (Anderson-Darling, Ryan-Joiner and Kolmogorov-Smirnov) conducted on the four variables (backward integration, forward integration, organizational resilience and organizational adaptability) consistently indicate significant departures from normality. In all cases, the p-values are below the 0.05 threshold, with most being less than 0.010, signaling strong evidence against the null hypothesis of normal distribution. Taken together, these results suggest that none of the four variables meet the assumption of normality, and as such, non-parametric statistical methods was considered more appropriate for subsequent analyses involving these variables.

4.2.1.2 Tests for Linearity Assumption for the Bivariate Data

The assumption requires that the two variables should be linear. Here the linearity assumption was tested using visual inspection by creating scatter plots for each of the dependent variables against each of the independent variables.

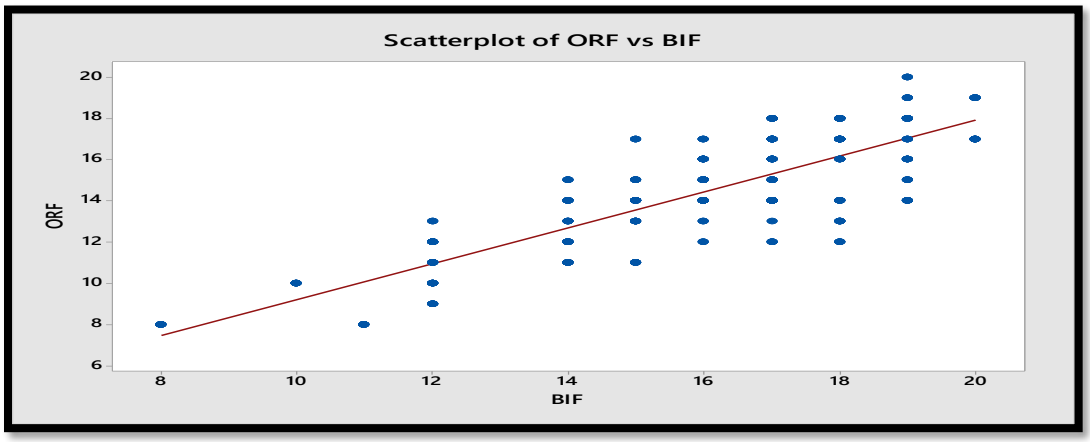

Fig. 3: Scatterplot of Backward Integration versus Organizational Resiliencewith Linear Fit

Figure 3 presents scatterplots of backward integration versus organizational resilience. The scatterplots with linear fits reveal that the relationship between these variables is not linear, as evidenced by the significant deviations of many points from the linear fit.

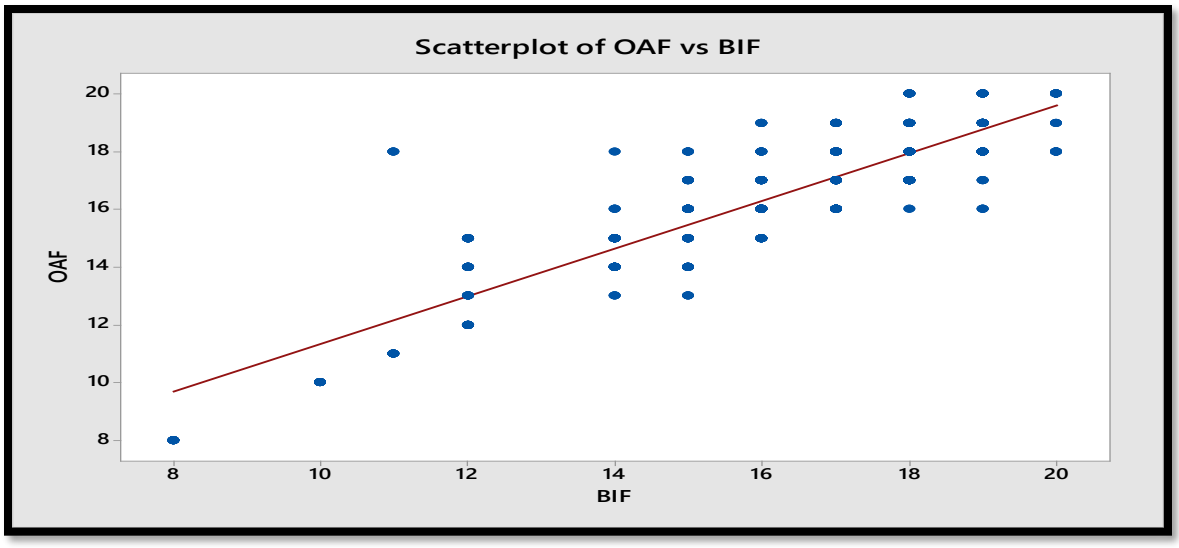

Fig. 4: Scatterplot of Backward Integration versus Organizational Adaptability with Linear Fit

Figure 4 presents scatterplots of backward integration versus organizational adaptability. The scatterplots with linear fits reveal that the relationship between these variables is not linear, as evidenced by the significant deviations of many points from the linear fit.

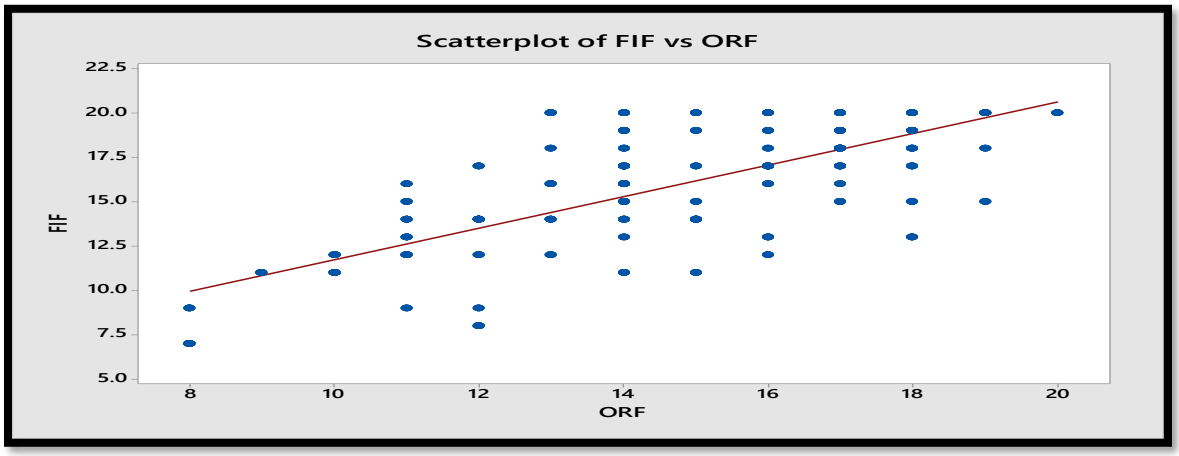

Fig. 5: Scatterplot of Forward Integration versus Organizational Resilience with Linear Fit

Figure 5 presents scatterplots of forward integration versus organizational resilience. The scatterplots with linear fits reveal that the relationship between these variables is not linear, as evidenced by the significant deviations of many points from the linear fit.

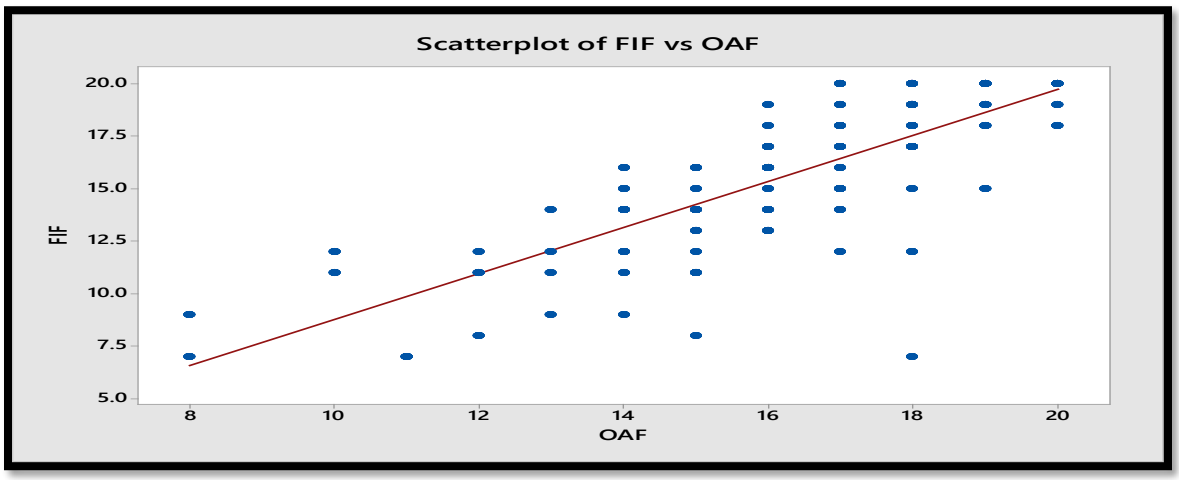

Fig. 6: Scatterplot of Forward Integration versus Organizational Adaptability with Linear Fit

Figure 6 presents scatterplots of forward integration versus organizational adaptability. The scatterplots with linear fits reveal that the relationship between these variables is not linear, as evidenced by the significant deviations of many points from the linear fit.

Since the normality assumption failed in all the four variables and linearity assumptions failed in all the bivariate combinations, the Spearman rank correlation technique was employed to test the hypotheses with the aid of IBM SPSS version 28.0.

4.2.2 Hypotheses Testing

Hypothesis 1

H_{01}: There is no significant relationship between backward integration and organizational resilience.

Table 5: Correlation Result of bivariate analysis between backward integration and organizational resilience

			Backward integration	**Resilience**
Spearman's rho (ρ)	**Backward integration**	Correlation Coefficient Sig. (2 tailed) *n*	1.000 . 304	0.784** 0.000 304
	Resilience	Correlation Coefficient Sig. (2 tailed) *n*	0.784** 0.000 304	1.000 . 304

**Correlation is significant at 0.05 levels (2 tailed)

Table 5 presents the result of the bivariate analysis performed between backward integration and organizational resilience of beverage firms in South-East. The result shows that resilienceis strongly and positively correlated to backward integration(ρ=0.784**) and this correlation is significant at 0.05 level as indicated by the symbol **. As a result of this, the null hypothesis (Ho_1) is rejected and the alternative hypothesis is accepted which states that there is a significant relationship between backward integration and organizational resilience of beverage firms in South-East. Thus, there is a high and positive significant relationship between backward integration and organizational resilience of beverage firms in South-East

Hypothesis 2

H_{02}: There is no significant nexus between backward integration and organizational adaptability.

Table 6: Correlation Result of bivariate analysis between backward integration and organizational adaptability

			Backward integration	**Adaptability**
Spearman's rho (ρ)	**Backward integration**	Correlation Coefficient Sig. (2 tailed) *n*	1.000 . 304	0.839** 0.000 304
	Adaptability	Correlation Coefficient Sig. (2 tailed) *n*	0.839** 0.000 304	1.000 . 304

**Correlation is significant at 0.05 levels (2 tailed)

Table 6 contains the result of the bivariate analysis carried out between backward integration and organizational adaptability. The result shows a very high and positive correlation between backward integration and organizational adaptability (ρ=0.839**) and this correlation is significant at 0.05 level as indicated by the symbol **. Consequently, the null hypothesis (Ho_2) is rejected and the alternative hypothesis is accepted. This means that the accepted hypothesis becomes "There is significant nexus between backward integration and organizational adaptability". Thus, there is a very high significant nexus between backward integration and organizational adaptability.

Hypothesis 3

H_{03}: Forward integration does not have significant relationship with organizational resilience.

Table 7: Correlation Result of bivariate analysis between forward integration and organizational resilience

			Forward integration	**Resilience**
Spearman's rho (ρ)	**Forward integration**	Correlation Coefficient Sig. (2 tailed) *n*	1.000 . 304	0.659** 0.000 304
	Resilience	Correlation Coefficient Sig. (2 tailed) *n*	0.659** 0.000 304	1.000 . 304

**Correlation is significant at 0.05 levels (2 tailed)

Table 7 contains the result of the bivariate analysis carried out between forward integration and organizational resilience. The result shows a high and positive correlation between forward integration and organizational resilience (ρ=0.659**) and this correlation is significant at 0.05 level as indicated by the symbol **. Consequently, the null hypothesis (Ho_3) is rejected and the alternative hypothesis is accepted. This means that the accepted hypothesis becomes "Forward integration does have a significant relationship with organizational resilience". Thus, forward integration does have a high and positive significant relationship with organizational resilience.

Hypothesis 4

H_{04}: Forward integration does not have significant association with organizational adaptability.

Table 8: Correlation Result of bivariate analysis between forward integration and organizational adaptability

			Forward integration	**Adaptability**
Spearman's rho (ρ)	**Forward integration**	Correlation Coefficient Sig. (2 tailed) *n*	1.000 304	0.810** 0.000 304
	Adaptability	Correlation Coefficient Sig. (2 tailed) *n*	0.810** 0.000 304	1.000 . 304

**Correlation is significant at 0.05 levels (2 tailed)

Table 8 contains the result of the bivariate analysis carried out between forward integration and organizational adaptability. The result shows a very high and positive correlation between forward integration and organizational adaptability (ρ=0.810**) and this correlation is significant at 0.05 level as indicated by the symbol **. Consequently, the null hypothesis (Ho_4) is rejected and the alternative hypothesis is accepted. This means that the accepted hypothesis becomes "Forward integration does have a significant association with organizational adaptability". Thus, forward integration does have a very high and positive significant relationship with organizational adaptability.

4.3Discussion of Findings

This study found a significant relationship between backward integration and organizational resilience of beverage firms in South-East Nigeria. This finding was derived from the result of the bivariate analysis carried out on the two variables in the first hypothesis. The result revealed a high and positive significant relationship between backward integration and organizational resilience of beverage firms in South-East (ρ = 0.784**) and this correlation is significant at 0.05 level. This finding aligns with several past empirical studies that reinforce the strategic importance of backward integration in enhancing a firm's capacity to withstand external disruptions. For instance, [38] demonstrated that supplier integration significantly improves supply chain resilience, particularly when organizations internalize critical input sources-an outcome that mirrors the resilience seen in beverage firms engaging in backward integration. Similarly, [15] reported that vertical integration enhanced crisis response and organizational recovery, particularly in Chinese state-owned enterprises, underscoring the role of internal control in fostering resilience. Additionally, the findings of [39], who established a significant positive relationship between backward integration and organizational competitiveness in Nigerian manufacturing firms, further validate this study's conclusion, since resilience is often intertwined with sustained competitiveness.

This study also found a significant nexus between backward integration and organizational adaptability among beverage firms in South-East Nigeria, as revealed by the bivariate analysis (ρ = 0.839, $p < 0.05$) in the second hypothesis. This strong positive correlation suggests that firms that internalize key input processes are better positioned to respond swiftly and effectively to changes in their operational environment. This finding is consistent with the work of [38], who observed that vertical integration enhances organizational innovation and adaptability, particularly by enabling firms to respond to shifting customer demands and technological trends.

This study found that forward integration has a significant relationship with organizational resilience among beverage firms in South-East Nigeria, as indicated by a strong and positive correlation (ρ = 0.659, $p < 0.05$) in the fourth hypothesis. This finding suggests that firms which take control of their downstream activities-such as distribution, retail, and direct customer engagement-are better equipped to withstand disruptions, maintain stability, and adapt to environmental changes. This result is similar with the findings of [40]who found a strong positive relationship between direct marketing (a forward integration strategy) and profit growth, reinforcing the idea that internal control over distribution enhances strategic endurance and financial resilience.

Forward integration was found to have a significant association with organizational adaptability among beverage firms in South-East Nigeria, as revealed by the result of the bivariate analysis ($\rho = 0.810$, $p < 0.05$) in the fifth hypothesis. This very strong and positive correlation indicates that organizations that internalize downstream functions-such as distribution, retail, and customer service-are better able to respond swiftly and effectively to shifts in the market, customer preferences, and broader environmental conditions. This finding aligns with the work of [16], who established that vertical integration enhances organizational flexibility, particularly in enabling manufacturing firms to respond to changing customer demands, which is a key element of adaptability.

5. Conclusion

In conclusion, the study underscores that beverage firms in South-East Nigeria can significantly strengthen their resilienceand adaptability by implementing well-structured vertical integration strategies. The findings offer valuable insights to managers, policymakers, and industry stakeholders, recommending a deliberate shift toward greater internal control of both supply and distribution chains as a means to achieve strategic agility and sustainable growth.

6. Future Scope

Based on the scope, findings, and limitations of this study, several areas are recommended for future research to deepen understanding and broaden the applicability of vertical integration strategies in organizational development:

1. Future research could extend the geographical scope to include beverage firms in other geopolitical zones in Nigeria or across West Africa. This would allow for comparative analysis and enhance the generalizability of the findings.
2. While this study focused exclusively on the beverage industry, future studies could explore vertical integration strategies in other manufacturing sectors such as pharmaceuticals, cement, textiles, and food processing to assess sector-specific dynamics and outcomes.
3. Subsequent studies could examine the mediating or moderating effects of factors such as innovation, digital transformation, supply chain digitization, or firm size on the relationship between vertical integration and organizational outcomes.
4. Comparative studies involving firms in both developed and developing economies could be conducted to explore how economic, regulatory, and technological environments shape the outcomes of vertical integration strategies.
5. Further studies could investigate the role of government policies, trade regulations, and investment incentives in facilitating or hindering the adoption of vertical integration strategies among firms.

By addressing these areas, future research can build on the foundation laid by this study and offer deeper insights that will be valuable to scholars, industry practitioners, and policymakers alike.

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