Do industries' structural attributes/characteristics influence their decision to utilize strategic alliances?

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Article Info	Abstract
	This study assessed the structural characteristics of industries and their influence in the decision to utilize strategic alliance by industries. A survey research design and a questionnaire survey of 309 industries were used in the study while percentages and tables were used to analyse the data and show results. Based on the structural characteristics of the surveyed industries, two types of industries were found in the study. These are small scale industries with 5 - 49 workers and medium scale industries with 50 - 199 workers. The result also indicated that 68% of the surveyed industries were small scale industries while 32% were medium scale industries. In area of strategic alliance decisions, the study discovered that strategic alliances were utilized by industries of all sizes. Consequently, this paper has shown that strategic alliance plays essential role in the production activities of small-scale industries. The paper suggests that industrial policies of government should be targeted at encouraging the potentials of small and medium scale industries.

1. Introduction

The structural characteristics or attributes of industries can be defined as the intrinsic qualities of industries, excluding their locational features. These attributes include the size, age, inputs, capacity utilization, asset base, ownership, and control structure of industries (Teriba et al., 1981). The attributes of an industry such as size is seen to be a crucial indicator of its success. Firms have always sought to grow in size in order to gain advantage over their competitors (Muange and Kiptoo, 2020, Bello and Bello 2021; Nwokocha, 2022). Firms in this era try to increase their size in order to gain a competitive advantage over their competitors. They do this by lowering their manufacturing costs and increasing their market share. For instance, the studies of Babalola (2013) Akinyomi and Olagunju (2013), Olawale et al. (2017), Ali (2017) and Muange and Kiptoo (2020) have all shown that firm size have a positive impact on the profitability of Nigerian manufacturing firms, both in the area of total assets and total revenues, as well as the competitiveness and profitability of manufacturing firms. There is however limited evidence on the influence of industrial structures on the use of strategic alliance by industries. For about a decade and still counting, the increasingly turbulent economic environment across the world has made many industries to strategically adjust their competitive relationship. This has made industries to change their business philosophy from outright competition to a more cooperative relationship (Liang, 2021). One important cooperative relationship adopted by industries and businesses involves the establishment of strategic alliance relationship.

Industries form strategic partnership by merging their resources, complementing each other's market-finding abilities, and gaining access to distribution channels. It also assists industries in utilizing new technologies, learning and internalizing business techniques as well as sharing and acquiring skills to achieve economies of scale (Todeva and Knoke. 2005). The primary motivation for industries to develop strategic alliances according to Varis and Littunen (2010) is to improve their overall performance and success. This according to Cheng (2015) promote new venture success, greater expertise, issue sharing, and higher return on investment. The impact of strategic

alliances on company performance, according to Muange and Maru (2015), is expressed in increased productivity and production efficiency. As important as these studies are, they have not been able to show the role of industrial structure in the utilization of strategic alliance by industries. These studies have not shown the effect of size, age, inputs, asset base, ownership structure etc on the utilization of strategic alliance by industries, hence the question: Do the structural attributes or characteristics of industries influence their decision to utilize strategic alliance?

2. Literature review

Strategic alliance is a long-term partnership between two or more industries with the goal of improving their competitive position and performance by pooling together their resources and expertise (Beamish & Killing, 1997 cited in Emami et al., 2022, Petchged, 2013). According to Gundolf et al. (2018) strategic alliances involving creative micro-firms seek for the reduction of over specialization and target a high degree of quality of life and pleasure at work. This is envisaged where there is trust and mutual support among the partners. Furthermore, the decision to form strategic alliances by creative micro-firms is guided by opportunism and necessity motivations. Ferreira and Franco (2020) found that strategic alliances is a viable strategy for industries to overcome human capital constraints, which has substantial implications for business practice. Because strategic alliances have an impact on human capital, the relationships that industries form with other businesses are becoming increasingly vital for their long-term survival and development. On the other hand, Ferreira et al. (2021) in their studies showed that strategic alliances provide a solution for small and medium scale enterprises to overcome intellectual capital resource limits, which has substantial implications for business practice. Prabhudesai et al. (2022) in their studies found that while both tangible resources such as finances, component parts etc and intangible resources such as knowledge, expertise etc. have a favorable impact on an organization's ability to establish alliances, intangible resources have a far larger impact. The interactive effect of each resource type and environmental uncertainty was also found to be a significant predictor of alliance formation by the authors. In view of this, the work of Emami et al. (2022) showed that alliance has a significant effect on the financial, operational, and organizational success of partners in the telecommunications sector. Similarly, Kafigi (2015) discovered that there is a link between alliance type, cost, risk reduction, and resource accessibility. The study found that if partners carefully study and establish the link between costs, risks, and resources, they might form alliances that simultaneously reduced costs and risks while also allowing them to obtain resources.

In Nigeria, Strategic alliances assist industries to outperform competitors. According to Ogunkoya et al. (2015) strategic alliance create favorable opening to external resources that can balance and compensate for the firm's internal strengths and weaknesses. On the other hand, Akinrata et al. (2020) found that the main effects of strategic alliance on the financial performance of the Nigerian construction sector are the potential to accumulate economies of scale and scope in value-added operations, and easy cash flow coordination. In addition, Ejekwu et al. (2020) showed that there is a positive and substantial association between operational sensitivity and strategic alliance success indicators such as partner computability and complementarity. Based on the study's findings, the practice of operations sensitivity should be exhibited and instilled in every worker, as it has the power to provide workers with system-wide knowledge to recognize and prevent error. On the other hand, Ekpudu et al. (2013) found that strategic alliance enables firms to collect adequate cash, penetrate saturated or challenging markets, confront rivalry, and acquire a competitive advantage in trying to improve their operational performance in the face of limited resources.

Similarly, Nwokocha et al. (2021) in their studies discovered that 24.81 percent, 25.01 percent, and 34.64 percent of the surveyed small scale industries saw relative increases, increases, and significant increases in their operations following the use of strategic alliance, while 5.06 percent and 10.48 percent had relative and significant decreases. Nwokocha and Madu (2021) also discovered that the need to accomplish "cost reduction, risk reduction, and resource accessibility" drives strategic alliance formation, rather than the spatial distribution of small and medium scale industries. Studies have also shown that strategic partnerships have a positive impact on the performance of the Nigerian telecommunication. According to Akingbade (2015), the competitive measure of customer happiness, customer loyalty, and customer retention, as well as the performance indices of customer satisfaction, loyalty, and retention, were found to have a positive association. Strategic alliances, according to Junaidu et al. (2019), assist the textile industries to function better.

Muthoka et al. (2022) in their studies found that environmental-based motives such as conformity with the government regulation, market share, and customer base, motivate manufacturing small and medium enterprises to form strategic alliances. The study also showed that these motives have positive and significant effect on the performance these SMEs. Inalegwu et al. (2022) also showed that there is a significant relationship between marketing and distribution alliance and sales performance as well as production alliance and competitive advantages

of SMEs in North Central Nigeria. Using structural equation modeling to analyze primary data obtained from a sample of 74 small entrepreneurial firms in the telecommunications sector, Emami et al. (2022) find that strategic alliances significantly and positively impact partners' performance in terms of financial, operational, and organizational effectiveness among small entrepreneurial firms in the telecommunication sector.

In the area of industrial structure, most studies have concentrated on the impact of size on the strategic cooperation among industries. For instance, the size of an industry is described by Emmanuel et al. (2019) as the quantity and range of a firm's production capacity and potential, or the number and diversity of services that a firm can make accessible to its clients at the same time. Because of the trend of economies of scale, the size of an organization is particularly important in today's world. Larger corporations, as opposed to smaller corporations, may be able to create things at significantly reduced costs. On the other hand, Muange and Kiptoo (2020) in their studies discovered that firm size has a moderating effect on the relationship between joint marketing alliance and firm performance in Kenyan retail firms. Babalola (2013) also noted that the size of an industry, both in terms of total assets and total revenues, has a favorable effect on the competitiveness of manufacturing enterprises in Nigeria. This was collaborated by the works of Olawale et al. (2017) and Ali (2017 cited in Muange and Kiptoo 2020) which found that the nature of the relationship between industry size and profitability is a critical area that offers some light on the elements that raise firm profits. In their study, Akinyomi and Olagunju (2013) found that firm size has a positive impact on the profitability of Nigerian manufacturing firms, both in area of total assets and total sales. However, if firm size according to Niresh and Velnampy (2014) is the primary factor in determining the profitability of the company due to the concept of economies of scale, Hosseini et al. (2018) found that growth in size of firms have transcended into poor performance on an annual basis. The studies reviewed in this paper have not shown sufficiently, the influence of industrial structural characteristics on their decision to utilize strategic alliance. This paper therefore analysed the structural characteristics of industries and its influence in the utilization of strategic alliance.
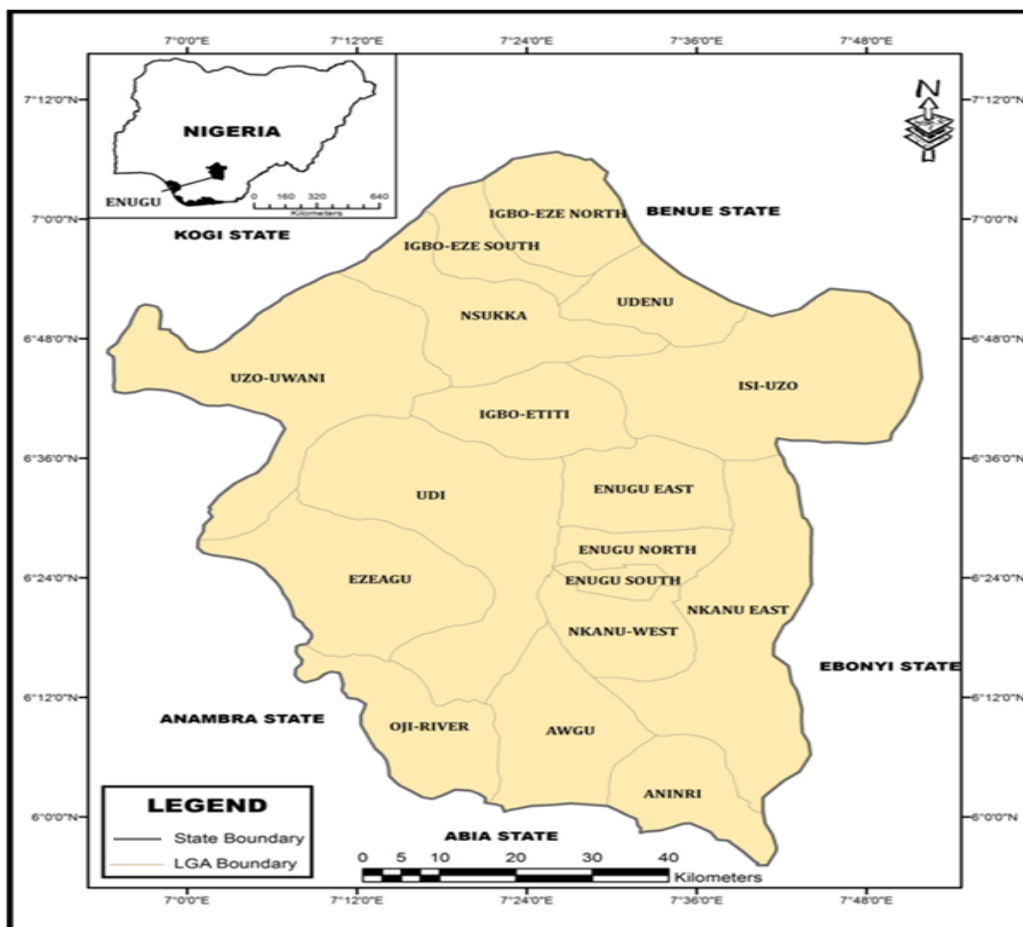

Figure 1: Research Area

Source: Adapted from Nwokocha (2021)

2.1. Study area

This study took place in Enugu State, South-eastern Nigeria. It lies between the Equator's latitudes of 5^0 58 1N and 7^0 081N, and the Greenwich Meridian's longitudes of 7^0 081E and 7^0 481E as was shown in as seen in Figures 1. The area is made up of seventeen (17) Local Government Areas as was described elsewhere in Nwokocha (2020). The research area is home to a plethora of industrial activities. In various sections of the state, these economic activities may be witnessed in the establishment of various small and medium-scale industries as well as large-scale industries. The Emene Industrial Estate is one of Enugu State's oldest industrial estates. The availability of these industries informed the choice of this area for this research.

3. Methodology

The survey design used in this paper was based on a quantitative methodology. This was employed to collect data for the study through the use of a questionnaire. Ordinal type questions were used to obtain the quantitative data.

3.1. Sample selection and sample size

The state of Enugu is divided into seventeen Local Government Areas (LGAs). However, twelve LGAs were purposefully chosen for this research. This is supported by the fact that all of the state's registered industries were concentrated in the state's twelve local government regions. In addition, the State's SME directory revealed that there are one thousand three hundred and sixty-six (1,366) such industries in the selected LGAs. Because data on Industries in other LGAs were unavailable, the choice to focus on the 12 (twelve) LGAs was made as was explained elsewhere in Nwokocha (2020). In the study area, seven (7) industrial groups yielded a total of 1,366 registered industries. These industries were chosen from the Enugu State Industrial Directory as was shown in table 1.

Table 1. Industrial groups in Enugu State Nigeria

	Industrial sub-sector	Number of industries
1	Food Processing	203
2	Cloth making	117
3	Wood and Wood product	215
4	Publishing and paper product	228
5	Paint and Domestic plastics including Nylon and water Sachet production	176
6	Non-metallic products (Aluminium)	209
7	Basic and Fabricated metals products	218
	Total	1,366

Source: Adapted from Nwokocha (2020)

Using the Yaro Yamane method for population size, this study calculated a sample size based on this value. Because of its ability to determine a suitable sample size, this formula was chosen for this study. Yaro Yamane It is given as:

$$n = \frac{N}{1 + Ne^2}$$

Where n = sample size, N = population size, e = the error of sampling/error of 5% points (0.05). In the current research n= 1366/1+1366(0.05)2 1366/1+1366(0.0025) 1366/4.415 = 309 n= 309. Based on the analysis, this study selected 309 (Three hundred and nine) industries from the seven industrial groups. Stratified random sampling was adopted to determine the appropriate number of industries from each of the industrial categories to be studied. This was to give all the selected industries the opportunity of been selected for the study

3.2. Data collection

A variety of data collection methods were used in the study. Field observations, citations of relevant literature, and a survey of 309 industries were used in the study. The primary data came from field observations and a questionnaire survey of Industries, whereas the secondary data came from published and unpublished materials. The direct delivery method was employed to disseminate the questionnaire for this investigation. This strategy was utilized to increase participation and response rates, as well as to reduce any linguistic challenges that the questionnaire might cause. The respondents were the ' managers of the industries. Three professionals reviewed and validated the tool. Experts in the fields of geography and economics were chosen. These professionals were chosen

based on their expertise and mastery of the topic. Similarly, the study instrument was put to test in a ten-industry pilot study to see how reliable it was. Cronbach alpha reliability co-efficient was used to determine the instrument's internal consistency. The study's Cronbach's alpha co-efficient was 0.72.

3.3. Data analysis

Data for this paper was analysed using percentages. Parentages were used to compare data series and the distribution of industries and the utilization of strategic alliance based on their structural characteristics. Results were presented in the paper using tables and percentages. Microsoft Excel version 16 was used for all of the analyses.

4. Result

4.1. Structural attributes of surveyed industries

The structural attributes of industries were investigated in this study using firm size/number of workers, asset base, and ownership structure. These three attributes have been linked to strategic alliances by the study of Diaz-Mora and Triguero-Cano (2007).

4.2. Number of workers of the industries

This study used the National Bureau of Statistics categorization system to classify the industries in the study area. This was done, however, with a minor change in the number of workers. As a result, the area's industries were divided into two groups. These are small and medium-sized industries with 5 - 49 workers, and medium-sized businesses with 50 and 199 workers. In view of this, table 2 showed that , 68 percent of the industries surveyed in the area were small scale industries, while 32 percent were medium scale enterprises.

Table 2. Size of industries in Enugu State Nigeria (number of employees).

Number of Employees	Frequency	Percentages (%)
5-49	210	68%
50-199	99	32%
Total	309	100

The finding signified that small-scale industries are at the center of the study area's industrial operations. This also highlights the ability of the study area to encourage entrepreneurship, innovation and human inventiveness. By implication, this finding showed that the area possesses the requisite tools to promote job development, resource use, entrepreneurship, and self-employment.

4.3. Asset base of the industries

Based on the National Bureau of Statistics definition of assets base, the asset base of the industries is categorized into two (Nwokocha, 2020). These are Small scale industries and medium scale industries. While small scale industries have an asset base of between N5 - N50 million, Medium scale industries had an asset base of between N50 - N500 million. This categorization matched what was found in the field. In view of this, the study showed that 68 percent of the surveyed industries had an asset base of less than N50 million, while 32 percent of industries had an asset base of between N50 million and 500 million as was shown in table 3.

Table 3. Asset base of industries in Enugu State

Asset Base (Million N-Naira)	Frequency	Percentages (%)
Less than N50	210	68%
N 51-200	99	32%
Total	309	100

This also signified that the small-scale industries are the hubs of industrial activity in the area. This, together with the previous conclusion, suggests that the full utilization of small-scale industries, would encourage and propel the expansion of production and industrial activities in the study area.

4.4. Ownership structure of the industries

In the study area, three different types of ownership structures were identified. These are sole proprietorships, partnerships, and limited liability companies. While a sole proprietorship is a one-man industry that cannot sue or be sued and is inseparable from its owner, a partnership is a business held by two or more people who are

personally accountable for the total amount of the business's obligations and claims. Limited Liability Corporations on the other hand are legal entities which are separate from the individuals who manage the company. The result of the study showed that 68 percent of the industries in the area were sole proprietors, while 24 percent and 8 percent were partnership and limited liability companies as was shown in table 4.

Table 4. Ownership structure of industries in Enugu State

Ownership Structure	Frequency	Percentages
Sole Proprietors	210	68%
Partnership	74	24%
Limited liability	25	8%
Total	309	100

The result showed that the most of the small-scale industries in the study area are owned by individuals who have sole control over their businesses' daily operations, whereas medium-sized businesses are managed by partnerships. The level of duties and decisions made in the industries can be related to this management system. Due to their size and capacity, small scale industries can manage decisions and tasks on their own; however, medium scale enterprises require more than one person to handle decisions and activities.

4.5. Strategic alliance decisions by industrial size

The study findings in the area of strategic alliance revealed that all of the industries were involved in strategic alliance, as indicated in Table 5. The result showed that whereas 68 percent of small scale industries with 5 - 49 workers used strategic alliances, 32 percent of medium scale industries with 50 - 199 workers used strategic alliances as well.

Table 5. Strategic alliance decision by industrial size

Size of employees	Frequency	Percentage use of strategic alliance
5 - 49	210	68%
50-199	99	32%
Total	309	100

This signifies that small and medium-sized industries, regardless of their size, utilize strategic alliances in their industrial activities. In light of this, it was discovered that, while small scale industries used strategic alliances to gain access to skills, technologies, and capacities, medium-sized businesses used strategic alliances to gain access to new markets and pursue production tasks for which they lacked in-house expertise. Due to lack of capacity, small scale industries form alliance to acquired parts and components from other industries. This has helped them to decrease their expenses and risks of performing such tasks in-house. Small scale food processing and fabricated metal industries, for example, have been observed forming alliances with other industries to tackle jobs that they lack the expertise, technology, or capacity to handle within their own businesses. This was also significant in small and medium-sized industries, particularly those producing aluminum roofing sheets. These industries were discovered to be in a subcontracting agreement with fabricated metal industries. As a result, fabricated metal industries provide technical help to aluminum industries in areas where they lack expertise. Finally, it was found that strategic alliances were not restricted by the size of the industry or its ownership structure. Both Small and medium-sized industries and ownership types employ strategic alliances to maximize their production activities.

4.6. Contribution to knowledge

The attributes of an industry such as size, asset base and ownership structure is seen to be a crucial indicator of its success. This study has been able to show that the structural characteristics of industries in Nigeria do not influence their use/utilization of strategic alliance. This is a point of departure from others studies- Babalola (2013) Akinyomi and Olagunju (2013), Olawale et al. (2017), Ali (2017) and Muange and Kiptoo (2020) among others which concentrated on the impact of firm attributes on profitability and competitiveness of manufacturing firms. This study has shown that the use of strategic alliances is not confined to industries of a certain size or ownership structure; rather, it is a technique adopted by industries of all sizes and ownership structures to maximize their production operations.

4.7. Contribution to practice

Practically, this study has shown that small and medium scale industries can acquire capacity through the formation of strategic alliance. The formation alliance helps these industries to decrease their expenses and risks

of performing production activities in-house. Small scale food processing and fabricated metal industries formed alliances with other industries in order to handle areas of their production where they lack the expertise, technology, or capacity. While food processing industries such as small-scale sachet and bottle water industries form alliance with plastics industries for the supply of plastic bottles and sachet bags, small scale fabricated metal industries form alliance with their medium scale counterparts so as to have access to heavy and hybrid equipment that increase the quality of their products. The cost of these equipment makes it difficult for the small scale metal industries to afford them hence their alliance with medium scale industries. Generally, this means that small scale entrepreneurs can address their business limitations through the formation alliance. The formation of this alliance which can be within or outside of the industrial groups, enables these industries to reduce the cost and risk of production while building a competitive product.

5. Conclusion

This study has shown that small scale industries dominated the manufacturing activities in the study area. These industries accounted for 68 percent of the industries in the study area, while medium-sized industries account for 32 percent. This showed that small scale industries are at the heart of the manufacturing activities in the study area. The investigation also revealed that there were three different types of ownership structures in the area. Sole proprietorships, partnerships, and limited liability industries were found to be the ownership arrangements in the area. The study also revealed that strategic alliances are not confined to industries of a certain size or ownership structure; rather, it is a technique adopted by industries of all sizes and ownership structures to maximize their production operations.

Author contribution statements

The authors contributed all to the research's design and implementation, the analysis of the results, and the writing of the manuscript.

Disclosure statement

The author reported no potential conflict of interest.

Ethics committee approval

All responsibility belongs to the researcher. All parties were involved in the research of his own free will.

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