

# **Optimizing Distribution Channels for Packaged Food Products: A Case Study of Consumer Goods Industry in Oyo State, Nigeria**

## **Abstract**

This study investigates the effectiveness of distribution channels for Indomie instant noodles in Oyo State, Nigeria, to increase product availability and reduce distribution costs. Utilizing a quantitative research design, quantitative data from 615 respondents, including members of staff of Dufil group Nigeria Plc, distributors, wholesalers, and sales representatives, combined with regression analysis, indicates that there is effectiveness in ascertaining that products reach their consumers in time at minimal costs through the producer-distributor-wholesaler-retailer-consumer channel. Significant elements of costs include transport, time taken for delivery, and infrastructural difficulties, with a case in point as poor road networks increase the cost of distribution. This study recommends strategic implementations such as the direct delivery system, integration of ICT, and company-owned logistics to improve the efficiency of distribution, reduce costs, and ensure that customers are satisfied with the service rendered by the company. These upgrades can be used to further strengthen the position of Indomie instant noodles as the leading noodle brand in Nigeria.

**Keywords:** Distribution Channels, Packaged Food Products, Indomie Instant Noodles, Supply Chain Efficiency, Cost Minimization, Customer Satisfaction

## **Introduction**

Distribution is critical in marketing, where products are moved to reach consumers effectively. Lang et al., (2023) held that it played a significant role not only in making sure that the consumers receive the products but also moves raw materials to result in consumer satisfaction. Rushton, Croucher, and Baker (2022) defined it as the effective movement of goods from production to consumption. This improves the quality of service while keeping the cost of the same at a minimum. This holistic approach includes goods and services, and information flows in manufacturing and services. Production and consumption are at the very core of economic systems, and each depends on the supply and demand of the other. When there is a disequilibrium between production and consumption, market failures occur: the first situation causes waste and a lowering of prices, while the latter brings about shortages and an increase in prices (Rodrigue, 2006). This makes the distribution sector critical in allowing and ensuring a harmonious flow of goods between the production and the consumption environment.

The nature of business environments has experienced great dynamism because of the technological revolution, which means that customer demands have become more sophisticated and, therefore, there is a need for companies to ensure that they deliver the right products at the right time and in the right quantities if they are to continue benefitting from competitive advantages (Allegra, Bellia, &Zarbà, 2014). Competitive pressures on the market, therefore, compel companies to review their distribution strategies to ensure minimum cost and optimum customer satisfaction. The physical and legal paths that products take to move from production to consumption are complex, and they feature several stakeholders and processes (Dutilhet al., 2017).

To this effect, the current global boom in population has presented expanded markets, forcing businesses to remodel their distribution methods to suit many consumers worldwide. The uneven distribution of resources and mounting demographic pressures foreground that, indeed, effective distribution systems are needed in managing increasing inter-regional interactions (Pu, 2021). Under such variable market conditions, particularly in this information technology era, businesses are increasingly compelled to constantly reassess their distribution channels to find a flourishing stand in such dynamic markets. However, just distribution is essential to bridge the gap between production and consumption. Global population growth and technological advancement are two things that keep happening, and these two things have eliminated the distance between different geographical areas. As a result, there is an outstanding need for a distribution plan capable of taking care of the extensive coverage of products. Today's distribution systems also need to be flexible to accommodate new products or emerging requirements in the market. Systems already in place to support either a new or an existing product might not be good enough without being re-evaluated and tweaked occasionally.

There are some elements of complexity for the distribution of packaged food products, including Indomie instant noodles; they are influenced by distance, costs and probably product and then market characteristics (Ma, & Wang, 2023, Arzani et al., 2021). Misalignment in these areas will significantly impact the accessibility, availability, and general market efficiency of a product. Indeed, distribution costs play a particularly critical role in pricing because of the context where lower expenses of distribution can provide a competitive edge (Khoubseresht&Shayanfar, 2020). Although much research has been directed at the distribution of agricultural products, little interest has been accorded to processed foods like

Indomie instant noodles, which have considerably different characteristics because of their packaging and long shelf life. This is a missing link in terms of the need for complete and thorough research on the packaged food items' distribution channels and what it implies in terms of cost, reach, and efficiency in reaching consumers. As a result, this research aims to analyze the physical distribution channels of Indomie instant noodles in Oyo State, Nigeria. To determine the impact of channelization on the effectiveness of distribution. The specific objectives are to:

- Identify the existing distribution channels of Indomie instant noodles.
- Determine the distribution rate of Indomie instant noodles into Oyo State.
- Examine the relationship between distance and cost of distributing in Oyo State.
- Examine the interplay between distribution costs and the choice of distribution channels.

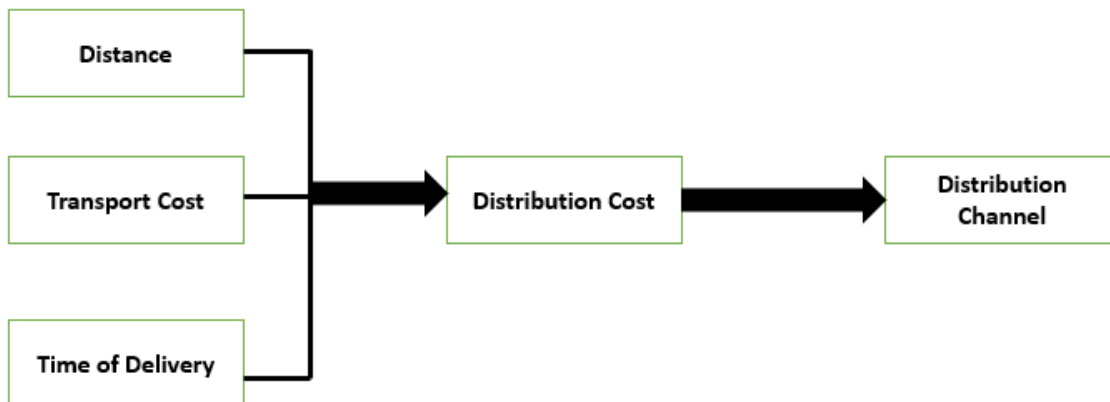
## **2. Literature Review**

Literature on the distribution of goods and services includes factors affecting cost and efficiency. According to Pahwa and Jaller, (2023), the level of cost can be highly reduced through direct delivery methods within organizations. They recommend that more organizations should consider direct delivery to reduce both the cost of distribution and capital locked up in inventory. In addition, they advise that transportation planning should be done; the state of roads and how they affect transport pricing should be noted. They also present the advantages of outsourcing the whole distribution system to outside transport operators. This will enable efficient product distribution, especially in cross-docking and direct delivery strategies. It will also help the company to redeploy the investment done in the distribution system to other supply chain elements.

Akerele et al., (2023) further explained that these are infrastructural challenges: road networks in poor conditions, inadequate transport facilities, and a lack of credit facilities. All these significantly disrupt the smooth distribution of products in the State of Oyo, Nigeria. They argue that road infrastructure and accessibility need to be improved, especially when considering rural areas. This would require government intervention to ensure healthy competition in distributing products in a way that enhances living standards for the citizens.

Achrol and Kotler, (2022) and Guru et al. (2023) defined physical distribution as the tasks associated with planning, controlling, and managing a physical supply of materials and finished goods from points of origin to points of consumption. The procedure is done with the customers' satisfactory needs met, and the company profits. According to Babalola, (2023), there are significant consequences in case the delivery of goods is not made on time; companies could lose clients due to a lack of timely deliveries.

The Conceptual Framework of the study is represented below in Figure 1. It attempts to close this particular gap in the literature on food products, including packaged foods such as Indomie Instant Noodles, where the quantification of how distance, delivery time, and transport costs affect the total distribution cost of a food product has not been done in any studies. The current study fills this gap by incorporating such crucial variables in the distribution cost analysis, and their influences are tested for the distribution channel selection. Distribution costs have been emphasized as a principal driver in choosing the distribution channel; thus, its importance in the strategic distribution planning.



**Figure 1: Conceptual framework**

### **3. Methodology**

The research focused on distributing Indomie instant noodles from Sango-Ota, Ogun State, to other parts of Oyo State. The study population comprised employees of the Distribution department of the Dufil Group and intermediaries, that is, distributors, sales representatives, and wholesalers of the Indomie instant noodles in Oyo state. Stratified sampling was the method employed in selecting a sample representing the entire diverse population, with 33 local government areas in Oyo State divided into three senatorial districts. Finally, 6 local government areas were selected from the 3 districts through random sampling. The sample

size therefore includes 100 distributors, 100 sales representatives, 400 wholesalers within the designated areas, and 113 distribution department staff members of the Dufil Group. This makes a total of 713 respondents. Though 616 questionnaires were duly filled and returned hence the sum of the respondents is 615.

The data collected was from both primary and secondary data sources. The primary data were collected through direct interviews and questionnaires administered to the personnels of Dufil Group Nig. PLc, distributors, sales representatives, and wholesalers. The respondents had all relevant records, such as invoices and waybills. The respondents were asked questions about distribution channels, lead times, and order frequencies. Secondary data were obtained from publications of the Dufil Group.

The analysis was done using descriptive and inferential statistics. Descriptive statistics in this study were expressed via frequency distributions. Inferential statistics analysis includes multiple regression analysis; it was meant to explain relationship between distribution cost and distance and then the relationship between distribution cost and adopted distribution channel.

#### 4. Findings

Table 1 findings indicate varying preferences for distribution channels of Indomie instant noodles: 14.8% of respondents are of the opinion that the producer-distributor-consumer channel is in use, 3.4% indicated that the existing channel is producer-wholesaler-consumer, 19.7% affirmed that producer-distributor-retailer-consumer is the most preferred channel, 11.9% attested to the adoption of producer-wholesaler-retailer-consumer while 50.2% stated that producer-distributor-wholesaler-retailer-consumer is the most suitable channel.

**Table 1: Distribution channel adoption**

	Frequency	Percent
Middlemen's distribution channel		
p-d-c	91	14.8
p-w-c	21	3.4
p-d-r-c	121	19.7
p-w-r-c	73	11.9
p-d-w-r-c	309	50.2
<b>Total</b>	<b>615</b>	<b>100</b>

Source: Field survey, (2024)

The highest lead time of products as indicated by table 2 is 72 hours as accounted for by 44.07% which implies that when an order is placed to the company, the order is gotten within two days, 37.07% agreed to 24 hours and 12.03% attested that order can reach them within 72 hours while 6.83% of the middlemen reported that they do get their order after 72 hours, it was also observed that 35.93% of the middlemen distributing Indomie instant noodles travelled between 21-50km to supply order, 18.70% covered a distance of 51-80km, 16.60% covered a distance of 81-110km, 14.63% covered a distance of 111-140km, 10.24% covered a distance of 141-170km while 3.90% travelled a distance of above 170km. The highest distance coverage of the middlemen is between 21-50km as accounted for by 35.93%.

**Table 2: Average lead time of indomie instant noodles and average distance coverage of middlemen (km)**

	Frequency	Percent
Average lead time of indomie instant noodles		
24 hours	228	37.07
48hours	271	44.07
72hours	74	12.03
Above 72 hours	42	6.83
Total	615	100
Average distance coverage of middlemen (km)		
21-50	221	35.93
51-80	115	18.70
81-110	102	16.60
111-140	90	14.63
141-170	63	10.24
Above 171	24	3.90
Total	615	100

Source: Field survey, (2024)

According to Table 3, distribution cost among middlemen varies: 13.8% spent between 8001 to 10000 naira, 19.5% spent between 10001 to 12000 naira, 43.6% spent between 12001 to 14000 naira, and 23.1% spent over 14001 naira. The majority, thus, spent between 12001 to 14000 naira on the average. For transport cost, 11.2% of middlemen spent below 5000 naira, 13.3% spent 5001 to 8000 naira, 32.7% spent 8001 to 11000 naira, 23.6% spent 11001 to 14000 naira, and 19.2% spent above 14,000 naira.

**Table 3 Average distribution cost incurred by middlemen men**

	Frequency	Percent
Distribution cost incurred by middlemen men(N)		
8001-10000	85.0	13.8
10001-12000	120.0	19.5
12001-14000	268.0	43.6
14001 and above	142.0	23.1
Total	615	100
Average transport cost incurred by middlemen men		
Below 5000	69.0	11.2
5001-8000	82.0	13.3
8001-11000	201.0	32.7
11001-14000	145.0	23.6
14001 and above	118.0	19.2
Total	615	100

Source: Field survey (2024)

#### 4.1 Relationship between Distance and Distribution Cost

To assess the impact of distance on distribution cost for Indmie instant noodles, distance was proxied by transport cost and delivery time, a multiple regression analysis was employed (see table 4), where the dependent variable was distribution cost (dc) and the independent variables were transport cost (tc) and time of delivery (td). The resulting regression equation was  $dc = 3.253 - 0.531tc + 0.492td$ . The correlation coefficient, R (0.739), indicates a strong association between distribution cost and the independent variables. A decrease in transport cost results in a corresponding decrease in distribution cost, while an increase in delivery time elevates the distribution cost.

The R<sup>2</sup> value at 55% suggests that 55% of the variability in distribution cost is explained by variations in transport cost and delivery time. Statistical analysis confirmed the model's robustness with an F-ratio of 68.534, significant at both the 0.05 and 0.01 levels, indicating significant regression parameters. Specifically, the beta coefficient for transport cost was -0.531, showing a significant reduction in distribution cost with reduced transport expenses. Conversely, the beta coefficient for time of delivery was 0.496, demonstrating that longer delivery times increase distribution costs. These findings align with Bairta et al. (2003), who noted potential cost savings with increased direct deliveries in organizations.

**Table 4: Test of the Relationship between Distance and Distribution cost**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.739	0.546	0.538	0.554

a. Predictors: (constant); td, tc

**Anova**

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	42.079	2	21.040	68.534	.000 <sup>a</sup>
	Residual	34.997	612	.307		
	Total	77.077	614			

**Source:** Researcher's computation (2024).

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients		T	Sig.
	B	Std. Error	Beta			
(Constant)	3.253	.248			13.093	.000
Transport cost	-.531	.061	-.570		-8.727	.000
Time of delivery	.496	.094	.345		5.284	.000

Dependent Variable: dc = distribution cost. Independent variables: tc = transport cost, td = time of delivery

**Source:** Researcher's computation (2024).

### 4.3 Relationship between distribution cost and adopted distribution channel

As shown in Table 5, distribution cost was proxied with transport cost, time of delivery and distance, the significance of transport cost, time of delivery, and distance in distribution was confirmed through t-tests, where each variable's t-value exceeded its corresponding p-value, indicating statistical significance. Specifically, transport cost had a t-value of -3.040 compared to a p-value of 0.003, time of delivery recorded a t-value of 3.062 against a p-value

of 0.003, and distance showed a t-value of 11.144 with a p-value below 0.000. These results underscore the crucial impact of each factor on the effectiveness of the distribution system.

The multiple correlation coefficient, R, was 0.882, illustrating a strong relationship between the combined independent variables (distance, transport cost, and time of delivery) and the dependent variable, the distribution channel. This strong correlation suggests that increase in distance, transport costs, and delivery time significantly influence the choice of distribution channel, supporting the recommendation by Bairta et al. (2003) for organizations to consider direct delivery to minimize distribution costs.

Furthermore, the R<sup>2</sup> value of 77% indicates that 77% of the variation in the distribution channel can be explained by the variations in distance, transport cost, and time of delivery. This finding is consistent with observations by Abdul-Azeez et al. (2009), who noted poor road conditions and inadequate infrastructure in Oyo State as significant challenges to effective distribution. These results collectively highlight the integral role these factors play in shaping distribution strategies.

**Table 5: Relationship between distribution cost and the adopted distribution channel**

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.882	0.777	0.771	0.398

a. Predictors: (Constant), distance, td,tc

**Anova<sup>b</sup>**

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	62.339	2	20.780	131.303	.000 <sup>a</sup>
Residual	17.883	612	.158		
Total	80.222	614			

**Source:**Researcher’s computation (2023).

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	.425	.315		1.350	.180
Tc	-.168	.055	-.177	-3.040	.003
Td	.218	.071	.149	3.062	.003

Distance	.623	.056	.686	11.144	.000
----------	------	------	------	--------	------

Dependent Variable: Dc, Independent variables: Tc, Td, Distance  
**Source;** Researcher’s computation (2024)

#### 4.5 Discussion of Findings

The distribution of goods is pivotal in linking production with consumption through a network of activities and organizations aimed at ensuring the delivery of products in their best condition. It is based on this that this research seeks to evaluate the physical distribution channels of Indomie instant noodles to different shops by their marketers in Oyo State, Nigeria, and, as well, pinpoint which distribution strategies or mix of strategies can be most effective about the maximization of profit, minimization of cost, and attaining maximum customer satisfaction. It emerged from the study that the most dominant distribution channel was producer-distributor-wholesaler-retailer-consumer, as indicated by 50.2% of the respondents. On average, the processing time of an order is 72 hours, as opined by 44.07% of the respondents.

The statistical analysis reflected considerable relationships within the distribution system. The regression model for the distribution costs showed an R-value of 0.739, R<sup>2</sup> of 0.546, and F-statistic of 68.534, also proving the model as significant at a 95% confidence level. Moreover, the model that evaluated the distribution channels had a value of R = 0.882, R<sup>2</sup> = 0.777, with F = 131.303, indicating that the value is significant, so the transport cost and delivery time have a substantial impact on the distribution cost and, as such, on the choice of the distribution channel.

Deeper inspection showed that, as the research indicates, significantly influencing distribution costs are transport cost, time of delivery, and distance. Transport cost presented a negative relationship with distribution costs (t = -3.040, p < 0.05) and time of delivery positively influenced distribution costs (t = 3.062, p < 0.05). The distance significantly influenced distribution costs (t = 11.144, p < 0.05). These variables together explained 77.7% of the variation of making the selection to distributive channels, thus being the ones of higher value within strategic plans in the field of distribution. The research is in line with a similar study by Oluwakoya and Ogundipe, (2022) that showed that distribution involves all activities regarding the transfer of goods from manufacturers to consumers. The same study goes further to confirm that distribution costs are part of significant company expenditures

and hence calls for effective strategic planning to ensure product delivery is cost-effective and as timely as possible.

## **5.1 Conclusion**

The research findings indicated the selected distribution channel for Indomie instant noodles to be one of the significant drivers of its high accessibility and acceptance in Nigeria. It suggests the approach adopted in distribution, including manufacturers, distributors, wholesalers, and retailers is very efficient in getting the product to consumers. The strategy of distribution is lean, albeit with high costs in distribution. The significant role of salespersons in linking the various channel members has also been emphasized, yet with no consideration for the cost of overall production. Key factors that might influence designing a distribution channel include channel, market and product characteristics, competitive variables, and the company's resources. Interestingly, the road infrastructures and the geographic intermediaries distance considerably reflect on the distribution costs, and these deteriorating conditions incur more costs.

## **5.2 Recommendations**

Given the above findings, a company such as Dufil Group should consider having its fleet of haulage vehicles to mitigate the risk of failure in third-party logistics agreements. By taking this step, the firm's products will always reach consumers to ensure a constant flow. In trying to cut down on distribution costs, direct delivery strategies should be implemented to strengthen the feedback loop between the company and its distributors. Moreover, further optimization of the distribution is by the use of ICT and reverse logistics in having to minimize transportation that is not necessary. The ICT may enable better control of stock levels by the distributors and, therefore, may reduce costs related to such frequent deliveries as fewer deliveries may be required. Furthermore, ICT can reduce the number of trips to be generated by the sales representative and this is achievable when perfect communication is maintained by the parties involved.

## **References**

Achrol, R. S., & Kotler, P. (2022). Distributed marketing networks: The fourth industrial revolution. *Journal of Business Research*, 150, 515-527.

- Akerele, E. O., Akanni, K. A., Agbaje, E. M., Oyebanjo, O., & Aderinto, O. (2023). Determinants of Marketing Channel, Margin and Efficiency in Local Stimulants Marketing in Osun State, Nigeria. *Acta Universitatis Danubius. Œconomica*, 19(2), 126-140.
- Allegra, V., Bellia, C., & Zarbà, A. S. (2014). The logistics of direct sales: new approaches of the EU. *Italian Journal of Food Science/Rivista Italiana di Scienza degli Alimenti*, 26(4).
- Arzani, M., Abazari, A., Oshnoei, A., Ghafouri, M., & Muyeen, S. M. (2021). Optimal distribution coefficients of energy resources in frequency stability of hybrid microgrids connected to the power system. *Electronics*, 10(13), 1591.
- Babalola, F. D. (2023). Assessment of Marketing and Distribution Channels of Bushmeat in Kwara State, Nigeria. *Tanzania Journal of Forestry and Nature Conservation*, 92(1), 122-137.
- Dutilh, G., Vandekerckhove, J., Ly, A., Matzke, D., Pedroni, A., Frey, R., ... & Wagenmakers, E. J. (2017). A test of the diffusion model explanation for the worst performance rule using preregistration and blinding. *Attention, Perception, & Psychophysics*, 79, 713-725.
- Guru, S., Verma, S., Baheti, P., & Dagar, V. (2023). Assessing the feasibility of hyperlocal delivery model as an effective distribution channel. *Management Decision*, 61(6), 1634-1655.
- Khoubseresht, O., & Shayanfar, H. (2020). The role of demand response in optimal sizing and siting of distribution energy resources in distribution network with time-varying load: An analytical approach. *Electric Power Systems Research*, 180, 106100.
- Lang, L. D., Behl, A., Guzmán, F., Pereira, V., & Del Giudice, M. (2023). The role of advertising, distribution intensity and store image in achieving global brand loyalty in an emerging market. *International Marketing Review*, 40(1), 127-154.
- Ma, J., & Wang, C. (2023). A review of studies on the relationship between paleogeography and resources: The interplay and impact of food, water resources, and energy. *Geographical Research Bulletin*, 2, 218-233.
- Oluwakoya, A. O., & Ogundipe, S. D. (2022). Investigating the Influence of Third-Party Logistics Providers on the Physical Distribution of Manufactured Products. A Study of MDS Logistics. *Journal of Behavioural Studies*, 3(2).
- Pahwa, A., & Jaller, M. (2023). Assessing last-mile distribution resilience under demand disruptions. *Transportation Research Part E: Logistics and Transportation Review*, 172, 103066.
- Pu, L. (2021). Fairness of the distribution of public medical and health resources. *Frontiers in public health*, 9, 768728.
- Rodrigue, J. P. (2006). Transportation and the geographical and functional integration of global production networks. *Growth and Change*, 37(4), 510-525.

Rushton, A., Croucher, P., & Baker, P. (2022). *The handbook of logistics and distribution management: Understanding the supply chain*. Kogan Page Publishers.

UNDER PEER REVIEW