

**Analytical Methods on Factors Contributing to the Poor Patronage
of Made-in-Nigeria Products: A Case of Nigeria**

ABSTRACT

This paper examines the factors that contribute to the poor patronage of made-in-Nigeria products in Nigeria using the methods of log-linear analysis and relative importance index. The data for this study were collected through a survey in Anambra state, using 2224 valid questionnaires. The log-linear analysis was used to model the factors, while the relative importance index was used to select the factor that contribute highly to poor patronage of made-in-Nigeria products. The result showed that “Negative perception of Nigerians that local goods are inferior” with $RII = 0.808840$, contribute highly to poor patronage. We recommended that the Nigerian government should ban the importation of those goods that can be manufactured in Nigeria, and as well introduce a policy to curtail the importation.

Keywords: Poor Patronage, Made-in-Nigeria Product, Log-Linear Analysis, Relative Importance Index, Nigeria

INTRODUCTION

One of the problems in qualitative research is to analyze the observations obtained from questionnaire contained in two or more categorical variables and to ascertain if there is a significant relationship existing between the variables. Thus, log-linear analysis is such statistical tool that will help to analyze the qualitative data. Log-linear analysis is a statistical technique used for examining the relationship between two or more categorical variables that involves an analysis of the natural logarithms of frequency counts within a contingency table (Agresti, 1993; Bishop et al, 1975; Koehler, 1986), and it attempts to model significant association among the variables. Log-linear model is of two types: saturated and unsaturated, of which the saturated model fits the observed values (cell frequencies) perfectly (where almost all the expected

frequencies are equal to the observed frequencies). But the aim of every researcher is to obtain a model which do not fit the observations perfectly, but to obtain a parsimonious model which fits the observations with lower residuals. This paper aims at analyzing the factors that contribute to the low patronage of made-in-Nigeria product in Nigeria using the methodology of Log-linear model and relative importance index.

The economy of any nation grows rapidly when locally made goods are promoted through patronage by its people and then through export. A made-in-Nigeria product (goods or services) is a product that is produced locally in Nigeria, meaning that the product is not imported, and the as well the materials used for the production of such product were obtained locally (Uchechukwu, 2019). However, patronizing made-in-Nigeria products cannot be overemphasized for it is one of the major ways Nigeria can grow its economy. Perhaps, it is obvious that we have been helping other countries to grow their economies by over depending hugely on products manufactured in those countries, especially those products that have direct local substitutes. Thus this overdependence on other people's products has contributed to lack of jobs and however, increase the unemployment in the country.

The products choice by consumers in Nigeria and other developing countries centers mostly on foreign products especially those products that are manufactured from more advanced countries with high technological know-how (Agbonifoh & Elimimian, 1999) such as China, Germany, USA etc. According to Ifediora et al (2017), the preference of Nigeria and other developing countries is a problem that is known to be on culturally, economically, technologically, politically, and grossly psychologically motivated. However, this is the reasons why the Nigerian markets are dominated by products from more technological advanced countries with cheaper production costs and more competitive prices.

Thus, when it comes to making choice of products in the market by the consumers, there is always a great tendency that the consumer is faced with certain doubts about the products of interest, especially when the price tag on that product is very high. However, the amount of perceived risk varies with the amount of money the consumer is holding, the amount of uncertainty, and the amount of consumer self-confidence at the point of purchase. According to Sunday & Alex (2009), factors that affect the consumers to patronizing made-in-Nigeria products are of two types: Psychological factors (which consists of attitude, learning, perception, personality, and self-control), and Environmental factors (which consists of culture, family,

social class, group influence, economic circumstances, socialization, education, promotional communication and price relationship). While Isah & Aliyu (2017) posit that one of the major factors affecting the patronage of made-in-Nigeria goods is the ostentatious lifestyle of the average Nigeria, especially those in the elite class whose taste for imported goods is very high. Leon & Kanuk (2007) posit that economic factors such as product quality, price, and product availability, contribute to poor patronage of made-in-Nigeria goods. While a research by Agbonifoh (1995) on “Consumer preference for foreign products” showed that 93% of the respondents considered locally produced textiles inferior to the imported ones.

The Nigerian government has put more effort to address this issue of poor patronage of made-in-Nigeria products (which is one of the major problems that has bedeviled the effort of Nigeria towards developing her industrial sector). However, statistics showed that the gross domestic product (GDP) generated from locally made products decrease very rapidly. The low patronage of locally made products has shattered the hope of the common and average sized production companies locally. Nigerians engage more on imported goods and services more than locally made ones. Though, the Nigerian government has used some medium to check the discrimination against locally made goods, such as imposing a ban on indiscriminate importation of consumer goods, the problem has remained unsolved (Miebaka et al, 2017) and the consequence had been a decline in many local industries (both common and averaged sized).

In November 2021, the federal government flagged-off campaign in the southwest region of the country towards addressing the patronage of made-in-Nigeria products and services as part of activities marking the 13th National Council of Industry, Trade and Investment meeting in Ekiti state. According to the Minister for Industry, Trade and Investment, Adeniyi Adebayo, the campaign was a part of the Economic Recovery and Growth Plan (ERGP) strategy and National Economic Sustainability Programme (NESP) of the Federal Government to reposition the country’s economy (Ayodele, 2021).

MATERIALS AND METHODS

This paper focuses on the log-linear analysis of two-way contingency table (where we have two categorical variables of interest: Causes of poor patronage of made-in-Nigeria products in Nigeria and Responses) and also the application of Relative Importance Index.

Part A: Statistical Independence for 2-Way Contingency Table

In the two-way contingency table, we have two categorical variables X and Y , with respective levels (values) indexed as i and j . The independence takes into account possible row and column effects, but assumes that there no interaction. The joint probability π_{ij} of observations falling into a cell equal the product of the of the marginal probabilities $\pi_{ij} = \pi_{i+}\pi_{+j}$ for all $i = 1, \dots, I$ and $j = 1, \dots, J$

The frequency in the cell ij is given as μ_{ij} and is defined as

$$\mu_{ij} = n\pi_{ij} = n\pi_{i+}\pi_{+j} \quad (1)$$

However, we also have that

$$\sum_i \sum_j \mu_{ij} = n; \quad \sum_j \mu_{ij} = \mu_{i+} = n_{i+}; \quad \sum_i \mu_{ij} = \mu_{+j} = n_{+j} \quad (2)$$

where n is the sum of all the frequencies (counts), and each cell count (frequency) n_{ij} is assumed to be Poisson distributed, i.e., $n_{ij} \sim Pois(\mu_{ij})$

Log-Linear Model of Independence for 2-Way Contingency Table

In log-linear model, the response variable equals the counts and expected cell counts μ_{ij} , rather than cell probabilities π_{ij} . The log of the frequency (count) is in a linear relationship of X and Y in a finite number of ways, which can be obtained using log-linear modeling defined as

$$\log(\mu_{ij}) = \lambda + \lambda_i^X + \lambda_j^Y \quad (3)$$

where λ is the overall effect; λ_i^X is the main or marginal effect of the row variable X , and λ_j^Y is the main or marginal effect of the column variable Y

The estimated fitted values for the independence log-linear model is defined as

$$\hat{\mu}_{ij} = \frac{n_{i+}n_{+j}}{n} \quad (4)$$

The Goodness-of-fit Test of the selected log-linear model

This is done by either testing the model using the Likelihood ratio statistic or the Pearson Chi-square test statistic. The Likelihood ratio statistic is defined as

$$G^2 = 2 \sum_i \sum_j n_{ij} \log \left(\frac{n_{ij}}{\hat{\mu}_{ij}} \right) \quad (5)$$

The Pearson Chi-square test statistic is defined as

$$\chi^2 = \sum_i \sum_j \frac{(n_{ij} - \hat{\mu}_{ij})^2}{\hat{\mu}_{ij}} \quad (6)$$

The null hypothesis of independence: The model $\log(\mu_{ij}) = \lambda + \lambda_i^X + \lambda_j^Y$ holds.

The Likelihood ratio statistic G^2 is also distributed approximately as Chi-square test statistic under the same conditions needed for Pearson's statistic. As the expected frequencies approach infinity, G^2 and Pearson's statistic converge on each other and on the parametric Chi-square distribution.

Saturated Log-linear Model for 2-Way Table

Saturated log-linear model denoted as $[XY]$ takes into accounts $(\lambda, X, Y$ and $XY)$, and it is used to test the interaction effect XY when it is added to the model $[XY]$. Saturated log-linear model fits the data perfectly, that is, it gives a situation where the fitted values are exactly equal to the observe values. It has many unique parameters, and also a degree of freedom of 0 (that is $df = 0$). The Saturated log-linear model is the most complex model possible for a 2-way table.

$$\log(\mu_{ij}) = \lambda + \lambda_i^X + \lambda_j^Y + \lambda_{ij}^{XY} \quad (7)$$

where λ_{ij}^{XY} is the association between X and Y

The null hypothesis of Saturated log-linear model: $\lambda_{ij}^{XY} = 0$ for all i, j

Testing the Adequacy of the selected Log-Linear Model

The selected log-linear model is tested for adequacy using the Pearson residuals (e_{ijk}) or standardized Pearson residuals (r_{ijk}). A good log-linear model is characterized by small residual. Pearson residuals and standardized Pearson residuals are defined as

$$e_{ij} = \frac{n_{ij} - \hat{\mu}_{ij}}{\sqrt{\hat{\mu}_{ij}}} \quad \text{and} \quad r_{ij} = \frac{e_{ij}}{\sqrt{(1 - \hat{h}_{ij})}} \quad (8)$$

where h_{ij} equals the leverage of cell (ij) . An adequate log-linear model has an absolute standardized Pearson residuals $|r_{ij}|$ less than 3 (that is, $|r_{ij}| < 3$), and if the model holds, then $r_{ijk} \approx N(0,1)$.

Part B: Relative Important Index (RII)

Relative Important Index denoted as RII is used to determine the relative importance of quality factors or the variables involved. It is defined as

$$RII = \frac{\sum W}{AN} = \frac{kn_k + (k - 1)n_{k-1} + \dots + 2n_2 + 1n_1}{AN} \quad (9)$$

where W is the weighting given to each factor by the respondents ranging from 1 to k , A is the highest weight, N is the total number of respondents. This paper adopts five (5) categories of responses by the respondents. Base on this paper, the Relative Important Index is given as

$$RII = \frac{\sum W}{AN} = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1}{5N} \quad (10)$$

Relative Important Index helps us to identify which of the categories is considered the highest cause of insurgency in Nigeria. Relative Important Index lies between 0 and 1, i.e., ($0 \leq RII \leq 1$), however, closer to 1 among others, indicates the category with the highest effect on insurgency.

RESULTS AND DISCUSSION

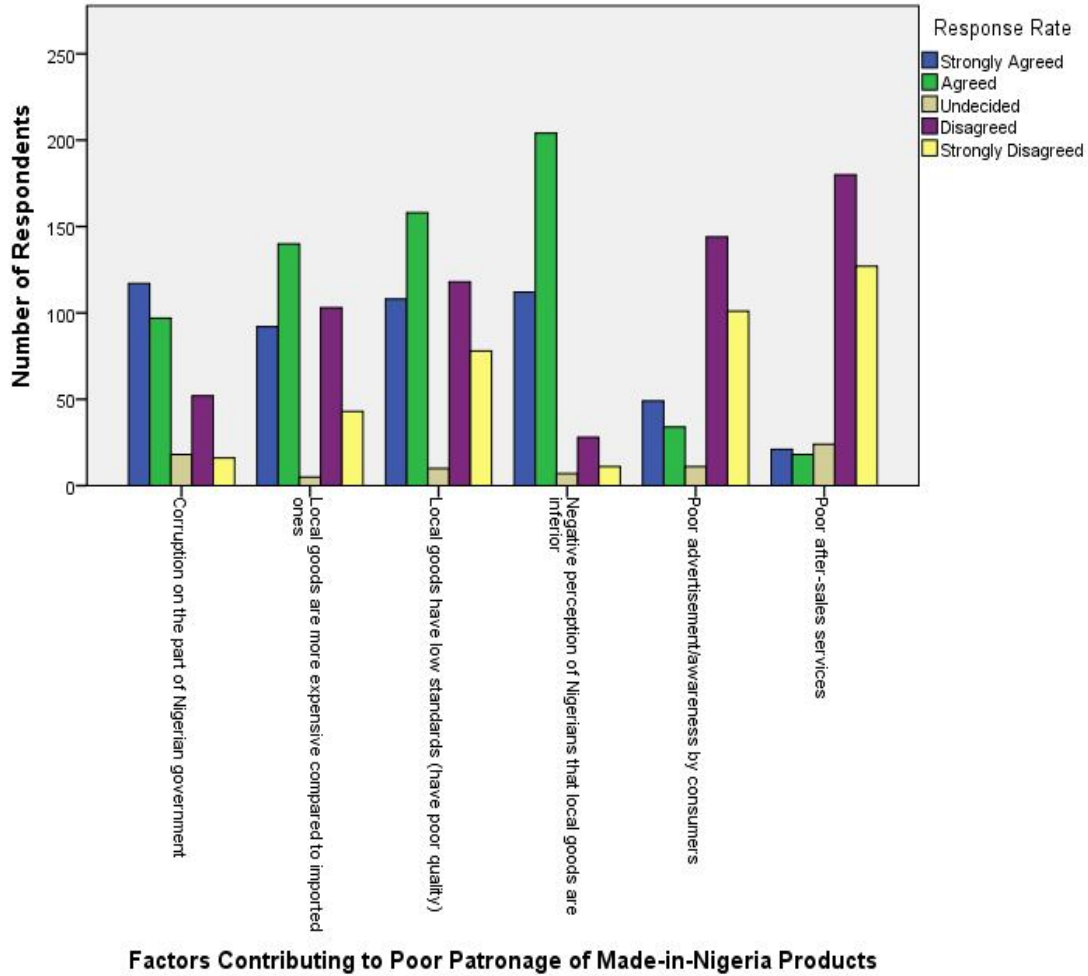


Figure 1. Bar Graph Showing the Factors that Contribute to the Poor Patronage of Made-in-Nigeria Products

Table 1. Goodness-of-fit Test from the Hierarchical Log-Linear Model

| Symbol | Model | df | G^2 | p-value | χ^2 | p-value |
|--------|--------------|------|---------|----------|----------|----------|
| X, Y | Independence | 20 | 737.986 | < 0.0001 | 671.202 | < 0.0001 |
| XY | Saturated | 0 | 0 | - | 0 | - |

X stands for “factors that contribute to the poor patronage of made-in-Nigeria product”

Y stands for “Response Rate”

In Table 1, the p-value of both the Likelihood ratio statistic G^2 and Pearson Chi-square test statistic χ^2 for the selected model (Independence Log-linear Model) are all less than 0.0001 (i.e., p-value < 0.0001). This implies that all the models selected are adequate for modeling the data.

The unsaturated model is used to estimate the number of respondents regarding the views towards the factors that contribute to the poor patronage of made-in-Nigeria product.

Table 2 shows the expected numbers of respondents using the independence log-linear model (X, Y) model, residuals, and the standardized Pearson residuals (r_{ij}).

Table 2. Computation of Residuals and Standard Residuals using the Independence Log-Linear Model from Hierarchical Model

| | | Cell Counts and Residuals | | | |
|--|--------------------|---------------------------|----------|--------------|----------------|
| Factors Contributing to Poor Patronage of Made-in-Nigeria Products | Response Rate | Observed | Expected | Residuals | Std. Residuals |
| | | Count | Count | (e_{ij}) | (r_{ij}) |
| Corruption on the part of Nigerian government | Strongly Agreed | 117.000 | 67.251 | 49.749 | 6.067 |
| | Agreed | 97.000 | 87.736 | 9.264 | .989 |
| | Undecided | 18.000 | 10.108 | 7.892 | 2.482 |
| | Disagreed | 52.000 | 84.232 | -32.232 | -3.512 |
| | Strongly Disagreed | 16.000 | 50.674 | -34.674 | -4.871 |
| Local goods are more expensive compared to imported ones | Strongly Agreed | 92.000 | 85.857 | 6.143 | .663 |
| | Agreed | 140.000 | 112.009 | 27.991 | 2.645 |
| | Undecided | 5.000 | 12.904 | -7.904 | -2.200 |
| | Disagreed | 103.000 | 107.536 | -4.536 | -.437 |
| | Strongly Disagreed | 43.000 | 64.694 | -21.694 | -2.697 |
| Local goods have low standards (have poor quality) | Strongly Agreed | 108.000 | 105.808 | 2.192 | .213 |
| | Agreed | 158.000 | 138.038 | 19.962 | 1.699 |
| | Undecided | 10.000 | 15.903 | -5.903 | -1.480 |
| | Disagreed | 118.000 | 132.525 | -14.525 | -1.262 |
| | Strongly Disagreed | 78.000 | 79.727 | -1.727 | -.193 |
| Negative perception of Nigerians that local goods are inferior | Strongly Agreed | 112.000 | 81.149 | 30.851 | 3.425 |
| | Agreed | 204.000 | 105.868 | 98.132 | 9.537 |
| | Undecided | 7.000 | 12.197 | -5.197 | -1.488 |
| | Disagreed | 28.000 | 101.640 | -73.640 | -7.304 |
| | Strongly Disagreed | 11.000 | 61.146 | -50.146 | -6.413 |
| Poor advertisement/awareness by consumers | Strongly Agreed | 49.000 | 75.993 | -26.993 | -3.096 |
| | Agreed | 34.000 | 99.142 | -65.142 | -6.542 |
| | Undecided | 11.000 | 11.422 | -.422 | -.125 |
| | Disagreed | 144.000 | 95.182 | 48.818 | 5.004 |
| | Strongly Disagreed | 101.000 | 57.261 | 43.739 | 5.780 |
| Poor after-sales services | Strongly Agreed | 21.000 | 82.942 | -61.942 | -6.801 |
| | Agreed | 18.000 | 108.208 | -90.208 | -8.672 |

| | | | | |
|--------------------|---------|---------|--------|-------|
| Undecided | 24.000 | 12.466 | 11.534 | 3.267 |
| Disagreed | 180.000 | 103.886 | 76.114 | 7.468 |
| Strongly Disagreed | 127.000 | 62.498 | 64.502 | 8.159 |

Table 3. Computation of Relative Importance Index of the Factors Contributing to Poor Patronage of Made-in-Nigeria Products

| Factors Contributing to Poor Patronage of Made-in-Nigeria Products | SA | A | U | D | SD | Total | RII | Rank |
|--|-----|-----|----|-----|-----|-------|----------|------|
| Corruption on the part of Nigerian government | 115 | 97 | 18 | 52 | 16 | 298 | 0.763087 | 2 |
| Local goods are more expensive compared to imported ones | 92 | 140 | 5 | 103 | 43 | 383 | 0.670496 | 3 |
| Local goods have low standards (have poor quality) | 108 | 158 | 10 | 118 | 78 | 472 | 0.642373 | 4 |
| Negative perception of Nigerians that local goods are inferior | 112 | 204 | 7 | 28 | 11 | 362 | 0.808840 | 1 |
| Poor advertisement/awareness by consumers | 49 | 34 | 11 | 144 | 101 | 339 | 0.473746 | 5 |
| Poor after-sales services | 21 | 18 | 24 | 180 | 127 | 370 | 0.397838 | 6 |

A stands for Agreed; SA stands for Strongly Agreed; D stands for Disagreed; SD stands for Strongly Disagreed; U stands for Undecided

Table 3 shows that “Negative perception of Nigerians that local goods are inferior” has the highest Relative Importance Index of 0.808840, implying that it contributes highly to the poor patronage of made-in-Nigeria products (goods) in Nigeria. This is followed by “Corruption on the part of Nigerian government”, which has a Relative Importance Index of 0.763087. Again another factor that contributes to poor patronage of made-in-Nigeria products is “Local goods (products) have low standard. While the factor “Poor after-sales services” has the least effect in the contribution to poor patronage of made-in-Nigeria products.

CONCLUSION

This paper aimed at modeling the factors that contribute to poor patronage of made-in-Nigeria products and to obtain that factor that has the highest contribution. The log-linear analysis and relative importance index were employed. The findings showed that the factor “Negative perception of Nigerians that local goods are inferior” is the major contribution to poor patronage

of made-in-Nigeria products, and that despite the government's intervention, patronage is still on the low, and many local manufacturing companies are shutting down.

We recommend that the Nigerian government should ban the importation of those products that can be manufactured in Nigeria, and it should come up with a policy that checkmate the importation. The government should grant free access to local manufacturing companies to Nigerian Television Authority (NTA) for proper advert of their brands.

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