

# Non-parametric study of the attitude of civil servants towards made-in-Nigeria goods (A Case Study of Owerri Urban, Imo State, Nigeria)

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**Abstract:** This study tends to analyze the attitude of civil servants towards made-in-Nigeria goods in Owerri Urban, Imo State. It is an attempt to provide a general picture of the level of acceptability of these goods and ways of raising their quality standards so as to increase demand. The analysis using the Chi-square test showed that the opinion of civil servants on the prices of made in Nigeria goods are independent of sex, educational attainment, level of income and various ages of the civil servants. The analysis using the non-parametric Friedman test revealed that there is at least a factor that is responsible for the low quality and less durability of made in Nigeria goods. The analysis using the non-parametric Kruskal Wallis test concluded that the suggested opinions are the ways of raising the quality standards of made in Nigeria goods so as to increase demand.

**Keywords:** Chi-Square Test, Friedman Test, Made in Nigeria Goods, Kruskal Wallis H-Test

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## 1. Introduction

Over fifty years should be a reasonable time for a nation like Nigeria to reflect on her past achievement. It is now a historical event to talk of petroleum era in our economy which when in existence, over-reliance on crude oil rendered our economy precariously fragile and vulnerable. The recent reduction in the world-wide demand for crude oil has so shaken our economy culminating in the adoption of stringent economic measures that have adversely affected all of us, both rich and poor.

The need has never been greater for us to strengthen our economy through diversification of our exports with consequent improvement in our balance of payments position. This is particularly important for a nation like ours that imports nearly all her needs. The maintenance of existing standard of living in the light of dwindling revenue from oil calls for a reduction in our import bills through intensification of local manufacture. If this is consciously and vigorously pursued, we will in the near future have our markets, shopping centers and homes, flooded with made-in-Nigeria goods.

Unfortunately, our taste for foreign products in this

country seems to have gone out of reasonable proportion.

This preference for imported goods arose partly from our colonial mentality and from the fact that we lack confidence in the commodities we produce. We are so indoctrinated by foreign businessmen to the extent that we lose sight of various opportunities on our finger tips.

Some Nigerians also assume quite wrongly that they are rich, more especially considering what they perceived as the oil boom. Consequently upon this, there is the tendency for them to look for what they wrongly brand as high quality imported materials since money is available. However, this wrong notion has been corrected by our public functionaries and policy makers.

For example, the information that Nigeria has to raise fund externally to meet the cost of the execution of some major projects must have to come to us as a rude shock and thus would make us dispel the notion that we are rich. Numerous advantages can be derived from buying home made goods. This idea will help in conserving out foreign exchange. The Central Bank of Nigeria's monthly report of August, 1977 estimated our external reserves at over three hundred thousand million naira at the end of June of that year. This shows a decline of over five hundred million naira in what we have in June 1976. But today, the country

is talking of borrowing from international financial bodies like the International Monetary Fund (IMF) to meet her needs, irrespective of the harsh and stringent conditionality, attached on the sum to be borrowed.

This is quite unfortunate, and we can assist the government in preserving our external reserves by importing less of consumer goods and putting more interest in home-made goods. If the degree of patronage for home-made goods increases, our local manufacturers will be encouraged to produce more goods, so as to meet increases in demands. This will of course, create an avenue for more work for Nigerians and also reduce the rate of unemployment.

Moreover, it will be unpatriotic if we should prefer imported goods to those made in our country. Even many of these imported goods have their own defects. Perhaps, we do not know that we all stand a better chance and have much to gain by taking active interest in patronizing goods made in Nigeria. The problem of scarcity and the poor quality of goods are being solved through standardization which the Nigerian Standard Organization (NSO) like all standard organizations the world over ensures that quality product standards are established to meet industry demands. We must do our nation proud by contributing our individual quotas towards the achievement of her economic objectives.

It is in realization of this that I decided to choose this topic and the ministerial civil servants in Owerri Urban to statistically study their attitude towards made-in-Nigeria goods with a view of arriving at a conclusion that will enable me make recommendations that is based on facts and figures.

The findings will in no small measure serve to help policy makers recognize the fact that the future of this country that is, our hope to attain self sufficiency and introduce resilience in our economy rests in our own hands. The task of helping solve our unemployment problems, the task of moving into the industrial age, the task of restoring our national pride as people capable of recreating the ingenuity of our fore-fathers as evidenced by the NOK culture and the Terra-Cottas, are ours to solve as is being adduced by opinions.

Increased travel and education as well as improvements in communications such as the global-spanning television networks and the internet have also contributed to a convergence of tastes and preferences in a number of product categories around the world. This has motivated consumers in developing countries to demand the same quality of goods available to their counterparts in developed countries (Saffu and Walker, 2006). With this increased globalization, it has become increasingly important to understand how consumers from different countries evaluate products of different origin.

Obviously, consumer perception toward countries, culture and their products keeps on changing therefore the issue is still interesting and important to academics and practitioners in the fields of international marketing and consumer behaviour (Josiasen and Herzing, 2008). In

addition, most studies have been conducted in large industrialized countries where a range of domestic alternatives or brands are available. The generalizability of findings to small developing countries, where there are no domestic brands or products in many product categories, is somewhat questionable. Yet, there are relatively few studies that have systematically investigated this phenomenon in developing countries in sub-saharan Africa and very little is known about consumer behaviour in this part of the world.

To help address this research gap, this study is undertaken to examine empirically consumer attitudes towards local and imported products in the Ghanaian market. As one of the only 7 emerging sub-saharan economies with a liberalised economy (Appiah-Adu and Blankson, 1998), Ghana was chosen as the context for this study because of the possible disproportionate trade imbalances that may result from the influx of foreign goods. Besides, Ghanaians came into contact with westerners and their products as far back as 1471 and it would also be interesting to know how such interaction might have influenced their product choice.

### **1.1. Statement of Problem**

Over the years, a lot of stigma has been attached to goods made in Nigeria. These range from near unstoppable allegation of poor quality to non-durability of Nigeria made goods as opposed to their foreign counterparts. These allegations virtually create doubts among potential buyers and even lead to obvious least acceptability of Nigeria-made-goods.

From the foregoing, Nigeria-made-goods have fallen victim to incessant low rating among potential customers (buyers). Some of these allegations are evidenced in the often repeated local parlance of "Is this original", is it foreign, which are attributes to non-acceptance of local made goods. Therefore, the manufacturers of these goods have had to parry blows with the monstrous creations and brain-washing of potential buyers in an attempt to fault them and prop-up the image of their products as high quality and durable ones.

### **1.2. Objectives of the Study**

The objectives of this study include;

1. To verify whether the opinion of civil servants on the factors that determine the prices of mad-in-Nigeria goods are independent of;
  - (i) Sex
  - (ii) Age
  - (iii) Educational attainment
  - (iv) Level of income
2. To verify whether there is significant difference between some of the factors that influence consumers' decision to buy made-in-Nigeria goods in preference to foreign goods and vice versa.
3. To suggest ways of raising the quality standards of Nigeria made goods so as to increase demand.

4. To draw conclusions and also make necessary recommendations from the findings.

### 1.3. Scope of the Study

This study covers all the ministerial civil servants of all categories in Owerri Urban. Though it was not possible to include all the civil servants in Owerri Urban in this study because of limitation in time and cost, the study was limited to only available civil servants in the ten existing ministries.

## 2. Literature Review

It has been established that consumers differentiate products from different origins, a phenomenon that has become known by both marketing academics and practitioners as the country-of-origin (COO) effect (Agrawal and Kamakura, 1999; Verlegh and Steenkamp, 1999; Bhaskaran and Sukumaran, 2007). As one of the most extensively researched topics in international marketing and consumer behaviour, a lot of studies have been conducted to ascertain whether country of origin affects products evaluations in many countries (see meta-analysis of some of such studies (Verlegh and Steenkamp, 1999; Bhaskaran and Sukumaran, 2007). However, the majority of these studies have focused on consumers in developed countries. These studies show that consumers in those countries tend to prefer products from developed countries to those from less developed countries (Wang and Lamb, 1983; Jaffe and Martinez, 1995). In particular, they tend to prefer products from their own countries first Canadian, German and Dutch respondents preferred TV set or car radios made in their own country first and foremost, followed by brands made in other developed countries and lastly those made in South Korea and Mexico. Invariably, consumers tend to prefer domestic products in countries where there is strong patriotism, national pride, or consumer ethnocentrism (Heslop and Papadopoulos, 1993).

In economically underdeveloped countries, preference for domestic products tends to be weaker (Cordell, 1992). For instance, consumers in the former socialist countries of eastern and central Europe prefer western to domestic products (Ettenson, 1993; Papadopoulos et al. 1990). Ettenson (1993) established that price was relatively less important than country of origin in Russian, Polish and Hungarian consumer purchase intentions for TV sets. Klenosky, Benet and Chadraba (1996) reported that Czech consumers preferred German cars and TV sets but not polish ones, to those made in the Czech Republic. Jaffe and Martinez (1995) found that Mexicans have a poor perception of domestic goods, rating American and Thailand household electronic products above Mexican-made brands. Upper-income earners in the same country have been identified to prefer foreign products (Almonte et al., 1995; Bailey and Gutierrez De Pineres, 1997). Jordan (1996) reported that there is a great demand for Western consumer goods among Indian consumers. In China,

manufacturer pass off local products as Western in a practice referred to as 'mao-yang' (Gilley, 1996). Even the current rapid economic growth has done little to change this western preference of Chinese people (Zhou and Hui, 2003). Kaynak, Kucukemiroglu and Hyder (2000) found that Bangladeshi consumers overwhelmingly preferred western made products, though there were differences in their perceptions across product classes as well as degree of suitability of sourcing countries. Khan and Bamber (2007) also found out that the elite segment of Pakistanis perceive COO image as one of the distinct attributes when making a purchasing decision. A study has also reported that Mexicans have a strong taste for foreign products.

In Africa, attempts have been made to examine this concept of country of origin effect in various spheres. For instance, in a study conducted in Nigeria by Agbonifoh and Elimimian (1999) and Okechukwu and Onyemah (1999), the results showed that products from the technologically more advanced countries were viewed more positively by nationals of developing countries, than those from the technologically less advanced counties. They found that situational personal characteristics, such as ethnocentrism and culture orientation, may influence COO preference in service evaluation. Mitgwe and Chikweche (2008) and Saffu and Walker (2006) have also examined the impact of country-of-origin effects and consumer attitudes towards buy local campaign initiatives. Basically, the attitudes of consumers in these studies to the buy locally-made campaigns can be characterized as protectionist, nationalistic and self-interest. In assessing the hiring preferences among organizations in one developing country, Carr et al. (2001) find that East Africans but not Western expatriates tend to be less preferred than fellow Tanzanians. The preceding empirical evidence, though not exhaustive, suggests that consumers in developing economies view products from their own country. Against this backdrop, this study was therefore designed to investigate the broad issues of the effects of country of origin image on consumers' perceptions of quality and of price and taste from the point of view of consumers in sub-saharan African country.

To establish a theoretical foundation for a study like this, a number of researchers have proposed measures or devised scales for measuring the country of origin image construct (Parameswara and Pisharodi, 1994; Roth and Romeo, 1992; Nebenzahl, Jaffe and Lampert, 1997). Parameswara and Pisharodi, (1994); Janda and Rao, (1997) proposed multi-dimensional measures of country of origin image while Roth and Romeo developed a unidimensional measure based on the innovativeness, design, prestige and workmanship of a country's products. In this study, country of origin image was measured following the Roth and Romeo approach, except that 'innovativeness' and 'design' were replaced with 'technological advancement' and 'quality', terms that have also been used in other studies (Cattin, Jolibert and Lohnes 1982; Han and Terpstra, 1988). This is because 'innovativeness' and 'technological

advancement' are comparable, but 'design' and 'quality' are not. The country-of-origin image is also defined in this study as how a product designed, manufactured, or branded in a developed country is perceived in a developing country.

Robert and Patrick (2009) carried out a research on the preference gap: Ghanaian consumers' attitudes toward local and imported products. The study was undertaken to examine empirically consumer attitudes towards local and imported products in a developing country market. A survey was conducted to elicit responses from a cross section of the Ghanaian community. The country of origin image in this study was measured following the Roth and Romeo approach. The results of this study suggested that country of origin is more important than price and other product attributes, the Ghanaian consumer holds the 'Made in Ghana' label in low regard relative to foreign labels, whilst superior quality and consumer taste are the 2 most important reason for the Ghanaian consumers' preference for foreign products. Limitations of the study are presented and suggestions for future research on country of origin effect and the consumer in developing countries are also discussed.

### 3. Methods of Analysis

The methods that shall be used in this paper are;

- Friedman Test
- Kruskal Wallis H-Test, and
- Chi- Square Test of Independence

#### 3.1. Friedman Test

Table 1a: Preference Data Layout

	Model 1	Model 2	...	Model c
Observation (Block) 1	R <sub>11</sub>	R <sub>12</sub>	...	R <sub>1c</sub>
Observation (block) 2	R <sub>21</sub>	R <sub>22</sub>	...	R <sub>2c</sub>
...	...	...	...	...
Observation (block) n	R <sub>n1</sub>	R <sub>n2</sub>	...	R <sub>nc</sub>
Total	R <sub>.1</sub>	R <sub>.2</sub>	...	R <sub>.c</sub>

It is obvious that the set of the *i*th row R<sub>i1</sub>, R<sub>i2</sub>, ... R<sub>ic</sub> is a permutation of the integers 1, 2, ... c for every *i* ∈ {1,2,...*n*} and the integers from 1 to c are assigned as rankings from the smallest distance to the largest for the competing models.

##### 3.1.1. The Null Hypothesis and the Test Statistic

The null hypothesis is that there is no winner in the competing models. If there is no winner in the competing models, then one can assign any permutation of 1, 2,... c equally likely as the ranks to the competing models. Hence, under the null hypothesis,

$$p(R_{ij} = K_1, R_{i2} = K_2, \dots, R_{ij} = K_j, \dots, R_{ic} = K_c) = \frac{1}{c!} \quad (1)$$

Where K<sub>1</sub>, K<sub>2</sub>, ... K<sub>c</sub> are any permutation of 1, 2, ..., c

for every *i* ∈ {1,2,...*n*} it follow from (1) that the marginal probability function of R<sub>ij</sub> is given by

$$p(R_{ij} = k_j) = \frac{1}{c} \quad (2)$$

Where *i* ∈ {1,2,...*n*}, *i* ∈ {1,2,...*c*} and *k<sub>i</sub>* ∈ {1,2,...*c*} . This result can be proven as follows: consider that the marginal probability function  $p(R_{ij} = k_j)$  is equal to the sum of all the probabilities  $p(R_{ij} = K_i, R_{12} = K_2, \dots, R_{ij} = K_i, \dots, R_{ic} = K_c)$  where K<sub>1</sub>, K<sub>2</sub>, ... K<sub>i</sub>, ... K<sub>c</sub> are any permutation of 1, 2, ... c under the condition that R<sub>ij</sub> is fixed as k<sub>j</sub>. If R<sub>ij</sub> is fixed as K<sub>j</sub>, then there are (c - 1)! Equally likely permutations for K<sub>1</sub>, K<sub>2</sub> ... K<sub>j</sub> ... K<sub>c</sub> then  $p(R_{ij} = K_i) = (c-1)! \frac{1}{c!} = \frac{1}{c}$ .

Notice that the conditional probability of the event R<sub>ij</sub> = K<sub>j</sub> under the condition of the event R<sub>ij2</sub> = K<sub>j2</sub> is given by:

$$p(R_{ij1} = K_{j1} | R_{ij2} = K_{j2}) = \frac{1}{c-1} \quad (3)$$

Where *j*<sub>1</sub> ≠ *j*<sub>2</sub> ∈ {1,2,...*c*}. The proof from (2) to (3) is similar to that from (1) to (2).

Theorem 1: let R<sub>1</sub> and u = (U<sub>1</sub>, U<sub>2</sub>, ... U<sub>c</sub>)<sub>1×c</sub> are defined

by  $R_j = \sum_{i=1}^n R_{ij}$  and

$$u^1 = \sqrt{\frac{12}{nc(c+1)} \left( R_1 - \frac{n(c+1)}{2} R_2 - \frac{n(c+1)}{2} \dots R_c - \frac{n(c+1)}{2} \right)}$$

respectively.

Then, E(U) = (0 0 ... 0)<sub>i×c</sub>.

Proof: Note that

$$E(R_j) = 1 \cdot \frac{1}{c} + 2 \cdot \frac{1}{2} + \dots + c \cdot \frac{1}{2} = \frac{c+1}{2} \quad (4)$$

By equation (2) furthermore, the expected of R<sub>j</sub> is given by

$$E(R_j) = E(R_{1j}) + E(R_{2j}) + \dots + E(R_{nj}) \quad (5)$$

As a consequence of (4) and (5), we have

$$E(R_j) = \frac{n(c+1)}{2} \quad (6)$$

where *j* ∈ {1,2,...*c*} . Thus, equation (6) completes the proof of theorem 1.

Theorem 2: Var(u) = 1  $\frac{1 \cdot 1'}{c}$  where I is c × c unit matrix

and 1 = (1 1 ... 1)<sub>1×c</sub>

Proof: Notice that

$$E(R_{ij}^2) = 1^2 \cdot \frac{1}{c} + 2^2 \cdot \frac{1}{2} + \dots + c^2 \cdot \frac{1}{c} = \frac{(c+1)(2c+1)}{6} \quad (7)$$

by equation (2), it follows from (4) and (7) that

$$Var(R_{ij}) = E(R_{ij}^2) - (E(R_{ij}))^2 = \frac{c^2 - 1}{12} \quad (8)$$

Since the observations (distances) are assumed independent of each other,  $Var(R_{ij})$  is:

$$Var(R_{ij}) = \frac{n(c^2 - 1)}{12} \quad (9)$$

On the other hand,

$$E(R_{ij_1}, R_{ij_2}) = \sum_{\ell_1 \neq \ell_2=1}^c \ell_1 \ell_2 \frac{1}{c} \cdot \frac{1}{c-1} \quad (10)$$

because

$$P(R_{ij_1} = \ell_1, R_{ij_2} = \ell_2) = P(R_{ij_1} = \ell_1) \cdot P(R_{ij_1} = \ell_1 / R_{ij_2} = \ell_2) = \frac{1}{c} \frac{1}{c-1}.$$

Notice that  $\sum_{\ell_1 \neq \ell_2}^c \ell_1 \ell_2 \left( \sum_{\ell=1}^c \ell \right)^2 - \sum_{\ell=1}^c \ell^2$ . Then, it follows from (10) and (4) that

$$Cov(R_{ij_1}, R_{ij_2}) = E(R_{ij_1}, R_{ij_2}) - E(R_{ij_1})E(R_{ij_2}) = \frac{c+1}{12} \quad (11)$$

Moreover, distances independency implies that:

$$Cov(R_{ij_1}, R_{ij_2}) = \frac{n(c+1)}{12} \quad (12)$$

By using definition of  $u$ ,  $Var(u)$  is give by

$$\frac{12}{c(c+1)} \cdot Var \left( \left( R_1 - \frac{n(c+1)}{2} \quad R_2 - \frac{n(c+1)}{2} \quad \dots \quad R_c - \frac{n(c+1)}{2} \right)' \right) \quad (13)$$

Substituting both (9) and (12) into (13) yields

$$Var(u) = \begin{pmatrix} 1 - \frac{1}{c} & -\frac{1}{c} & \dots & -\frac{1}{c} \\ -\frac{1}{c} & 1 - \frac{1}{c} & \dots & -\frac{1}{c} \\ \vdots & \vdots & \ddots & \vdots \\ -\frac{1}{c} & -\frac{1}{c} & \dots & 1 - \frac{1}{c} \end{pmatrix}_{c \times c} \quad (14)$$

This completes the proof of Theorem 2.

Lemma 1:  $\frac{R_j - E(R_j)}{\sqrt{Var(R_j)}} \sim N(0, 1)$  as  $n \rightarrow \infty$  for each

$j \in \{1, 2, \dots, c\}$ .

*Proof:* By equations (4) and (8), the components of  $R_j$  have finite means and finite variances. These conditions are sufficient (even if not necessary) for the central limits theorem (Dudewicz and Mishra, 1988). This completes the proof of Lemma 1.

Now, we can introduce the test statistic for testing the null hypothesis. To do this, consider the following

quadratic form  $Q = u' \left( I - \frac{11'}{c} \right) u$ . It is possible to show that

this quadratic form is equivalent to the Friedman statistic, and it is appropriate for testing the null hypothesis. To show this, first the following lemma is presented.

*Lemma 2:*  $I'u = 0$ .

*Proof:* Notice that  $\sum_{j=1}^c R_j = \frac{nc(c+1)}{2}$ . On the other hand,  $I'u$  can be shown to be equal to

$$\sqrt{\frac{12}{nc(c+1)}} \cdot \left( \sum_{j=1}^c R_j - \frac{nc(c+1)}{2} \right).$$

Therefore, substituting the former into the latter completes the proof of Lemma 2.

Hence, as a result of Lemma 2,  $Q$  can be rewritten as follows:

$$Q = u'u \quad (15)$$

and its distribution is provided in following theorem.

*Theorem 3:*  $Q \sim \chi_{c-1}^2$  as  $n \rightarrow \infty$ .

*Proof:* Since  $I - \frac{11'}{c}$  is an idempotent matrix, its eigenvalues ( $\lambda_i$ 's) are equal to either 0 or 1 with the number of 1's is equal to its trace, which is  $c - 1$ . Hence,

$$P \left( I - \frac{11'}{c} \right) P = \text{Diag}(1 \quad 1 \quad \dots \quad 0) = \text{Diag}(\lambda_i) \quad (16)$$

where  $P_{c \times c}$  is an orthogonal matrix with  $PP' = PP' = I$  and  $\text{Diag}(\lambda_i)$  is a  $(c \times c)$  - dimensional diagonal matrix. Therefore, it follows that

$$\left( I - \frac{11'}{c} \right) = P \text{Diag}(\lambda_i) P' \quad (17)$$

In addition, let  $v = (V_1 \quad V_2 \quad \dots \quad V_c)'_{\text{bc}}$  be defined by  $v = P'u$ . By using equation (6), one can obtain  $E(v) = (0 \quad 0 \quad \dots \quad 0)'$ . Similarly,  $Var(v) = \text{Diag}(\lambda_i)$  can be derived from Equation (16). Hence  $V_1, V_2, \dots, V_{c-1}$  are standardized random variables since their mean values are equal to 0 and their variances are equal to 1. In addition, the degenerate random variable  $Z_c = 0$  since both its mean value and variance are all equal to 0. Further,  $Var(v)$  also denotes that the covariance between any pair of  $V_1, V_2, \dots, V_{c-1}$  is equal to 0 while  $V_1, V_2, \dots, V_{c-1}$  have limiting  $N(0, 1)$  distribution by virtue of both Lemma 1 and the definition of  $v = P'u$ . These conclusions imply that  $V_1, V_2, \dots, V_{c-1}$  are mutually independent when  $n \rightarrow \infty$ . Hence, by the definition of  $Q$  given in (15) can be written as

$$Q = u'u = v'PP'v = v'v = V_1^2 + V_2^2 + \dots + V_{c-1}^2 \quad (18)$$

On the other hand, since  $V_1, V_2, \dots, V_{c-1} \sim N(0, 1)$  and mutually independent as  $n \rightarrow \infty$ ,  $Q$  has a limiting chi-square distribution with  $c - 1$  degrees of freedom, which

completes the proof of Theorem 3.

Notice that by equation (15),  $Q$  is shown to be equivalent to the following

$$Q = \frac{12}{nc(c+1)} \cdot \sum_{j=1}^c \left( R_j - \frac{nc(c+1)}{2} \right)^2 = \frac{12}{nc(c+1)} \cdot \sum_{j=1}^c R_j^2 - 3n(c+1) \quad (19)$$

The statistic given in equation (19) is obviously the Friedman statistic having a limiting chi-square distribution with  $c - 1$  degrees of freedom as proven in Theorem 3. Therefore, the rules of testing hypothesis when  $n$  is large is given by

Reject  $H_0$  if  $Q > \chi_{c-1, \alpha}^2$ : otherwise do not reject, where  $\alpha$  is the first type error and  $\chi_{c-1, \alpha}^2$  is the upper  $\alpha$  percentile point of a chi-square distribution with  $c - 1$  degrees of freedom. Notice that rejecting the null hypothesis based on the above rule requires rejecting validity of equation given in (1), which implies that at least some of the competing models have better prediction performances than the others have. To discover the 'great' winner of all the completing models, the above procedure should be repeated by eliminating the 'weakest' model, to which the largest rank mostly assigned.

### 3.1.2. Chi-Square Test of Independence

The Chi-square test for independence is used to know whether or not two criteria of classifications are independent of each other (Nwachukwu, 2008). Contingency tables are tables with cells corresponding to cross classifications of attributes or events. Thus, the hypotheses are:

$H_0$ : The two criteria of classification are independent.

$H_1$ : They are not independent.

Chi-square test, according to Nwobi (2003), is used for testing hypothesis of independence or association of variables in a contingency table, about multinomial variables and goodness of fit test. The contingency table is a two-way classification table, which is arranged in rows and columns.

The test statistic is given as,

$$\chi_{cal}^2 = \sum_{i=1}^r \sum_{j=1}^c \frac{(O_{ij} - e_{ij})^2}{e_{ij}} \quad (20)$$

with  $v = (r - 1)(c - 1)$  degrees of freedom; where

$r$  = number of rows;

$c$  = number of columns;

$O_{ij}$  = the observed frequency of the  $ij$ th cell;

$e_{ij}$  = the expected frequency of the  $ij$ th cell, and is given as,

$$e_{ij} = \frac{R_i \times C_j}{N} \quad (21)$$

where  $R_i$  =  $i$ th Row's marginal frequency;

$C_j$  =  $j$ th column's marginal frequency;

$N$  = the grand total

The decision rule is to reject  $H_0$ , using the level of significance ( $\alpha = 5\%$ ) if  $\chi_{cal}^2 \geq \chi_{tab}^2$ . Where  $\chi_{tab}^2$  the chi-square is tabulated which is read from the chi-square table (Nwobi and Nduka, 1998).

### 3.1.3. Assumptions Adopted in Chi-Square Test

The following are assumptions adopted in chi-square test according to Nwobi (2003).

- All expected frequencies are at least one (1)
- At most 20% of the expected frequencies are less than five (5).

### 3.1.4. Kruskal-Wallis Test

The Kruskal-Wallis Test may be described thus:

Suppose that we have  $k$  samples of sizes  $N_1, N_2, \dots, N_k$ , with the total size of all samples taken together being given by  $N = N_1 + N_2 + \dots + N_k$ .

Assuming again that the data from all the samples taken together are ranked, and that the sums of the ranks for the  $k$  samples are  $R_1, R_2, \dots, R_k$ , and if we define the statistic as in equation (23) then it can be shown that the sampling distribution of  $H$  is very nearly a chi-square distribution with  $k - 1$  degrees of freedom, provided  $N_1, N_2, \dots, N_k$  are all at least 5.

Consider the sampling scheme where  $n$  integers are selected at random, without replacement, from the first  $N$  integers, 1 to  $N$ . Let  $X_i$  be the  $i$ th integer selected, and let

$$T_n = X_1 + X_2 + \dots + X_n \quad (22)$$

be the sum of the integers selected. Thus, the test statistic is given as

$$\therefore T = H = \frac{12}{N(N+1)} \sum_{i=1}^k \frac{R_i^2}{n_i} - 3(N+1) \quad (23)$$

### 3.1.5. Source of Data

This survey is carried out in Owerri capital of Imo State. The primary data collected were from civil servants in the ten selected Ministries in Owerri urban.

### 3.2. Sample Frame

The frame for this study was obtained from the manpower section of the State Cabinet Office. The population distribution of these civil servants is shown in the table below:

**Table 1b.** The Distribution of Civil Servants in Owerri Urban by Ministries and Sex.

Ministry	Male	Female	Total
Agriculture and Natural Resources	1038	149	1187
Finance and Economic Planning	543	163	706
Education	423	130	553
Health	291	112	403

Ministry	Male	Female	Total
Information, Culture, Youth and Sports	649	107	756
Justice	149	34	183
Works, Transport and Public Utilities	1279	138	1417
Local Government	338	102	440
Lands, Survey and Urban Planning	349	26	375
Commerce and Industries	457	72	529
Total	5516	1033	6549

### 3.2.1. Pilot Survey

This is a miniature of the main survey. The aim was to test for the effectiveness of the questions contained in the questionnaire, besides this pilot survey also aimed at finding out which questions should be removed and which should be retained.

The returns revealed that the questions were not misinterpreted in any form. This gave me a firm base to take off with the main survey. I used 70 questionnaires and five ministries for this survey. The ministries are:

- Agriculture and Natural Resources
- Lands, Survey and Urban Planning
- Education
- Information, Culture, Youth and Sports
- Finance and Economic Planning.

The allocation of the 70 questionnaires to the stratified ministries was by proportional allocation to size, using the Neyman formula;

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

where

$n$  = Total sample size for the pilot survey

$n_h$  = Number of questionnaires for each stratum (Ministry)

$N_h$  = Total population in each ministry

$N$  = Overall population for the five ministries

$h$  = Number of strata used ( $H = 1, 2, 3, 4, 5$ ).

The allocation is shown below

**Table 2.** Allocation of Questionnaires

Ministry	No of Questionnaires
Agriculture and Natural Resources	23
Lands, Survey and Urban Planning	7
Education	11
Information, Culture, Youth and Sports	15
Finance and Economic Planning	14
Total	70

### 3.2.2. Returns of the Pilot Survey

**Table 3.** The Allocation of Questionnaires and Corresponding Valid Returns from the Ministries.

Ministry	No of Questionnaires allocated	Valid Returns of Questionnaire
Agriculture and Natural Resources	23	10
Lands, Survey and Urban Planning	7	7
Education	11	9
Information, Culture, Youth and Sports	15	10
Finance and Economic Planning	14	9
Total	70	45

Using the valid returns as individual observation denoted by

$X_i$ , the sample variance estimate,

$S^2$ , was calculated thus

$$S^2 = \frac{n\sum X_i^2 - (\sum X)^2}{n(n-1)}$$

$$S^2 = 1.5 \text{ and } S = 1.2$$

### 3.2.3. Determination of Sample Size

The sample variance computed from the pilot survey was then used to determine the appropriate sample size for the main survey.

At 5% level of significance ( $\alpha$ ) and allowable error of prediction ( $\ell$ ), of 0.1, the size of sample was obtained.

Hence the sample size  $n$ , for the main survey is 557, and this is the least value for which the whole population of civil servants in the ten ministries should be truly represented.

Reference to the result of the pilot survey some non-responses should be anticipated. To take care of this, the sample size was increased to 580 to enable us have increase in accuracy. In effect 580 questionnaires were printed and distributed randomly to the civil servants. The 580 questionnaires were hand delivered to the civil servants in their ministries using the proportional allocation method as shown in the table below:

**Table 4.** Proportional Allocation of Questionnaires

Ministry	No of Questionnaires allocated
Agriculture and Natural Resources	105
Finance and Economic Planning	63
Education	49
Health	36
Information, Culture, Youth and Sports	67
Justice	16
Works, Transport and Public Utilities	125

Ministry	No of Questionnaires allocated
Local Government	39
Lands, Survey and Urban Planning	32
Commerce and Industries	47
Total	580

### 3.3. Methods Used in Distributing Questionnaires for the Main Survey

The stratified random sampling technique was used here. A comprehensive list of civil servants obtained from the payroll section, was stratified into ministries as the different strata, was stratified into ministries as the different strata, thus making the ministries homogenous. Then, the entire population was numbered serially and a table of random numbers was used in selecting each sample from the population.

To those selected, questionnaires were given to them for completion on the survey. It is also pertinent to note that, after taking due proportion of civil servants according to ministries, a total of 557 civil servants were selected randomly from the different ministries.

### 3.4. Reasons for Stratification

The reasons for choosing this method of sampling technique are as follows:

- It gives a higher precision.
- It eliminates differences between strata from the sampling error.
- Inferences got from this method of sampling are usually good and reliable as to when the whole population is used.

### 3.5. Result of the Main Survey

The table below shows the valid returns recorded in the main survey from each ministry

**Table 5: Valid Returns from Each Ministry**

Ministry	Population	Allocation to Ministries	Valid Returns
Agriculture and Natural Resources	1187	105	94
Finance and Economic Planning	706	63	53
Education	553	49	46
Health	403	36	27
Information, Culture, Youth and Sports	756	67	55
Justice	183	16	14
Works, Transport and Public Utilities	1417	125	119
Local Government	440	39	26
Lands, Survey and Urban Planning	375	33	29
Commerce and Industries	529	47	40
Total	6549	580	503

The table below shows the distribution of civil servants in Owerri Urban by sex and salary grade (Low, Middle and High) of income earn, 01 – 06, 07 – 12 and 13 – 16 grade levels for Low, Middle and High income earners respectively for the valid returns got from the main survey.

**Table 6. Distribution of Civil Servants in their Status and Gender**

Ministry	Low		Middle		High		Total
	M	F	M	F	M	F	
Agriculture and Natural Resources	60	18	8	5	2	1	94
Finance and Economic Planning	33	9	4	5	1	1	53
Education	13	14	10	4	4	1	46
Health	15	3	7	1	0	1	27
Information, Culture, Youth and Sports	38	11	6	0	0	0	55
Justice	3	4	3	3	0	1	14
Works, Transport and Public Utilities	76	29	4	6	4	2	119
Local Government	5	5	7	4	5	1	26
Lands, Survey and Urban Planning	6	8	9	3	3	0	29
Commerce and Industries	12	20	2	5	1	0	40
Total	263	121	50	46	20	8	503

#### 3.6.1. The Problem of Data Collection

This study may not be completed if I fail to mention the problem I encountered during data collection. The first is the task of obtaining an up to date population of civil servants in Owerri Urban.

Secondly, the problems of refusals and lost of questionnaires by the respondents. Some refused for fear of being exposed. All these accounted to non-response which lowered the number of valid returns.

Lastly, some respondents completed the questionnaires wrongly. Take the case of a respondent who chose that he/she buys home made goods only, but comes to the follow up question to complete the reason for a respondents purchase for foreign made goods.

Furthermore, some others refuse to recognize the need for order of preferences in choice making. All these rendered some of the questionnaires invalidated.

#### 3.6.2. Solution to Non-Response Problem

To solve this problem, I embarked on a follow up survey in which case, I applied the replacement method recommended by Konijin, (1973) to increase response. And after this follow-up exercise, the number of valid returns increased from 478 to the present figure of 503.

### 3.7. Method of Analysis

#### 3.7.1. Test Involving the Use of Chi-Square Distribution

The chi-square distribution method of analysis of data



was used in this chapter to determine whether “The opinion of civil servants on the prices of Nigerian made goods” is dependent on:

- i. Sex
- ii. Educational attainment
- iii. Income
- iv. Age

### 3.8. Classification of Civil Servants Opinion on Nigerian Made Goods by Sex

It is our interest in this section to consider whether civil servants opinions are independent of their sex.

The ( $r \times c$ ) contingency table is used. This is given below in Table 7

**Table 7:** Contingency Table of Civil Servants Opinions

Sex	Opinion				Total
	A	B	C	D	
Male	67 (65.46)	82 (84.25)	76 (74.53)	101 (101.75)	326
Female	34 (35.54)	48 (45.75)	39 (40.47)	56 (55.25)	177
Total	101	130	115	157	503

The values in bracket are the expected frequencies obtained using the formula and the other observed frequencies.

### 3.9. Setting of Hypothesis

- $H_0$  : Opinion of civil servants are independent of sex.  
 $H_1$  : Opinion of civil servants are not independent of sex.

### 3.10. Level of Significance

This is the error allowance and it is denoted by  $\alpha$  which equals 0.05.

For 0.05, (0.05, 3) = 7.81

### 3.11. Decision Rule

Reject the null hypothesis ( $H_0$ ) if  $\chi_c^2 > \chi_{(0.05,3)}^2$  otherwise do not reject  $H_0$ .

## 4. Conclusion

Since  $\chi_c^2 = 0.3718 < \chi_{(0.05,3)}^2 = 7.81$  we do not reject  $H_0$  and conclude that, the opinion of civil servants towards made-in-Nigeria goods is independent of sex.

### 4.1. Educational Attainment and Opinion on Made-In-Nigeria Goods

The distribution of civil servants by opinion and educational attainment:

**Table 8:** Distribution of Civil Servants by Opinion and Educational Attainment

Educational Attainment	Opinion				Total
	A	B	C	D	
None	1	2	1	3	7
Primary	9	13	7	22	51
Secondary	57	92	78	120	347
Tertiary	14	29	21	34	98
Total	81	136	107	179	503

### 4.2. Data Analysis

The statistical techniques discussed in this paper shall be used to carry out the analysis.

#### 4.2.1. Hypothesis I

- $H_0$ : Opinion of Civil servants is independent of sex.  
 $H_1$ : Opinion of Civil servants is out independent of sex.

Using the MINITAB software package for data in Table 1, we have p-value = 0.946 since p-value = 0.946 > 0.05, we do not reject  $H_0$  and conclude that the opinion of civil servants towards made-in-Nigeria goods are independent of sex.

#### 4.2.2. Hypotheses II

$H_0$ : Opinion of Civil servants is independent of educational attainment.

$H_1$ : Opinion of Civil servants is not independent of educational attainment.

Using Table 2 for the analysis, p-value = 0.944. Since p-value = 0.944 > 0.05, we do not reject  $H_0$  and conclude that opinion of Civil servant is independent of educational attainment.

#### 4.2.3. Hypotheses III

The null and alternative hypotheses are

- $H_0$ : Opinion of Civil servant is independent of income.  
 $H_1$ : Opinion of Civil servant is not independent of income.

Table 3 was used for the analysis using MINITAB 15.0, and it was observed that p-value = 0.07.

Since p-value = 0.07 > 0.05, we do not reject  $H_0$  and conclude that the opinion of civil servant is highly independent of income.

#### 4.2.4. Hypothesis IV

$H_0$ : The opinion of civil servants on their attitude towards made-in-Nigeria goods is independent of age.

$H_1$ : The opinion of Civil servants on their attitudes towards made-in-Nigeria goods is not independent of age.

The analysis using Table 4 shows that p-value = 0.571. Since p-value = 0.571 > 0.05, we do not reject the null hypothesis which says that the opinions of civil servants on their attitude towards made-in-Nigeria good are independent of their ages, and hence concluded that the opinions of civil servants are independent of their ages.

Test involving the Non-parametric Kruskal-Wallis H-Test.

Because the assumptions in the parametric test failed, it becomes necessary to adopt the non-parametric equivalent.

#### 4.2.5. Hypothesis V

The null and alternative hypotheses are

$H_0$ : There is no way of raising the quality standards of made-in-Nigeria goods so as to increase demand.

$H_1$ : There is a way of raising the quality standard of made in Nigeria goods so as to increase demand.

From Table 5, using MINITAB software, p-value is 0.024.

Since  $p\text{-value} = 0.024 < 0.05$ , we reject  $H_0$  and conclude that the suggested opinions are the ways of raising the quality standards of made in Nigeria goods so as to increase demand.

#### 4.2.6. Test Involving the Non-Parametric Friedman F-Test

It is reasonable to adopt the Friedman test here since the parametric assumptions in the RCBD failed. Thus, the null and alternative hypotheses are:

##### Hypotheses VI

$H_0$ : There are no factors responsible for low quality and less durability of made in Nigeria goods.

$H_1$ : There is at least a factor responsible for low quality and less durability of made in Nigeria goods.

From Table 6, p-value for the Friedman test statistic is 0.00. This mean that  $H_0$  is rejected since  $p\text{-value} = 0.00 < 0.05$ , and we conclude that there is at least a factor that is responsible for the low quality and less durability of made in Nigeria goods.

## 5. Conclusion

This research work talks about an assessment of the opinion of civil servants in Owerri Urban towards made in Nigeria goods. It is an attempt to provide a general picture of the level of acceptability of these goods and ways of raising their quality standards so as to increase demand.

The analysis using the Chi-square test showed that the opinion of civil servants on the prices of made in Nigeria goods are independent of sex, educational attainment, level of income and various ages of the civil servants.

The analysis using the non-parametric Friedman test revealed that that there is at least a factor that is responsible for the low quality and less durability of made in Nigeria goods.

The analysis using the Non-parametric Kruskal Wallis test concluded that the suggested opinions are the ways of raising the quality standards of made in Nigeria goods so as to increase demand.

## Recommendation

Having carried out this study to this extent, the following recommendations are made;

(a) Government should ban the importation of foreign

made products if the Nigerian market can be satisfied by existing local manufactures.

- (b) The ban on the importation of these products should be followed with a ban on their consumption.
- (c) Where a product is banned for reasons in (a) above, government should ensure that restrictive business practices do not develop within that industry. In particular, there should be no collusion on pricing, zoning of markets, or artificial barriers to entry of new firms.
- (d) Government should lead the way in patronizing locally made goods. In particular, government should always patronize the products of government owned enterprises. Corrupt public officials should not be allowed to find ways to buy from other suppliers in order to obtain kick-backs.
- (e) Nigerian industrialists should show good example by buying from one another where feasible. They should also learn to develop pride in the quality of their products. A well-equipped quality control unit should be created in every medium-scale organization.
- (f) The Nigerian Standard Organization (NSO) should intensify efforts to prescribe and enforce minimum standards for our local products.
- (g) Provisions should be made for adequate capital, management expertise to give loans, overdrafts and also do thorough research respectively. This will be achieved by setting up investment banks, merchant banks, and research centers and so on.

Therefore, if the above mentioned, among other recommendations are judiciously implemented by both the manufacturers and the government, it will go a long way in ensuring more patronage of Nigerian made goods.

## Questionnaire

### (For Consumers (Civil Servants))

#### Instructions

Please read the questions carefully and on your own fill in the space provided or mark an 'x' where appropriate.

1. Name (optional): .....
2. Sex: Male ☐ Female ☐
3. Date of Birth (Age): .....
4. Marital Status: Single ☐ Married ☐  
Widowed ☐ Divorced ☐ Separated ☐
5. Educational attainment: None ☐ Primary School ☐  
☐ Secondary school ☐ Tertiary ☐
6. Ministry you are working in: .....
7. Rank/Post Held: .....
8. Please state your salary grade level: .....
9. How much of your monthly salary do you pay as tax? ☐
10. What type of goods do you usually prefer to buy in the market? (Assuming both is available)  
(a). Local ☐ (b). Foreign ☐

11. What factors influence your behaviour towards leading to buy local or foreign goods?

s/n	Local Goods	Opinion		
		Yes	No	Undecided
i.	There is pride in buying goods made in my country			
ii.	The goods are always available			
iii.	The prices are cheaper than that of their foreign counterparts			
iv.	To respect government order on the need for citizens to patronize producers of home made goods			
v.	This is a habit that has long been formed.			

s/n	Local Goods	Opinion		
		Yes	No	Undecided
i.	Early orientation about superiority of foreign made goods			
ii.	Local made goods are of low quality and less durable			
iii.	Special features and line of foreign goods			
iv.	The respect got from buying ostentatious goods			
v.	Satisfaction and utilization derived are commensurate to money spent on foreign goods			

12(a) Do you subscribe to the view that Nigerian made goods are of low quality and less durable?

(i) Yes ☐ (ii). No ☐

12(b) If yes to (12(a) above, why do you think this is so?

(i) Manufacturers refuse to make high quality one ☐

(ii) Producers think Nigerians can buy anything if they are cheap. ☐

(iii) Refusal to adapt to Nigerian Standard Organization (NSO) standard ☐

(iv) Inadequate capital, management expertise to do thorough research ☐

(v) Goods are not test marketed before offered for sale ☐

13. Kindly tick in the boxes provided which or a combination of the following factors that determine the prices of home made goods.

s/n		Agree	Disagree
i.	High production cost		
ii.	Engagement to get quick returns on investment in short time by procedures		
iii.	High ambition to get rich quick		
iv.	Lack of infrastructural facilities like machines, manpower to help reduce cost		

14. How do you describe the type of goods you desire to buy (Tick the most appropriate)

(i) High quality goods ☐

(ii) Prestige goods ☐

(iii) Unique goods ☐

(iv) Low profile goods ☐

(v) Others ☐

15. Is there poor patronage for made-in-Nigeria Goods?

(a). Yes ☐ (b). No ☐

16(a) Would innovations in the manufactures of local made goods make you change your attitude to buying home made goods

(a). Yes ☐ (b) No ☐

16(b) If yes to question (16(a) above, rank in order of preference, the under listed points you may consider necessary for raising the quality standard of Nigeria made goods so as to increase demand

s/n		A	B	C	D	E
i.	Government subsidy to produce of home made goods					
ii.	Imposition of tariffs on foreign made goods					
iii.	Reduction or even complete ban on importation					
iv.	Distribution home made goods across the Nigerian boarders for them to stand the tests of foreign competition					
v.	Welcoming pieces of advice commendations, and even criticisms from individuals, groups and other bodies from both within and outside the country.					

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