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# Cost Implication of Packaging and Labeling on Profitability of Bakery Firms in Ebonyi State, Nigeria

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**Abstract**
The food processing industry and their distributors are presently facing extra challenges and demands on how to provide the variety of foods that are expected from them by the consumers and still strive to remain profitable. The study aims to ascertain the cost effect of packaging and labeling on the profitability of bakery firms in Ebonyi State, Nigeria. The study adopted an ex-post facto research design. The data used was mainly time series data which are quantitative in nature and the ten year-data generated for the study was analyzed using multiple regressions. The Microsoft Excel spreadsheet was used to transform the data into its usable format for analyses and the Statistical Package for Social Sciences (SPSS) was employed for data analysis at 5% level of significance. The findings, however, revealed that the cost of packaging and labeling has no significant effect on the profitability of bakery firms in Ebonyi State, Nigeria. Notwithstanding the potential for packaging to successfully achieve marketing goals in bakery, it is recommended that managers should be mindful of the percentage of their operating costs that goes into packaging in order not to affect their profits negatively.
**Keywords:** Bakery, Packaging, Labeling, Profitability,

## 1.0 INTRODUCTION

The principal function of food packaging in tropical and other environment is to protect food products against contamination and from all types of deteriorative agents during the useful life of the products. Tropical environments are unique, in having exceptionally high relative humidity, and high usually fluctuating ambient temperature, both of which encourage the growth and activities of microorganisms and insects, and accelerate physical deterioration of foods.

The word 'packaging' has plethora of definitions and range from being simple and functionally focused to more extensive, holistic interpretations. Packaging is an extrinsic element of the product - a characteristic that has close relation to the product even though it does not form a constituent of the physical product itself. Packaging can be seen as:

> the container for a product – encompassing the physical appearance of the container and including the design, color, shape, labeling and materials used" (Arens, 1996 in Louw and Kimber, 2007:2).

Packaging design has been developed as a result of the different types of products as the consumers have more choice to the products. Some of the products are alike in terms of quality and quantity, but what differentiates them among the other is their packaging design. Consumer cannot taste or see the product, but they can see the packaging directly and then make a decision. That is the reason why packaging is one important factor that affects the consumer decision on product preference (Natadjaja, 2003).

In considering packages for foods in tropical and sub-tropical regions, Okaka (2009) suggests that special attention must be paid to the peculiar environment and economic situations of persons living in each area. Price is often an important determinant of the ultimate choice of a food packaging systems for foods in especially developing countries where the average income of the consumer is quite low. It is theoretically possible to in generally formulate alternative packaging systems for any food product based on the knowledge of composition and stability characteristics of the product and the properties of available packaging materials. There is always the need to match the packaging to the product and the rationale for doing this is fundamental to the study of food packages for fresh and processed plant perishable foods. However, the ultimate choice of a suitable package is much more a function of availability of alternative packages and the cost.

All pre-packed and many non-pre-packed bakery products must show the name of the product on the label. Some baked products have trade names whereas others have a descriptive name. The name must be precise enough to distinguish it from other products. Most baked products have the ingredients listed in descending order of weight. Water is not always included because it is often considered an integral part of the food, unless it falls within the constraints of legislation. If added water takes up five percent or more of the finished product, it must be listed with the other ingredients. There has been a recent trend towards listing water as aqua, presumably to take it sounds less ordinary (Webster-Gandy, 2000).

Packaging materials offer considerable area and assistance for innovation. For the fact that materials constitutes a greater proportion of cost of packaging, they provide a viable ground for equipment producers

 

interested in competitive edge over others. The focus on reducing the level of materials consumption enables the bakery firms to compete successfully on the basis of sustainability. Reduction in the use of packaging materials and ameliorating packaging waste also reflect the aims of the regulatory measures in existence in industrialized nations.

Packaging plays an important role in the marketing of bakery products. The right packaging can help a bakery firm carve a unique position in the marketplace and in the minds on consumers. In bakery firms, packaging has a better reach than advertising does, and can set a brand apart from its competitors. It promotes and reinforces the purchase decision not only at the point of purchase, but also every time the product is used. Packaging in different loaf sizes can extend a product into new target markets. As the market becomes more competitive and shelf space is at a premium, bakery products need to be able to stand out from the crowd and packaging needs to provide more than just functional benefits and information.

However, irrespective of the positive roles and functions packaging plays in the bakery firms, the cost of packaging is a source of concern to the investors and managers alike in this food processing industry worldwide. To show that much amount of money is incurred on packaging, Cauvain and Young (2005) reiterated that packaging cost constitutes a fair portion (10 to 25%) of the entire cost of production and the entire capital needs of a functional bakery firm. Therefore, the study aims to ascertain the cost effect of packaging and labeling on the profitability of bakery firms in Ebonyi State, Nigeria.

## 2.0 LITERATURE REVIEW

### 2.1 Packaging Cost in Bakery Firms

The term *'sensation transference'* was coined by Louis Cheskin in the 1930's. Louw and Kimber (2007) note that Cheskin was one of the first marketers to notice that people's perceptions of a product or service were proportionally related to the aesthetic elements of their design. He believed that consumers didn't make a distinction between the product and the package. Instead how we feel about the package is most of the times transferred to how we feel about the product itself. In essence, it invariably means that for consumers the product is the package and the product combined.

In opposition to advertising, which has limited reach due to the knowledge gap in the literacy level of the people, a product's packaging is something which all buyers experience and which has strong potential to engage the majority of the target market. This makes it a significantly important and unique tool in the modern marketing environment. Consequent upon this fact on product packaging, Ogba and Johnson (2010) assert that

> It is now becoming common knowledge that in order to satisfy customers, marketers are becoming increasingly ethically conscious. Ethically conscious by reacting to demand for more responsible behavior in terms of the ways and manners in which products are presented to customers, like product packaging, and provision of clear information on nutritional content of their products, particularly where products could be seen as being marketed towards vulnerable groups such as children (Ogba and Johnson, 2010: 78)

The important and fundamental principles of packaging technology are to protect, to preserve, to contain and to inform. Principally, the purpose of packaging is to contain and protect a product throughout its distribution and sale. Packages perform the primary function of containment and protection, but vary enormously in appearance, texture, graphic, shape, cost and structure. When designing a package, no single package is necessarily the best or the worst but one might be considerably more appealing and appropriate than another (Natadjaja, 2003).

> In recent years packaging has developed well beyond its original function as merely a means of product protection and now plays a key marketing role in developing on shelf appeal, providing product information and establishing brand image and awareness. As packaging's role in the marketing mix gains momentum, so research into this arena becomes increasingly important (Louw and Kimber, 2007:1).

Basically there are two types of packaging: either 'primary' or 'secondary'. The primary packaging is that which immediately protects a product; the secondary package is composed of the several individual primary units, usually for transportation purposes. The primary package has the most salient task in the area of product or brand identity. It will contain all relevant or necessary information about the product. It will be a standardized size and dimension, so that it fits standardized shelf layout and transportation containers. It will have a strong graphic identity and product imagery (Natadjaja, 2003).

Kuvykaite, Dovaliene and Navickiene (2009) state that the main function of packaging is to protect the product against potential damage while transporting, storing, selling and exploiting a product and to ensure the convenience during performance of these activities. While the main use for packaging can be considered to be protection of the goods inside, packaging also fulfils a very important role in that it provides the consumer with a recognizable logo, or packaging, so that we instantly know what the goods are inside. From the consumer perspective, packaging plays a major role when products are purchased, as a source of information.

 

Total packaging cost is a term that include all costs in connection with the packaging of a given product, and include the packaging material costs, packaging equipment cost - purchase costs, lease costs, utility costs, operations costs, maintenance and spare parts costs, and so on, and all secondary packaging costs (wrapping, code dating, palletizing) to still be in business with the increased costs of doing business, bakery firms have raised their product prices in recent years. The rapid increase in total packaging costs has changed the accounting landscape for bakery firms. Schmitt (2008) suggested that when managers continue to measure the performance of their bakery firms on reports of labour and direct raw materials cost percentages, and then they may be misled by their past experience of the constituents of a good labour percentage or a bad direct raw material cost.

### 2.2 Bakery Product Labeling

As well as the name of the bakery product, all labels should list ingredients, date by which the baked product should be eaten, additives and nutritional information. The labeling of food regulations in 1970 introduced requirements for claims about energy content, especially those aimed at slimmer and people with diabetes, and criteria for vitamin and mineral claims (Webster-Gandy, 2000). By the mid 1980s, food manufacturers began using nutritional labeling as a marketing tool. Nutrition labeling is only mandatory when a nutrient claim is made on the label.

Ingredients that fall into the category of additives are usually added in small quantities and therefore appear towards the end of the list. Additives are used for flavouring, sweetening or colouring, to enhance the preservation of food or to affect its consistency or texture. It required that foods that have a shelf-life greater than three months must show a month and year by which they must be eaten. Foods with a shelf-life of less than three months must show the day and month by which they should be used. Products with a “sell by” date rather than a “best before” date should tell you within how many days the product should be eaten from that date. Retailers can be prosecuted for displaying product for sale after these dates.

Information on label should be given about energy, protein, fat and carbohydrates, then about dietary fibre and sodium, and mineral values are given when they are present in amounts greater than one-sixth of the recommended literary intake. Manufacturers who falsify claims can be prosecuted. However, the terminology used can be very confusing. For example, “low fat” has a legal definition, but a “lower in fat” can mean anything less than normal for that product category.

Bakery product labeling helps you to decide whether to buy a product now that there is more storage, preserving and processing.

### 2.3 Benefits/Objectives of Packaging in Bakery

Packaging maintains the benefits of processing foods even when the food process is complete, thereby enabling bakery products to be distributed safely from different places of production to the various areas of retails and still be wholesome at the time of consumption. Meanwhile the advanced technology of packaging should be able to balance the protection of bakery products with other production issues like energy and raw material costs, regulations on disposal of packaging materials (polytene bags and polymers), regulations on environmental pollutants, increased social and environmental consciousness, and waste recycling.

The main essence of food packaging is to protect the bakery products from external influence and damages. Other reasons for packaging of bakery products are to contain the content (the product); to make available to the consumers the necessary ingredient and nutritional information; tractability assistance; ease of convenience; and tamper indications. The purpose of bakery product packaging is to contain the product in a cost effective way that satisfies industry requirements and consumer desires, maintains food safety, and minimizes environmental impacts (Marsh and Bugusu, 2007). In attempt to slow down product deterioration rate, retention of the beneficial effects of processing, increase the shelf-life, quality and safety of bakery products, packaging provides protection from three different extraneous factors namely biological, chemical and physical factors. In the opinion of Marsh and Bugusu (2007), chemical protection reduces constituent changes caused by environmental influences like exposure to moisture, gases or light. A good number of different bakery packaging materials can provide barrier to chemicals. For instance, the polymer made packages contain materials that allow minimal levels moisture permeability thereby extending the shelf-life and safety of the product (bread, biscuits, etc).

Biological protection by packaging materials provides a barrier to pathogens and other micro-organisms, rodents, insects and other animals. By so doing, packaging prevents spoilage of the product disease content by the consumers. The third external influence protected and prevented by packaging is the physical influence. Packaging shields bakery products from mechanical damages and abrasion caused by vibration experienced during distribution of the products.

The impact assessment of food packaging on the environment should always take into consideration the favourable effects of reduced product waste throughout the supply chain. Significant food wastage has been reported in many countries, and it ranges from 25% (twenty five percent) for grains to 50% (fifty percent) for

 

fruits and vegetables (perishable products) (Marsh and Bugusu, 2007).

In Kirwan (2003), the use of paper and paperboards for bakery product packaging dates back to the 17th century with accelerated usage in the later part of the 19th century. Paper and paperboards are sheet materials made from pulp of wood that are bleached and treated with chemicals and strengthening agents. Plain papers are not used to protect food for long duration because they are not heat sealable and have poor barrier properties. Different types of paper used in food packaging as provided by Marsh and Bugusu (2007) are craft paper (to package flour, sugar, dried fruits, etc), sulfite paper (used to make small bags or wrappers for packaging biscuits and confectionary); grease proof paper (used to wrap snack foods, cookies candy bars and other oily food products); glassine (used as a liner for biscuits, fast foods, and baked foods), and parchment paper (used to package fats such as lard and butter). Paper board is always thicker than with a higher weight per unit area and always made in different strata.

The hint to successful packaging is to select the package material and design that most appropriately take care of the competing needs of the competitors. These competing needs are in connection to product characteristics, distribution needs and consumer needs (marketing consideration), cost of packaging materials, and so on. Other factors that are usually considered in product packaging are packaging material properties, the bakery product type to be packaged, the proposed market for the product, desired product shelf-life, envisaged interaction between product and package, the associated costs related to packaging, environmental conditions of storage and distribution, package disposal technique, usability of product, and so on. Most importantly, the consumer plays a significant role in package design. While the package is a vital sales and marketing tool, consumer desires drive product sales.

Louw and Kimber (2007) maintain that packaging and package labeling have several objectives as follows: physical protection, barrier protection, containment or agglomeration, transmission of information, theft reduction, convenience, and marketing strategy.

## 3.0. METHODS

The study adopted an ex-post facto research design. Kerlinger (1977) cited in Obasi (1999) states that ex-post facto research is a form of descriptive research in which an independent variable has already occurred and in which an investigator starts with the observation of dependent variable then studies the independent variable in retrospect for possible relationship to and effects on the dependent variable. The source of data was purely secondary sources from Annual Accounts of 26 bakery firms that belong to Master Bakers Association of Nigeria, Ebonyi State Chapter. The data used was mainly time series data which are quantitative in nature and the ten year-data generated for the study was analyzed using multiple regressions. The Microsoft Excel spreadsheet was used to transform the data into its usable format for analyses and the Statistical Package for Social Sciences (SPSS) was employed for data analysis at 5% level of significance.

To capture the relationship between cost of packaging/labeling and profitability in bakery firms, the empirical model that accommodates cost of packaging/labeling (cost of plastic containers, total cost of bakery bags and tiles, the cost of bakery labels, cost of bakery box, and cost of jars and lids) and profitability was specified.

Thus, the model is

$$\Pi = \alpha_0 + \alpha_1 BAGT_t + \alpha_2 LABELS_t + \alpha_3 BBOX_t + \alpha_4 JARLID_t + \alpha_5 PLASTCON_t + \varepsilon_t$$

Where $\Pi$ = profits from bakery firms

$\alpha_0$ = constant

$BAGT_t$ = total cost of bakery bags and tiles

$LABELS_t$ = the cost of bakery labels

$BBOX_t$ = cost of bakery boxes

$JARLID_t$ = the cost of jars and lids

$PLASTCON_t$ = cost of plastic containers

$\varepsilon_t$ = error term capturing other variables not explicitly included in the model

***Hypothesis:*** The null hypothesis formulated and tested in the study is

*$H_o$:* The cost of packaging and labeling has no significant effect on the profitability of bakery firms in Ebonyi State, Nigeria

 

## 4.0 RESULTS AND DISCUSSIONS

Table 1: Effect of Cost of Packaging and Labelling on the Profitability of Bakery Firms in Ebonyi State, Nigeria

| Variables | Coefficients | Std. Error | t-value | Sig. |
|---|---|---|---|---|
| Constant | -11148719.17 | 29376091.96 | -0.380 | NS |
| Total cost of bakery bags & tiles | 11.250 | 20.796 | 0.541 | NS |
| The cost of bakery labels | -4.428 | 10.541 | -0.420 | NS |
| Cost of bakery box | -11.408 | 43.859 | -0.260 | NS |
| The cost of jars and lids | 55.606 | 73.905 | 0.752 | NS |
| Cost of plastic containers | 324.332 | 112.361 | 2.887 | ** |
| R | 0.874 | | | |
| $R^2$ | 0.764 | | | |
| Adj R | 0.468 | | | |
| Std Error Estimate | 9751552.979 | | | |
| Durbin-Watson | 1.320 | | | |
| F-value | 2.584 | | | |

Source: SPSS Analysed Data, 2014
NS indicates non-significant
**indicates significance at 5% level.

The analysis in Table 1 shows that the multiple regression co-efficient (R) was 0.874 or 87.4%. This implies that the included independent variables (cost of plastic containers, total cost of bakery bags and tiles, the cost of bakery labels, cost of bakery box, and cost of jars and lids) were highly correlated with profits from bakery firms. The coefficient of determination ($R^2$) was 0.764 or 76.4%, implies that 76.4% of the total variation observed in the dependent variable (profits from bakery firms) was explained by the changes in the independent variables included in the regression model. The goodness of fit of the regression was moderately high after adjusting for the degrees of freedom as indicated by the adjusted $R^2$ (0.468 or 46.8%). The F-statistic 2.584, which is a measure of the joint significance of the explanatory variables, is found to be statistically insignificant. The Durbin-Watson statistic 1.320 was low, indicating absence of autocorrelation.

The coefficients of total cost of bakery bags and tiles, cost of jars and lids, and cost of plastic containers were positively signed. However, only cost of plastic containers showed statistical significance at 5% level. The coefficients of cost of bakery labels, and the cost of bakery box were negatively signed and statistically insignificant and this conforms to the a priori expectations.

**Hypothesis Testing**

The null hypothesis which states that the cost of packaging and labeling has no significant effect on the profitability of bakery firms in Ebonyi State, Nigeria was tested using the F-statistics.
Mathematically stated as:

$$F\text{-cal} = \frac{R^2 (N - K)}{1 - R^2 (K - 1)}$$

Where: $R^2 = 0.764$, $N = 10$, $K = 6$,

$$F\text{-cal} = \frac{0.764^2 (10 - 6)}{1 - 0.764^2 (6 - 1)}$$

$$F\text{-cal} = \frac{2.334784}{2.08152}$$

F-cal = 1.12
F-tab = 6.26

**Decision rule:** If F- cal > F– tab, reject the null hypothesis otherwise accept.
Since F-cal (1.12) is less than F-tab (6.26), the alternative hypothesis is rejected and null hypothesis accepted that the cost of packaging and labeling has no significant effect on the profitability of bakery firms in Ebonyi State, Nigeria.

This result is similar to the findings of Cauvain and Young (2005) that packaging cost constitutes a fair portion of the entire cost of production and the entire capital needs of functional bakery firm.

 

## 5.0 CONCLUSION AND RECOMMENDATIONS

Baking is a vital industry with a long history that has evolved to the presence of a good number of small and medium size bakery firms so that to be successful in this industry is very challenging. The primary objective of entrepreneurs and the organization management is to maintain the long term viability of the company based on the continuous creating of equilibrium platform for the internal and external environment (Chladkova and Kudova, 2008). Consumers today are demanding increasingly different types of retail concepts and foods. The food processing industry and their distributors are presently facing extra challenges and demands on how to provide the variety of foods that are expected from them by the consumers and still strive to remain profitable (Martinez and Stewart, 2002). The acceptability of commercial bakery products depends on the extent of capital investment in the firm to produce competitive products. For instance, in bakery enterprises, capital is used to create market acceptable packaging quality and other aesthetic features. The packaging of the bakery product is closely related with the production, presentation, storage, distribution, transportation and marketing function. Survey has shown that the amount of money spent by bakery enterprises in Ebonyi State on packaging is increasingly high. However, our findings revealed the opposite as it shows that the cost of packaging and labeling has no significant effect on the profitability of bakery firms in Ebonyi State, Nigeria.

Notwithstanding the potential for packaging to successfully achieve marketing goals in bakery, it is recommended that managers should be mindful of the percentage of their operating costs that goes into packaging in order not to affect their profits negatively. Also, management by exception approach should be used on the procurement of plastic containers for packaging bakery product because it is the only component of packaging cost that is statistically significant in the study based on the findings.

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