Understanding the Dynamics of Eco-Product Labeling Strategy for Marketing Success in Quoted Food and Beverages Firms in Nigeria

Beatrice C. Acee-Eke
Ignatius Ajuru University of Education
bettyacee1@gmail.com
And
Juliet Gladson-Nwokah
juglad@yahoo.co.uk
Department of Marketing
Ken-Saro Wiwa Polytechnic, Bori

Abstract

The quest to be environmentally friendly has remained a growing concern in the management and sustainability of our environment. As a response, this study aims at unraveling the dynamics of eco-product labeling in ascertaining marketing success of food and beverages firms in Nigeria. The study was guided by two research objectives and hypotheses. The study adopted descriptive survey and cross-sectional research designs. The population and sample size comprised all 15 quoted food and beverages firms in Nigeria as at 2016. Data on eco-labeling was obtained through a structured questionnaire while panel data was obtained on marketing success through the annual reports and accounts of the sampled firms over a 5-year period from 2012 to 2016 and both were analyzed using descriptive statistics and multiple pool regression techniques. The research instrument was validated by experts, its reliability was ascertained using Cronbach Alpha and obtained a reliability coefficient above 0.7 on eco-product labeling only. The study results indicate that eco-product labeling has positive and highly significant influence on market share but has negative and insignificant influence on sales growth of food and beverages firms. On this basis therefore, the study concludes that eco-product labeling is a dynamic strategy that ensures marketing success of food and beverage firms in Nigeria. This implies that the adoption of eco-product labeling guarantees marketing success as environmental production. The study recommends that management of food and beverages firms should make labels that communicate safety about their products by guarantying that their products are not harmful and toxic but environment friendly in order to enhance their marketing success.

Keywords: Eco-product labeling, marketing success, market share, sales growth.

1. Introduction

In recent time ecological marketing has become a holistic and responsible strategic management process that stresses the importance of green product strategies as a response to the socio-economic quest of environmental friendliness (Peattie & Crane, 2011; Sarkar, 2012). Currently, there are studies on green marketing and how it influences better organizational image because of their care for the environment (e.g. Saravanaraj & Pillai, 2017; FuiYeng & Yazdanifard, 2015; Gbadeyan & Omolekan, 2015). These studies observed that consumers are now more conscious and responsible when it comes to their choice of products. As a result, more companies are moving towards a more health-conscious market by producing healthy, organic and eco-based products (Saravanaraj & Pillai, 2017; Kinoti 2011). The emergent of environmental friendliness has also attracted studies in accessing its potency in ensuring marketing effectiveness. In the same vain literature abounds on how green marketing as a movement has come to encourage the production of environmentally friendly products which has become almost inevitable as the market for socially responsible products is increasing greatly (Ottman, 2011). Studies (Ledwith & O'Dwyer, 2006; Hart & Dowell, 2010), and recent ones (Worsley, 2013; Hasan & Ali, 2015) have been carried out on environmental marketing and or environmental product strategies. Presently, the quest to sustain the tempo of business or marketing performance/success in all spheres of production, distribution

and exchange has prompted scholars into showing growing awareness in studying exactly how green marketing can be built-in or integrated in the business system (Ar 2012; Nwokah, 2008; Hunt & Arnett, 2006; Ambler, Kokkinaki & Puntoni, 2004). Also, an increasing number of studies have shown attention to the incorporation of ecological issues into the production of goods and services (e.g., Ward 2017; Abdulrahman 2017; Katsikeas, Leonidou & Zeriti 2016; Cheng, Yang & Sheu, 2014). Studies in this direction are those who have delved into examining the nexus between product development practices and business performances to determine the extent to which green products have sustained successful marketing.

Also, an increasing number of studies have shown attention to the incorporation of ecological issues into the production of goods. Studies are those who have delved into examining the nexus between product innovations practices and business performances to determine the extent to which green products have sustained successful marketing. Example of such study is Nguyen and Du (2011) carried out a study on effectiveness of eco-label and green innovation on environmental performance and competitive advantage in Taiwan. They investigated the effectiveness of eco-label in students' food products choice. Banerjee and Solomon (2003) carried out a study on eco-labeling for energy efficiency and sustainability: A meta-evaluation of US programs. Karbhar and Aswale (2014) investigated green marketing awareness among customer and firms in Aurangabad, and in their study, and found most consumers believe that firms are trying to attract them by labeling their products environment friendly. Another study in this area is that of Soederberg and Cassady (2015) who carried out a study on the driver of green labeling and green image - green core competence. Similarly, Liu, Yan and Zhou (2017) investigated consumer choices and motives for eco-labeled products in China: An empirical analysis based on the choice experiment.

Interestingly, a look at the cream of literature however, appear to show that no empirical studies have investigated how eco-product labeling influences marketing success. This research interest is therefore informed by recognizing the unique nature of eco-products that distinguishes itself from the conventional products and the critical role the strategies adopted in production have on the environment and human wellbeing. Therefore, our point of departure is to fill this gap, hence this is the background that motivated this study. Now that the environmental concern is the spotlight in today's business environment world over, this study expects food and beverages firms to queue behind the eco initiative in ensuring that their operating environments as well as their products are in line with the 21st century business operation procedures. It is against this backdrop that this study investigates the effect of eco-product labeling on marketing success of food and beverages firms in Nigeria. This study however, is carried out in the context of eco-friendly technology as a moderating variable on the influence of eco-based product strategies on marketing success.
The food and beverages industry must be aware of the contents of the wastes they generate with the view to making them environment friendly. This is more so when it is realized that waste from food industry have the potential of polluting the environment. Pollution of environment resulting from unrestrained activities of the food and beverages firms has impacted negatively on land use and land capability for man, and aquatic life (Chukwu, 2009). This is obvious in the published annual report of some of the quoted food and beverages firms. A case in point is the annual statement of Nigeria breweries Plc, from 2014 -2016 and UAC Plc that reported fluctuations in market share and sales growth as a measure of marketing success.

2. Theoretical Foundation

2.1. Resource-Based View

The theoretical footing of this study is founded on Resource-Based View (RBV). This theory postulates that organizational performance outcomes are dependent on its resources and capabilities. It further stresses that the basis for the competitive advantage of a firm lies primarily in the application of a bundle of valuable tangible or intangible resources at the firm's disposal. By supporting the potency of this theory Barney (1991) argues the possession of strategic resources enables an organization to gain a golden opportunity to develop competitive advantages over its rivals. Such resources are strategically divided into tangible and intangible. The tangibility of a firm's resource is an important consideration within resource-based view theory. Tangible resources are resources that can have a physical presence. They include among others, a firm's technology, property, assets, plant, and equipment, as well as cash. In contrast, intangible resources are not physically present. Among these comprise, the knowledge and skills of employees, a firm's reputation, and a firm's culture, capabilities which are key element of intangible resources, information in form of labeling, organizational processes. In the context of this theory, resources refer to what an organization owns; while capabilities refer to what the organization can do (Barney, 1991). Capabilities often arise over time while the firm takes actions that build on its strategic resources (Hart & Dowell, 2010). Some firms develop a dynamic capability, where a company has a unique ability of creating new capabilities to keep pace with changes in its environment. The theory also holds that it is important to recognize that strategic resources can be created by taking several production strategies, such as product packaging; product labeling, package recyclability, advertising, to mention a few; and resources that each could be put together in a way that cannot be imitated (Hart & Dowell, 2010).

Discussing the relevance of this theory, Barney (1991) argues a resource is strategic to the extent that it is valuable, rare, difficult to imitate, and non-substitutable. Strategic resource is an asset that is analyzed using the tool of VRIN; which stands for strategic resources that are valuable (V), rare (R), difficult to imitate (I), and non-substitutable (N). From the analytical tool of VRIN, the resources-based theory postulates that a resource is valuable to the extent that it helps a firm create strategies that capitalize on opportunities and ward off threats. It aids in improving the organization's performance and success while neutralizing the opportunities and threats of competitors. Looking through the lens of this theory, it is imperative to point out that the second letter "R" which stands for rare resources are those held by few or no other competitors that are likely to access them. The third letter, "D" stands for difficult-to-imitate resources these resources often involve legally protected intellectual property such as trademarks, patents, or copyrights. Other difficult-to-imitate resources, such as brand names, usually need time to develop fully. And the last letter, "N" stands for non-substitutable resources, which exist when the resource combinations of other firms cannot duplicate the strategies provided by the resource bundle of a particular firm. Sambu (2016) contend that new resource-based view (NRBV) now extends resource-based theory by highlighting that the environment should be another factor of consideration when discussing the efficacy of resource-based theory. This is because man's dealings in relation to his environment, makes him to be concerned about the sustainability of the environment. According to him, quoting Hart (1995), firms which manage environmental link, better than others, in terms of production of goods and services, might generate more sustainable competitive advantage. From the foregoing, resource-based theory holds that the possession of resources that is valuable, difficult to imitate, rare, and cannot be substituted helps an organization to stand conspicuously out in

a competitive environment. It then, suggests that firms should look inward to find the sources of marketing success through the use of their internal resources (Hart & Dowell, 2010). If firms focus on their knowledge in eco-friendly initiative such as eco-product strategies as internal resources than their competitors, the resultant influence of course is marketing success. Base on this theory we were interested in investigating the influence of eco-product strategies on marketing success.

3. Conceptual Literature

3.1 The Concept of Eco-Product Labeling

Eco-product labeling is an important green marketing tools used on eco-based products. Eco-labels are appealing tools notifying customers about the possible environmental impact of their purchase determination (Orsato, 2009). Eco-label is referred to as a tool to assist consumers in the progress of making a decision to choose eco-based products among others (D'Souza, Taghian, Lamb, & Peretiatko, 2007). McCluskey and Loureiro (2003) submit that eco-labeling of products identifies environmentally preferable products based on environmental-impact assessment of the products compared to other products in the same category. The environmental-impact assessment includes the process of production, use of products, and disposal. Eco-labeling or eco-certification informs consumers about the green characteristics of the product and motivates them to purchase green products (Young, *et. al.,* 2010). Horne (2009) submits that environmental labels allow consumers to easily distinguish environmentally friendly products from conventional products. Eco-labels guide consumers to identify products which are more environmentally favoured than other identical products (Grant, 2007).

Eco-product labeling according to Thøgersen (2000) is a good way to convince the customers regarding green products. Thøgersen (2000) opines eco-based product labeling as a means of informative tool that usually utilized logo to convey information to consumers on the environmental implications of buying such product. Additionally, Grant, (2007) describes eco-product label as a means that enables consumers to make choices of products that will reduce environmental impact and as an important marketing tool to overcome market failure due to information asymmetries between sellers and buyers of environmental friendly products.
Eco-label is defined by Porto, Malandrino and Supino (2007) as a product claim to furnish consumers with credible and easily accessible information on the environmental attributes of a product. In another development, Nilsson and Ostrom (2004) conceptualized eco-label as a single dimension variable that consisted of four items; ranging from consumer recognition of various eco-labels, the comprehension of the meaning of eco-labels, and trust of the eco-labels message. Biel (2004) observes that eco-labels are intended to educate and increase consumer awareness of the environmental impacts of a product which results in environmental protection by encouraging consumers to buy products with a lower environmental impact.

Some scholarly enquiries (Ottman, 2011; D'Souza, *et al.,* 2007; Grant, 2007) have shown that consumers make purchase decisions depending on how they perceive the label information. Mostafa (2007) further assert that consumers complain frequently about the ambiguous meaning of eco-labels, which can be considered as one of the main obstacles that restrain the effectiveness. Other studies in this regard (Bougherara & Combris, 2009; Nilsson & Ostrom, 2004; Peattie, 2001) states the mission of eco-label therefore is: to guide consumers and buyers in their desire to practice environmental conscious shopping; and to stimulate the development of product and service that is associated with a lesser environmental burden.

4. The Concept of Marketing Success

Marketing success according to Arnold (2016) is defined as the number of new customers, revenue, and the return on investment (ROI) of a firm. Ultimately, these are the three items that will determine the success of any business and what senior management will mostly care about. If they can deliver results on these three areas, then marketing success is guaranteed (Arnold, 2016). In the marketing literature, market share and profitability are the most common performance measures (Day, 1990). The essence of a business strategy is an integrated set of actions in the pursuit of a competitive advantage thus placing the emphasis on market share Performance as the degree of market success attained by a product at market maturity or the point at which product boundaries change (Asiegbu, 2009).

The concept of marketing success is an unwritten law of every organization. This suggests that every organization should see success as an absolute prerequisite for its sustenance. A critical concern for firms is success; hence, unique, invaluable and difficult to imitate resources is considered to be the major drivers to succeed for any firm especially food and beverages firms (Ambler & Kokkinaki, 1997). Hunt and Arnett (2006) define firm's success from perceived benefits perspective which may be achieved through integration of environmental management in their business operations. Marketing success is a measure of the contributions of a firm's marketing functions to its corporate objectives. Excellence in success is the main competitive advantage for any firm. Many scholars have defined success in similar way yet, there is a variation in measuring success criterion. Thus this study pins tent with Hunt and Arnett (2006) to determine the success measurement index (sales growth, market share) for this study.

4. Measures of Marketing Success

4.1 Market Share

Market share is a measure of the consumers' preference for a product over other similar products. A higher market share usually means greater sales, lesser effort to sell more and a strong barrier to entry for other competitors (Katsikeas, Leonidou & Zeriti, 2016). A higher market share also means that if the market expands the leader gains more than the others. By the same token, a market leader - as defined by its market share - also has to expand the market, for its own growth. However, Ambler and Kokkinaki (1997) argue that usually, gaining 100% market share is not a good idea, as the risk associated with market actions, like fashion changes, product use changes will impact the company heavily. Also, it is a percentage of firm's total sales, calculated as the product of the firm's sales over the sales during a specified period. In other words, it's the amount of sales a firm gets compared to what it has as a whole. Market share is the percentage of business or sales a company wields out of total business or sales by all competitors combined in any given market, hence the total available business is called market potential (Abdulrahman, 2017). Hunt and Arnett (2006) further conceptualize market share as a percent of sales and as one measure of market share. Market share can be difficult to calculate for those firms that do not know their competitors' sales figures, and that's where private market research firms come in. They keep track

of market share figures of competing firms and monitor their share on an annual basis (Hunt & Arnett, 2006).

Following this, it therefore means that there are several key advantages of market share. According to Abdulrahman (2017) one advantage is increased bargaining power. The implication is that firms with the largest market share may get special deals on products, as their buying power is likely greater than smaller companies. The bigger firms sell more products, which leads to bigger orders from their suppliers. Conversely, a smaller company may lose its higher profit margins by increasing market share drastically (Abdulrahman, 2017). Again, sometimes a firm gains too much market share; if this is the case scenario it becomes important to examine how stakeholders perceive it in relation to eco-based products (Katsikeas, Leonidou & Zeriti, 2016)

4.2 Sales Growth

Bilal, *et al.,* (2016) describe sales growth as an increase of a firm's sales when compared to a previous quarter's revenue performance. The current quarter's sales figure can be compared on a year-over-year basis or sequentially. Sale growth is the extent to which firms gain intensity, magnitude, and value, hence the greater the sales growth the better (Bilal et al. 2016). Again sales growth is used to measure the success of a sales function or analyze business results to better understand market conditions, which can increase/decrease over time. It is used to measure how fast a business is expanding (Eneizan et al., 2016). Sales growth rates refer to the change of a specific variable within a specific time period, given a certain context. For investors, growth rates typically represent the compounded annualized rate of growth of a firm's revenue, earnings, dividends and even macro concepts such as GDP of a nation's economy as a whole. Expected forward-looking or trailing growth rates are two common kinds of growth rates used for analysis (Eneizan et al., 2016).

There is a serious need for the adoption of green marketing strategies by firms so the new sales may generate. The literature indicates most firms claim they have green strategies but in the actual sense they have not adopted any green strategy. The question that is often asked today is, how can firms be able to go green, clean, as well as be profitable at the same time? The findings of Eneizan et al (2016) direct us towards the conclusion that there is influence of adoption of green marketing strategies by firms and their sales growth. According to them there is a clear indication growth in sales of green products cannot be achieved by ignoring the eco-based product strategies, despite the fact that green marketing strategies is rarely discussed in academic literature. Conversely, if the firm has a growth in income for two consecutive quarters, it is considered to be expanding. Given that sales growth is an outstanding index for measuring marketing success, it is therefore considered in this study as one of the measures of the dependent variable. Taking the growth of green products worldwide into consideration, the marketing executives must avail themselves of this golden opportunity to identify the need of best practices of green marketing and adopt them to increase their sales and compositeness.

5. **Technology as a Moderating Variable**

Technological innovation has become the most important driver of competitive success in many industries. Firm's competitiveness is the ability to provide products and services more effectively and efficiently than relevant competitors. At the firm level, technological innovations which contribute to technology development, market orientation, cost reduction and quality improvement

enables firms to compete effectively in national and international markets. Indeed, technological innovation has increased in relevance to become a topical issue in policy and economic debates (Dada, 2016). The benefits derivable from science and technology are not actually realized in an economy until innovation and diffusion occur. It is innovation that transforms research and development (R&D) results into useful products or processes which are then diffused through to the end-user (Dada, 2016).

Although the adoption of technology has been identified as a key driver of innovation in the literature, the empirical evidence of its benefits in the relationship between eco-based product strategies and marketing success has been surprisingly limited. Firms are interested in knowing what the key drivers are in establishing eco-innovation practices (Weng, Chen, & Chen, 2015). Incomplete understanding of the potential benefits of technology in the production of food and beverages may hamper the development of a widely accepted framework that would characterize and categorize eco-based product strategies activities in manufacturing firms. Therefore, it is important to acquire a holistic view to investigate whether and how technological adoption affects eco-based product strategies and marketing success. In this study, we attempt to fill this research gap by focusing on the potential antecedents of eco- product strategies and marketing success specifically the adoption of technology. In addition, in order to fully understand technology and its relationship with eco-based product strategies and marketing success, there is a need to examine how individual types of AMT are related to the independent and dependent variables.

Through empirically examining the influence of use of technology in the relationship between eco-based product strategies and marketing success, this study extends prior research by developing a theoretical basis and providing empirical evidence for the influence of technology adoption in the relationship between eco-based product strategies and marketing success (Sohal, Sarros, Schroder, & O'neill, 2006). According to Dada (2016) creativity and innovation are the only means to resurrect and stand firm to challenge their foreign counterparts and regain their pride in the nation's economy. Manufacturing industries are expected to upgrade their products with up to date technology to enhance their sales volume and ensures higher profitability in order to survive in the competitive business environment.

Furthermore, previous studies emphasized that the link between adoptions of AMT in the manufacturing of eco-products may not be direct (Sohal et al, 2006). This calls for exploring the issues of how technology adoption exactly influences eco-based product strategies and marketing success. Against the foregoing backdrop, we argue that whereas technology has a potential value for EBPS and MS, the actual impact is achieved when experts, analysts, and decision makers can detect and assimilate technological knowledge within the firm. Because technological knowledge is tacit in nature, information sharing across various departments reflects a key competitive capability for successful knowledge assimilation and green innovation achievement. Therefore, we argue that effective technology adoption can ultimately establish a relationship between eco-product strategies and marketing success.

Based on the review of literature, conceptual framework is drawn as shown in Figure 1

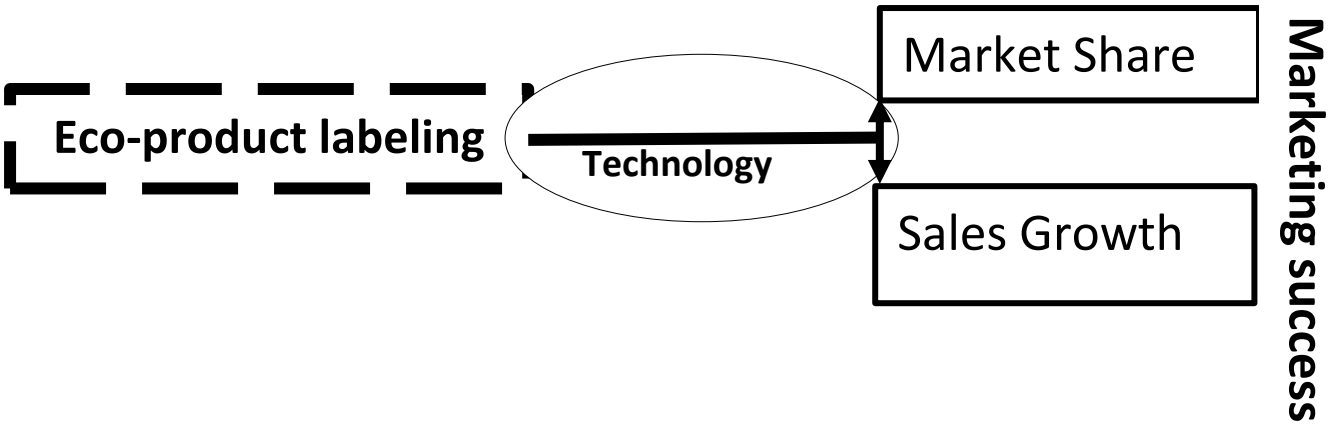

Figure. 1: Conceptual framework.

The conceptualized framework empirical studies are reviewed based on the dimensions of marketing success. This frame of reference or scheme do not only explain the relationships between constructs in the study, but also grounded to integrate them into a meaningful pattern. Therefore, this study is rooted based the researcher's perceived underpinnings and assumptions implicit in this work. Hence, the following hypotheses were tested:

Ho_1: Eco-product labeling does not significantly influence market share.
Ho_2: Eco-product labeling does not significantly influence sales growth.

2.3 Review of Empirical Literature

Abdul and Asad-ur (2014) in their study investigated the impact of product labeling on market share for durable goods. The scholars used primary data in their study and for this purpose a survey was conducted through a structured questionnaire. The views of 300 middle class households or business people were recorded; the study results show that the product labeling is a significant factor that affects on market share positively. Abdul and Asad-ur (2014) found product success is highly involved to making customers more satisfied in their purchasing behavior. The finding of Saravanraj and Pillai (2017) reveals purchase of a particular category of green product depends on the frequency to which consumers notice the greenness in that particular product based on promotional aspect. Their finding also states customers do understand that green products are less harmful to the environment when compared to conventional product. Karbhar and Aswale (2014) in their study found most consumers believe that firms are trying to attract them by labeling their products environment friendly. Again Soederberg and Cassady (2015) found nutrition information on food labels is an important source of nutrition information but is typically underutilized by consumers. This review examined whether consumer nutrition knowledge is important for communication of nutrition information through labels on packaged foods. Belz and Peattie (2009) in their study found that in France, Hewlett-Packard addressed environmental challenge by selling its laptops in a ready-made carrying case, thereby reducing the use of disposable packaging for laptops by 97% (Boye & Arcand 2013). Ottman (2011) in their study found Nestle confronted the environmental challenge by reducing the size of paper labels on its bottled water brands by 30%.

Similarly, Nilsson and Ostrom (2004) conducted choice-based conjoint analysis involving potential washing machine buyers in Switzerland. The study analyzed the relative importance of European Union (EU) energy-labeled products compared to other product attributes, such as brand, water and energy consumption level, energy efficiency rating, and price factor on consumer buying decision for a washing machine. The research findings indicate energy label positively influenced consumers' buying decisions for washing machines. Grant (2007) in their study found eco-label is positively correlated with consumer enthusiasm to buy. This implies that the recognition of eco-label has a positive impact on the information of an eco-based product and consumer willingness to buy. Ramkumar and Soundarajan (2014) found pro-environmental concerns and consumer's awareness affect green purchase decision but higher price are discouraged to customers preferences. In addition, previous studies (D' Souza et al., 2007) have agreed that most consumers have positive green consciousness on eco-labeled products. They found that eco-labels are appealing tools notifying consumers about the environmental impact of their buying determination.

Also Grant (2007) carried out an empirical study on product labeling, firms' performance and market valuation in Nigeria and their study was motivated by the fact that strong support for labeling information, remains with respect to how labels influence consumers and make firms to grow sales. The study empirically investigated how consumers who differ in terms of environmentalism respond to product labels. The study made used structured questionnaire administered on the phone using quantum research data collection services. The data were analyzed using both descriptive measures and correlations between variables. The findings revealed there is proportion of consumers that find product labels hard to understand. The study found there are consumers who will buy green products even if they are lower in quality in comparison to alternative products, but would look for environmental information on labels. With respect to price sensitive green consumers, there appears to be a influence of price sensitivity and "always" reading labels as well as indicating there is "sufficient" information on product labels to make informed purchase decisions (Grant, 2007).
Uguru, Nnachi, and Nkwagu (2015) did a study on the cost implication of packaging and labeling on profitability of Bakery firms in Ebonyi State, Nigeria. Their study found food processing industry and their distributors are presently facing extra challenges and demands on how to provide the variety of food that are expected from them by the consumers and still strive to remain profitable. The findings, however, reveal 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. Notwithstanding the potential for eco-labeling to successfully achieving marketing goals in bakery, the study recommend managers should be mindful of the percentage of their operating costs that goes into eco-labeling in order not to affect their profits negatively.

In the study of Tanner and Kast (2003) it was found green food purchases were strongly facilitated by positive attitudes of consumer towards environmental protection. It contrasted from the study by D'Souza et al (2007) who indicated no differences with respect to gender in the respondents' attitude towards green labels. The result indicated no significant influence of consumers' attitude on the environmental protection and their attitude on green products. This means that consumers' attitudes about green products are not facilitated by the positive attitudes of consumers towards

environmental protection. Evidence from the empirical literature has shown that eco-product labeling can enhance profitability.

6. Research Methodology

6.1 Data and Sample

In this study, we collect our data for the empirical analysis from both primary and secondary sources. The sample consists of fifteen quoted food and beverage companies in Nigeria. The data on both eco-product labeling and technology were collected from ninety managers from the sampled companies through a structured questionnaire instrument designed titled "Eco-Product Labeling Strategy Questionnaire (EPLSQ)". The departments include marketing, production, customer care, procurement/purchasing, research and development and quality assurance. Although, 90 managers were initially selected using the key informant approach; 6 from each company constituted our respondents, 84 returned the questionnaire and out of which 67 were duly completed, making a response rate of approximately 80%, hence analysis was done with only 14 firms because one firm was not able to return their questionnaire. The descriptive summary of the data shows that 51% of the participants were male, 70% were married and the average work experience is 15 years. The least educational qualification is senior secondary school certificates.

For sales growth and marketing success, panel data covering from 2012 to 2016 were used. The source of data is annual reports and accounts of the quoted companies for different years downloaded from their official websites. Thus, the panel sample size is $75(15 \times 5)$. For quality results, the logarithmic form of the data on both market share and sales growth data were used. Figure 2 shows the mean plot of the raw data for market share and sales growth.

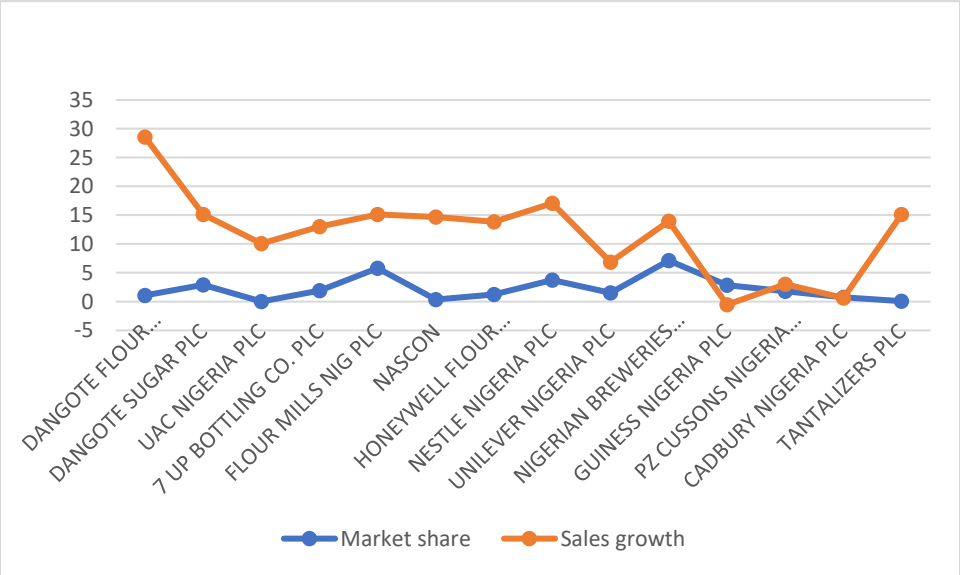

Figure 2: Mean market share and sales growth (2012 – 2016)

7. Measurement

- **Eco-Product Labeling:** This variable is measured on an interval scale. The scale contains eight Likert-type statement items adopted from different studies but modified to suit the purpose of this study. Each of the items describes a company's use of eco-based materials

in product labeling their products and the participants were asked to rate the extent (from very low extent which is assigned 1point to very high extent which is assigned 5points) to which their product labeling is based on these materials. The responses on the eight items are converted into an interval scale based on their means through the SPSS variable transformation window.

- **Technology:** This variable is also measured on an interval scale. The scale contains five Likert-type statement items adopted from different studies but modified to suit the purpose of this study. Each of the items describes a company's use of technology in the production of labeling materials and the respondents were asked to rate the extent (from very low extent which is assigned 1point to very high extent which is assigned 5points) to which the production of their labeling materials is based on technology. All responses are converted into an interval based on their means through the SPSS variable transformation window.

- **Market Share:** This variable is measured on a continuous or ratio scale. It is the contribution of a company's sales to the aggregate sales in a given period and is computed as follows:

$$Market\ Share_{it} = \frac{Sales_{it}}{Aggregate\ Sales_t} \times 100$$

where the subscript i represents individual company and t represents current period. Aggregate sales = sum of the sales of the 14 companies in the sample.

- **Market Share**: This variable is also measured on a continuous or ratio scale. It is a simple growth rate in sales and is computed as follows:

$$Sales\ growth_{it} = \frac{Sales_{it} - Sales_{it-1}}{Sales_{it-1}} \times 100$$

where the subscript i represents individual company, t represents current period and $t-1$ represents previous period.

3.3 Methods and Models

The empirical analysis is based on the pooled least square panel data method (PLSM). As the name implies, the PLSM pools the panel data together as time series data and apply the popular OLS technique on the pooled data. Thus, it ignores the unobserved cross-sectional heterogeneity that is usually associated with panel data. The other standard panel data methods are the fixed effects and the random effects methods, with both recognizing the cross-sectional heterogeneity in the panel data. This method is employed because it is our view that since the 15 quoted companies in our sample operate and compete in the same industry, the unobserved company-specific effects such as management culture and style are irrelevant. Thus, they face the same industry trend as any technological innovation that affects one company would simultaneously affect others. Our pooled least square model is given as follows:

$$MS_{it} = \alpha_0 + \alpha_1 EPL_i + \alpha_2 TECH_i + \alpha_3 EPL * TECH_i + \epsilon_{it} \quad (1)$$

$$SG_{it} = \beta_0 + \beta_1 EPL_i + \beta_2 TECH_i + \beta_3 EPL * TECH_i + u_{it} \quad (2)$$

where *MS* = market share, *SG* = sales growth and *EPL* = eco-product labeling, technology = *TECH*, *EPL*TECH* = the interaction between eco-product labeling and technology. The coefficients α_0 and β_0 are the intercepts which respectively represent the market share and sales growth values that are independent of eco-product labeling strategy. The coefficients α_1 and β_1 are the slope parameters which capture the effect of eco-product labeling on market share and sales growth respectively. While α_2 and β_2 captures the direct effect of technology on market share and sales growth, α_3 and β_3 captures the moderating effect of technology on the relationship between eco-product labeling and marketing share and sales growth. While the subscript i represents the cross-sectional dimension of the data, the subscript t represents the time dimension. As we can see, both subscripts are attached to *MS* and *SG* because both market share and sales growth data vary cross-sectionally and over time. On the other hand, *EPL, TECH and EPL*TECH* all have only the subscript i since data on them are collected from study participants from different companies at a single period. Hence, they are time invariant. It is generally known that that both interval and ratio variables are statistically the same and the relationship between them can be examined within the classical linear regression framework, under the assumption that the residuals are independently and identically distributed. Here, we assume that both ϵ_{it} and u_{it} satisfy these assumptions so that models 1 and 2 can be analyzed under the popular OLS framework.

8 Results and Discussions

8.1 Influence of Eco-Product Labeling on Market Share

Table 1 shows the linear regression results for model 1 based on pooled regression method as it expressed the linear function of eco-product labeling (EPL), technology (TECH) and their product of the two variables (EPL*TECH) which captures their interaction.

Table 4.1: The regression results for Market share

1		2		3	
Variable		**Beta Coefficient**		***p*-value**	
Constant		-4.747661		0.0056	
EPL		2.204540		0.0041	
TECH		-0.983030		0.0649	
EPL*TECH		1.171420		0.0027	
R-square	0.1781	Adj. R-squared	0.1349	Prob.(F-statistic)	0.0103

Source: E-Views version 10 outputs, 2018.

From table 1, the F-statistic, which formally checks whether all the included regressors are jointly significant, has a probability that is a little above 1% (*p*-value = 0.0103), suggesting that the estimated regression pooled model for market share is statistically significant. The Adjusted R-squared of 0.1349 indicates that the collective influence of EPL, TECH, and EPL*TECH significantly explain up to 13.4% of the changes in market share of food and beverages firms. The remaining 86.6% changes that occur in market share are explained by other variables beyond eco-product labeling.

The table also shows that the estimated coefficients have mixed signs but are all statistically significant. The coefficient of TECH, which is statistically significant at 10% level (*p*-value = 0.0649), has a negative sign (beta = -0.9830). This indicates that, holding the influence of both eco-product labeling and the interaction term constant, eco-friendly technology has a negative but weakly significant effect on market share. The coefficient of EPL is however, positive and

significant at 1% level (beta =2.2045, p-value = 0.0041), suggesting that holding other factors constant, eco-package labeling has a direct positive influence on market share.

The coefficient of EPL*TECH (= 1.1714) is also positive and significant at 1% level (*p*-value = 0.0027), indicating that eco-friendly technology moderates the influence of eco-product labeling and market share. From table 1, the associated *p*-value of the t-statistic corresponding to EPL (eco-product labeling) is 0.0041 which is much lower than the stated 0.05. Thus, we strongly reject the stated null hypothesis, implying that there is highly significant influence of eco-product labeling on market share of food and beverages companies. Thus, our finding supports this view and implies that the use of eco-friendly labeling increased the market share of the companies in our sample. This finding is also consistent with resource-based theory and a number of previous findings including those of Nguyen and Du (2011).

8. 2 Influence of Eco-Product Labeling on Sales Growth

Table 2, shows the linear regression results for model 1 based on pooled regression method as it expressed the linear function of eco-product labeling (EPL), eco-friendly technology (TECH) and their product of the two variables (EPL*TECH) which captures their interaction.

Table 4.2: Regression results for sales growth

1	**2**		**3**	
Variable	**Beta Coefficient**		***p*-value**	
Constant	2.385388		0.0044	
EPL	-0.474371		0.1636	
TECH	0.146262		0.5612	
EPL*TECH	-0.367922		0.0564	
R-square	0.0584	Adj. R-squared	0.0156	Prob.(F-statistic) 0.2607

Source: E-Views version 10 outputs, 2018.

The results in table 2 are broadly similar to those in table 1, with the probability of F-statistic (= 0.2607) being well above the standard levels of significance (that is, 1%, 5% and 10% levels). This also implies that the fitted pooled regression model for sales growth is statistically insignificant. The Adjusted R-squared (= 0.0156) suggests that the included regressors collectively can explain very little proportion of the changes in sales growth of the quoted food and beverages firms in Nigeria. Thus, almost all the changes in sales growth are due to factors not considered in the specified pooled model. As table 2 further indicates, the estimated coefficients for both EPL and TECH are statistically insignificant, although, they have different signs. While EPL (= -0.4743) is associated with a negative coefficient, TECH (0. 1462) has a positive coefficient. Thus, sales growth has a negative influence on eco-product labeling, and a positive influence on eco-friendly technology. The interaction term (EPL*TECH) also has a negative coefficient (= -0.3679) but its significance occurs only at 10% level (p-value = 0.0564). Thus, there is weak mediating influence of eco-friendly technology on the influence of sales growth on eco-product labeling. Therefore, the information in column 3 of table 2 was used to test the second hypothesis.

From table 2, the associated *p*-value of the t-statistic corresponding to EPL (eco-product labeling) is 0.1636 which is higher than the stated 0.05. Thus, we do not reject the stated null hypothesis, implying that the influence of eco-product labeling on sales growth of the selected companies is not significant. This is consistent with Soederberg and Cassady (2015) who found nutrition

information on food labels is an important source of nutrition information but is typically underutilized by consumers. This implies that consumer patronage of products will be affected because consumers do not have adequate knowledge about the content of the products, which will thereafter after negatively on the sales growth of the food and beverages firms hence, our result corroborated with their findings. However, this result is not consistent with the findings of Eneizan et al (2016) who in their quantitative analysis found there is a significant positive influence of the green marketing strategies for which eco-labeling is one on sales growth. Their result further state effective sales growth can be achieved by implementing a successful green marketing strategy as it has strong evidence of relationship under the condition of adopting the green strategies by firms.

9. Concluding Remarks

Categorically, eco-product labeling have been found in the study to have highly significant influence on market share of food and beverages companies and the use of eco-product labeling increased the market share of food and beverages companies. However, eco-product labeling was also found to have a negative influence on sales growth and a positive influence of technology. Some implications for practitioners can be given: First, the framework can help food and beverages firms design their market place. Food and beverages firms can reduce the negative impact of their operations by adopting favorable eco-product labeling strategies. Second, our study provides a new perspective of the business value of eco-product labeling strategies and how it can engender marketing success. Based on the findings, it is strongly recommended that the management of food and beverages firms should, make labels that communicate safety about their products by guarantying that their products are not harmful and toxic but environment friendly.

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