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**EFFECT OF VALUE ADDITION ON PRICE: A HEDONIC ANALYSIS OF PEANUT IN
RETAIL SUPERMARKETS IN NAIROBI, KENYA**

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**A Thesis submitted to the Graduate School in Partial Fulfillment for the Requirements for
the Collaborative Master of Science Degree in Agricultural and Applied Economics
(CMAAE) of Egerton University**

EGERTON UNIVERSITY

October 2010

DECLARATION AND APPROVAL

DECLARATION

This thesis is my original work and has never been presented in this or any other university for the award of a diploma or a degree.

Sign -----

Date -----

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KM17/2061/08

APPROVAL

This thesis has been submitted to the graduate school of Egerton University with our approval as University supervisors.

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DEDICATION

To my dear uncle, Mr. Dickson Omburo, for his continued support throughout my studies and his entire family for providing an enabling environment, my beloved wife, Millicent Adhiambo for her encouragement and tolerance and my brother-in-law, Mr. Collins Okoth, and his wife Maureen for being resourceful. Thanks for your support.

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ABSTRACT

Market liberalization, globalization, and changing consumer behaviour are causing transformation in Kenyan agro-food value chains. Production, marketing and consumption are moving towards high-valued products resulting to diversification in the agricultural food production portfolio. The purpose of this research was to evaluate the effects of value addition on product price in reducing the declining per capita expenditure as well as reduced competitiveness of peanut and its products sold in the supermarkets of Nairobi. The objectives were, to characterize peanut value addition levels, establish whether the level of value addition affects prices, and determine if there are price differentials due to supermarket location, division as well as across the types of the supermarkets in addition to establishing factors that influence price differentials in Nairobi. The eight administrative divisions of Nairobi were stratified to give a sample of 100, who were randomly selected. Descriptive statistics were used to analyze and describe the nature of the supermarkets, while one way ANOVA, least square difference (LSD), Tukey post hoc tests and hedonic model were used in the analysis. Results show that there were eight different levels of value addition for peanuts, and prices differed significantly across the levels of value addition. product packaging, brand and product weight significantly influenced peanut product prices. Therefore, the study suggests policy interventions' to stimulate production of value added products, establishment of a national market education program in addition to strengthening agricultural research extension services.

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ACRONYMS AND ABBREVIATIONS

FDI- Foreign direct investment

SCA- Sustainable Competitive Advantage

EQN- Equation

FXN- Function

CPI – Consumer Price Indices

SSA – Sub Saharan Africa

IFPRI – International Food Policy Research Institute

CBD – Central Business District

Kg – Kilograms

Ksh – Kenya shillings

EDLP- Every Day Low Pricing

HLP- High- Low Pricing

CHAPTER ONE: INTRODUCTION

1.1 Background Information

Increasing agricultural productivity, increasing market accessibility, enhancing better marketing, poverty eradication and increasing value of agricultural products are some of the goals Kenya as a country is looking forward to achieving in her vision 2030 (Kenya Vision 2030, 2007). Market liberalization and globalization are causing transformation in Kenyan agriculture and agro-food markets. Production, marketing, and consumption are moving towards high-value food products. In response, the agricultural food production portfolio is diversifying. These changes are creating opportunities as well as challenges in production and marketing dynamics (Birtal *et al.*, 2007). Market dynamics have changed because of forces, which are interrelated. Such forces include, population growth, urbanization, rising consumer incomes, increasing global competition and the desire to copy western culture enhanced by the advancement in media and advertisement (Best *et al.*, 2005). All markets demanding international food standards uphold to the demand of high quality goods enhanced by value addition. The markets include modernized food outlets, which include food restaurants, hotels, institutional buyers, and tourism (Reardon *et al.*, 2003). Thus, it follows that as these investments grow, there is an increasing demand for high value products. This is opening investment alternatives especially for food products. Supermarkets have undisputable role in the food supply chains in developing countries where grades and standards are becoming key tools for product differentiation and agro-food chain coordination. These standards link to; First, quality and safety of the product itself second, actions taken during the production stages to produce quality and safety attributes in the final product. Third, environmental, and labor attributes of the production process and fourth, communication like reporting of implementation of standard of which are relayed to the suppliers by the buyers. If specified by buyers, then they include specification of transaction attributes such as delivery volume, timing, and packaging as well as a specification of the price (Reardon and Swinnen, 2004). In recent years, there has been an increasing interest in “value-added” agriculture and its products, driven by changes in consumer’s tastes and preferences and the desire of farmers and firms to capture a larger share of the consumer expenditure. “A broad definition of value addition is to economically add value to a product by changing its current place, time and from one set of characteristics to other characteristics that are more preferred in the marketplace” Value-added

agricultural products such as organic and locally produced products have received considerable attention at both the national and global levels.

1.2 Global trends in peanut trade

Global trade in peanut mainly comprises edible peanut (raw and prepared/preserved), processed products (oil and cake/meal), and peanut butter. During the 1970s, at least half of the global trade of peanut was for subsequent oil production. The decade of the 1980s saw a shift in trade from the oil and peanut butter market to edible peanut. During this period demand for edible peanut showed dramatic growth and world trade increased by more than 20 percent per year. This also slowed in the subsequent decade, although it was still considerable (Luz and Steven, 2008). In contrast, since the early 1980s, global exports of peanut oil, cake, and peanut butter have declined, despite growing global consumption of both products. Increases in per capita incomes, consumer health awareness, and industry demands are probably the reasons for the rise in consumption of edible peanut in developed countries. Peanut are consumed roasted nuts or used by the confectionery industry in many different ways. For example, they are consumed as a seasoned snack, as peanut butter, in sauces, and in chocolate bars. Within the edible peanut sector, trade for prepared peanut (roasted and salted among others) has had especially rapid growth, whereas trade in raw edible peanut has leveled off in recent years (Luz and Steven, 2008). As a result, of these differential trends, the share of prepared/preserved peanut in total peanut product trade increased from 9 percent in 1995 to 27 percent in 2005. Some importing countries, especially in the European Union, are increasingly demanding blanched peanut, which are apparently reported in international trade statistics as “prepared peanut. Reduced competitiveness and constrained demand for peanut oil and butter, along with an inability to shift industry focus to the edible confectionery market, have contributed to the marginalization of SSA’s global peanut market position. Thus, Sub-Saharan Africa’s (SSA’s) participation in the global trade and consumption of peanut and peanut products has been decreasing both in the dynamic (edible peanut) and the less dynamic (oil/cake and peanut butter) sectors. SSA’s decline in exports was exacerbated by the shift in the trade from the oil market to edible peanut—a market with higher quality and safety requirements (Luz and Steven, 2008)

In Kenya (like other developing nations), supermarket chains accounts for a bigger percentage of consumer products sales. Today, goods and services provided by these supermarkets are not only linked to urban population but also to the rural setups in the small towns’ lifestyles who demand year

round access to high quality trustworthy goods at consistent prices (Kangazi *et al.*, 2008). This then means that supermarkets are not only a shopping place for the rich but also for the poor and middle-income earners. They have spread from wealthy suburbs of major towns and cities to smaller towns and the poor areas. The supermarkets in Kenya stock an array of diversified peanut products that are, highly differentiated possessing different product attributes. These different peanut products are designed to target specific market segments like children, health conscious consumers, value conscious consumers, or status. The differentiation and diversification of products are achieved by using different product attributes like, branding, product forms, and package quantities. The dynamic peanut products with different attributes vary with consumer preferences and retail market environment.

1.3 Importance of peanut

Peanut have been considered as one of the important crops because of the significant roles it plays in human health in addition to food security. In nutritional content, it contains 26% protein. It has been established that on equal weight basis, peanut contain more protein than meat and about 2.5 times more than eggs. In addition to protein, peanut are a good source of calcium, phosphorus, zinc, and boron. In addition, it contains vitamin E and small amounts of vitamin B complex. Peanut also have high amounts of calories. Besides being an oil seed crop, it contains 40-49% oil. (www.icrisat.org)

1.4 Statement of the problem

Food marketing is undergoing significant changes with emphasis on high value food commodities increasing considerably. Despite the increase in awareness of the importance of peanut to human health and industrial need, for the last two decades, Kenya has shown a decline in per capita consumer expenditure on peanut and its products. In addition to this, Kenya like other SSA countries has been experiencing reduced competitiveness and constrained demand for peanut oil and peanut butter, along with inability to shift industry focus to the edible confectionary market. Hence, the marginalization of peanut products markets both nationally and internationally. Quantities of the peanut product stocked in the supermarkets have been decreasing both in dynamic (edible peanut and peanut butter) and less dynamic (oil and cakes) sectors. Besides this, supermarkets prefer stocking products, which can fetch better prices. This point out that supermarkets welfare depends on the prices of the goods, which determines the level of their profit. Levels of value addition on peanut were also not known. Whether the prices charged at a particular level of value addition were the same for the different type's

supermarkets in Nairobi and, what causes price variations/differences if any had not been established. Price also being an important incentive to both supply and demand of a product, dictates the welfare of sellers and the consumers. Therefore, what causes price differentials that would mean difference in wellbeing needed to be established.

1.5 Objectives

1.5.1 General objective was

The main objective of the research was to establish the effects of value addition on the price of peanut products sold by supermarkets in Nairobi.

1.5.2 Specific objectives were

1. To characterize value addition levels of peanut sold in Nairobi's supermarkets.
2. To establish whether value addition levels affects the price of peanut products in Nairobi's supermarkets.
3. To determine if there are price differentials due to location and, /or division and across the types of supermarkets in Nairobi.
4. To establish factors that influence price differentials in the peanut product pricing across retail supermarkets in Nairobi.

1.6 Research questions

1. What are the levels of value addition on peanut sold in Nairobi's supermarkets?
2. Are peanut products prices sold in Nairobi's supermarkets affected by value addition levels?
3. Are there price differentials due to location and/or division across the supermarkets in Nairobi?
4. What are the factors that influence prices of the peanut products in the retail supermarkets in Nairobi?

1.7 Justification

Retail supermarkets are rapidly penetrating both the urban and rural food retail in Kenya. Their growth is following the same pattern similar to that observed in other countries like Central America. They have developed various new stores and penetrating small and poorer towns. Their share on urban food markets have increased to 20% over a decade ago (Chege *et al.*, 2005). However little economic researches have been done in Kenya about the relationship between value addition and pricing of peanut products sold in the supermarkets. In addition to this, the development of the Kenyan retail supermarkets had not been adequately studied. Also, Since diversified demand of consumers have important proposition in the supply chain as it dictates which products need to be processed and stocked and their profitability which is an incentive to investment as well as the economic development at large, it was therefore important to explore and explain these diversified observations.

This research was therefore to reduce the inadequate literature on this area of concern by analyzing the effects of value addition causing heterogeneous attributes on peanut products and price variations that result to sales and demand variations. The research would help in improving agricultural and industrial sectors in production of demand driven products. It would also form the basis for further research in food production, value addition, as well as marketing.

1.8 Scope and limitation of the study

1.8.1 Scope

In this study, supermarkets were considered as the marketing channel and therefore the study population. The study intended to focus only on peanut products sold by supermarkets in Nairobi Kenya. The task was to establish the different level of value addition done on peanut and how these levels of value addition affects prices of peanut products. The study only considered those supermarkets in Nairobi. Variables that influence the price of peanut apart from level of value addition were also to be established. Effects of inflation were not considered in the study.

1.8.2 Limitations

Only peanut value added products sold in the Kenyan supermarkets in Nairobi were studied yet other retail outlets apart from supermarkets also sell these products. Also not all variables that affect prices (e.g. rate of inflation and benefits due to economies of scale), were considered due to resource constraints. There were also a few literatures on Kenyan supermarket subsector and peanut value addition hence limited amount of information about the study became a challenge.

1.9 Operational definition of terms

For the purpose of this research, the following terms were used. It is however important to note that these definitions had been used to fit the purpose of the study and might slightly differ from the normal definitions.

Value addition: the increase in worth of a product or service because of a particular activity. Factors which constitute the additional values are features, quality, customers perception (or image) and exclusiveness. Value addition is done by manufactures to increase satisfaction from consuming a product. This can be in form of time, form and place satisfaction.

Supermarkets: self-service stores, which carry a complete line of food products as well as other convenience items. Customers place their shopping into shopping bags and do checkout including scanning products and making payments. They include, superstores (e.g. Nakumatt), mini-supermarkets (e.g. those found in the estates relatively smaller than Nakumatt) and fuel stations.

Product attributes distinctive tangible and intangible features or characteristics of a product that give it its value to a user. These features prompt a consumer to prefer one product to the other. This is what causes the level satisfaction and hence its preference amongst other products.

Value variation: difference in price of a commodity due to difference in the value added. Prices of commodities are not the same due to the increase in an attribute to distinguish it from other commodities.

Market differentiation: drawing attention to distinct, unique features, traits, or aspects for setting a market apart from competitors.

Utility: this is the amount of satisfaction a consumer derives from consuming a good.

Multinational: a large commercial organization with affiliates operating in a number of different countries or possesses other fixed assets in at least one foreign country and makes its major management decisions in a global context.

Blanching: removal of the red skin from peanut.

Quality: overall superiority or excellence of a product.

CHAPTER TWO: LITERATURE REVIEW

2.1 Rapid growth of supermarkets

Supermarkets have increased in the past decade and are increasingly being important agents in the agri-food systems of developing countries. This increase is attributed to the changing behaviour of consumers who in liberalized markets decide which retail firms and what products are consumed. Supermarkets are developing very fast in the developing countries. According to IFPRI, (2005), this development began mainly in the last two decades. The diffusion has varied over regions and it is described in three waves. The first wave started in early to mid 1990's. During this wave, the average share of supermarkets in food retail went from a mere niche of about 10 to 20% of food retail in 1990 to dominate the market with 50 to 60% of food retail by early 2000. This wave started small in South America, East Asia outside China and Japan, Northern Central Europe and South Africa.

The second wave began taking off in the mid to late 1990's. It was in parts of South East Asia and Central America, Mexico and Southern Central Europe. During this wave share went from 5 to 10% in 1990 to 30 to 50% by early 2000 taking off in the mid to late 1990's.

The third wave-involved countries in which supermarkets take off started in late 1990's or early 2000 reaching about 10 to 20% of national food retail by 2003. It included countries in Central and South America (e.g. Peru and Bolivia), South East Asia (e.g. Vietnam), China, India and Russia. The latter three are the foremost destinations for Foreign Direct Investment (FDI) in the world with the supermarket sector growing at 20 to 40 % per year. It is only South Africa that is in the first wave of supermarket penetration while the rest are in either the third wave take off or in a pending or not yet started fourth wave. Kenya, Zambia, and Zimbabwe are in the early face of the third wave and have supermarkets initiated by both domestic investment and FDI from South Africa. This investment was due to a middle class base and a high urbanization rates. The penetration is still only, where South America was in the early 1980's (Neven and Reardon, 2004). It is important to note that diffusion occurs at different rates over the space within a country and over socioeconomic strata. The diffusion is from large to middle to small cities and even to rural towns and from upper to middle class and then even to the poorer population (Dries *et al.*, 2004)

2.2 Factors for diffusion of supermarkets

According to the work of Reardon *et al.*, 2003, diffusion was majorly driven by demand factors and by FDI and procurement change. They include, first, Urbanization coupled with the consequent entry of women into the work force outside home and their incentive to seek shopping convenience and processed foods to save cooking time coupled with increased demand for processed food in addition to rise in per capita incomes. Second, price reduction and large assortment. The low prices are single most important driver behind the fast consumer acceptance of supermarkets in Kenya especially for the more price –sensitive low income by supermarkets relative to traditional retail on processed and perishable products. This price reduction is because of evolution of technologies and procurement systems by supermarkets and processing firms. Third, real mean per capita income growth. Fourth, Reduction of transaction cost through access to or acquisition of private or collective capital that reduces the cost to access supermarkets i.e. rise in refrigeration ownerships, growing access to cars and public transport. Fifth, liberalization of FDI. In 1990's and after, FDI was crucial to the take-off of supermarkets. Domestic chains had been growing slowly before the waves of DFI, thereafter grew, and developed faster in order to keep pace with foreign chains. The FDI grew faster because of saturation and intense competition in home markets and hence profit margins could be made higher by investing in developing markets resulting to consolidation and increase in multinational supermarket chains. Sixth, retail procurement logistics. Technology and inventory management underwent revolution in the 1990's. These resulted to dramatic reduction of costs thereby allowing supermarkets to extend beyond high price luxury niches in the markets penetrating the mass market for food.

2.3 Supermarkets and consumers in Kenya

In Kenya, (Neven and Reardon, 2004), supermarkets are growing at an annual rate of 18% having a 20% share of the urban food. They have began to modernize their procurement systems by centralizing procurement over the country by selecting preferred supplier-farmers and specialized wholesalers and instituting initial and basic private standards of quality (Neven and Reardon, 2006). In terms of supermarkets, Kenya has advanced in comparison to the rest of East Africa. The country has approximately 206 supermarkets and 10 hypermarkets (equivalent to the floor space of approximately 100 supermarkets) (Dave and Thomas, 2003). Kenyan supermarkets have three levels of operation (Neven and Reardon, 2004). The first level consists of two market leaders i.e. Tuskys and Nakumatt supermarkets. They represent almost 50% of the supermarket sector in terms of sales. Tuskys targets

consumers from all socio-economic classes while Nakumatt focuses on the high-income segment (50%). The second level consists of Naivas, Ukwala and Metro cash and carry chains and Woolworths (foreign- owned chains) who are competing for the middle to low income urban consumers. These top five supermarkets chains represent 28% of store and 60% of the sales. The third level consists of small chains and independent (single-store) supermarkets (Reardon *et al.*, 2003)

Geographically, supermarkets have rapidly expanded. In 2003, nearly 60% of the supermarkets outlets and 44% of the supermarkets sales were located outside Nairobi and at every provincial capital in Kenya. The country- level supermarket density is seven supermarkets per million people. Since 1995 supermarkets in terms of their sales have been growing at an average of annual growth rate of 18%. Supermarkets are increasing their market share vis-à-vis traditional food retailers e.g. kiosks, greengrocers, over the counter shops, market stalls and street hawkers and it is estimated that at this growth rate, supermarkets will be the dominant food retailers by 2011 (Neven *et al.*, 2005)

2.4 Consumers and commodity attributes

Quality attributes from final product from peanut vary among developed and developing countries. Peanut are mainly used for making peanut butter and consumed roasted or in confectioneries. In developing countries, it is mainly processed for its oil. Users demand certain attributes and technical specification. Peanut quality and consumer preference may be judged by, flavor which is enhanced by roasting peanut. Hence, it plays an important role in its acceptance by consumers and other users. Flavor also plays an important role in the acceptability of peanut products like peanut butter. Secondly, peanut are judged by texture. Such textures include crunchy and crisp. These textural attributes are important and desirable sensory qualities of peanut. Crisp food is one that is firm (stiff) and snaps easily when deformed. Thirdly, peanut are judged by Colour. Colour of raw peanut is attributed to both the testa and the oil. Colour of roasted peanut is due to the sugar-amino acid reactions with the subsequent production of melanin's (www.fao.org)

Peanut commodities must not always match the consumption in every period of production, but can be stored after value addition, hence stored in the form of inventories. Usually storage is undertaken in the hope of price appreciation (Nielsen and Schwartz, 2004). In marketing, brand equity has become an important strategy requiring consistent monitoring to ensure long-term performance. Brand equity helps in ensuring that a brand becomes profitable by achieving higher brand loyalty, premium pricing,

lower price elasticity, lower advertising to sales ratio and trade leverage (Keller, 1993). Many firms nowadays appoint brand equity managers to both detect signs of good or bad performance and hence initiate programs to improve the performance of a brand. Marketing practitioners in consumer packaged goods use store-level data in monitoring brand performance by store type and geographical region in addition to assess the impact on sales changes in advertising, price, and distribution (Sriram *et al.*, 2007). Working from consumers market interface backwards, firms search for possible sources of value creation derived from market intelligence and determine if they can meet these needs based on their own core capabilities (Erick and Hamish, 2008). This calls for a market orientation to generate and disseminate market intelligence through the firm as well as the marketing channel and in turn, use the new knowledge to create products that meet the expressed needs and satisfaction of consumers. Other than having a cost advantage over competitors, another method for providing SCA is through product differentiation. In this premium, prices are earned through distinguishing characteristics of the product (Erick and Hamish, 2008). Market orientation is important in either a commodity or value added market. The market awareness gained by highly market-oriented producers allows them to internalize appropriate market information and earn higher prices for providing the specific product attributes demanded by consumers. Market orientation therefore provides a more efficient method for the transfer of the expressed and consumer attributes requirements to producers for use in the production of value added products. If higher prices and excess rents are to be earned for products which provide consumers desired attributes, it is important that firms learn which attributes would provide the most value, and if the value-attributes relationships change over time (Erick and Hamish, 2008). Most empirical analysis have used different but appropriate tool set to isolate individual product characteristics and their specific influence on price in order to provide an insight on what consumers purchase. Respondents are asked to make repeated choices between different consumption bundles, which include different attributes, and the level of these attributes. The choice experiments show that respondent's utility depends on attribute levels of choices made from these sets (Greibitus *et al.*, 2009). This enables the researcher to determine the attributes that influence the choice significantly for an increase or decrease in the significant attribute.

2.5 Related empirical studies

Steiner, (2004) in his study employed hedonic price analysis to estimate implicit prices for labeling attributes. By combining data on actual consumer choices with the assumptions of optimizing

behaviour, he obtained information on consumer preferences for attributes contained on the labels of Australian wine bottles. A parametric approach was used to estimate implicit prices for these attributes from prices and quantity proxies of wines sold in the British off-license market in 1994. The results confirm that consumers attach a distinct valuation to the quality of the sales channel. However, in the absence of detailed information on individual retailer traits, he was unable to reveal the origin of these distinctive valuations. Interaction terms were used in order to reveal the differential effects between attributes, and where these were found to be statistically significant, consumers are viewed as regarding attribute bundles as imperfect substitutes. His results suggested that consumers value regional origins jointly with grape varieties and regard these bundles as proxies for brands. This contrasts with the general observation that grape varietal labeling is the distinctive feature of New World wines. The analysis was inherently static and did not account explicitly for valuation due to repeat purchases or different advertising intensity across wines. Due to the nature of the data (dummy variables), he argued that limited functional flexibility would affect the validity of their estimates, although early studies suggest that such constraints may not be as problematic.

Brasington and Hite, (2005) in their study estimated the relationship between house prices and environmental disamenities using spatial statistics, confirming that nearby point source pollutants depress house price. They then calculated implicit prices of environmental quality and related characteristics from the house price hedonics to estimate a demand curve for environmental quality, finding a price elasticity of demand. They found evidence of significant spatial effects in both the hedonic and demand estimations. In addition, they found that environmental quality and school quality are purchased together, environmental quality and house size are substitutes, and environmental quality and lot size are not related goods.

Bryan *et al.*, (1996) in their study used experimental auction data to evaluate consumer perceptions, willingness-to-pay, and attribute values for fresh pork chops that differ simultaneously in multiple quality attributes such as, colour, marbling and size. Furthermore, the consumer presentation format of the experimental treatments were varied in terms of, the appearance of the chop in pictures, the appearance of fresh chops and the appearance of the chops after tasting comparable chops. Results confirmed that consumers could distinguish rather slight differences in embodied attributes of a heterogeneous product such as fresh pork chops. Furthermore, consumers are able to simultaneously

value those differences across presentation formats. However, hedonic analyses of price differences for either market or bid prices showed marked differences across presentation format. These results demonstrated the potential effectiveness of experimental auction data to elicit consumer prices and attribute values for widely varying products such as fresh pork. Furthermore, presentation format together with auction protocol affect bids and market prices in ways that make results difficult to compare across formats and are a warning to those who try to promote fresh meat products based on photo advertising. Their results also pointed out that experimental auctions have the potential to help agricultural producers and marketers identify and capitalize on important qualitative attributes for their heterogeneous products and to identify consumer differences that affect product values. The nature of consumer preferences and pork attributes depend upon the characteristics of the consumer, the product, and the way product information is presented to consumers.

Kelly *et al.*, (2004) in their study combines a unique data set with the hedonic framework to estimate how consumers (specifically, parents of babies) value reductions in pesticide exposure, as evidenced through the organic baby food market. Results indicate that individuals are willing to pay more, for organic baby food as opposed to conventional varieties. These results provide interesting insights into the prices consumers are paying for organic baby food. Even though baby food is only purchased for a short period in a child's life (typically ages 3-12 months), some consumers pay a premium to feed their baby organic rather than conventional baby food.

Philippou *et al.*, (2005), used hedonic pricing approach to examine retail egg prices in Greece which is highly differentiated their objective was to identify the product attributes that affect egg prices. Using primary data collected for the study, the retail price was studied in relation to product attributes, production and distribution methods, and packaging. Findings suggested that the retail price is influenced by specific natural attributes of eggs indicative of their quality. The main attributes that positively affect the retail price of eggs are egg size, enrichment, poultry feeding system (i.e. organic and free-range feeding methods) and package appearance. By considering these attributes, suppliers of eggs for example, a farmer or retailer can enhance the opportunities to develop an effective marketing mix. Their findings supported vertical integration in egg production and marketing, which leads to lower retail prices. Distribution through retail chains reduces egg retail prices and weakens producer bargaining power. Under these conditions, egg producers have to make their own choices on pricing policy and marketing strategies. In order to be competitive, egg producers have either to improve

marketing mix components, such as the enhancement of specific egg attributes, or collaborate in the formulation and implementation of a single price policy. The implementation of quality systems or alternative poultry-feeding regimes does not affect prices.

2.6 Matched model as an alternative to hedonic model

The matched models method is the universally accepted procedure for the compilation of Consumer Price Index (CPI) and the measurement of inflation. The details and prices of a representative selection of items are collected in some base/reference period, and their matched prices are collected in subsequent periods. So that, like is compared with like. It has nonetheless been criticized for its inability to properly incorporate quality changes, substitution bias and the effects of new goods (Boskin *et al.*, 1996 and 1998). However, results from hedonic regression studies have shown different results, usually lower rates of price changes. Recent examples of different results are shown in by the researches of, Silver and Heravi, (2001b and 2002) and Pakes, (2001). Yet the matched method has its supporters. Alan Greenspan, in commenting on the need for better micro data for price measurement, reported on how the conceptually simpler matched model method can give comparable results to the hedonic approach when detailed micro data are used (Greenspan, 2001 citing Aizcorbe *et al.*, 2000).

2.7 Disadvantages of matched models

Four reasons are considered to disqualify matched models. These include, first, its static nature of sampling the universe. This makes the matching procedure to avoid price changes due to quality changes. Yet its adoption constrains to a static universe of models that exist in both the reference and base period. In addition to this, the models that exist in the reference period, but not in the current period are therefore not matched, and similarly those new models existing in the current period but not the reference one are not matched. Yet the dynamic new models not in the reference period may be the ones undergoing more rapid technological change and the old ones may incorporate an obsolete technology, both experiencing unusual (quality adjusted) price changes. The conundrum is that the very device used to maintain a constant-quality sample not marred by technological change, may itself give rise to a biased sample that excludes new, unmatched technological developments and old, unmatched obsolete ones.

Secondly, is the issue of missing items and quality adjustment. In this case, when items in subsequent periods are missing, the items are simply not available for any record to be made of their prices. They

may be obsolete or no longer stocked by the establishment. A number of procedures are available to statistical offices in such circumstances to assign the missing prices, replace the missing prices with comparable models or non-comparable ones with associated adjustments for quality differences. If this is undertaken on a substantial basis and there is a bias in these procedures the matched models method fails.

Thirdly, is the concern about quality adjustment and the sample space. As noted above quality adjustment techniques are used when an item is permanently missing. The practices used when items are missing have implications for the active sample. For example, the selection of comparable items may be directed towards items with high sales to improve the sample reduction, or conversely towards similar items which by their nature will have low sales. Alternatively, the use of imputations based on the price changes of the existing sample may suffer from allowing the sample to further deteriorate. When this degraded sample is used to make imputations as to the price changes of replacement items, it of course reflects the changing technology of a sample not representative of current technological changes.

Fourth is the issue of new products. This results to an error that lies when something new is introduced into the market place. There is a difficulty in distinguishing between new items and quality changes. When a quite new item is introduced, there is a gain to consumers. This utility gain (welfare gain), from its introduction could not be properly brought into the index by waiting until the index was re-based and a new basket. We would include the subsequent price changes, but not the initial gain in welfare accompanying its introduction. A measure of the welfare gain requires an estimate of the reservation price of the commodity in the period before its introduction, that is, when demand would be zero. (Mick and Saeed, 2001)

2.8 Advantages of hedonic model

First, hedonic approaches use regression techniques whereby, in their simplest form, the price of an item is regressed on its quality characteristics and dummy variables for the period to which the observations relate. The coefficients on these time dummies are estimates of the change in price over the period concerned, controlling for changes in the quality mix of what was bought. Studies have found substantial differences in the results from the matched and hedonic approaches. When comparing results, there is often a preference for hedonic approach as the benchmark. Though the

basis for this is not always apparent, (Boskin *et al.*, 1996 and 1998) and, (Hoffmann, 1998). Second, hedonic analysis can be used in the background as a guide to application of the matched model method or used directly in making quality adjustments for sample items that are being replaced, (Liegey, 1993) and (Fixler *et al.*, 1999). Third, hedonic method always result in a lower rate of price change as opposed to the matched models that have resulted to higher rates of price change, hence hedonic is specifically designed to correct for downward bias. Finally, hedonic methods are prohibitively expensive in that data already collected by the statistical agencies are perfectly adequate for hedonic analysis, hence minimal requirement for secondary data, (Fixler *et al.*, 1999). The actual regression analysis itself is also often straightforward.

2.9 Theoretical and conceptual framework

2.9.1 Theoretical framework

The research focused on the economic theory of consumer utility whereby,

$$U = f(X_1, X_2, \dots, X_n) \quad \text{FXN 1}$$

And that; X_1, X_2, \dots, X_n are peanut products with different levels of value additions.

Moreover, supermarket being a firm operates under the theory of the firm, with the primary objective of maximizing utility driven by revenues so the FXN 1 becomes:

$$\text{Max } U(X_1, X_2, \dots, X_n) \quad \text{FXN 2}$$

Subject to, price of products X_1, X_2 to X_n and the amount of resources (M) available.

Thus,

$$M = P_{X_1} + P_{X_2} + \dots + P_{X_n} \quad \text{EQN 1}$$

When supermarket i , faces a choice alternative n , (peanut products) in the z^{th} choice set with attribute levels represented by vector X_n , the supermarket would choose alternative j as preferred alternative if and only if the utility (revenues) associated with alternative n is greater than other available alternatives under the same produce category. Random utility theory allows a supermarket to express the direct utility (U_{inz}) associated with alternative n for supermarket i in the z^{th} choice set as shown below (McFadden, 1974):

$$U_{int} = \beta X_{int} + e_{nt} \dots\dots\dots \text{EQN 2}$$

Where: β is a vector of unknown parameters (level of value addition, location, division, type of supermarket, brand, packaging, size of purchase) to be measured in relation to price.

X is the peanut product with differentiated feature due to different value addition.

e_{nt} is an error term reflecting the randomness of this utility expression.

The probability of choice is therefore, represented by a conditional logit model shown as;

$$Prob_{int} = \frac{\exp(\beta X_{int})}{\sum_{k=1}^n \exp(\beta X_{ikt})} \dots\dots\dots \text{EQN 3}$$

So that the expression above is the probability for supermarket, i choosing alternative n in the z^{th} choice set. In addition to product attribute variables, other factors like individual characteristics would also be important in determining utilities associated with various products. This demographic information is likely to function through product attributes. Thus, interaction terms can be created between respondent demographic variables and attribute variables. This modification, however, does not avoid the restrictive substitution pattern shown by conditional logit model showing probability of choice (Louviere, *et al.*, 2000 and Carlsson *et al.*, 2007a).

2.9.2 Conceptual framework

Commitments in enhance high value products through value addition is important in marketing. Its concern enables a firm to quickly react to consumers' demands and changes in the market. If higher prices and higher sales are to be realized, for products that provide consumers desired attributes, then it is important that firms learn which attributes would realize what price and therefore a product's quantity to produce. Value-attributes relationships therefore which change over time play an important role in product survival in the market. Attributes that signal quality are intrinsic and extrinsic. Intrinsic involves the physical composition of the product. They cannot be changed without altering the nature of the product itself and are consumed as the product is consumed. Extrinsic are product related but not part of the physical product itself.

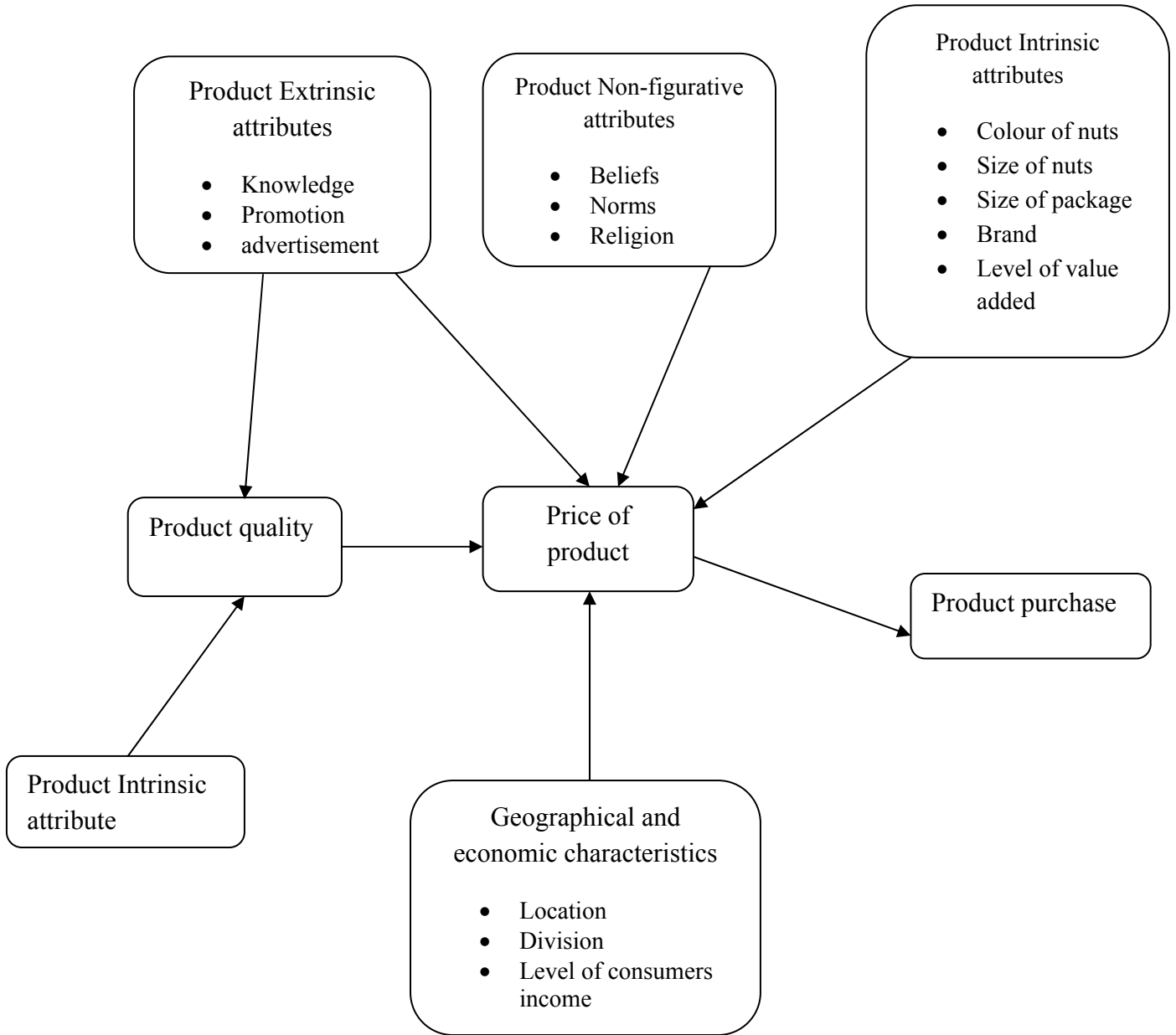


Figure 1: Conceptual framework

Source: own conceptualization

CHAPTER THREE: METHODOLOGY

3.1 Study area

Nairobi is one of the eight provinces in Kenya. It is the capital city of Kenya. It lies at an altitude of 1,670 meters above the sea level and occupies an area of 696 Km². It is divided into eight administrative divisions namely; Embakasi, Makadara, Pumwani, Central, Kasarani, Westlands, Kibera and Dagoreti. Its population has expanded to 2.7 million people currently. Nairobi experiences an average annual rainfall of about 925mm, varying from 500mm to more than 1500mm. It has two rainy seasons, from mid March to end of May (long rains) and from mid October to mid December (short rains). The province has an average temperature of 17.7°C during July and August to 20°C in March. It experiences an average of 2525 hours of sunlight per year with an average of 6.9 hours of sunlight per day (www. Climatemp.info). Nairobi was selected for the study because it houses numerous supermarkets that are found in all parts of the city. Again, Nairobi houses very many people with different economic status staying in different parts of the city with varied products demand.

3.2 Sampling design and sampling procedure

The sampling frame included all the supermarkets in Nairobi. The sampling procedure for the study was done as follows; all the eight divisions of Nairobi were administratively stratified (Embakasi, Makadara, Pumwani, Central, Kasarani, Westlands, Kibera and Dagoreti). This was because they have variety of supermarkets. Supermarkets from these divisions were then randomly selected. A random sample size of 100 (as shown in the formula below) supermarkets were equally selected so that 15 supermarkets from each division were randomly chosen. Determination of the sample size followed a proportionate to size sampling methodology as specified by Kothari, (2004) and was calculated as;

$$n = \frac{Z^2 pq}{e^2} \quad \text{Where;}$$

n is the sample size

p is proportion of population (50%) containing the major attribute of interest,

q is **1-p**,

z is the standard variation given confidence level of $\alpha = 0.05$ and

e is the acceptable error/precision of 9.8%. A sample size of 100 was therefore, determined by the following computation;

$$n = \frac{Z^2 pq}{e^2} = \frac{1.96 \times 1.96 \times 0.5 \times 0.5}{0.098 \times 0.098} = 100$$

The formula above was justified because the total number of supermarkets (as used for the study) in Nairobi area was not known because the research included also fuelling stations in Nairobi. Because of this, the assumption of the formula was that 50% of the subject of interest (supermarkets) possesses major attributes of interest for the study (stock peanut products). The acceptable precision of 8.95% was chosen because of the smaller sample size and hence higher confidence level of the results.

3.3 Data collection

Primary data and secondary data were collected. Primary data was through check list administered in form of questionnaire to the managers and shelf attendants of the selected supermarkets. Secondary data were gotten from the supermarkets database. These provided information about the trends in their products prices.

3.4 Data analysis

Data collected were analyzed using descriptive and inferential statistics with the assistance of SPSS, EXCEL, and STATA computer software packages.

3.5 Model specification

The research employed utility economic theory which considers price of a product as an important variable among other variables which dictates' the level of utility satisfaction. The amount of utility depends on the level of value addition which dictates' price of a product. It was therefore imperative to analyze price. Therefore, the study employed hedonic econometric model. In essence, the hedonic relation arises because of heterogeneity of products attributes. The model postulates a market containing a heterogeneous peanut products stock, which could only be modified at some cost, and heterogeneous supermarkets, some of which put different valuations on a given bundle of characteristics than others. Price differences are assumed to be due to differences in product attributes that include intrinsic attributes and extrinsic attributes (Parcell and Schroeder, 2007). Intrinsic quality attributes are those associated with the actual characteristics of the product, such as fat content, taste,

smell, and colour. Extrinsic attributes relate to promotional or informational characteristics that can also affect consumer. Focusing on the demand side of the market, utility is not generated by goods *per se*, but by characteristics of the goods.

The hedonic model would generally then be written as;

$$P_{it} = f(S_1, S_2, \dots, S_n) \quad \text{FXN 3}$$

Where, P_{it} is the price of good i at time t (for the study t does not vary because the data was cross sectional and thus what varies is the space) and

$$S = (S_1, S_2, \dots, S_n) \quad \text{FXN 4}$$

is a vector of attributes that determine the price of the product.

Each attribute j can be measured on a continuous scale or by dummy variable depending on its type. In this research, the attributes were expressed as dummy variables. Dummy variable coding was used as it is easily interpretable (Kristofersson and Richertsen, 2004). The attribute that was expressed in continuous form is package size to obscure marginal value differences. Therefore, the above functions (3 and 4) could be written as;

$$P_{it} = \alpha_t + \sum_{j=1}^k b^t_j s_j + e_{it} \quad \text{EQN 4}$$

It suffices to mention that there has been some debate about the preferred functional form of hedonic models. Many researchers believe that the choice of the functional form is an empirical rather than a theoretical matter. Most empirical findings favour the logarithmic model over its linear counterpart. This is in agreement with Diewert, (2001 and 2003) a priori point of view. Among other things, he argues that the residuals from a logarithmic model are less likely to be heteroskedastic. Because of the homoscedasticity, the Hedonic model is assumed to be linear in nature. Time dummy approaches to hedonic regression use a logarithmic specification merely for reasons of convenience. The model could compare two time periods; the base period 0 and the current period 1. Hence the (semi-) logarithmic function of the above equation 4 for the two periods will be;

$$\ln P_{it} = a_t + \sum_{j=1}^k b_j^t s_j + e_{it} \quad (t=0, 1) \quad \text{EQN 5}$$

Where; p_{it} is the price of product i in period t , b_j is the corresponding parameter, s_j is the j^{th} attribute of the product and e_{it} is an error term with an expected value of zero. Analysis does not change when some or even all characteristics are logarithmic. All parameters are time dependent as there is no reason to believe they must be constant over time, and EQN 5 should preferably be estimated on cross-section data for each time period separately. However, the research expects the parameters to be approximately constant in the short run. Thus if period 0 and period 1 are adjacent periods (i.e. months or days) it seems justifiable to impose a priori restrictions for all j 's as;

$$b_j^1 = b_j^0 = b_j$$

This implies that the restricted model would be estimated on the pooled data similar to estimating the model with one time (cross-sectional data).

3.6 Empirical Model

The dependent variable was price, which would be influenced by products attributes and was expressed as follows;

$$\ln P_{it} = a + \beta_1 \text{YEAR} + \beta_2 \text{SIZE} + \sum_{i=1}^n v_i V_i + \sum_{i=1}^n l_i L_i + \sum_{i=1}^n b_i B_i + \sum_{i=1}^n d_i D_i + \sum_{i=1}^n w_i W_i + e_{it}$$

Where; YEAR is the year for the supermarket establishment

SIZE is the quantity of peanut product purchased in kilograms

V_i is the dummy for the level of value addition

L_i is the dummy for the location of purchase (Central Business District or not)

Bi is the dummy for brand purchased

Di is the dummy for division of purchase

Wi is dummy for type of supermarket

eit is the error term

Table 1: Explanatory variables and the priori expectations for the study

Variable	Label	Units	Priori expectation
Level of value addition	LEVAD	Dummy	+
Location of purchase	LOCPACH	Dummy	+,-
Size of purchase	SIZPACH	Kilogram	+
Brand purchased	BRAPACH	Dummy	+
Division of purchase	DIVPACH	Dummy	+,-
Type of supermarket	TYPSUP	Dummy	+
Year of supermarket establishment	YRSUP	Year	+,-
Product packaging	PRODPACH	Dummy	+

CHAPTER FOUR: RESULTS AND DISCUSSIONS

This chapter presents the research results and discussions of the findings of the study. The results and discussions have been outlined with reference to the research objectives used in the study. The main objective was; to establish the effect of value addition on the price of peanut products sold by supermarkets in Nairobi. The specific objectives were; to establish the value addition levels of peanut, to establish if value addition affects the price of peanut products, to determine if there are price differentials due to location and/or division and across the supermarkets and to establish factors that influence price differentials in the peanut product pricing across retail supermarkets in Nairobi. Frequency/percentage distribution tables and figures are the main descriptive statistics used in this study. Inferential statistics such as correlation coefficients and tests of means have also been used, to show the relationship between various pairs of variables.

4.1 Description of the sampled supermarkets in Nairobi

This section focuses on the socio-economic overview of the sampled supermarkets in Nairobi area. From the results as shown table two below, it was evident that majority of the supermarkets employees were male who accounted for 62% while female accounted for 38% of the total respondents. These results conforms to studies that majority of urban employees are men compared to women. In addition, that the overall urban unemployment was increasing, with female unemployment being higher at 38% compared to 12.5% for males. In addition, more women also spend less time in wage employment and devote more time to household duties than the male counterparts who are still believed to be the providers of most families hence need for employment (Were and Wanjala, 2008). Majority of the respondents (55%) were employed in the medium stores followed by superstores (25%) and fuel stations absorbed 20%.

In relation to supermarkets and their branches, the results showed that 88% of the superstore, 34.5% of the medium stores, and 95% of the fuel stores had branches in Nairobi. The reasons for branches observed for the superstores could be due to the size of the chains and/or access to financial and capital to make the investments. In addition, it is because of the capacity of the chain to manage complex and centralized procurement systems (Reardon *et al.*, 2003). As the number of stores in a given supermarket chain grows, there is a tendency to shift from a per store procurement system to a distribution centre serving the branches. This is characterized by fewer procurement officers and increased use of centralized warehouses. Additionally, increased levels of centralization may also

occur in the procurement decision-making process and in the physical produce distribution processes. Centralization increases efficiency of procurement by reducing coordination and other transaction costs, although it may increase transport costs by extra movement of the actual products.

Table 2: Supermarket employment by gender and availability of branches

Supermarket type	Employees by gender		Branches	
	Male	Female	Yes	No
Superstore	21(84%)	4 (16%)	22 (88%)	3 (12%)
Medium store	29 (52.7%)	26 (47.3)	19 (34.5%)	36 (65.5%)
Fuel station	12 (60%)	8 (40%)	19 (95%)	1 (5%)
Total	62 (62%)	38 (38%)	60 (60)	40 (40%)

Source: Survey data, 2010

With respect to prices, results as shown in table three, revealed that, 84% of the superstores and 52.7% of the medium stores and only 5% of fuel stations have the same prices for all their branches for the goods that they stock. In addition to this, 16% of the superstores and 47.3% of the medium store and 95% of the fuel stations respondents responded that prices are different in the branches. The reason is that the almost all of the superstores and most of the medium store supermarkets that have branches control and operations are done at a central decision unit and the decisions are implemented in the branches.

In addition to this, 46.9% of supermarkets that had different prices in the branches showed that the difference is between 1 and 2 shillings while 42.85% attested that the difference is between 3 and 5 shillings and about 10.2% attested that the difference is above 5 shillings. With respect to the types of supermarkets, between 1 and 2 shillings, 50%, 46.15% and 47.36% of superstore, medium stores, and fuel stations respectively exhibited this price difference. Between 3 and 5 shillings, 50%, 42.3%, and 42.1% of the superstore, medium stores and the fuel stations respectively exhibited this price difference. Above 5 shillings, 0%, 11.5% and 10.5% of the superstore, medium store and the fuel stations showed this price difference for their branches.

Table 3: Distribution of supermarkets with similar and different prices

Supermarket	Similarity in prices		Difference in prices (Ksh)		
	Yes	No	1-2	3-5	Above 5
Superstore	21 (84%)	4 (16%)	2 (50%)	2 (50%)	0 (0%)
Medium store	29 (52.7%)	26 (47.3%)	12 (46.15%)	11 (42.3%)	3 (11.5%)
Fuel store	1 (5%)	19 (95%)	9 (47.36%)	8 (42.1)	2 (10.5%)
Total	51 (51%)	49 (49%)	23 (46.9%)	21 (42.85%)	5 (10.2%)

Source: Survey data, 2010

The results also showed that, majority of superstores were in the central division accounting for 40% of the superstore respondents. However, the superstores had their branches in other administrative divisions of Nairobi. Medium stores are found throughout the administrative divisions of Nairobi and form the bigger percentage in the divisions except in the central division where none was realized (0%). Fuel stations were also found throughout the divisions of Nairobi. However, a lower observation of 8% for fuel stations was observed in Westlands division. The reason for this low observation of fuel station in Westlands division could be attributed to the fact that Westlands close proximity to the city center where most Westlands residents prefer doing their shopping. In addition, it could be because of prices. Prices in Westlands tend to be higher hence relatively low number of people avoid shopping in this area leading to low business hence low investment in the fuel stations.

4.2 Levels and description of peanut value additions sold in Nairobi's supermarkets

From the sampled supermarkets, the study established that there are seven levels of value additions on peanut products stocked by the supermarkets in Nairobi. However, in the level of peanut butter, there are two major levels. These are smooth/crunchy and chocolate. The results indicated (as shown in figure 1) that the number of supermarkets that stock a level of supermarkets vary with the most number of supermarkets stocking redskin roasted peanut and fried peanut (94% each) followed by peanut butter (90%). The lowest number of supermarkets stock raw peanut (43%).

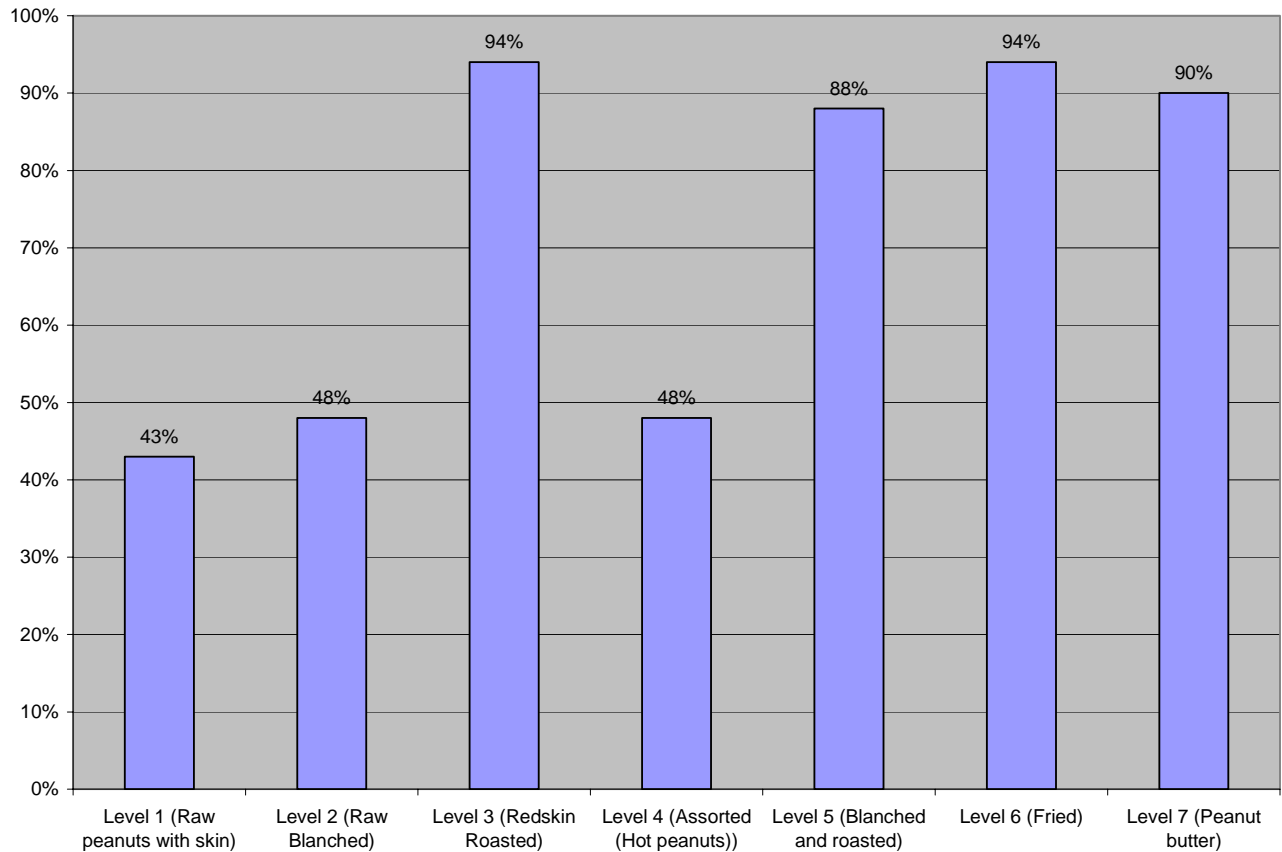


Figure 2: Existing levels of peanut value additions in the supermarkets

Raw redskin Peanut, This is the first level of value addition on the peanut in the supermarkets. The raw red skin peanut is what is inside the peanut husk. The whole peanut are only exposed from the husk. No more activities are done on the seeds apart from being packaged in different weights. Raw Blanched peanut, this is the second level of value addition on peanut. In this level, the peanut red skin covering have been removed. The peanut red- skins are removed by dropping the peanut through a set of mechanical brushes, which makes the red skins break open. The redskins are then blown to the side by a blast of air. This is mechanical blanching. Another method commonly used is to blast the redskin with water. This does a better job, but it is more costly and the peanut have to be dried again. Redskin Peanut Roasted. This is the third level of value addition. In this level, the red-skinned peanut are roasted. There are two different products that can be produced in this level, these are; Salted where salt is added to the red skin peanut before being roasted and unsalted where no salt is added to the red skin peanut .This level therefore caters for the varied consumption of salt by the consumers. Hot peanut, this is the fourth level of peanut value addition. In this level, the peanut are roasted to

perfection and then coated with spicy hot coating, to give the product a distinct taste to the consumers. Blanched and roasted. This is the fifth level of value addition on peanut. In this level, the red skins of peanut are removed before the nuts are roasted. Two products are usually found in this level of value addition. These are, first, roasted and salted and second, roasted and unsalted. Roasted and blanched peanut are one of the most fashionable peanut products in the supermarkets. They are relatively expensive than the previous levels because the blanched peanut lack skin. Fried peanut, this is the sixth level of value addition on the peanut that are in the supermarkets in Nairobi. In this level, dry peanut that are not blanched are fried using cooking oil. Frying is done for two reasons, one, to gives the seeds a shiny and good outlook and two, to increases the level of crunch and taste besides enhancing the flavor of the peanut. In this level, there are also two products. These are, first, fried and salted and second, fried and unsalted. Peanut butter, this is the seventh level of value addition on peanut. In this level, peanut have further been manufactured to or blended with other products to form peanut butter. Just as the other levels, this level has different brands from different manufactures in addition to being packed in different weights. Peanut butter also has different value addition for the brands and different weights that are stocked. This includes, smooth, crunchy and chocolate.

4.3 Relationship between value addition levels and the prices of peanut products

The objective for studying this was to find out if prices of peanut products were affected by the level of value added to the product. To achieve this, prices of peanut product were converted to equivalent of a kilogram. This was done purposely do give an equal level for price comparison between the levels of value addition. From table four and figure two, it is evident that the prices per kilogram of peanut products differed from one level to the other. Price per kilogram increases from raw redskin peanut (Ksh 310.44), which is relatively low priced due to low level of value added to chocolate peanut butter that has more value added fetching a high mean price of ksh 516.33 per kilogram.

Table 4: Levels of peanut value addition and corresponding prices per kilogram

Descriptions of value additions	Level of value addition	Mean Prices Per Kg (in Ksh)
Raw Redskin Peanut	1 st	310.44
Raw Blanched Peanut	2 nd	340.08
Redskin Peanut Roasted	3 rd	351.00
Hot peanut	4 th	363.48
Blanched and roasted	5 th	366.60
Fried peanut	6 th	382.20
Peanut butter (Smooth and Crunchy)	7 th	394.44
Peanut butter (Chocolate)	8 th	516.33

Source: Survey data, 2010

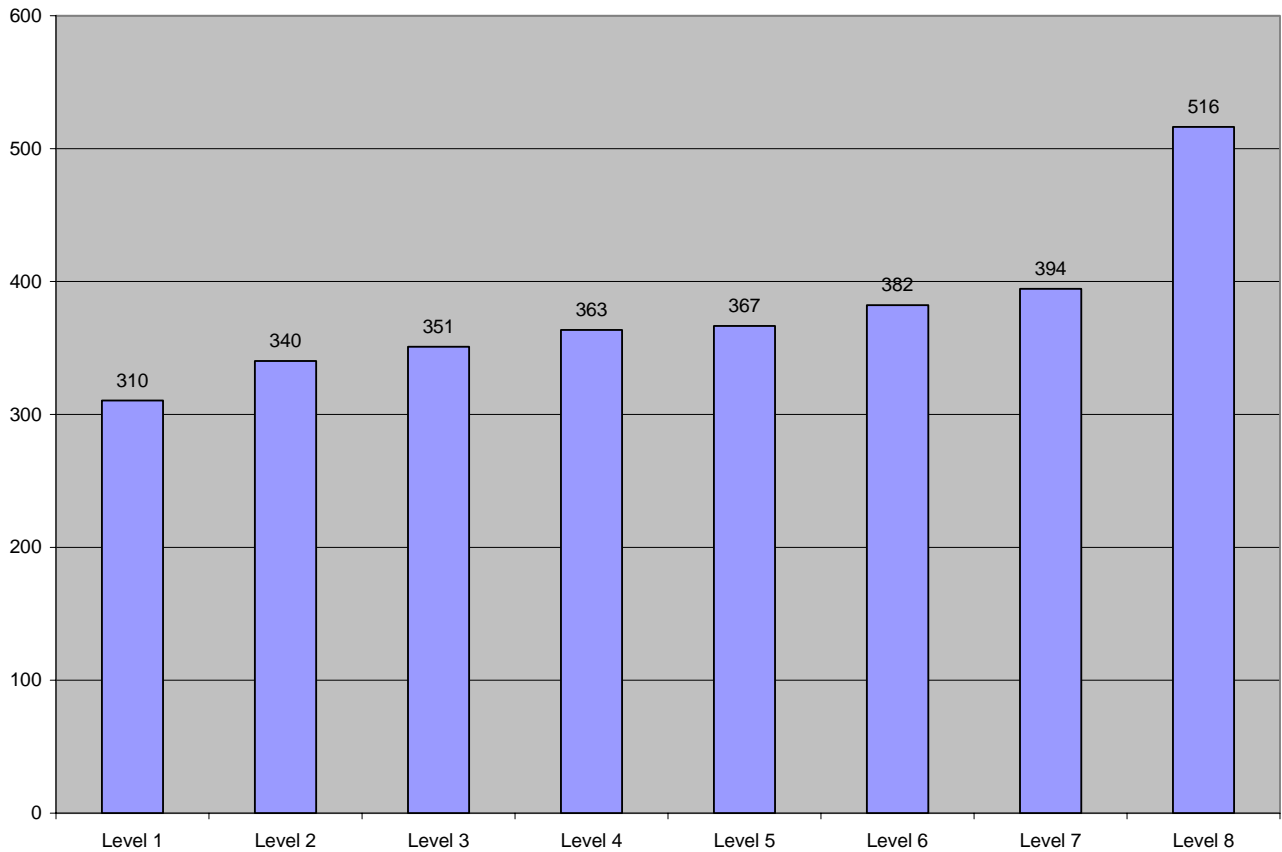


Figure 3: Graph of price per kilogram against value addition levels of peanut products

Key:

Level 1: Raw red skin peanut

Level 5: Blanched and roasted

Level 2: Raw blanched peanut

Level 6: Fried peanut

Level 3: Redskin peanut roasted

Level 7: Peanut butter (smooth and crunchy)

Level 4: Hot peanut

Level 8: Peanut butter (chocolate)

The results from person correlation statistics (shown in table 5) further indicated that there was a strong relationship between the levels of value additions and prices. The more value is added to peanut product through further processing, the more price the product attracted. This is seen through a calculated Pearson's correlation coefficient of +0.858, which is significant at the 0.01 level (2-tailed) this is because the P-value of 0.006 is less than 5%.

Table 5: Correlation between prices and level of value addition

		Levels of value additions	Price in Kshs
Levels of value additions	Pearson Correlation	1	.858**
	Sig. (2-tailed)		.006
	N	8	8

** Correlation is significant at 0.01 level (2-tailed)

Source: Computed from survey data, 2010

Due to other factors, such as tastes and preferences, seed sizes, advertisement, product branding and supermarkets pricing strategies/policies, there was need to find out price similarity if any in peanut butter prices (smooth, crunchy, and chocolate types). To achieve this, further analysis for the objective was done; the respondents were also asked to state the prices for 250 grams of peanut butter (Nuteez) products that had been added value by being processed into smooth, crunchy, and chocolate. The intention was to determine whether the three products were priced differently or otherwise. To find out this, Levenes test for variance homogeneity was used. Price variations within the above three types of peanut butter was evident. This is because the calculated Levenes statistic of 0.596 was not significant because the p-value was 0.552 implying that the prices are not similar. However, the descriptive results showed that the mean prices for smooth and crunchy were similar (Ksh 98.6) and that for chocolate was relatively higher (Ksh 129.1) as shown in appendix 2. In finding out whether chocolate peanut butter that is more processed as compared to smooth or crunchy were charged different, one-way ANOVA, LSD, and Tukey post hoc tests were used to compare the average prices of the three types of peanut butter. The one- way ANOVA results (as shown table 6) indicated that, there was an observable difference in mean prices of the three types of peanut butter. This is because the p-value (0.001) for the calculated F-ratio is lower than 5% suggesting that $F_{(2,174)} = 512.264$ is significant hence, an evidence of price difference.

Table 6: Variation in the mean prices for smooth/crunchy and chocolate peanut butter

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	32903.496	2	16451.748	512.264	0.000
Within Groups	5588.142	174	32.116		
Total	38491.638	176			

Source: Computed from survey data, 2010

Though, on average (see appendix 2) there was mean differences in price for peanut butter products (smooth, crunchy and chocolate), the LSD and Tukey post hoc tests showed that the mean difference in prices (0.000) for smooth and crunchy was not significantly different (1.000) between smooth and crunchy. However, the mean prices difference of chocolate (30.47226) was different from that of both smooth and crunchy (0.001) at 95% as shown in the multiple comparisons (table seven) below.

Table 7: Comparisons for mean prices for the peanut butter types

	(I) brand	(J) brand	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey	smooth	Crunchy	0.00000	1.00181	1.000	-2.3682	2.3682
		Chocolate	-30.47226*	1.07575	0.000	-33.0153	-27.9293
	crunchy	Smooth	0.00000	1.00181	1.000	-2.3682	2.3682
		Chocolate	-30.47226*	1.07575	0.000	-33.0153	-27.9293
	chocolate	Smooth	30.47226*	1.07575	0.000	27.9293	33.0153
		Crunchy	30.47226*	1.07575	0.000	27.9293	33.0153
LSD	smooth	Crunchy	0.00000	1.00181	1.000	-1.9773	1.9773

	Chocolate	-30.47226*	1.07575	0.000	-32.5955	-28.3491
crunchy	Smooth	0.00000	1.00181	1.000	-1.9773	1.9773
	Chocolate	-30.47226*	1.07575	0.000	-32.5955	-28.3491
chocolate	Smooth	30.47226*	1.07575	0.000	28.3491	32.5955
	Crunchy	30.47226*	1.07575	0.000	28.3491	32.5955

*. The mean difference is significant at the 0.05 level.

Source: Computed from survey data, 2010

4.4 Relationship between prices, administrative divisions and location in Nairobi

To study this relationship, prices of 250 grams of peanut butter products were classified into two categories. One, high prices (Ksh 100 or more for 250 grams of Nuteez peanut butter) and two, low prices (less than Ksh 100 for 250 grams of Nuteez peanut butter) as shown below.

where:	Remark
price \geq 100	High
price \leq 99	Low

The following cross tabs in table 8 result shows the distribution of ‘high’ and ‘low’ prices for smooth, crunchy and chocolate peanut butter in the administrative divisions in Nairobi. It is important to note that, for the analysis, only smooth and chocolate has been used. This is because the prices of smooth and crunchy are the same as analyzed and discussed above. From the distribution results, it was evident that the number of supermarkets charging ‘high’ prices for smooth/crunchy are in all divisions of Nairobi. The same observation was also seen for the case of chocolate peanut butter for all administrative divisions of Nairobi as shown in table 8 below.

Table 8: Distribution prices of peanut butter in the administrative divisions

		Remarks for Smooth/Crunchy		Remarks for Chocolate	
		High	Low	Low	High
Division	Central	8	1	1	8
	Dagoretti	5	1	1	5
	Embakasi	8	2	2	8
	Kasarani	10	1	2	9
	Kibera	5	1	2	4
	Makadara	8	1	2	7
	Pumwani	6	2	4	4
	Westlands	4	1	1	4
Total		54	10	15	49
Calculated		$\chi^2 = 1.395$, df = 7, p-value = 0.986		$\chi^2 = 4.664$, df = 7, p-value = 0.701	

Source: Computed from survey data, 2010

Chi-square computation results also indicated that there was no significant difference in pricing patterns of supermarkets in different administrative divisions of Nairobi for the smooth/crunchy types of peanut butter. The calculated chi-square was 1.395, with 7 degrees of freedom and p-value of 0.986, and therefore insignificant at 5% confidence level while for chocolate, the calculated chi-square was 4.664, with degrees of freedom of 7 and a p-value is 0.701, and therefore also insignificant at 5% level. This leads to the conclusion that, there is no price differential in the supermarkets in Nairobi due to administration divisions.

Further using the results of one-way ANOVA results as shown table 9,

Table 9: Mean price differences for peanut butter types in administrative divisions

		Sum of Squares	Df	Mean Square	F	Sig.
price (smooth& crunchy)	Between Groups	160.710	7	22.959	0.543	0.798
	Within Groups	2366.524	56	22.959		
	Total	2527.234	63			
price (chocolate)	Between Groups	34.070	7	4.867	0.399	0.897
	Within Groups	499.604	41	12.185		
	Total	533.673	48			

Source: Computed from survey data, 2010

The results showed that there was no difference in prices for smooth/crunchy and chocolate across the divisions of Nairobi. This is because the F-ratios for smooth/crunchy and chocolate were 0.543, 0.399 respectively, and were all not significant given that the p-values were 0.798 and 0.897 respectively. To analyze the difference in prices per location of supermarkets (CBD and not CBD) for the smooth and crunchy (considered together) and a chocolate brand, chi-square test was used. The available data for smooth and crunchy products were compared with their corresponding prices in two categories, 'high' and 'low' as explained above to obtain the results shown in the below cross tabulation in table 10.

Table 10: Distribution of prices of peanut butter in the locations

			Remarks for smooth/crunchy		Remarks for chocolate	
			High	Low	Low	High
Location	CBD	Count	8	1	0	9
		% within location	88.9%	11.1%	.0%	100%
	Not CBD	Count	46	9	7	48
		% within location	83.6%	16.4%	12.7%	87.3%
Total		Count	54	10	7	57
		% within location	84.4%	15.6%	10.9%	89.1%
Calculated			$\chi^2 = 0.162, df = 1, p\text{-value} = 0.687$		$\chi^2 = 1.286, df = 1, p\text{-value} = 0.257$	

Source: Computed from survey data, 2010

It was evident that the proportion of supermarkets charging ‘high’ prices for smooth and crunchy products from both CBD and not CBD respectively is 88.9% and 83.6% respectively. This difference was not significant. While the proportion of supermarkets charging ‘low’ prices for smooth and crunchy products from both CBD and not CBD respectively is 11.1% and 16.4% .This difference was not statistically different. This was evident from a computed chi-square statistic of 0.162 and a p-value of 0.687, which was not significant at 5% level with a one degree of freedom. To analyze price differences in chocolate products per the supermarket location, the researcher also organized the data for comparison with their corresponding prices in two categories, ‘high’, and ‘low’ as explained above to obtain the results shown in the above cross tabulation in table ten.

The percentage of supermarkets charging ‘high’ prices for chocolate products from both CBD and not CBD locations respectively is 100.0% and 87.3% respectively. This difference was not significant. While the percentage of supermarkets charging ‘low’ prices for chocolate products from both CBD and not CBD respectively is 0.0% and 12.7%. This difference is also not significant. This is evidenced from a computed chi-square statistic of 1.286, which was not significant at 5% level because the p-value was 0.257 at one degree of freedom.

To confirm these results, F test and t-tests were done. The results (as in appendix 3) indicated that the mean prices for smooth/crunchy in supermarkets at the CBD is 98.33 and 98.65 for supermarkets not in the CBD. Similarly, the mean prices for chocolate in supermarkets at the CBD are 128.90 and 130.00 and for supermarkets not in the CBD. The mean price differences were 0.321 for smooth/crunchy and 1.098 for chocolate. These mean price differences were not statistically different. This is because F values (0.007 and 3.689) and the t-values (0.14 and 0.849) are all not significant at 95% confidence level and hence the prices are not different.

4.5 Peanut value added prices across supermarkets in Nairobi

Since the distribution frequency of stocking of smooth and crunchy was equal (64%) and slightly higher than that of chocolate (49%) as shown in the table below.

Peanut product	Frequency	Percentage
Smooth	64	64%
Crunchy	64	64%
Chocolate	49	49%

Source: Computed from survey data, 2010

Results showed that, the mean prices for fuel stations was highest for Nuteez smooth peanut butter (Ksh. 104.8), followed by medium stores (Ksh 99.74) and then superstores (Ksh 91.8), see appendix 4. Using one-way ANOVA, the results indicated that there was difference in mean prices of the Nuteez smooth peanut butter in the three types of supermarkets in Nairobi. This is because the p-value of 0.001 for the calculated F-ratio. Further analysis using LSD and Tukey tests results (table 11), revealed that there was difference in prices for Nuteez smooth peanut butter among the types of supermarkets. Both Tukey and LSD tests showed that the mean prices were different between the three types of supermarkets at 95% confidence level. However, the greatest mean price differential was observed between the superstore and the fuel station (13.00452) while the lowest mean price difference was realized between the fuel station and medium stores (5.03394). The reason for the observed high prices in the fuel stations could be the feeling that the fuel station customers are well off with motor vehicle ownership being a proxy for being rich. The low prices observed in the superstores could be because of low transactional costs, which increase their ability for competition to their advantage.

To respond to the need felt by the superstores to the other existing retail and wholesale outlets, and to pursue competition strategies of lowering transactional costs while raising quality, Dries *et al.*, (2004) found out that, leading superstores chains have shifted over the past few years towards the use of new procurement system characterized by six pillars. These are; first, the shift towards centralized procurement systems, second, the shift towards cross-border procurement systems, third, the shift towards specialized/dedicated wholesalers, fourth, the use of global logistics to quickly improve procurement systems, fifth, the shift towards preferred supplier systems and finally, a shift toward adding private standards.

Table 11: Mean price differences among the three types of supermarkets

Dependent variable: price							
	(I) Types of supermarkets	(J) Types of supermarkets	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey	Super store	Medium store	-7.97059*	1.43014	0.000	-11.4061	-4.5351
HSD		Fuel station	-13.00452*	1.77387	0.000	-17.2658	-8.7433
	Medium store	Super store	7.97059*	1.43014	0.000	4.5351	11.4061
		Fuel station	-5.03394*	1.56998	0.006	-8.8054	-1.2625
	Fuel station	Super store	13.00452*	1.77387	0.000	8.7433	17.2658
		Medium store	5.03394*	1.56998	0.006	1.2625	8.8054
LSD	Super store	Medium store	-7.97059*	1.43014	0.000	0.000	-5.1108
		Fuel station	-13.00452*	1.77387	0.000	-16.5516	-9.4575
	Medium store	Super store	7.97059*	1.43014	0.000	5.1108	10.8303
		Fuel station	-5.0339*	1.56998	0.002	-8.1733	-1.8946
	Fuel station	Super store	13.00452*	1.77387	0.000	9.4575	16.5516
		Medium store	5.03394*	1.56998	0.002	1.8946	8.1733

** . The mean difference is significant at the 0.05 level

Source: Computed from survey data, 2010

4.6 Factors affecting prices of peanut products sold in the supermarkets in Nairobi

In establishing the factors that influence the prices of peanut products in supermarkets found in Nairobi, hedonic model was used. For the analysis, raw redskin peanut, superstore, central division, CBD, year between 1990-1995, Nuteez brand (as the best packed), Supermeal brand and 250 grams for smooth Nuteez were used as the base terms chosen randomly upon which, the parameters estimates b_j were interpreted as deviations from the basic factor against whose values the other factors are interpreted. In each dimension, the investigation was whether the different factors had different marginal values by testing whether the associated parameters are zero. The results were as shown in table 12. The factors are discussed as follows.

Table 12: Regression results for factors affecting peanut products prices in supermarkets

	Mean	Parameter estimates	Std. Error	t-value	P-value
Intercept	-	2.96*	-	8.852	0.012
Levels of value additions					
Raw Redskin Peanut (base)	310.45	-	-	-	-
Raw Blanched Peanut	340.08	-29.63*	1.60615	-8.869	0.012
Redskin Peanut Roasted	351.00	-40.55*	2.51661	-10.551	0.009
Hot peanut	363.480	-53.03*	2.00093	-14.396	0.005
Blanched and roasted	366.600	-56.15*	1.60000	-17.485	0.003
Fried peanut	382.200	-71.75*	1.72434	-20.841	0.002
Peanut butter (Smooth)	394.440	-83.99*	0.29484	-42.100	0.001
Peanut butter (Chocolate)	516.330	-205.88*	0.57744	-84.724	0.000
Types of supermarkets					
Superstores (base)	91.7644	-	-	-	-
Medium stores	99.7353	-7.9709*	0.66433	-5.544	0.031
Fuel stations	104.7692	-13.0048*	0.91343	-15.048	0.004

Division of purchase					
Central (base)	98.33	-	-	-	-
Makadara	100.22	-1.89	0.84620	-0.772	0.452
Pumwani	100.13	-1.8	1.34214	-0.651	0.525
Embakasi	96.50	1.83	2.75359	0.505	0.620
Kasarani	100.45	-2.12	0.69234	-0.963	0.349
Westlands	96.60	1.73	4.15452	0.400	0.696
Kibera	97.83	0.5	3.64615	0.123	0.904
Dagoretti	97.17	-1.16	3.43915	0.294	0.773
Location of the supermarket					
CBD (base)	98.0000	-	-	-	-
Not CBD	98.6964	-0.69643	0.83585	-0.0289	0.774
Year of establishment					
1990 – 1995 (base)	101.5000	-	-	-	-
1996-2000	100.2500	1.25000	0.16366	1.501	0.164
2001-2005	98.5217	2.97826	1.59405	0.762	0.453
2006-2010	97.8276	3.67241	1.19014	1.122	0.270
Product Packaging					
Best packed (Nuteez) –base	98.6094	-	-	-	-
Second best (Supermeal)	92.8814	5.728*	0.455	12.138	0.007
Third best packed (Zesta)	89.2182	9.391*	0.356	42.392	0.007
Brand purchased					
Supermeal (base)	92.8814	-	-	-	-
Nuteez	98.6094	-5.72802*	0.134	-12.138	0.007
Zesta	89.2182	3.663*	0.356	6.278	0.024

	Weights of products				
250 g (base)	92.0159	-	-	-	-
400 g	123.0159	-31.000*	0.66112	-33.156	0.000
800 g	233.0159	-141.000*	0.66112	-150.808	0.000

* the mean difference is significant at the 0.05 level. $R^2 = 0.68$

Source: Computed from survey data, 2010

Levels of value addition

As expected, the results revealed that level of value addition affects the prices of peanut products in the supermarkets. Prices of the products increased with an increase in the level of value added to the product. The parameter estimate (mean price difference) of the product increased as the level of value addition increased. The highest mean price (Ksh 205.88) difference was experienced between raw red skin peanut, which had the least value added and chocolate peanut butter that had the most value added. The p-value for this mean difference (0.000) was highly significant as well as for those of other levels as shown in table 12. Value addition is potentially an important activity in product positioning. The base attribute was raw redskin peanut (which only the husks had been removed) were priced relatively, lower than the subsequent products, which also were priced differently depending on the extent of value added. Asche *et al.*, 2002 found out that processing a product was an important attribute for the positioning of retail products among consumers, targeting certain markets segments and also that the price of a product is not independent of the process form.

Type of supermarkets

From the results, it was evident that mean prices varied depending on the types of supermarket. The mean price difference between superstore (base) and medium store and fuel station was Ksh 7.9709 and Ksh 13.0048 with p-values of 0.031 and 0.004 respectively, which were significant at 95%. This showed that super stores prices were lower followed by the medium stores prices while the fuel stations were the most expensive for the three types of supermarkets that stock peanut products. The lowest prices exhibited by the superstores is attributed the extensive use of modern technologies and procurement systems which lowers transaction cost (Reardon *et al.*, 2003) as well as ability to coup up with risk due to diversification of stocked products (Neven and Reardon, 2006) in addition advantages

of economies of scale they have. These factors are not found with the medium store which are mostly possessed by individuals leading to higher prices compared to the superstores. The highest prices in the fuel stations could be because of the mentality that clients of the fuel stations are vehicle owners hence a sign of wealth.

Division and Location of the supermarket

Mean prices differences of peanut products did not vary across the administrative divisions of Nairobi even though the mean prices are not the same. However, the mean price difference was greatest between the central division (base) and Kasarani division (Ksh 2.12) and lowest for Kibera division (Ksh 0.5). No mean price differences were significant as shown by the p-values at 95% level. Similarly, prices for peanut products in the supermarkets also did not vary with the location of the supermarket. From the results, the mean price difference between supermarkets in the CBD and outside CBD was Ksh 0.69643 with a p-value of 0.774, which was not significant at 95%. This observation could be because of the fact that the three types of supermarkets were found in all the locations and divisions of Nairobi and hence competition leading to an almost negligible price difference for the sake of customer acquisition and retention. However these results were not in agreement with the findings of Steve, (2008) and Roheim *et.,al* (2007) who found that prices vary with location.

Year of supermarket establishment

The mean price difference was witnessed more between the base year (1990-1995) and supermarkets established between 2001 and 2010 (Ksh 3.672) showing that the older the supermarket, the higher the prices. However, the mean price differences were not significant at 95%. It is important to note that, the superstores, and the fuel station were established or opened their branches between the 2006 and 2010 and the prices were similar in the branches. In order to attract and retain customers, these supermarkets employ different pricing strategies due to competition. Some use EDLP strategy enjoying low costs and higher profits due to their sales levels while others used the promotional or HLP. The superstores that used EDLP strategy makes the competition to be high and hence the competitors in the category tends to emulate the prices of each other or price their products relatively lower to dominate the market. However, for the supermarkets to increase their competitiveness, they tend to adopt the attributes of HLP format by doing promotions, media advertisement and in store

advertisement in what is known as game theory. This process is known as non-cooperative game theory. Time constrained customers are attracted to the HLP store because of greater service and large product assortment and cherry pickers are attracted because of products promotion. On the other hand, for the EDLP store, time constrained consumers are attracted by the low basket prices and convenient locations. Cherry pickers who are limited by time are also attracted by the low basket prices and limited need for a high level of service. These two strategies lead to increased competition and hence reduced prices to attract and retain customers. (Jones, 2004)

Product packaging

Frequency distribution revealed that Nuteez was the best packaged, followed by Supermeal and third was Zesta. Analysis showed that the mean price were different due to peanut packaging as prioritized by the consumers. The mean price difference between the best packed which was Nuteez (base) and second best (Supermeal) was 5.728. This mean price difference increased to 9.391 for Zesta, which was ranked third in terms of packaging. The p-values were all significant at 95% confidence level. This shows that packaging influences the prices. Therefore, new and innovative packaging designs could increase the perceived benefits to consumers' thus increasing value added to the product. Value is added when packages are designed for aesthetic and ability to deploy positive information to consumers and at the same time preserve the product qualities through time and from the environment (Gonzalez *et al.*, 2007). At the point of purchase, packaging undertakes increased importance as compared to other communication tools since it is easily available (Underwood and Klein, 2002). Packaging provides efficient barriers, preserve product and increases the shelf life of the product, besides enabling the consumers to understand the contents of the product and usage. Besides these functional utilities, packaging has a marketing role of providing competitive advantage. Innovative and distinct packaging with aesthetic presentation of colour, image, scent, and design can intrigue consumers and change their interests (Peters and Badrie, 2005)

Brand purchased

The results as expected (appendix 5) showed that, the mean prices for the three types of peanut butter brands were different. Using Tukeys post hoc test, Nuteez, was charged the highest, followed by Supermeal and third was Zesta. The mean price difference between the base (Supermeal) was 5.728 for Nuteez and 3.663 for Zesta brands. The p-values were 0.007 and 0.024, which shows significance

at 95%. These results are in line with the results of Roheim *et al.*, 2007 that brand name is an attribute that is relevant to the consumers' decision during purchase and that price is dependent of brand contributing to the differentiation of products. Therefore Nairobi supermarkets stock brand varieties with products with improvements in package design, labeling, advertising and brand strategies. From raw material through the final point of consumption, products should be managed effectively to deliver the end-consumers value (Christopher, 2005). Businesses have to overcome the challenges of satisfying demand of consumers unique and rapidly changing needs by producing brands that are acceptable (Gunasekaran *et al.*, 2008). Factors that enhance product survival are, brand quality, customer brand service quality and brand experience based quality. Brand functional value (involves brand characteristics and its benefit to the consumers) represents the customers overall assessment of the utility of a brand based on the perception of what is received and what is given. Best (2002) showed that brand value is a factor that creates value to the consumers.

Weights of products

Weight of product affected the price of the product. From the results, the mean prices for 250g, 400g and 800g of peanut butter were Ksh 92.0159, Ksh 123.0159 and Ksh 233.0159 respectively. The mean price differences were, Ksh 31 and Ksh 141 between the base weight (250g) and 400g and 800g respectively, showing that the mean price difference was most between the smallest and the biggest weight. The p-values (0.000) indicate high level of significance at 95% level that was used. The larger the package size, the larger the relative price. From the research, it was evident that most supermarkets stock mostly the 400g of the types of peanut butter. The reason was that customers preferred this weight because it was economical in the sense that compared to the 250g the additional 150g cost only Ksh 31 more. The most stocked weights were 250g and 400g. Hence, package size is an important attribute of a product. These results are in agreement with the results of Roheim *et. al* (2007) who attested that, package size is an important attribute in positioning of a product. Prices vary by package size. As expected, the larger the package size, the larger the relative price.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

One of the critical factors affecting firms to be successful in competition driven market place is consumers' perceptions of value on their products. This has resulted to a shift from traditional marketing era to consumers' oriented era with supermarkets increasingly dominating the markets. This has resulted to a far-reaching impact on food business, other retailers, and trade in processed food products. In this research, a quantitative estimate has been made for the relationship between value addition and prices of peanut products stocked by the supermarkets in Nairobi.

Findings of the research have shown that value addition has an effect on the prices of the peanut products. Prices of the products have been shown to differ depending on the level of value added. The lower the value added, the lower the price of the product and vice versa. Levels of value addition, types of supermarket, product packaging, product brand, weight of the product were factors found to affect the prices of peanut products sold in the supermarkets. However, administrative division, location of purchase (CBD or not CBD), and year of the supermarket establishment were found not to affect peanut products prices.

5.2 Policy recommendations

1. Stimulate production of value-added products

Most analysts believe that the prices of primary agricultural commodities will continue to fall in the future. Unless the mix of industrial activity is changed, economic growth will not occur. Market access measures now provide the opportunity to attract investment in the country to improve the quality and range of products and, more importantly, to produce value-added products made from locally produced raw materials. Every effort should be made to capitalize on these opportunities by promoting inward investment. Consideration should be given to strengthening the role of existing market and investment promotion organizations to include the preparation of detailed investment plans and packages in added-value products that will attract greater investment. Tax regimes should be modified where necessary to encourage this form of investment.

2. Establish a national market education program

Many actors in the agricultural sector in Kenya are still not familiar with the idea of competitive markets. A national market education program should be established to primarily target the farmers, traders, and agricultural product processors. Such a program needs to be linked to the agricultural market analysis, market information services and run in conjunction with other stakeholders, including Ministries of Agriculture, Education and Trade, farmers' and traders' associations and other private sector actors, and with extension services. The program needs to set targets for training farmers to understand how competitive markets work, to take advantage of market information, and to inform them of the difficulties and opportunities associated with market conditions. Issues addressed need to include the stimulation of collective activity to improve economies of scale, linking supply variety and quality to market needs, negotiation of sales and inputs, and the use of credit and business management.

3. Strengthen agricultural research and extension services

If Kenya is to compete successfully in the world economy, the institutions providing research for development in addition to extension services need to develop or acquire new skills and expertise in market analysis and market linkage. Producers need to ensure that there are viable markets for any existing or new products. They need to ensure that the quality and packaging of those products meet the requirements of customers both on the domestic and export market. Research and extension services have a vital role to play in this effort and must be prepared to reform quickly to meet the challenges of globalization. In many respects, national research programs have succeeded in their goal to achieve food security, and the emphasis should now be on developing dynamic and commercially orientated research that supports improved market analysis, market access, and value addition. Extension services should now focus on assisting producers to trade more effectively within a liberalized market. Special attention should be given to aspects such as linkage of production to markets, access to credit, and collective marketing which will enable the millions of small-scale farmers and producers to gain from economies of scale in their input and output markets. Government research services need to work closely with the private sector, which is increasingly developing its own research capacity, particularly concerning higher value commodities and research related to issues and problems further up the value chain.

5.3 Suggestions for further Research

This study focused more on the relationship between value addition and prices of peanut products in Nairobi besides establishing other factors that have influence on the prices. However, researches on long-term relationships between customer and product perceived value in the consumer market have not been studied adequately and they therefore constitute a very important area for research. To get an in-depth understanding of customer-perceived product value in a relationship marketing setting, further study on the socio economic factors or determinants that maximize customer-perceived product value is necessary. An understanding of customer-perceived product value relationships is fundamental for development and implementation of marketing strategies that are market efficient as well as cost-efficient.

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APPENDIX 1: QUESTIONNAIRE

SECTION A: GENERAL INFORMATION

1) Date of interview

2) Name of the supermarket.....

3) Respondent's name

4) Respondent's gender (tick one)

Male

Female

5) Which year was the supermarket established?

6) Which Division in Nairobi is the supermarket is situated ? (tick one)

Embakasi

Makadara

Pumwani

Central

Kasarani

Westlands

Kibera

Dagoreti

7) In what location is the supermarket found? (tick one)

CBD

Not CBD

8) What is the type of supermarket? (tick one)

Superstore

Medium store

Fuel station

9) Do the supermarket have another branch(s) in Nairobi? (Tick one)

Yes

No

10) If yes, are the prices of the products similar for the other branch(s)?

Yes

No

11) If No in No. 10 above, by how much are the prices different in Ksh?

1 - 2

3 - 5

above 5

SECTION B: PEANUT PRODUCTS

12) Do you stock peanut products?

Yes No

13) If yes, are your peanut product prices similar to those of the other supermarkets in this division or location of your establishment?

Yes No

14) What qualities of peanut products do you stock? (tick the appropriate)

- Peanut pods have not been removed
- Peanut pods have been removed
- Whole raw nuts are graded according to different sizes
- Whole raw nuts are colour sorted
- Whole nuts have been roasted
- The skin of the roasted nuts have been removed
- Whole nuts have been packed in different weights
- The nuts have been processed into different products

15) What peanut products do you stock? (tick the appropriate)

- Peanut whole seeds
- Peanut confectionaries
- Peanut butter
- Peanut oil
- Peanut cakes

16) What are the levels of value added peanut products are available in your supermarket or other supermarkets that you know? Tick the appropriate

- Raw peanut
- Raw but the redskin removed
- Have redskin and roasted
- Assorted nuts
- Blanched and roasted fried peanut
- Processed to other product

17) Do the level of value addition affect prices of the peanut products?

- Yes No

18) If yes, rank the levels of value addition in order of expensiveness from the less expensive to the most expensive

- Raw peanut
- Raw but the redskin removed
- Have redskin and roasted
- Assorted nuts
- Blanched and roasted fried peanut
- Processed to other product

19) What brands of these peanut products do you stock?

A.

B.

C.

D.

20) Are the customers concerned about the peanut whole seed size?

Yes

No

21) If yes, which size do they prefer? (tick one)

Small sized

Medium sized

Big sized

22) Are the price charged different due to the whole seed size?

Yes

No

23) Are the consumers concerned about the peanut seed colour?

Yes

No

24) What weights of packaging of the different brands of whole seed sizes do you stock and their corresponding prices?

	Small sized whole seed		Medium sized whole seed		Big sized whole seed	
	Weight	Price	Weight	Price	Weight	Price
Brand A	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
Brand B	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
Brand C	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
Brand D	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____

25) Which two of these brands (above) of peanut whole seeds do you stock most? What weights of these brands do you stock most?

Brand stocked most (in order of preference)	Weight stocked most
<hr/> <hr/>	<hr/> <hr/>

26) What brand of peanut confectionaries are most liked by the consumers?

.....

27) Are they expensive compared to the other brand's confectionaries? Yes No

28) What weights of packaging of the different brands of peanut butter do you stock and their corresponding prices?

Brand A		Brand B		Brand C		Brand D	
Weight	price	Weight	price	Weight	price	Weight	price

29) Which two of these brands (above) do you stock most? What weights of these brands do you stock most?

Brand stocked most (in order of preference)	Weight stocked most
<hr/> <hr/>	<hr/> <hr/>

30) What weights of packaging of the different brands of peanut oil do you stock and their corresponding prices?

Brand A		Brand B		Brand C		Brand D	
Weight	price	Weight	price	Weight	price	Weight	price

31) Which two of these brands (above) do you stock most? What weights of these brands do you stock most?

Brand stocked most (in order of preference)	Weight stocked most
_____	_____
_____	_____

32) What weights of packaging of the different brands of peanut cakes do you stock and their corresponding prices?

Brand A		Brand B		Brand C		Brand D	
Weight	price	Weight	price	Weight	price	Weight	price

33) Which two of these brands (above) do you stock most? What weights of these brands do you stock most?

Brand stocked most (in order of preference)	Weight stocked most
_____	_____
_____	_____

34) How did you learn about the peanut products that you stock? (tick the appropriate)

Sales representatives/sales promotion

Advertisement

35) If through advertisement, by which means did you learn? (tick the appropriate)

Newspaper

Television

Radio

Other (specify).....

36) Of all the brands that you stock, which three brands have the best packaging in order of preference?

i.

ii.

iii.

APPENDIX 2: DESCRIPTIVE FOR MEAN PRICE COMPARISON

					95% confidence interval for Mean			
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Min	Max
Smooth	64	98.6094	6.33363	0.79170	97.0273	100.1915	80.00	105.00
Crunchy	64	98.6094	6.33363	0.79170	97.0273	100.1915	80.00	105.00
Chocolate	49	129.0816	3.33440	0.47634	128.1239	130.0394	125.00	132.00
Total	177	107.0452	14.78859	1.11158	104.8515	109.2389	80.00	132.00

$F_{(2,174)}=0.552$

APPENDIX 3: TEST FOR EQUALITY OF PRICE VARIANCE AND MEAN PRICE

Levene's Test for Equality of Variances			t-test for Equality of Means						
			95% Confidence Interval of the Difference						
		F	Sig	t	d.f	Sig. (2- tailed)	Mean Difference	Lower	Upper
smooth &crunchy	Equal variances assumed	0.007	0.933	-0.14	62	0.889	-0.321	-4.910	4.267
chocolate	Equal variances assumed	3.689	.061	-0.849	47	0.400	-1.098	-1.503	3.698

Note: mean price for smooth/crunchy in CBD and not CBD are 98.33 and 98.65 respectively.
Mean price for chocolate in CBD and not CBD are 128.9 and 130 respectively.

APPENDIX 4: MEAN PRICES OF PEANUT PRODUCTS PER SUPERMARKETS

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
					Lower Bound	Upper Bound		
Super store	17	91.7647	9.17557	2.22540	87.0471	96.4824	80.00	100.00
Medium store	34	99.7353	1.39933	0.23998	99.2470	100.2235	97.00	101.00
Fuel station	13	104.7692	0.43853	0.12163	104.5042	105.0342	104.00	105.00
Total	64	98.6406	6.60295	0.82537	96.9913	100.2900	80.00	105.00

APPENDIX 5: PRICE DIFFERENCES FOR THE BRAND OF PEANUT BUTTER

(I) brands	(J) brands	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Nuteez	Zesta	9.39119*	1.24726	0.000	6.4429	12.3395
	Supermeal	5.72802*	1.22431	0.000	2.8340	8.6221
Zesta	Nuteez	-9.39119*	1.24726	0.000	-12.3395	-6.4429
	Supermeal	-3.66317*	1.27145	0.012	-6.6687	-0.6577
Supermeal	Nuteez	-5.72802*	1.22431	0.000	-8.6221	-2.8340
	Zesta	3.66317*	1.27145	0.012	0.6577	6.6687

*. The mean difference is significant at the 0.05 level.