Objective Quality and Price Variation in Tea Marketing

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Abstract: Tea sector is an important part of Kenya's economy as a leading export earner. Kenya Tea Development Agency (KTDA) farmers' earnings in bonus payment fluctuate based on variation in tea prices, however farmers in the West of rift valley under KTDA factories are paid less compared to East of rift valley and this disparity has caused economic difficulty. The purpose of the study was to investigate the relationship between objective quality and price variation in tea marketing. This was anchored on the quality dimensions' framework. The study employed correlational research design with cluster and purposive sampling proceduresadopted to collect secondary and primary data. A sample of 7 factories representing 7 clusters with 69 tea factories was used to sample 2,142 invoices consisting of 19,890 panel data. The panel data was obtained using data extraction tool from secondary sources while primary data was obtained using questionnaires. The primary data utilized a census of 128 tea brokers, tea warehouses and buyers who handle tea in Mombasa tea Auction. Cronbach alpha obtained for objective quality were 0.895. Descriptive and inferential analysis was done using Microsoft Excel, SPSSand STATA. Panel multiple regression analysis was used to test research hypotheses at 5% significance level. The findings indicated that there is significant difference in objective quality of tea from East and West region (P<0.05)with quality of tea from KTDA factories in East better KTDA factories in West of rift valley. The study also found that objective quality had significant relationship with price variation. The study concluded that objective quality had significant relationship with price variation and supply had negative moderating effect on this relationship. The study recommended that KTDA factories and small scale farmersin West of rift valley should benchmark against KTDA factories in East of rift valley tea quality to improve quality of their tea.
Keywords: Objective Quality, Price Variation, Correlation Research Design, Kenya Tea Development Agency (KTDA), Kenya.

Introduction

Tea is Kenya's leading export earner generating revenue of Kshs 129.3 billion in 2018 (EATTA, 2019).Kenya's tea trade is based in Mombasa where most of the teas particularly from small scale producers are sold through Mombasa tea auction. Tea pricing is an important aspect of tea marketing that helps generate revenue to farmers and for this reason pricing is regarded as the most important element in the marketing mix (Ingenbleek & Vanderlans, 2013).

Most of Kenya's teas are sold through Mombasa tea auction managed by East Africa Tea Trade Association (EATTA) which is the industry's self-regulating agency.Tea prices at Mombasa tea auction have been a major issue for more than two decades due to its fluctuating nature and unpredictability therefore resulting in instability in farmer's earnings (Mutegi, 2015).Smallholder tea farmers in the West of rift valley under KTDA continue to experience difficulties in tea earnings attributed to variation in 2nd tea payment rates(KETEPA, 2015) compared to their counterparts in the East of rift valley. Currently there is little evidence that explains the cause of price variation and hence the need to determine the factors that have led to price variation in tea earnings among KTDA factories in the West and East of rift valley.

Empirical studies on quality (Faulds & Lonial, 2001; Espejel et al., 2007; Oczkowski & Doucouliagos, 2014) found weak association between price and objective quality. Similar studies done earlier arrived at varying strengths of relationship between price and objective quality and therefore inconclusive results. There is need for more studies to cover more product categories, economies and markets (Burgess & Steenkamp, 2006).

These quality dimensions are measured objectively by tea tasters and are based on physical product attributes of made tea that are graded and packed.Made tea is a term used in the tea industry referring to processed tea which is an outcome of transforming green leaf. The process involves the standard operating procedures of withering, cutting, tearing and curling (CTC), oxidation, drying, sorting and packing (KTDA, 2019).

These stages influence quality in standard production process and must be complied with at every stage to achieve desired effect and produce the best quality of made tea with product features that rated highly both on

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physical and organoleptic attributes.Turkmen, Sari, &Velioglu (2009) explains that production process is important in determining product quality which can be measured in terms of tea polyphenols commonly referred to as antioxidants. This means that the physical quality aspects of made tea are tangible and can be measured using a set evaluation process and therefore an objective quality level can be determined.

Objective quality concept has received a lot of attention in terms of literature over the last several decades from diverse disciplines such as production, manufacturing, economics and consumer behaviour amongst other disciplines. Notable features from early objective quality-price literature include tendency and inclination to respective disciplines, varying contexts and line of thought process with most focusing on lower value chain. Examples of objective quality-price literature include De Toni, Milan, Saciloto&Larentis (2017); Oczkowski &Doucouliagos, 2014) amongst others. The authors' findings from these empirical studies on objective quality-price relationship were mixed and inconclusive. The authors highlight that most early literature found little or weak association between quality and prices and some authors found a stronger association between quality and price.

More recently, De Toni, Milan, Saciloto, & Larentis (2017) and Oczkowski,&Doucouliagos (2015) found stronger association between product quality and prices. Based on mixed and inconclusive results of previous studies, there is need to carry out more studies with more clarity in terms of quality constructs. Present study aims to determine if there is association between objective quality and price variation in tea marketing among KTDA factories in West and East of rift valley.

Objective quality in the context of made tea infersphysical attributes of made tea characteristics based on tea tasting which are categorized into made tea leaf appearance, infused tea appearance and liquor properties. According to EATTA (2019), leaf appearance is measured and described using quality factors that include colour of made tea, fibre content, and quality of cut amongst others. Infused tea factors used to measure and describe quality are brightness and colour of infusion, while liquor properties assessed and described using colour of liquor, briskness/pungency, strength and flavour/character of the tea amongst others.

Made tea quality parameters in commercial set up are tasted to determine the tea product attributes and are measured by tea tasters at tea processing factories, tea brokers and tea buyers (EATTA, 2019; KTDA 2019). Tea connoisseurs, practitioners and scholars agree that made tea quality is determined by both the physical and organoleptic properties. Physical properties refer to observed physical attributes of dry made tea and observed physical attributes for infused (decanted) leaf used by tea tasters to assess quality. Organoleptic properties reflect quality of tea when tasted to determine quality levels. Objective quality in tea has several sub-dimensions used and adopted as the best practice in the industry with clear methodology of evaluating and describing each attribute. Each made tea quality dimension has been developed over time and there is a consensus on adopted measurement scale that rates objective quality ranging from low to high quality. The overall goal of objective quality evaluation is to set market valuation in terms of price.

Packed auction teas are categorized into primary and secondary grades and marked into palletized invoices at the tea factory before being transported to Mombasa for auctioning. According to Mukhweso (2003) tea as a product has several grades that include Broken Pekoe (BP1), Pekoe Fannings 1 (PF1), Pekoe Dust (PD), Dust 1 (D1), Fannings 1 (F1) and Broken Mixed Fibre (BMF). In most KTDA tea factories, PF1 grade constitutes 60% of the tea produced. Physical quality is largely determined during the process of manufacturing at the factory level influenced by quality of raw materials used and specific processing activities.

Made tea product quality is assessed or evaluated through tea tasting.EATTA (2019) defines tea quality as "cup quality and denotes a combination of the most desirable liquoring properties". This study intends to operationalize product quality using made tea quality dimensions that include physical and organoleptic properties accepted and used in tea tasting. Tea tasting also referred to as cupping, is a process that evaluates characters of different teas and compares different product quality attributes and ratings. This is done by assessing both physical and organoleptic product quality attributes (KTDA, 2019). Physical attributes involve evaluating physical appearance of dry made tea leaf and physical appearance of infused made tea leaf, while organoleptic also commonly referred to as tea liquor assesses colour of infused liquor in the cup, astringency, and briskness. Kumar et al. (2011) emphasizes that astringency and colour of tea are the most tested parameters of tea and their associated polyphenols also referred to as theaflavins and thearubigins. These are key product quality attributes that determine how good the tea is made. The study operationalized made tea quality using these factors as tasted by professional tea tasters at the tea auction by tea brokers.

This represents the best method of evaluating objective quality parameters with a view to determining the value of tea and marketing it based on the product quality attributes. Tea tasting is a tool of product quality control in production process meant to help address bridging variance in product quality (Teaguardian, 2019).Therefore, it can be argued that if there is a variance in product quality within factories and regions, it may lead to variation in price achieved at the tea auction. This is on the basis that buyers may be willing to pay higher prices for higher product quality and relatively lower prices for lower product quality.

Despite this ideal situation, KTDA factories have been achieving different prices at the auction and paying farmers in all factories a monthly rate of Kshs. 20 to 21 per kilogram of green leaf which is treated as the 1st payment. At the end of every financial year after financial results is declared for every factory, a 2nd payment is madepopularly referred to as tea bonus and may not be a uniform rate across factories. The study's area of focus is on the 2nd payment rate (tea bonus) which is conceptualized as a price variationleading to differential revenue to smallholder tea farmers under KTDA management system. Although there is variation in 2nd tea payment amongst the KTDA factories, the variance is even more pronounced between the KTDA tea factories in the West and East of rift valley tea producing regions.Price variation is a major social economic issue among KTDA smallholder farmers in the West of rift valley and based on previous studies little is known on various factors such as product quality that may be the cause of price variation. Based on reviewed literature, there is need to determine if objective product quality and demand has an association with price variation among KTDA factories in the West and East of rift valley.

Literature Review

Product quality has attracted a lot of attention in terms of literature and covers diverse disciplines that include production, manufacturing, economics, and consumer behaviour amongst other disciplines. Although the initial literature on quality is traced to Chase & Schlink in 1927 as argued by Faulds &Lonial (2001), most literature was done between 1950s and 1980s and theoretically were centered around economic and behavioral paradigms with price viewed as both an indicator of sacrifice or quality cue or both as suggested by Rao & Monroe (1988).

The author further explains that quality-price relationship literature has taken two approaches and the first approach is to test whether quality-price has a positive correlation. This approach assumes that changes in physical quality of a product leads to variation in price which reflects the changes and implies higher prices denotes higher product quality achieved through more expensive inputs. Most literature initially followed this approach and focused on product physical quality also referred to as objective quality and its relationship with price, however most of the literature ignored factors related to product and not physical in nature such as product knowledge, information, brand awareness, brand association amongst others. These factors are largely influenced by referrals, word of mouth, advertising and promotions, experience with product usage, satisfaction amongst others. Further, these empirical findings created a marketing dilemma for organizations and marketing managers in terms of continued investment in marketing activities and promotions as part of marketing strategy implementation.

Subsequent literature between 1980's and 2000's (Garvin, 1984; Steenkamp, 1986&1989; Rao & Monroe, 1988; Iglesias & Guillen, 2004; Espejel, Fandos & Flavian, 2007; Veale & Quester, 2009) emerged with a second approach to quality-price relationship with a wider and broader perspective of product quality that includes additional product attributes that are not directly related to the physical product and introduced consumer perception in quality-price relationship. Present study intends to combine the two approaches under the impact of market demand to determine product quality relationship with price in tea marketing because limited studies exist that have incorporated market demand concept in the design. This approach resonated well with marketers and justifies investment in marketing mix elements to create the necessary brand differentiation.

Early empirical studies on objective quality-price relationship (Oxenfeldt, 1950; Friedman, 1967; Morris & Bronson, 1969; Sproles, 1977; Riesz 1978, 1979; Dardis & Gieser, 1980; Gerstner, 1985; Bodell, Kerton, & Schust, 1986; Boyle, Kim, & Lathrop, 2018) found a weak association between quality and price. The authors further established that quality-price relationship was product specific and quality-price association was weaker in frequently bought products and small pack size products compared to infrequently bought products and large pack sizes. Despite important contribution of these studies to literature on quality-price relationship, they did not conclusively clarify the reasons for their findings which contradicted consumer rationale.

The findings negate expectations of a perfectly functioning free-market economy, disagrees with rational consumer behaviour and contradicts conventional wisdom that price is an indicator of quality(Gerstner, 1985; Bodell, Kerton & Schust, 1986; Hanf & Von Wersebe, 1994) and set the stage for new trend in future literature due to insufficient information.Explanations given for such findings include consumer exaggerations, variation in product sizes and variation in product classes. Gerstner (1985) asserts that weak quality-price association is more pronounced in frequently bought goods compared to infrequently bought goods implying that smaller sizes with lower price tags exhibit weaker quality-price association compared to bigger sizes that command higher price tags. Despite the valuable explanations given, more confirmatory studies were required in respect to categories or product classes that had not been explored and further the early empirical studies' findings contradicted expected rational consumer behaviour and this study intends to investigate if there is a relationship between objective product quality and prices and the strength of association.

Despite the importance of early empirical studies on quality-price relationship, their findings on weak quality-price association and varying strengths across product classes, little was known on different market contexts such as auction systems, industrial or organizational markets and post purchase behaviour (Riesz 1978, 1979; Dardis & Gieser, 1980; Gerstner, 1985; Bodell, Kerton & Schust, 1986) amongst other factors and the key question is would the tea auction system exhibit similar results? Most literature largely dealt with consumer markets and consumer goods focusing on consumer brands, private labels, and retail prices with little emphasis on industrial or business to business (B2B) markets and related goods. In future more diverse literature on quality-price in respect to different market set ups, different regions and economies, more inclusive studies need to be done for different product categories/classes to build more robust data on quality-price relationship and there is need to extend beyond retail prices by following up with how consumers behave after usage to determine emotional and psychological aspects.

Other than similarities in findings, the early literature on quality-price relationship largely used similar methodology; experiments, controlled-use, expert opinions and user surveys. Data used in these studies were collected from consumer organizations and publications, retail markets and experts. This approach tends to inhibit extrinsic attributes and bring out more intrinsic attributes of the products in respect to quality-price association. According to Espejel et al. (2007), intrinsic product attributes are parts of a product such as taste, smell, texture, and appearance and are largely associated with physical/objective quality while extrinsic attributes are associated with the product but are not part of the physical product such as brand imagery, advertising, packaging and labelling, brand messages and claims amongst others which are more perceptional in nature.

Further, the price surveys mostly used retail prices and did not extend to determine to customer value from their own assessment in relation to product performance. More studies are required to provide more literature particularly under post purchase circumstances which largely focus on product extrinsic attributes.

Theoretically, early literature used well developed models for evaluating and measuring objective quality and applied consumer economic theories on expected consumer behaviour. The most dominant theory used was product-based approach that views quality as a precise and measurable variable (Garvin, 1984) implying the higher the quality the higher the level of attributes leading to high cost of production and subsequently higher price. The author further argues that this theory is linked to economic theory which suggests that costs and prices are correlated, and it is naturally expected that quality and price would move together. This explains the reason why most early empirical studies' finding of weak quality-price relationship negated the expectations of marketers and economists leading to more studies in search for conclusive evidence. However, it is equally important to address the question of irrational findings in the context of tea product quality and auction prices by determining the nature of their relationship.

Subsequent literature on quality–price relationship trended and focused more on gaps identified with specific emphasis on more diverse categories, market information, regions, and product classes to determine whether similar findings could be replicated (Faulds & Lonial, 2001;Oczkowski & Doucouliagos, 2014). Interestingly, literature also emerged to determine whether longitudinal studies covering longer period to determine if the quality-price association was growing stronger (Dardis & Gieser,1980).

The authors used the same methodology and only varied product classes, regions and countries and extended period. Future studies are necessary with a variation in methodology based on an extended period to determine if similar results were achieved.

The findings reflected in early literature indicating weak quality–price association energized more studies and a new trend started emerging between strong brands versus private labels indicating stronger quality-price association amongst brands compared to private labels. The difference in quality-price association rating indicates that there could be other quality cues for consumers such as advertising, packaging, promotions amongst others. This is verified by literature that highlighted quality-price association is product specific (Gerstner, 1985) and has led to emergence of perceived quality concept that is largely influenced by brand association and functional benefits of a brand related to emotional and psychological factors. The findings validated the emergence of intrinsic and extrinsic attributes of products that are associated with objective and perceived quality and possibly adds to reason why most studies arrived at weak quality-price association. Espejel, Fandos, & Flavian (2007) suggests that this could be attributed to the nature of their design which inhibited expression of emotional and psychological brand attributes and it is important to address inconclusive findings through more confirmatory studies with flexible alternative designs.

Apelbaum, Gerstner & Naik (2003) in their study on "The effects of expert quality evaluations versus brand name on price premium" the authors found that national brands charge more price premium compared to store brands of similar objective quality implying that there are more quality cues than just price that could not explain the "irrational" consumer behaviour in the previous studies on objective quality and price association.

A new trend on quality-price literature started emerging aligned to consumer focus rather than manufacturing conformance and adhering to set standards and adopted a broader and more balanced perspective of quality and price concepts. However, the new literature focused on perceived quality-price relationship independently and there is need for studies that combine both perspectives of product quality.

The new trend literature that tended more to perceived quality includes Garvin (1984), Rao & Monroe (1988), Steenkamp (1988), Apelbaum, Gerstner,&Naik (2003), Espejel, Fandos,&Flavian (2007)Steenkamp, Van Heerde,&Geyskens (2010) amongst others. The authors highlighted the importance of perceived quality in consumer behaviour and diverse conceptual models and frameworks. Despite emergence of more literature on national brands, private labels and price premiums, little is known on products that are more of commodities and hence the need for more studies that include tea as a product.

According to Espejel*et al.*(2007), new trend quality-price relationship literature championed multi-disciplinary approach with more attention to consumer behaviour rather than transactional behaviour implying as much as objective quality is important, there is need to go beyond intrinsic attributes in a product and understand extrinsic attributes that motivate and inspire consumers emotionally and psychologically. The previous literature and new trend literature agree on customer value as a trade off of benefits and sacrifices, with intrinsic quality typically being the primary benefit, and price typically being the primary sacrifice.

Ideally, it is on the price where consumers judge the value of their sacrifice in form of convenience and benefits derived from the product verses the cost of obtaining it, however it is not clear whether this is applicable in industrial or business to business markets and hence the need to examine if there is an association between objective tea quality and auction prices among tea factories in the West and East of Rift valley in Kenya.

Perceived quality-price literature further differs from previous objective quality literature by introducing more focus on additional dimensions of extrinsic and intrinsic attributes. Suggestions have emerged for joint consideration of both concepts because quality evolves along the value chain (Yang, 2017; Buntak,Adelsberger& Nad, 2012). The authors suggest that product quality concept evolves across functions and departments along the value chain and deserves prioritization as a key strategic goal driven by desire to meet customer needs.

The author argues that "Product quality can be observed through variousdimensions, i.e. product features which contributeto its quality as perceived by the consumer" implying the need to view objective and perceived quality dimensions as linked. The authors (Yang, 2017; Buntak, Adelsberger & Nad, 2012) recognize the importance of linking the two concepts from organizational perspective to improve performance. However, practically it is limiting in situations where both objective and perceived quality are not applied. The purpose of the present study is to determine how objective and perceived quality concepts are practically applied in tea marketing and how they are related to auction prices in real commercial set up.

In conclusion, early literature on quality-price relationship focused more on objective quality aspects and in general there was consensus on findings that quality-price association was weak and product specific.

Further, the literature noted that quality-price relationship was stronger on national brands compared to private labels. Most empirical studies (Oxenfeldt, 1950; Friedman, 1967; Morris & Bronson, 1969; Sproles, 1977; Riesz 1978, 1979; Dardis & Gieser, 1980; Gerstner, 1985; Bodell, Kerton, & Schuster, 1986) done early used varying methods/designs though rigid when assessing physical product quality attributes in respect to retail prices and arrived at almost similar findings. Early literature contributed immensely to development of robust methods of measuring objective quality and applied to many product classes and sectors including service sector, however oversights were equally noted in linking objective quality to price evaluations by omitting product related aspects that were not physical in nature (extrinsic product attributes) and thus consistently found quality-price association weaker and little was known on the contribution of extrinsic quality attributes to quality-price association.

Most early studies on product-quality association also focused on developed economies with consumers who earned relatively high incomes such as North America, Europe and Japan largely ignoring developing economies with consumers who earned less and hence low purchasing power (Burgess & Steenkamp, 2006).Other notable areas for further research include different market contexts other than consumer markets such as business to business (B2B), different market systems other than retail markets for example auction systems among others. There is need for research to be extended to African economies taking into account alternative market systems such as the tea auction. Based on this context there is need to carry out research to determine if made tea quality has a relationship with tea auction prices among KTDA factories in the West and East of rift valley in Kenya. This study added to existing literature by providing information based on a developing country, different market context of tea auction and provide an additional product class.

Theoretical Review

Product quality dimensions' model developed by Garvin (1984) and popularly referred to as quality dimensions' framework views the concept of product quality from a holistic perspective and it has developed multi-dimensional definition of quality. Garvin's model is based on the pillars of the business organization and the consumer objectives arguing that product quality is key for a business to achieve competitive edge by meeting and surpassing consumer expectation leading to satisfaction. Yang (2017) emphasizes that product quality is a multifaceted concept and it encompass quality standards, satisfaction of customer needs, and expectations to customer delight. These definitions lay the foundational framework that underlines the work done from various disciplines and perspectives on product quality concept and advocates for a common approach by recognizing the various product quality dimensions.

Garvin's product quality dimensions model propose five approaches to product quality definition that includes transcendent approach of philosophy; product-based approach of economics; user-based approach of marketing, economicsand operations management; manufacturing-based and value-based approaches of operations management. The author in the model further proposes eight dimensions for use in thinking about basic product quality elements that may be used in ranking quality levels. The dimensions include; Performance,Features,Reliability, Conformance,Durability,Serviceability, Aesthetics and Perceived Quality.

According to Garvin (1984), performance refers to basic and primary operating characteristics of a product that is made up of various elements of both the product and user-based approaches. Core product attributes that are inherent in the physical product can be measured and ranked while user-based attributes can also be determined and measured as dimensions of performance related to core product. Features dimension refers secondary characteristics that support product's basic functioning. Variables associated with product features can be determined, measured and ranked based on product user's preference and experience. Reliability as a dimension of product quality is the rate of failure by a product which can be measured by determining failure rate possibly at production level. Related to reliability is conformance dimension which refers to the degree in which physical products design and characteristics match the set standards and commonly referred to as defects level. According to Garvin (1984) reliability and conformance dimensions are closely linked to manufacturing approach.

Durability dimension refers to economic value of the product to the user. This can be determined and measured by number of uses before product deteriorates or get finished and this dimension is closely related to reliability.

Garvin (1984) posits that serviceability dimension can be viewed from user perspective and refers to ability to restore a product for use when it breaks down. Attributes related to serviceability can be determined and measured objectively such as turn-around time, downtime, service lead times amongst others. Aesthetics and perceived quality are the last two product quality dimensions proposed by Garvin and are more subjective and based on consumer perceptions.

Aesthetics product quality dimensionis concerned with the product image, looks, tastes, feels and sounds based on consumer's sense of judgement and can be measured against preferences. Yang (2017) suggests that perceived quality dimension on the other hand refers to consumer rating of their preferences when comparing competing brands' performances based exposure to the products, advertising, referrals amongst others. The author further provides factors that he suggests are correlatted to the product quality concept such as profitability, market share, price, advertising, costs amongst others.

Proponents of Garvin's product quality dimensions include Deming (1982), Friedman (1967), Juran &De Feo (2010), Steenkamp (1988), Yang (2017) amongst other authors. These authors concur on the common tenets advocated by Garvin's product quality dimensions framework such as multiple approach to the definition of product quality, basis of product quality on objective and perceived dimensions, basis of product quality on organizational and consumer objectives, evolution of product quality concept and development of common aproach to product quality concept. Garvin's model provides the framework for this study to link objective quality and perceived quality and relating the two concepts to market demand.

Garvin's product quality dimensions framework has received criticism on level of details on various approaches to definition of the concept. Although the model attempts to create a common approach to product quality concept, the various definitons given for each approach appear cumbersome, technical and complex. Product quality dimensions framework has been improved by further empirical studies on product quality concept by Juran &De Feo (2010), Yang (2017), Sebastianelli &Tamimi (2002), Steenkamp (1988) amongst other authors.

Product quality dimensions framework contributes to the present study by anchoring product quality concept across the tea value chain and links the preceding theories and models by providing cross-sectional dimensions for various factors to be anchored in the study. The model accomodates the concepts of objective quality, perceived quality and market demand by recognizing that they all have an effect on the auction price.

This is very important since it emphasizes that business organization should view quality from a broader perspective and it is not enough just to produce a good quality product but must go the extra mile of ensuring the customers needs and wants are met, satisfied and delighted (Cruz, 2015) which means appealing to emotional and psychological needs of the consumer. This studyused technical data extracted from made tea processing and auction market and relate the same with market dynamics that involves the auction market. Although the terms appear technical, they are anchored across Garvin's product quality dimensions as measured and applied in the tea industry and underlines the importance of business organizations developing a unified approach to product quality concept and at the same time respecting the technical perspectives across the value chain.

Product quality dimensions model further lays the foundation and provides useful insights on possible relationship with factors such as market supply, price, market share, advertising amongst others with given product quality dimensions. Garvin's framework introduced factors that could have a relationship with product quality dimensions that business organizations need to recognize and manage in the course of executing their organizational strategy. This is important to the study since price was the dependent variable and in future more studies could be done by establishing sales volume, market share amongst other factors by attempting to create more customer value as suggested by Yang (2017).

Garvin's product quality dimensions model highlights the importance of minimizing conflict arising from product quality definition by acceptance of multiple approaches to the meaning of the concept. The author argues that reliance on a single approach to product quality definition has been a major source of conflict while in practical terms product quality concept changes and evolves as it moves along the value chain from product design, production, distribution, consumption and post purchase evaluation. The author's arguments are supported by Porter (1985) and Steenkamp (1988) amongst other authors who adopted a holistic view on product quality and suggests that business organizations could achieve competitive advantages by focusing on the value chain and customer needs and wants.

Research Methodology

This study is based on post positivism paradigm thatacknowledges that theories, hypotheses, background knowledge and values of a researcher can influence what is observed and measured (Phillips & Burbules, 2000). This enabled the research toadoptedcorrelational research which is non-experimental where relationships are assessed without manipulating independent variables (Stangor, 2011). The study was conducted based on information collected and relating to tea production areas in the West and East of rift valley which have seven regions referred to as clusters. The population of interest is PF1 made tea invoices for 65 individual KTDA factories that sold through Mombasa tea auction. Therefore, an average of Secondary data in respect to objective quality that corresponds to sample PF1 invoices were extracted and fitted to Likert scale. PFI was purposefully selected since it is the most sold grade in tea auctionand generally represents the average quality of other grades (EATTA, 2019; KTDA, 2019). Objective quality variables from the sample factory used PF1 grade produced, invoiced and sold at the tea auction. KTDA factories are grouped into 7 clusters with each cluster having between 4 to 13 factories (KTDA, 2019). Due to homogeneity of study cases, the first stage was to randomly pick one sample factory from each cluster resulting in 7 sample KTDA factories. This was followed by sampling 51 weekly records for 6 year making 306 records totaling to 2,142 panel data. Secondary data associated with objective quality and auction prices were sought from tea brokers gathered for the period Jan 2017 to Dec 2022.

Secondary data formed a panel data for a period of sixyears which were obtained using data extraction tool for PF1 invoices. Panel data obtained for time series data analysis are commonly utilized secondary data collection methods (Windle, 2010). Exploratory factor analysis (EFA) is used to examine the construct validity of the instrument which examine the association between variable correlation (Epstein, Whitehead, Prompahakul, Thacker, & Hamric, 2019). This is because the variables are measured differently from the secondary data based on objective quality. According toOthman, Othman &Juhdi, (2019), KMO more than 0.5 and significant Bartlett's test was threshold criteria for validity test. The findings indicated that Kaiser-Meyer-Olkin (KMO) value was 0.863 with Barlett's test of Sphericity of 9261.851 with P=0.000<0.05. The study to determine reliability of the objective quality using Cronbach alpha where a coefficient of 0.895 was above threhold of 0.7 hence, reliable.

Data sorting was done with use of excel spreadsheet since the invoice are excel generated. The spreadsheet assisted in arranging panel data so that it was exported directly into coded data sheet in STATA and SPSS version 21.Tea quality attributes used descriptive statistics that include percentages, frequency, mean and standard deviation.

Inferential statistics utilized panel data to produce simple linear regression model, the author asserts that regression analysis is used to establish if there is relationship amongst variables and develop a model that best predict the relationship. Hypothesis testing was done at 5% significance and employed t statistic and P

values.Pearson product moment correlation coefficient represented by R wasused to test the relationship between variables while coefficient of determination represented by R^2wasused to test percentage variation of dependent variable that is as result of independent variable based on percentage.Simple regression model was adopted in examining objective qualitywith prices of tea. Based on the nature of data collected, the studycarried out several diagnostic tests that include model specification tests, cross sectional independence test, heteroscedasticity test, multi-collinearity test, and normality test. Model specification test applied Hausman test to determine whether to use fixed or random effects regression model. cross sectional independence test adopted Pesaran test to determine the independence of KTDA clusters/factories as units.

Results And Discussions
Descriptive Statistics -Objective Quality

Objective quality data was extracted from tea taster'sreports recorded by tea brokers for the sample factories as tasted before being offered to the tea auction. The data was converted to 5-point quality scale ranging from very poor quality (1) to very good quality (5) and coded into frequency table based on different quality attribute dimensions that includedphysical colour, fibrecontent, cut, colour of infusion, liquor colour, liquor briskness and liquor strength. The results were presented in Table 1;

Table 1: Objective Quality Summary

		Region					
		East		West		Total	
		F	F %	F	F %	F	F %
Physical Colour	Very Poor Quality	4	0.3%	157	17.2%	161	7.5%
	Poor Quality	213	17.5%	682	74.5%	895	41.9%
	Fair Quality	626	51.3%	76	8.3%	702	32.9%
	Good Quality	377	30.9%	0	0.0%	377	17.7%
	Very Good Quality	0	0.0%	0	0.0%	0	0.0%
Fibre Content	Very Poor Quality	91	7.5%	461	50.4%	552	25.9%
	Poor Quality	407	33.4%	439	48.0%	846	39.6%
	Fair Quality	655	53.7%	15	1.6%	670	31.4%
	Good Quality	65	5.3%	0	0.0%	65	3.0%
	Very Good Quality	2	0.2%	0	0.0%	2	0.1%
Physical Cut	Very Poor Quality	70	5.7%	425	46.4%	495	23.2%
	Poor Quality	406	33.3%	460	50.3%	866	40.6%
	Fair Quality	656	53.8%	30	3.3%	686	32.1%
	Good Quality	87	7.1%	0	0.0%	87	4.1%
	Very Good Quality	1	0.1%	0	0.0%	1	0.0%
Colour of Infusion	Very Poor Quality	4	0.3%	90	9.8%	94	4.4%
	Poor Quality	307	25.2%	703	76.8%	1010	47.3%
	Fair Quality	884	72.5%	119	13.0%	1003	47.0%
	Good Quality	22	1.8%	3	0.3%	25	1.2%
	Very Good Quality	3	0.2%	0	0.0%	3	0.1%
LiquorColour	Very Poor Quality	0	0.0%	2	0.2%	2	0.1%
	Poor Quality	152	12.5%	892	97.5%	1044	48.9%
	Fair Quality	1041	85.3%	21	2.3%	1062	49.7%
	Good Quality	27	2.2%	0	0.0%	27	1.3%
	Very Good Quality	0	0.0%	0	0.0%	0	0.0%
Liquor Briskness	Very Poor Quality	15	1.2%	157	17.2%	172	8.1%
	Poor Quality	319	26.1%	588	64.3%	907	42.5%
	Fair Quality	751	61.6%	170	18.6%	921	43.1%
	Good Quality	133	10.9%	0	0.0%	133	6.2%
	Very Good Quality	2	0.2%	0	0.0%	2	0.1%
Liquor Strength	Very Poor Quality	7	0.6%	143	15.6%	150	7.0%
	Poor Quality	480	39.3%	659	72.0%	1139	53.3%
	Fair Quality	659	54.0%	113	12.3%	772	36.2%
	Good Quality	74	6.1%	0	0.0%	74	3.5%
	Very Good Quality	0	0.0%	0	0.0%	0	0.0%

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The study investigatedthe relationship between objective quality and price variation in tea marketing among KTDA factories in East and West of rift valley, and in terms percentage frequency, KTDA teas from East of rift valley had the highest percentage frequencyon objective quality (Physical colour, fibre content, physical cut, colour of infusion, liquor colour, liquor briskness and liquor strength)associated with fair quality, whileto KTDA teas from the West of rift valley with highest percentage frequency associated with poor quality.

The results in table 2 revealed higher percentage frequency on sub dimensions of Physical colour, fibre content, physical cut and colour of infusion for KTDA teas from the East of rift rated on rated as fair quality compared to West of rift valley rated on poor quality.

According to the results, quality attribute sub dimensions of liquor colour, liquor briskness and liquor strength, KTDA teas produced in the East of rift valley were rated between poor quality and fair quality but tending to fair quality compared to the West of rift valley rated between poor quality and fair quality but tending to poor quality.

Further, examination of overall mean and standard deviation were obtained and presented in Table 2.

Table 2: Descriptive Statistics for Objective Quality

Region	Mean	N	Std. Deviation
East	2.7816	1220	.39023
West	1.8618	915	.28174
Total	2.3874	2135	.57295

According to overall descriptive statistics for objective quality, KTDA teas from East of rift valley had a mean value of 2.7816 associated with a quality rating of fair quality and variation among the KTDA factories and time series was low with a standard deviation of 0.39023.

Data associated with KTDA factories in West of rift valley had a mean of 1.8618 with standard deviation of 0.28174 which was associated with quality rating of poor quality with a relatively low variation among KTDA factories in the region.

ANOVA analysis of data per region was examined to determine if there was a significant difference in objective quality in terms of KTDA production region and the results are presented in table 3.

Table 3: ANOVA for Objective Quality per Region

			Sum of Squares	df	Mean Square	F	Sig.
Objective Quality * Region	Between Groups	(Combined)	442.344	1	442.344	3654.444	.000
	Within Groups		258.184	2133	.121		
	Total		700.527	2134			

According to the results in Table 3, there was significant difference between objective quality of KTDA teas from East and West of rift valley (F(1,2133) =3654.444, P=0.000<0.05). Measure of association was done on objective quality and KTDA production region, and the results are summarized below;

Table 4: Measure of Association

	Eta	Eta Squared
Objective Quality * Region	.795	.631

The results indicated that there was a very strong association between objective quality of tea and KTDA production region (Eta =0.795) with 63.1% in variation in objective quality associated or explained by KTDA production region, while 36.9% is explained by other factors which were not measured in the study.

Descriptive Statistics –Price variation

Analysis of tea auction price was done, and the mean price and standard deviation are in US cents per Kg for the period 2017 to 2022. The results were groupedinto KTDA factories in East and West of rift valley using aggregate mean auction prices of tea and results presented in Table 5.

Table 5: Descriptive Statistics for Price of Tea

Region	Mean in US Cents	N	Std. Deviation in US Cents
East	300.17	1220	56.062
West	240.03	915	37.896
Total	274.40	2135	57.413

The results indicatedteas from KTDA factories in East of rift valley had a mean price ofUS cents 300.17 per Kilogram while tea from KTDA factories in West of rift valley had a mean price of US cents 240.03 per Kilogram and the aggregate mean price of was US cents 274.40 per kilogram. The findings show KTDA factories in East of rift valley achieved higher prices at the tea auction compared to teas from KTDA factories in West of rift valley with standard deviations of US cents 56.062 and 37.896 per kilogram of tea sold at the auction respectively.

Test of Hypothesis
H_{01}: *There is no statistically significant relationship between objective quality and price variation in tea marketing.*
To test the hypothesis, the study used simple linear regression using fixed-effectsand the results are presented in Table6.

Table 6: Objective Quality and Price Regression

```
Fixed-effects (within) regression            Number of obs    =       2,135
Group variable: FACTORY                      Number of groups =           7

R-sq:                                        Obs per group:
    within  = 0.0668                                       min =         305
    between = 0.8168                                       avg =       305.0
    overall = 0.2912                                       max =         305

                                             F(1,2127)        =      152.22
corr(u_i, Xb)  = 0.4712                      Prob > F         =      0.0000


        PRICE |     Coef.   Std. Err.      t    P>|t|    [95% Conf. Interval]

           OQ |   40.54915   3.286588    12.34   0.000    34.10389    46.99441
        _cons |   177.5902    7.90967    22.45   0.000    162.0787    193.1016

      sigma_u |  17.739817
      sigma_e |  46.189768
          rho |  .12854409   (fraction of variance due to u_i)

F test that all u_i=0: F(6, 2127) = 35.00                    Prob > F = 0.0000
```

Objective quality had statistically significant relationship with price ($F(1,2127)=152.22$, $P=0.000<0.05$) and the null hypothesis that there is no statistically significant relationship between objective quality and price variation in tea marketing was rejected.The results indicatedobjective quality of KTDA teas had weak relationship with the auction price of tea ($R= 0.4712$).A variation of 29.12% in tea auction price was associated with objective quality of KTDA teas while other factors contributed 70.88%. From the results above, the summary model is presented below;

$$PRICE_t = 177.5902 + 40.54915OQ_t$$

Objective quality of KTDA teas had positive significant influence on tea auction prices (Beta = 40.54915, $P=0.000<0.05$).A unit change in objective quality had 40.54915 change in price indicating price had an association with the objective quality (OQ).

The study on objective quality-price relationship findings agrees with the findings of Gavious & Lowengart (2011),Garvin (1984), Dardis & Gieser (1980), Gerstner (1985), Bodell, Kerton & Schust (1986), Steenkamp (1988), Apelbaum, Gerstner &Naik (2003), Espejel et al. (2007) who found a weak association between objective quality and price. The authors also found that the relationship was brand or product

specific,and the study affirms the same findings that there is an association of objective quality with tea production region which offers specific brand or products in form of garden name, indicating the relationship to be garden specific.

Summary, Conclusions and Recommendations

Summary
The findings on objective quality and price indicated that there was significant difference between objective quality of KTDA teas from East and West of rift valley (F(1,2133) =3654.444, P=0.000<0.05).This was further confirmed by measure of association which indicated that there was a very strong association between objective quality of tea and KTDA production region (Eta =0.795). The results highlight that KTDA teas produced from East of rift valley are of higher quality compared to KTDA teas produced from West of rift valley on basis of objective quality.

The regression analysis indicated that there was statistically significant relationship between objective quality of KTDA teas and tea auction prices (F(1,2127)=152.22, P=0.000<0.05), however the relationship was weak (R= 0.4712). Objective quality of KTDA teas was related to the tea auction prices realized.KTDA teas from East of rift valley, which had higher objective quality are associated with relatively higher tea auction prices. KTDA teas from West of rift valley, which have relatively lower objective quality, are associated with relatively lower prices at the tea auction.

Conclusions
Objective quality and price variation analysis showed that KTDA teas from the East of rift valley were of higher quality compared to KTDA teas from the West of rift valley. The study affirms that higher level of product attributes may be associated with higher prices and therefore KTDA teas from the East of rift valley attract better prices at the tea auction because of relatively higher objective quality compared to KTDA teas from the West of rift valley.

This is confirmed by average auction prices of tea from East of rift valley which had an average of US cents 300 per kilogram, which were significantly different from the tea pricesachieved by factories in the West of rift valley with an average price of US cents 274 per kilogram and therefore tea auction prices are influenced by objective quality of tea which varies between KTDA factories in East and West of rift valley and hence the reason for variation in prices achieved at the tea auction.

Recommendations
This study found that tea from KTDA factories in East of rift valley were of relatively higher objective quality compared to tea from KTDA factories in the West of rift valley and recommends improvement of objective quality of tea from KTDA factories in the West of rift valley. To understand the causes for the difference in objective quality, it is recommended that the management and smallholder farmers from KTDA factories in the West of rift valley benchmark best practices against KTDA factories in the East of rift valley in terms of objective quality improvement.Enforcement of policy guidelines may be required improve objective quality amongst tea factories in the West of rift valley.

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