



St. Mary's **ቅድስት ማርያም**  
University **ዩኒቨርሲቲ**  
*Committed to Excellence*

**School of Graduate Studies**  
**Department of Marketing Management**

**Factors affecting Consumer-based Brand Equity**  
**(The case of aquaddis bottled water)**

**By:**

Amanuel Abate  
SGS/0078/2012A

**Advisor:**

Dr. Temesgen Belayneh

July, 2021

ADDIS ABABA, ETHIOPIA

SMU

ST. MARY UNIVERSITY

SCHOOL OF GRADUATE STUDIES

DEPARTMENT OF MARKETING MANAGEMENT

FACTORS AFFECTING CONSUMER-BASED BRAND EQUITY

(THE CASE OF AQUADDIS BOTTLED WATER)

ADDIS ABABA

BY

AMANUEL ABATE BELAYNEH

(SGS/0078/2012A)

ADVISOR

DR. TEMESGEN BELAYNEH

THE THESIS SUBMITTING TO ST. MARY UNIVERSITY SCHOOL OF GRADUATE  
STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF  
MASTERS OF MARKETING MANAGMENT

JULY 2021

ADDIS ABABA, ETHIOPIA

ST. MARY UNIVERSITY

SCHOOL OF GRADUATE STUDIES

DEPARTMENT OF MARKETING MANAGEMENT

FACTORS AFFECTING CONSUMER-BASED BRAND EQUITY

(THE CASE OF AQUADDIS BOTTLED WATER)

ADDIS ABABA

BY

AMANUEL ABATE BELAYNEH

(SGS/0078/2012A)

APPROVED BY BOARD OF EXAMINERS

\_\_\_\_\_  
Dean, Graduate Studies

\_\_\_\_\_  
Signature & Date

\_\_\_\_\_  
Advisor

\_\_\_\_\_  
Signature & Date

\_\_\_\_\_  
External Examiner

\_\_\_\_\_  
Signature & Date

\_\_\_\_\_  
Internal Examiner

\_\_\_\_\_  
Signature & Date

## **DECLARATION**

I, the undersigned, declare that this thesis is my original work prepared under the guidance of Temesgen Belayneh (PhD). All the source of materials used for this thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other high institutions for purpose of earning any degree.

---

Name

---

Signature

## **ENDORSEMENT**

This thesis has been submitted to St. Mary's University, school of graduate studies for examination with my approval as a university advisor.

---

Name

---

Signature

## **ACKNOWLEDGMENT**

I would like to express my heartfelt gratitude to my advisor Dr. Temesgen and to many other people who have supported and helped me during the course of this research.

Finally, I would like to thank the participants of this research for their willingness to provide this valuable information.

God Bless!

## Abstract

*This thesis aims at investigating factors that have influence on building a strong consumer-based brand equity and its impact on consumer satisfaction and buying preference. Strong brand equity is built overtime as result of a successful brand management to produce strong attributes that influences consumer's decision making process. Following the review of many literatures on brand equity attributes, Aaker's brand equity conceptual mode is selected. The model consists of 4 attributes (brand dimensions) namely brand awareness, perceived quality, brand loyalty, brand association. A general survey using a structured questionnaire through convenient sampling technique will be applied across 380 aquaddis bottled water consumers. Pearson correlation analysis done between the independent variables (brand dimensions) and dependent variable (brand equity) showed a great level of relationship. To measure the factor determining brand equity of aquaddis natural mineral water and examine the effect of the independent variable on customer satisfaction binary regression model was used. Hence the goodness of fit of the model is 89% indicated that the independent variables had a significant power to explain the variance in brand equity after confirming the model was valid the regression analysis and hypothesis testing is performed using SPSS software. The result showed that there is a strong predictability and influence of brand awareness, perceived quality, brand association to brand equity. Thus, aquaddis bottled water company should exert its efforts to increase the perceived quality, brand awareness and brand association of its consumers so that their overall brand equity increases. Finally, the study recommended the appropriate and adequate measures of marketing mix strategies to long-term business successes.*

**Keywords:** Brand equity, Consumer Perception, Perceived quality, Brand Association, Brand Loyalty, Brand Awareness.

Table of Contents

DECLARATION .....4

ENDORESEMENT..... 5

ACKNOWLEDGMENTS ..... 5

ABSTRACT ..... 7

**CHAPTER ONE ..... 13**

**INTRODUCTION ..... 13**

1.1 Background of the Study..... 13

1.2 Statement of the Problem..... 15

1.3 Basic Research Questions ..... 16

1.4 Research Objective ..... 17

    1.4.1 General Objective ..... 17

    1.4.2 Specific Objectives ..... 17

1.5 Significance of the Study ..... 17

1.6 Scope of the Study ..... 17

1.7 Limitations of the Study..... 18

1.8 Organization of the Study ..... 18

**CHAPTER TWO ..... 20**

**REVIEW OF RELATED LITRATURE..... 20**

2.1 Theoretical Review ..... 20

    2.1.1 Brand..... 20

    2.1.2 Brand Equity ..... 22

    2.1.3 Dimensions of Brand Equity ..... 23

    2.1.4 Brand Equity & Consumer Response..... 26

    2.1.5 Brand equity and consumer satisfaction / preference manifestations ..... 26

2.2 Empirical Review ..... 28

    2.2.1 Studies on brand dimensions influences on brand equity in Ethiopia..... 28

2.3 Research Hypothesis ..... 29

    2.3.1 The impact of Brand Equity Dimensions on overall Brand Equity ..... 29

2.4 Conceptual Framework..... 31



**CHAPTER THREE..... 32**

**REASERCH DESIGN & METHODOLOGY ..... 32**

3.1 Research Approach ..... 32

3.2 Research Design ..... 32

3.4 Source of Data ..... 33

3.3 Sampling Techniques and Procedures ..... 34

3.4 Target Population ..... 35

3.5 Sample Size ..... 35

3.6 Methods of Data Collection ..... 36

3.7 Data Analysis Techniques ..... 37

3.8 Ethical Consideration ..... 37

3.8 Validity and Reliability ..... 37

    3.8.1 Reliability Analysis ..... 37

    3.8.2 Validity Analysis ..... 37

**CHAPTER FOUR..... 38**

**DATA PRESENTATION, ANALYSIS AND INTERPRETATION..... 38**

4.1 Data collected from the respondents ..... 38

    4.1.1 Questionnaire Response Rate ..... 38

    4.1.2 Questionnaire Response – Sociodemographic data ..... 39

    4.1.3 Bottled water rate of consumption experience ..... 40

    4.1.4 Bottled water rate of consumption occasion ..... 40

    4.1.5 Respondents Brand Choice Analysis ..... 41

    4.1.6 Consumption Rate – aquaddis water ..... 41

    4.1.7 Consumption Rate – By age group – aquaddis ..... 42

4.2 Validity & Reliability Test ..... 42

    4.2.1 Validity Measurement Testing ..... 42

    4.2.2 Reliability Measurement Testing ..... 43

4.3 Descriptive Analysis ..... 44

4.4 Correlation Analysis ..... 44

    4.4.1 Brand dimension variables to Brand Equity ..... 45

4.5 Regression Analysis.....	46
4.5.1 Sample Size Test.....	46
4.5.2 Normal Distribution Test .....	47
4.5.3 Linearity Test.....	49
4.5.4 Multicollinearity Test.....	51
4.5.5 Homoscedasticity Test .....	51
4.5.6 Residual Test.....	52
4.5.7 Regression analysis summary .....	55
4.5.8 Variance analysis summary.....	56
4.5.9 Coefficients analysis summary.....	56
4.6 Finding & Hypothesis Interpretation.....	57
<b>CHAPTER FIVE .....</b>	<b>60</b>
<b>SUMMARY, CONCLUSION AND RECOMMENDATION .....</b>	<b>60</b>
5.1 Summary of Findings.....	60
5.2 Conclusion .....	61
5.3 Recommendation .....	62
<b>References.....</b>	<b>63</b>
Appendix 1 – QUESTIONNAIRE - English.....	67
Appendix 2 – QUESTIONNAIRE – Amharic .....	70
Appendix 3 – Chi-Square Distribution Chart.....	74

## List of Tables

Table 1: Definitions of Brand Equity	19
Table 4.1.1 Questionnaire Response Rate (Source: survey data)	30
Table 4.1.2 Respondents sociodemographic data (Source: survey data)	31
Table 4.3 Respondents bottled water consumption experience (Source: survey data)	31
Table 4.1.4 Respondents bottled water consumption occasion (Source: survey data)	32
Table 4.1.5 Respondents' Brand consumption pattern (Source: survey data)	32
Table 4.1.6 aquaddis brand consumption pattern (Source: survey data)	32
Table 4.1.7 aquaddis brand consumption rate by age group (Source: survey data)	33
Table 4.2.1 Measure Parsons correlation significance value (Source: survey data)	34
Table 4.2.2 Measure of the internal consistency of Cronbach's alpha (Source: survey data)	34
Table 4.3.6 Normal Distribution of Independent variables (Source: survey data)	38
Table 4.4.1 Correlation Analysis brand dimension variables to brand equity (Source: survey data)	39
Table 4.5.1 Independent variables sample size (Source: survey data)	40
Table 4.5.2.1 Descriptive Brand equity normal distribution test (Source: survey data)	40
Table 4.5.3 Linearity test (Source: survey data)	41
Table 4.5.4.1 Multicollinearity b/n independent variables (Source: survey data)	42
Table 4.5.7 Scatted plot diagram – Homoscedasticity test (Source: survey data)	44
Table 4.5.8.1 Table showing a residual test values (Source: survey data)	45
Table 4.5.8.2 Table showing a residual test values (Source: survey data)	46
Table 4.5.9 Model summary analysis (Source: survey data)	46
Table 4.5.10 ANOVA summary analysis (Source: survey data)	47
Table 4.5.11 Coefficients summary analysis (Source: survey data)	48
Table: 4.6 Hypothesis testing summary (Source: survey data)	49

## List Figures

Fig 1. Customer Behavior and Brand Equity (Rogers, 2008)	22
Fig 2. Conceptual framework diagram	25
Fig 4.5.2.2 Statistical Brand equity normal distribution test (Source: survey data)	41
Fig 4.5.3 Scatter Plot Diagram - Linearity test (Source: survey data)	42
Fig 4.5.6 Standardized residual diagram – Normality Test (Source: survey data)	43
Fig 4.5.8 Chi-square Distribution	45

# CHAPTER ONE

## INTRODUCTION

In this section of the paper, the researcher will present a situation analysis of the subject matter of the research topic; which will include; the background of the study, statement of the problem, research questions, the main and specific objectives of the study, significance of the study and how the study is organized.

### 1.1 Background of the Study

Consumers possess considerable discretion to make independent and autonomous choices about what they will buy, from whom they will buy, as well as from whom they will not, and this purchasing power leaves most businesses that are not monopolies little choice but to adopt a consumer orientation, meaning that they must resolutely focus on understanding customers in order to more effectively fulfil their needs (Baker & Hart, 2003). (UKessays, 2020)

Specifically, in marketing, a good understanding of consumers' lives to the maximum extent possible is crucial to ensuring that the most appropriate products and services are being marketed to the right people in the most effective way possible ( (Kotler and Keller, 2012)).

Influencing consumers' behavior, and in particular their purchasing decisions, is at the focal point of all the effort and resources that are devoted to marketing (Kotler & Armstrong, 2014) and because of this fact, marketers will require an in depth understanding of the principles and motivations behind consumers' behavior if they expect to be able to effectively anticipate, forecast and perhaps even instigate what consumers will do in the future (Baker & Hart, 2003). According to (Mahy & Jobber, 2006)it is nearly impossible to succeed at marketing without an in-depth understanding of how and why consumers behave in the ways that they do and therefore, it is unsurprising that consumer behavior and the ways in which consumers make decisions,

particularly purchasing decisions, are prominent research topics and have been studied extensively in the various fields of consumer science ( (Erasmus, Boshoff, & Rousseau, 2001)).

This is even more prevalent when looking at the bottled water products which have very little attributes “Liquid Profile” to differentiate them from competition brands, brand perception which influences brand choice and subsequently building a strong brand equity.

The bottled water industry is the fastest growing business in Ethiopia today. Due to the economic growth which led to urbanization and failure of municipality water supply to meet the increasing demand, following expansion of towns and cities meant that bottled water demand has increased exponentially. According to the Food standards agency report, the supply of bottled water industry is believed to have grown from 1.3million hectoliters to 8 million hectoliters in the past decade alone.

Currently there are well over 100 bottled water brands exist in Ethiopian market. The main trade area is in and around the capital city, 30 plus brands are competing for market share creating an intense marketing competition. This intense competitive landscape is forcing marketers to consider and study factors that influence consumer behavior and brand preference which give them influential edge over consumers’ purchase preference.

In many literatures, {Aaker (1991), Keller (1993), Cob-Walgren et al (1995), Lasser et la (1995), Yoo et al (2000), Chang (2003) have all suggested that strong brand equity have an influence on consumers.

The two most influential conceptualizations of brand equity are (Aaker, Managing Brand Equity, 1991) and (Keller L. K., 1993) conceptualizations. Aaker defines brand equity as “a set of brand assets and liabilities linked to a brand, its name and symbol, that add to or subtract from the value provided by product or service to a firm and/or to that firm’s customers”. Aaker then proposes four dimensions of brand equity: brand awareness, brand loyalty, brand associations/image, and perceived quality. (Baalbakl & Guzmán Sally, 2016)

Based on Aaker's brand equity model, this paper will address the impact of the four dimensions of the model (namely brand awareness, brand loyalty, perceived quality, brand association) on brand equity, which in turn influencing consumer buying behavior, purchasing preference in Ethiopian bottled water market where similar bottled water products compete with a specific focus on aquaddis bottled water.

## **1.2 Statement of the Problem**

In today's highly competitive business environment, producers of commodity products like bottled water, where many different brands have close attributes must achieve some degree of differentiation for their products to avoid their products being viewed as a basic generic commodity. According to consumer involvement theory, this differentiation can move customers from low-level involvement decision making to high-level involvement decision making pattern (Muncy & Hunt, 1984).

Consumer purchasing decisions to buy a product or services involves many processes based on the consumer's needs and economic condition. Hence manufacturers of the commodity should be able to find out the consumer's preference pattern and the factors which influence the consumer's preference which can be used as a platform for developing a competitive product.

Currently, the bottled water industry in Ethiopia poses a unique challenge due to the fact that the products don't have a unique "taste profile" that distinguishes the brands. In essence different brands of bottled water are "just water" in the eyes of the consumers. Alike other beverage products, bottled water lacks the taste profile across different manufactured products.

In most part, Price has been used as the only possible means by which consumers differentiate one brand from another. But this has adverse impact on the brand equity as price promotion and discounts lead to a constant price war weakening customer loyalty and perceived quality.

Several studies carried out in the bottled water industry in the context of our country revealed that “there is no positive and direct relationship between the four dimensions and brand equity, however the inter correlations between perceived quality and inter correlation between brand awareness and brand loyalty were significant and positive. Thus perceived quality and brand awareness might affect brand equity by affecting brand loyalty first”

This research explored the most influential factors that are behind the brand equity of bottled water. It was done in such a way that it could give an insight to the major determinants that have an impact on the brand equity of the aquaddis water plc. This study measures the different variables which determine the brand equity of aquaddis so that there will be a clear understanding of the market.

The motivation behind this study is the fact that aquaddis is currently a strong brand which is in stiff competition with other bottled water products like Arki, Gold, Dega; this study will help to take a larger share of the market over its rivals. However, it has not been clear which factors of brand equity have a strong influence on the customer’s brand preference. Employing the concept of brand equity to address their customers’ needs will in turn increase their sales volume and market share in this very competitive market.

### **1.3 Basic Research Questions**

- Which brand dimensions are the key determinants of brand equity of aquaddis bottled water?
- What is the relationship among the determinants of brand equity in the product of aquaddis bottled water?
- Which determinants are the most influential of brand equity of aquaddis bottled water?



## **1.4 Research Objective**

### **1.4.1 General Objective**

This research tries to examine the relationship among the four dimensions of brand equity and overall brand equity in the context of consumers of aquaddis bottled water.

### **1.4.2 Specific Objectives**

The research has these specific objectives

- To assess the factors affecting brand equity
- To determine the type of structural relationship that exists among the four dimensions of brand equity of aquaddis bottled water
- To identify the most critical factor of brand equity of aquaddis bottled water

## **1.5 Significance of the Study**

The research will contribute by being used as a reference by other researchers who want to conduct further study on the concept of brand equity and its influences on the consumption in Ethiopian bottled water industry.

## **1.6 Scope of the Study**

The study was delimited conceptually, geographically as well as methodologically. Conceptually, this study only focuses on the determinants (brand awareness, brand association, perceived quality and brand loyalty) in relative terms rather than absolute terms. Geographically, the research will be analyzing aquaddis water brand within the context of the bottled water competition landscape. The geographic scope of the study was delimited only within Addis Ababa city of Ethiopia. This was decided because it is believed that this market could be representative for other similar consumer markets in the regions. Methodologically, the research designs considered in the study were explanatory and descriptive research designs where quantitative research approach was

employed. Additionally, the main source of this data was primary data. The questionnaires were distributed to collect the intended data in Addis Ababa.

## 1.7 Limitations of the Study

This research had the following limitations:

The inherent bias in convenience sampling means that the sample is unlikely to be representative of the population being studied. This undermines to make generalizations from the sample to the population being studied. As a questionnaire was used, phrases used in the questionnaire can often skew answers in a particular direction without given an unbiased picture of what the respondent actually thinks.

## 1.8 Organization of the Study

This study is organized into five chapters.

**Chapter One:** The Introduction section which consists of the background of the study, statement of the problem, research questions, the main and specific objectives of the study, significance of the study and how the study is organized.

**Chapter Two:** Discusses literature related to the study, the conceptual framework for the study.

**Chapter Three:** Explains the research methodology used in the study.

**Chapter Four:** Presents the data collection, data analysis based on the objectives of the research questions.

**Chapter Five:** Contains the conclusions and recommendations of the study.

## 1.9 Definition of Keywords

**Brand:** A name, term, sign, symbol, design or a combination, which is intended to identify the goods and/or services of a firm in order to differentiate them from the competition. (AMA & American Marketing Association, n.d.)

**Brand Equity:** A set of brand assets and liabilities linked to the brand that adds or detracts the product or service value based on the customer perspectives (Aaker, Managing Brand Equity, 1991).

**Consumer Based Brand Equity:** The differential effect that brand knowledge has on consumer response to the marketing of the brand (Keller, 2001).

**Brand Awareness:** The ability of a consumer to recognize and recall a brand in a different situation (Aaker, Building Strong Brands, 1996).

**Perceived Quality:** Customers / Consumers perception of the overall quality or superiority of a product or a service compared (Paramerwaran, 2015) to alternatives. (Paramerwaran, 2015)

**Brand Association:** Informational nodes that evoke strong feelings in the consumer's mind about a particular brand; and in this way creates a unique position that differentiates itself in relation to competition. (Keller K. , 2011)

**Consumer Behavior:** The dynamic interaction of affect and cognition, behavior, and the environment by which human beings conduct and exchange aspects of their lives (Kotler, Pfoertsch, & Waldermar, Being Known or Being One of Many, 2006).

**Brand Loyalty:** A deeply held commitment by consumers to re-buy a preferred product or constantly, despite situational influences and marketing efforts (Kotler & Pfoertsch, Ingredient Branding: Making the invisible visible, 2010).

## CHAPTER TWO

### REVIEW OF RELATED LITRATURE

In this section of the paper, the researcher will present theoretical literature papers related to the study, the conceptual framework for the study.

#### 2.1 Theoretical Review

##### 2.1.1 Brand

**“A brand is an identifiable entity that make specific promise of value”** (Nicolino, 2000)

- ✓ Identifiable: has a logo, color, word that is used to separate it
- ✓ Entity: has a separate and distinct existence
- ✓ Specific promise: a product / service making claims of what it offers
- ✓ Value: offers something of worth

**“A brand is emotional, has a personality and captures the heart and minds of its customers”**  
(Kotler, Pfoertsch, & Waldermar, Being Known or Being One of Many, 2006)

According to the American Marketing Association a Brand is a “name, term, symbol or design or a combination of them, intended to identify the goods or services ...” although the definition was formed in the early days of marketing, it is still prevailing and captures the main idea and essence of branding. According to G. Randall brand is something different from a product, more than a simple commodity. (Randal, 2000). Whereas commodities are characterized by lack of perceived differentiation. Brands represent a product but with added value customers experience when buying or consuming the branded product. Even though all brands start as undifferentiated products in the beginning, the point of differentiation is what will distinguish them from other offerings.

A product is something that is made in the factory; a brand is something that is bought by a consumer (Randal, 2000). In the carbonated soda industry, it could be observed indifferences

between the various manufacturers products (similar to the bottled water industry in Ethiopia); some consumers could just be seeking for a thirst quenching drink; other much more than the product to the company that manufactures it (e.g. Coca-Cola) and connect a certain lifestyles and image to it. The key change that allows a product to evolve into a brand in consumer's minds is the existence of intangibles. Features like image, credibility, reputation and unique associations...etc. (Sherrington, 2003).

According to Chernatony, brands aim at delivering and satisfying both consumers' rational and emotional needs, ranging from taste, quality, aesthetics to the feelings of prestige, style or social assurance. (De Cheratony, 2010). The adequate balance of satisfying these needs distinguishes a successful brand from less successful ones. (Randal, 2000) identified the achievement of a competitive advantage over rivals as a main purpose of brands. Moreover, the mechanism to achieve this is by creating differentiated attributes that customers value and are willing to pay a premium price for. According to (Keller K. , 2011) "Strong brands blend product performance and imagery to create a rich, varied but complementary set of consumer response to the brand". This means that a strong brand should address both head and heart, which entails a certain duality. Whatever consumers associate with it, however has to be defined in consumer terms, clearly communicated and carefully managed to ensure the constant delivery of these values. The added values of a brand enable the competitive offerings, and therefore brands are often critical factors of the company's portfolio.

Consequently, brands need to be managed strategically, attributing to the importance to the matter. Moreover, it is necessary to acknowledge that it entails a continuing relationship between brand and consumer, which is not static but in constant shifting (Sherrington, 2003). The company, therefore, needs to invest effort to maintain the relationship. Branding has to be continuously adapted to remain both effective and efficient and to stand out in comparison to the magnitude of alternatives (Randal, 2000).

The extremely important role customers play in the whole branding concept, is widely acknowledged. (Randal, 2000) summarizes that it is not the manufacturer or supplier who decides

whether or not a product is a brand. It is the customer who considers the product as a distinct from others. A successful brand has to transfer this unique set of noticeable benefits, not only to few individuals, but to a collective target group.

In order to establish a strong brand, a high degree of familiarity and awareness in consumers' minds has to be created which ultimately should conclude a strong favorable and unique associations. It is essential to deliver a message that there is a meaningful difference among brands in the same product category.

### **2.1.2 Brand Equity**

The concept of brand equity is generally meant to capture the value of a brand according to (Kotler, Pfoertsch, & Waldermar, Being Known or Being One of Many, 2006). Different definitions of brand equity exist.

With all the definitions solidly defining brand equity as a value that is place on a brand; two distinct understandings of a brand equity (value) exists;

- ✓ Strategic “subjective” understanding of brand value (consumers’ perception of the brand)
- ✓ Financial “objective” expression of the value of a brand (the way to account how much monetary value the brand holds)

For the purpose of this study, the researcher will be focusing on the subjective value of a brand value; consumers’ perception of the brand. Consumer are the ones who experience the brand and their perception of brand equity can be defined as “A consumer perceives brands equity as the value added to the functional product or service by associating it with the brand name (Aaker, Building Strong Brands, 1996).

Duane E. Knapp for instance defines brand equity as “the totality of brand’s perception, including the relative quality of the products and services, financial performance, customer loyalty, satisfaction and overall esteem toward the brand” (Knapp & Daune, 2008).

Brand equity is a multi-dimensional and complex concept. As such, it is important to understand the concept of brand equity for both researchers and practitioners. (Farquhar, Han, & Ijiri, 1991) defined brand equity as the added value endowed by the brand to the product. Similarly, (Aaker, Managing Brand Equity, 1991) provides a definition of brand equity: “a set of brand assets and liabilities linked to a brand, its name and symbol that add to or subtract from the value provided by a product or service to a firm and/or to that firm’s customers”. Drawing upon a cognitive psychology approach, (Keller L. K., 1993) also views brand equity as the “differential effect of brand knowledge on consumer response to the marketing of the brand”.

Furthermore, there are many definitions for the concept of brand equity which are summarized in the following table. They are primarily inherited from the definition of (Aaker, Managing Brand Equity, 1991), which is cited and applied frequently by researchers. This research is also based on Aaker’s definition. Definitions of Brand Equity (Ngan, April 2019)

Farquhar (1989)	The added value endowed by the brand to the product.
Aaker (1991)	A set of brand assets and liabilities linked to a brand, its name and symbol that add to or subtract from the value provided by a product or service to a firm and/or to that firm’s customers.
Keller (1993)	The differential effect of brand knowledge on consumer response to the marketing of the brand.
Lassar et al. (1995)	The enhancement in the perceived utility and desirability a brand name confers on a product.
Yoo et al. (2000)	The difference in consumer choice between the focal-branded product and an unbranded product given the same level of product features.
Vázquez et al., (2002)	The utility that the consumer associates to the consumption and use of the brand.
Kotler and Keller (2006)	A bridge between the marketing investments in the company’s products to create the brands and the customers’ brand knowledge.
Christodoulides and De Chernatony (2010)	A set of perceptions, attitudes, knowledge, and behaviors on the part of consumers that results in increased utility and allows a brand to earn greater volume or greater margins than it could without the brand name.

Table 1: Definitions of Brand Equity

### 2.1.3 Dimensions of Brand Equity

There is little agreement on exactly what the dimensions of brand equity entail (De Cheratony, 2010). (Aaker, *Managing Brand Equity*, 1991) proposes brand equity with the five dimensions of brand awareness, perceived quality, brand associations, brand loyalty and other proprietary brand assets. However, the fifth dimension is not directly relevant to the consumer; consequently, it is usually omitted. (Keller L. K., 1993) focuses on two components of brand knowledge signified as brand awareness and brand association. In addition, (Lasser, Mittal, & Sharma, 1995) proposes five basic components of brand equity: performance, social image, value, trustworthiness and attachment. According to (Atilgan, Aksoy, & Akinci, 2005), brand equity consists of perceived quality, brand loyalty, brand associations and brand trust. Other dimensions have also been proposed by many researchers. (Nguyen & Ngan, 2019) However, Aaker model (Aaker, *Managing Brand Equity*, 1991) is clearly the most popular brand equity model, and has been used by a large number of studies. It can be understood easily and adheres to the concept of overall brand equity as evaluated by customers. Therefore, this research uses the brand equity model of (Aaker, *Managing Brand Equity*, 1991) consisting of four core dimensions: brand awareness, perceived quality, brand associations, and brand loyalty.

#### *2.1.3.1 Brand awareness.*

Brand awareness is “the ability of the potential buyer to recognize and recall that a brand is a member of a certain product category” (Aaker, *Managing Brand Equity*, 1991). According to (Keller L. K., 1993), brand awareness refers to the ability to identify the brand easily in the customer’s mind. Thus, (Ho, 2006) (Hooper, Coughlan, & Muller, 2008) (Israel, 2013) (Kim, Kim, & An, 2003) brand awareness includes brand recognition and brand recall (Aaker, *Managing Brand Equity*, 1991); (Keller L. K., 1993) Precisely, brand recall relates to a brand name that can be recalled correctly by customers when they see a kind of product. In contrast, brand recognition refers to the ability of a customer to distinguish a brand based on information which they have seen or heard before.



#### *2.1.3.2 Perceived quality.*

Perceived quality is defined as “the consumer’s [subjective] judgment about a product’s overall excellence or superiority” by (Zeithaml, 1988). This term does not refer to the objective (or physical) quality of the products. Perceived quality is a subjective quality based solely on the consumer’s perception, while objective quality is based on the product or production process. Thus, perceived quality has a higher degree of abstraction than objective quality (Aaker, *Managing Brand Equity*, 1991); (Keller L. K., 1993) (Zeithaml, 1988). High perceived quality occurs when customers recognize the difference and superiority of the brand in relation to the competitor's brand.

#### *2.1.3.4 Brand associations.*

(Aaker, *Managing Brand Equity*, 1991) defined brand associations as “anything linked in memory to a brand”. Brand associations are complicated and closely inter-connected. The concept consists of multiple ideas, episodes, instances, and facts that establish a solid network of brand knowledge (Yoo, Donthu, & Lee, *An examination of selected marketing mix elements and brand equity*, 2000). It is formed by the customer’s belief in the brand created through direct experience with the product or based on available associations (Aaker, *Managing Brand Equity*, 1991). The concept of brand associations represents the functional attributes and experience provided by a particular brand. Invisible attributes such as creativity, differentiation, dynamism and prestige are also considered under the umbrella of brand associations. The combination of tangible and intangible attributes creates brand identity, in turn leading to brand associations (Aaker, *Building Strong Brands*, 1996).

#### *2.1.3.5 Customer loyalty.*

The concept of customer loyalty in past decades has usually been investigated from two perspectives: behavioral and attitudinal loyalty (Nam et al., 2011). Behavioral loyalty emphasizes the frequency of repurchase (Ehrenberg et al., 1990). According to the attitudinal perspective, loyalty relates to the psychological commitment such as a purchase intention without undertaking the repurchase behavior (Jacoby, 1971; Jarvis and Wilcox, 1976). The behavioral perspective has been strongly criticized, while the attitude perspective is more appropriate for studying loyalty due

to the fact that customers can be loyal to a product even if they do not buy that product. Thus, in the study, brand loyalty is viewed from attitudinal perspective. Brand loyalty is defined as “the attachment that a customer has to a brand” (Aaker, *Managing Brand Equity*, 1991). According to (Yoo, Donthu, & Lee, *An examination of selected marketing mix elements and brand equity*, 2000) brand loyalty refers to loyalty to a specific brand, as exemplified by the brand always being the first choice when customers intend to buy. Brand loyalty is the result of brand trust or the promise of building high-value connections between customers and brands.

#### **2.1.4 Brand Equity & Consumer Response**

The concept of brand equity has received much attention from marketers in both academia and practice since the 1980s. Brand equity has an important and strategic role in the gaining of competitive advantage (Atilgan, Aksoy, & Akinci, 2005). Many previous studies have asserted that brand strength can create differential responses in consumers (Hoeffler & Keller, 2003).

The relationship between brand equity and consumer responses has been mentioned in many studies (Lassar et al., 1995; Netemeyer et al., 2004; Hoeffler and Keller, 2003; Ailawadi et al., 2003; Rangaswamy et al., 1993; Czellar, 2003; Chen and Chang, 2008; Buil et al., 2013; Naeini et al., 2015), yet these studies have merely focused on the effect of brand equity with regard to one or a few manifestations of customer responses.

#### **2.1.5 Brand equity and consumer satisfaction / preference manifestations**

The relationship between brand equity and customer satisfaction has become one topic that has received much attention from marketers (Aaker, *Managing Brand Equity*, 1991) (Keller L. K., 1993) (Pappu, Quester, & Cooksey, 2005). However, no studies have examined the impact of brand equity on customer satisfaction in addition to the above manifestations of customer responses in the same research model. As such, there exists a gap in the literature of brand equity and customer responses. (Nguyen & Ngan, 2019)

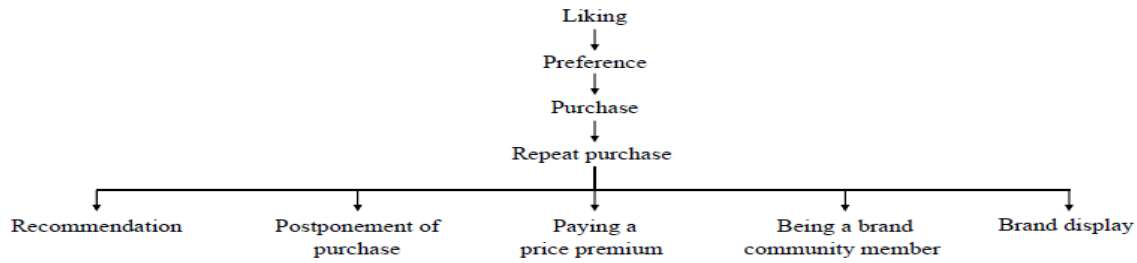


Fig 1. Customer Behavior and Brand Equity (Rogers, 2008)

Buil et al. (2013) and Naeini et al. (2015) have recently proposed a model of this relationship with the most varied manifestations of customer response, including willingness to pay high price, brand preferences and purchase intention. Furthermore, customer satisfaction is also a customer response which has received much attention from both academicians and practitioners (Kotler, 2000; Zeithaml et al., 2006; Levy and Weitz, 2007; Kim, 2010; Kang, 2011; Faed et al., 2013; Liberati and Mariani, 2013).

For this study I will focus on the following consumer response manifestations (Customer Satisfaction, Brand Preference and Purchase intention) to analyse how brand equity in turn impact consumer buying inclination.

## 2.2 Empirical Review

There were several researches done on the brand equity of different products.

An empirical evidence from the bottled water market in china conducted by Xio Tong in 2015, brand association and brand loyalty have a positive and direct significant influence whereas perceived quality and brand awareness were found to have either very low or negative parameter estimates.

Hossien (2012) studied CBBE in the Chocolate industry of Iran with the intention of identifying which factors are influential in building brand equity and also to measure the relationship among the dimensions of CBBE in the Iranian chocolate industry. After employing Aaker's CBBE model, the researcher found out that the brand equity of chocolate products is directly made up of two dimensions, namely brand loyalty and brand image. These two dimensions have a medium direct impact on brand equity. The rest dimensions have a very small and indirect impact on brand equity that in chocolate industry of Iran.

Abad (2012) studied CBBE in the Banking sector of Iran aiming to conceptualize the customer based brand equity in the financial service sector with respect to its effect on perception of brand. After employing Aaker's (1996) CBBE model, he found out that perceived quality, brand loyalty, Brand Awareness and brand association are influential criteria of brand equity that enhances perception of brand in financial service sector.

### 2.2.1 Studies on brand dimensions influences on brand equity in Ethiopia

Seifu (2016) had studied customer based brand equity with the study aims to test the bottled water customers' perception in view of the five brand equity dimensions, and how these dimensions are influencing brand building in the customers' mind in Addis Ababa market. The researcher took sample size 134 respondents selected randomly and analyzed on the bottled water brands towards, assessing the perception of consumers on the dimensions of brand equity. He found that the

customers' perception is highly influenced by Brand Perceived Quality followed by Brand Awareness and concluded that Brand Perceived Quality is the influential dimension than the other dimensions of brand equity.

Shemila (2014) had studied on factors that influence Brand Awareness in leather footwear industry in Ethiopia. Four determinants: brand perception, advertising, perceived quality and product innovation have been kept in mind while doing this research. The researcher used both qualitative and quantitative techniques in which 50 respondents from Addis Ababa were included. Structured questionnaire for customers identified through convenience sampling and an interview was made to marketing managers of sample five footwear producers engaged both in domestic and international markets. The researcher used person correlation and regression analysis to analyze the data. The reported shows that among the four variables brand perception, and perceived quality have a significant positive impact on Brand Awareness of local leather footwear while advertising and product innovation do not have.

Wongelawit (2014) had studied on the coca cola product in the Ethiopian context using a sample size of 470 respondents and employing a structural equation modeling has concluded that brand association and brand loyalty have positively influenced brand equity while perceived quality and Brand Awareness negatively influenced it.

## 2.3 Research Hypothesis

This study is prepared to clearly show the impact each brand equity dimensions have on the overall brand equity of aquaddis bottled water.

### 2.3.1 The impact of Brand Equity Dimensions on overall Brand Equity

Brand awareness is an important dimension (Tong, 2009) and the first step to creating brand equity (Buil et al., 2013a). Brand awareness can be a sign of quality and commitment, allowing consumers to become familiar with a brand and helping them consider it at the point of purchase (Aaker, Managing Brand Equity, 1991). (Vinh, 2019) Hence the following hypothesis is proposed:

**H1. Brand awareness has a positive influence on the overall brand equity.**

Perceived quality is the “core/primary” dimension across the CBBE model (Aaker, 1996; Farquhar, 1989). For marketers, high perceived quality can support high prices, leading to greater profits for the company and reinvestment in brand equity (Yoo, Donthu, & Lee, An examination of selected marketing mix elements and brand equity, 2000). High perceived quality gives consumers a good reason to buy the brand, and as such it encourages customers to choose this brand. Therefore, the higher the perceived quality, the higher the brand equity (Yoo, Donthu, & Lee, An examination of selected marketing mix elements and brand equity, 2000). The influence of perceived quality on brand equity has been verified (Vinh, 2019). Hence the following hypothesis is proposed:

**H2. Perceived Quality has a positive influence on the overall brand equity.**

Brand loyalty is a major component of brand equity (Yoo, Donthu, & Lee, An examination of selected marketing mix elements and brand equity, 2000). Moreover, brand loyalty can affect the behavior of customers toward buying the same product or brand; such customers will decline switching to other brands (Yoo, Donthu, & Lee, An examination of selected marketing mix elements and brand equity, 2000). If a customer is loyal to a brand regardless of its outstanding features, this brand has a significant value to the customer. According to (Vinh, 2019), brand loyalty has a positive direct influence on brand equity. Hence the following hypothesis is proposed:

**H3. Brand Loyalty has a positive influence on the overall brand equity.**

With brand association, companies can differentiate and position their products, as well as build appropriate attitudes and beliefs about the brand (Dean, 2004). This can lead to increased brand equity (Yoo, Donthu, & Lee, An examination of selected marketing mix elements and brand equity, 2000). According to Rio et al. (2001), brand association is an important factor in creating

brand equity. Similarly, the results of studies have also proved the relationship between brand association and brand equity. (Vinh, 2019) Thus the following hypothesis is proposed:

**H4. Brand Association has a positive influence on the overall brand equity.**

### 2.4 Conceptual Framework

Based on the above related literature review and concepts the conceptual frame work for this study is developed having Brand Equity as dependent variable and Brand Awareness, Brand association, Perceived quality and Brand loyalty as independent variables.

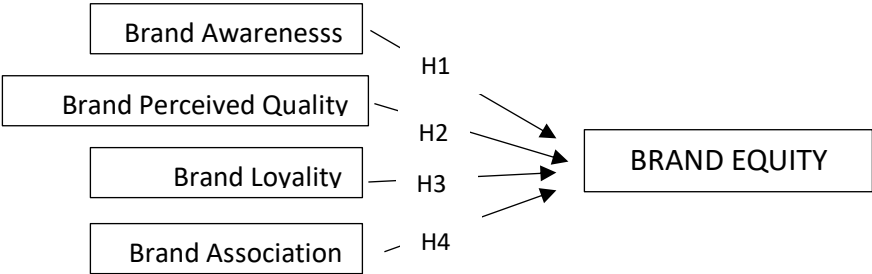


Figure 2. Conceptual framework diagram

## **CHAPTER THREE**

### **REASERCH DESIGN & METHODOLOGY**

In this section, the researcher presents the research design framework, types of research approach and design, data type and source, target population, sampling technique and sample size determination, data collection procedure, method of data analysis, ethical issue, reliability and validity of the study were covered.

#### **3.1 Research Approach**

There are three types of research approaches: the first one is qualitative research which involves studies that do not attempt to quantify their results through statistical summary or analysis. In qualitative research data are often in the form of descriptions not in numbers. The other one is quantitative research, which engages in systematic and scientific investigation of quantitative properties and phenomenon and their relationships. Quantitative research is the systematic and scientific investigation of quantitative properties and phenomena and their relationships (Kothari, 2005).

In this study, quantitative research approach was used in order to achieve the desired objectives with the use of statistical tools and numbers to address the mentioned research questions. The study was designed to explain, understand, predict and control the relationship between variables.

#### **3.2 Research Design**

Research design explains and justifies the type and method of data collection, source of information, sampling strategy and time-cost constraints (Saunders, 2012). There are four types of research designs based on the study purpose: exploratory, explanatory, descriptive and causal. Explanatory and descriptive research designs using cross-sectional survey were employed in the study. The explanatory research is ideal to describe the characteristics of the variables and at the same time investigate the cause effect relationship between variables (Malhotra et al., 2012), where



as descriptive study stems from prior knowledge and is concerned with describing a specific phenomenon (Saunders, 2012).

This research has tried to identify factors affecting the aquaddis water brand. Therefore descriptive study is the appropriate method of research design. The choice of cross-sectional allowed collection of quantitative data from a population is an economical way (Saunders et al., 2009). Explanatory research design was representative because of its suitability in elaborating the characteristics of a particular individual or a group of individuals (Kothari, 2005). The main aim of explanatory research is to identify any causal links variables that pertain to the research problem; such research is also very structured in nature. In this study, by employing cross-sectional field surveys, independent and dependent variables were measured at the same point in time using a single questionnaire.

**Research method:** Primary quantitative research method is used for the study. This is to allow the researcher to focus on collecting the data directly rather than depending on data from previous researches.

**Research type:** Explanatory research is used. Given the subject matter for this study, where the analysis will be on already established phenomenon (consumer's attitudes towards brand variables) this research type enables the researcher to examine the relationship between the independent variables of brand equity to the dependent variable of consumer buying preference.

**Survey method:** Quantitative survey method is used to enable the researcher to quantify consumer attitudes and behavior and find out how the population feels about the issues studied on this paper (i.e. How brand variables impact brand equity and in turn how brand equity influence consumers purchase preference). In addition to that a Qualitative data will be collected through conducting an interviews.

### 3.4 Source of Data

Basically there are two types of sources of data: Primary and secondary sources of data. According to Malhotra (2005), primary data are originated by the researcher for the specific purpose of

addressing the problem at hand. Secondary data are data that are collected for some purpose other than the problem at hand. Secondary data are usually collected from journals, existing reports, and statistics by government agencies and authorities. Even if obtaining them can be expensive and time consuming, primary data, being the most significant were gathered through structured questionnaire. In this study, the sources of data were primary data and collected by administering structured questionnaires purposively to select the study respondents who were regularly use bottled water in the study area.

### 3.3 Sampling Techniques and Procedures

As stated in the scope of the study, the research tried to measure the determinants of the brand equity of aquaddis bottled water product. But due to time and financial constraints, the study was limited to Addis Ababa.

Hence the target population for this study was men and women in Addis Ababa who are consumers of bottled water. As there are usually a highly populated number of consumers available at cafes, restaurants and recreational centers, they were chosen as a place of contact with the respondents.

The researcher selected the respondents out of the total population of consumers of bottled water through convenience sampling. Convenience sampling which also called accidental or opportunity sampling was used because it's a non-probability sampling technique in which a sample is drawn from that part of the population that is close to hand, readily available, or convenient so because of this it's a fast and easy way of sampling.

The number of population in Addis Ababa is estimated to be 5 million. A sample size of 384 bottled water consumers was chosen for this study. This sample size was determined by using a table developed by krejcie and Morgan (1970) using the formula for sample size determination when the population size is known (see next section)

### 3.4 Target Population

According to Sekeran (2001), the target populations of the study were volunteer people, who consume bottled water of different brands. Population or universe represents the entire group of units which is the focus of the study. To make the samples representative of the population, the sample frame from which samples drawn from different sub-cities of Addis Ababa for bottled water consumers in the Addis Ababa city were included. Thus, the sample frame designed has made to be mainly employees of various organizations, merchants, house wife, student and very few farmers who were customers of bottled water for their consumptions on regular basis based on convenience. Since, the bottled water market has mainly characterized by its availability anywhere in offices, mini-markets, super markets, hotels and restaurants were selected as to gather data.

### 3.5 Sample Size

It is important that the sample size is adequate enough so that a meaningful inference can be made. Therefore, to determine the sample size, a sample size formula is used to help in calculating the minimum sample size required to know the adequate proportion of the population along with the confidence level and margin error.

$$SampleSize = \frac{z^2 \cdot p(1 - p)}{e^2}$$

Sample size formula is:

Valid where

z = estimate of score confidence level estimate (at 95% confidence level = 1.96)

e = margin of error = 5% (0.05)

p = proportion of the population at 50% (0.5)

$$Sample\ Size = (1.96)^2 * 0.5 * (1 - 0.5) / (0.05)^2$$

$$= 3.8416 * 0.25 / 0.0025$$

$$= 384.16 = Approximate = \mathbf{384\ respondents}$$

This sample size determination is based on the unknown population of (the exact bottled water consumers in Addis Ababa.). Thus, 384 respondents are used for this research.

### 3.6 Methods of Data Collection

The researcher used self-administered questionnaire to collect the primary data. Where required an interview was also conducted. The questionnaire has three parts. The first part was regarding the socio-demographic data of respondents. The second part encompass the items to measure the five dimensions of brand equity. The third part contains the items to measure the three selected consumer response factors to the overall brand equity aspect which is based on work of Yoo and Donthu (2001). Apart from the first part, the rest was measured by using 5 point Likert scale ranging from "strongly agree" to "strongly disagree".

*Perceived quality*: has four measures the first three were adopted from Aaker (1991), Pappu et al. (2005) and the last one will be adopted from Yoo & Donthu (2000). It assesses consumers' subjective judgments about a brand's overall excellence or superiority.

*Brand awareness*: has five measures which are adopted from (Aaker, Managing Brand Equity, 1991)and Yoo & Donthu (2000). It measures the strength of the brand in a consumer's memory as reflected by the consumer's ability to identify various elements of it.

*Brand association*: has five measures which were adopted from (Brands, 1996)Keller (1993), Pappu et al. (2005) and (Donthu, 2000). It tries to measure the brand's uniqueness and favorableness and organizational associations.

*Brand loyalty*: has five measures which were adopted from Yoo & Donthu (2000) and Pappu et al. (2005). It tries to attain consumer's overall commitment to being loyal to a brand.

The customer-based overall brand equity tries to look at consumers' overall attitudes toward the focal brand (aquaddis bottled water) and their intention to select the brand against its competitor.

*Brand Preference*: has three measures base on the scale of Davies et al. (2006). It is to assess how a favorable attitude toward the brand leads to the intention to purchase (Buil et al., 2013).

*Customer satisfaction*: is measured using four items adapted from Cronin et al. (2000). It measures how brand equity is a measure of customer satisfaction (Jang, 2010).

### 3.7 Data Analysis Techniques

The analysis of the data, a descriptive and inferential statistical analysis techniques were used. Descriptive analysis for percentages, means, standard deviations and frequencies was calculated. Qualitative techniques was incorporated in the study to facilitate description and explanation of the study findings. With regard to inferential statistic, correlation and regression analysis was done to test the significance contribution of independent variable to the dependent variables.

### 3.8 Ethical Consideration

Research ethics related to the rights of human participants, notably the right to informed consent; right to privacy and confidentiality; the right not to be deceived or harmed as a consequence of the participation in the research ( Bell, 2007)is observed in this research. Respondent were informed about the purpose and procedures of the research and must give consent to participate in the survey. Anonymity and confidentiality of the participants will be observed.

### 3.8 Validity and Reliability

#### 3.8.1 Reliability Analysis

This study uses Cronbach's alpha to assess the internal consistency of variables in the research instrument. Cronbach's alpha is a coefficient of reliability used to measure the internal consistency of the scale; numbers between 0 and 1 are represented. Scales with coefficient alpha between 0.6 and 0.7 indicate fair reliability (Zikmund, 2013).

#### 3.8.2 Validity Analysis

Validity is the most important factor and indicates the degree to which the instrument measures what it is supposed to measure. (Kothari, 2004). In order to test the construct validity Pearson's correlation is used to check correlations of each item in the questionnaire scores; in Pearsons' correlation coefficient with significant (2-tailed) value  $< 0.05$  is declared valid; above 0.05 is declared invalid.

## CHAPTER FOUR

### DATA PRESENTATION, ANALYSIS AND INTERPRETATION

The aim of this study was to analyze the effects of brand equity determinants towards brand equity of aquaddis bottled water in Addis Ababa, in Ethiopia. Pretested structured close ended questionnaires used to collect the data (Appendix I and II). The choice of using questionnaire is based on Fisher (2007) view on structured questionnaire as stated before. The questionnaire designed on commonly employed questions for different brand equity related studies used. For the data analysis SPSS version 21.0 was used. The methods used in data analysis include descriptive statistics, regression, One Way ANOVA and multi- collinearity test and Cronbach’s Alpha. Descriptive analysis is used to summarize the general profile of respondents while regression and One Way ANOVA analysis were applied to determine whether the proposed independent variables (Brand Awareness, brand association, brand perceived quality, brand loyalty) have effect on the dependent variable (brand equity). Cronbach’s Alpha is also used to test the reliability.

Out of 384 questionnaires distributed to increase response rate based on convenience, 380 questionnaires returned and used for the analysis out of the total amount distributed with 98.3% response rate in the study area.

#### 4.1 Data collected from the respondents

##### 4.1.1 Questionnaire Response Rate

	Circulated	Correctly Filled	Wrongly Filled	Not Returned
Number	384	380	4	0
Percentage		99%	1%	0%

Table 4.1.1 Questionnaire Response Rate (Source: survey data)

As per the recommended sample size, 384 questionnaires were distributed via paper and online methods. As shown on the table 4.1.1 only 4 papers were not properly filled. We can safely use

380 records; which accounts for 99% of the required sample. We can conclude that this is sufficient to proceed with the study.

#### 4.1.2 Questionnaire Response – Sociodemographic data

Profile	Description	Frequency	Percentage
Gender (380 Respondents)	Female	169	0.45
	Male	211	0.55
Age group (380 Respondents)	16 - 20	56	0.15
	21 - 30	172	0.45
	31 - 40	108	0.28
	41 - 50	34	0.09
	Over 50	10	0.03
Education Profile (380 Respondents)	Certificate	40	0.11
	Degree	128	0.34
	Diploma	120	0.32
	Masters	92	0.24

Table 4.1.2 Respondents sociodemographic data (Source: survey data)

On this part of the questionnaire, the sociodemographic makeup data of the respondents were collected. As shown from the table above the collected data indicates the following:

Considering the gender profile more males participated in the survey with 10 PPTS percentage points advantage of 55% over 45% to female respondents. This keeps the balance of participation within the acceptable range.

Regarding the age group of the respondents 16 and over were targeted with 5 levels groups. The group classification was distributed within the 10-year gap. The collected analysis shows the age group 21 – 40 are the majority participants. Over 50 years old respondent contributed to only 3%.

Given the majority of consumption and spend ability of the age group (working age group) are within the age of 21 – 40; it is safe to accept the participation for this study.

Education profile of the participants is evenly distributed across the levels of education set out on the questionnaire. Please refer to the table 4.1.2 for more details as it is presented above.

#### 4.1.3 Bottled water rate of consumption experience

Do you consume Bottled water? (380 Respondents)	Frequency	Percentage
Yes	380	100
No	0	0

Table 4.3 Respondents bottled water consumption experience (Source: survey data)

The consumption experience of the respondents was captured for this study; and it shows all (100%) of the respondent are bottled water consumers. This clear any worries of biased intentions on the bottled water product.

#### 4.1.4 Bottled water rate of consumption occasion

How often do you consume bottled water? (380 Respondents)	Frequency	Percentage
All the time	272	0.72
Only when TAP water is not available	108	0.28

Table 4.1.4 Respondents bottled water consumption occasion (Source: survey data)

This finding from the respondents pose a tricky situation where 28% of the respondents only resort in consuming bottled water if TAP water is not available. This needs further analysis as to why 108 respondents decide not to drink bottled water as their first choice. But for this study it is not required and we will accept the data as it is.



#### 4.1.5 Respondents Brand Choice Analysis

Brand	Frequency	Percentage
aquaddis	360	0.26
TOP	288	0.21
YES	244	0.18
GOLD	204	0.15
ARKI	121	0.09
ONE	86	0.06
DAILY	58	0.04
S.SPRING	22	0.02

Table 4.1.5 Respondents' Brand consumption pattern (Source: survey data)

The research is designed to focus on aquaddis brand as a case study. As part of analysis of the major players on the competition landscape, the study wanted to identify the position of the aquaddis brand; as preference from the respondents. The data shows that aquaddis is clear favorite by a majority of the respondents; 26% of the respondents picked aquaddis brand as their first choice. In the next section the study will explore aquaddis brand dimensions in detail to see what is making the brand so attractive to consumers.

#### 4.1.6 Consumption Rate – aquaddis water

When was the last time you have consumed aquaddis? (380 Respondents)	Frequency	Percentage
Today	139	0.37
This week	138	0.36
Last week	91	0.24
A month ago	12	0.03

Table 4.1.6 aquaddis brand consumption pattern (Source: survey data)

The data collected on the aquaddis consumption rate shows 37% consumed on the same day; over 70% consumed in the last 7 days shows high level of consumption rate. This is a clear indication of the frequency of consumption and sufficient to proceed with the study.

#### 4.1.7 Consumption Rate – By age group – aquaddis

<b>aquaddis consumption frequency (380 respondents)</b>	<b>16 - 20</b>	<b>21 - 30</b>	<b>31 - 40</b>	<b>41 - 50</b>	<b>Over 50</b>	<b>Frequency by consumption rate</b>	<b>Percentage</b>
A month ago	2	8	2			12	0.03
Last week	22	37	22	8	2	91	0.24
This week	18	72	34	10	4	138	0.36
Today	14	55	50	16	4	139	0.37
<b>Frequency of consumption by age group (380 respondents)</b>							
	56	172	108	34	10		
Percentage	0.15	0.45	0.28	0.09	0.03		

Table 4.1.7 aquaddis brand consumption rate by age group (Source: survey data)

The table above is analyzing the frequency of consumption to the age group; and the result shows a high consumption among between 20 – 40 age groups with over 70% consumption rate. This is sufficient to conclude that there is a fair distribution of consumption; which we will analyse and see in more detail when conducting “normal distribution” testing.

## 4.2 Validity & Reliability Test

Validity & Reliability instruments are essential in a research data collection. Therefore, the correct data will be determining the true result of the quality and consistency.

### 4.2.1 Validity Measurement Testing

Validity is a measure of the degree of integrity and precision of the research instrument (i.e. respondents' data). An instrument is said to be validated if it is able to measure what is to be measured also if it can reveal the data of the variables studied. Pearson correlation is done by correlating each item questionnaire scores. The significance value  $< 0.05$  is considered valid. Above 0.05 is considered invalid

<b>Correlations</b>					
		Brand Association	Brand Awareness	Perceived Quality	Brand Loyalty
Brand Association	Pearson Correlation				
	Sig. (2-tailed)				
	N				
Brand Awareness	Pearson Correlation	.189**			
	Sig. (2-tailed)	.001			
	N	380			
Perceived Quality	Pearson Correlation	.159**	.900**		
	Sig. (2-tailed)	.005	.000		
	N	380	380		
Brand Loyalty	Pearson Correlation	.159**	.900**	1.000**	
	Sig. (2-tailed)	.005	.000	0.000	
	N	380	380	380	

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

Table 4.2.1 Measure Parsons correlation significance value (Source: survey data)

The above indicates a significance value score of  $< 0.05$  and hence can be concluded that the data is valid.

#### 4.2.2 Reliability Measurement Testing

Reliability is used to measure and estimate the reliability and consistency of the instrument (respondents' data). In SPSS Coefficient Alpha (or Cronbach's Alpha) is used to measure the reliability of the instrument; it is represented as a number between 0 & 1; which is generally interpreted as follows below 0.6 as low reliability, 0.6 to 0.7 as fair reliability; 0.7 to 0.8 determines good reliability and any score over 0.8 is considered high levels of reliability and consistency.

Variable	Cronbach's Alpha	No. of Items
Brand Awareness	.815	4
Brand Perceived Quality	.773	3
Brand Loyalty	.770	3
Brand Association	.808	3
<b>Reliability Statistics Summary</b>		
Cronbach's Alpha	N of Items (variables)	
.844	4	

Table 4.2.2 Measure of the internal consistency of Cronbach's alpha (Source: survey data)

As shown on the analysis obtained; reliability statistics analysis obtained Cronbach's alpha value of 0.884 which is above the .7 based on the decision-making in the reliability test can be concluded that this research data is reliable.

### 4.3 Descriptive Analysis

In this study the researcher analyses the data collected from the different aspects (Variables) of the brand dimensions' brand awareness, brand association, brand loyalty and perceived quality of the aquaddis brand. In the following statistical analysis; the study shows to what extent the respondents disagree or agree on the various statements asked on the aspects of the brand dimensions.

<b>Variables</b>	<b>No</b>	<b>Missing</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>St. Deviation</b>
Brand Awareness	380	0	8	25	4.45	0.56
Brand Association	380	0	7	25	3.99	0.41
Brand Perceived Quality	380	0	10	25	4.63	0.51
Brand Loyalty	380	0	10	25	4.48	0.44

### 4.4 Correlation Analysis

Correlation measures the relationship among variables. In this study the correlation is used to measure the relationship between predictors brand dimensions and outcome brand equity. Pearson's correlation coefficient (  $r$  ) is used to conduct the correlation analysis. In this study a bivariate correlation is used. The analysis rule states; Pearson's correlation coefficient  $< 1.0$  is accepted. In the following sections the study will assess the correlation as indicated on the conceptual model of Brand Dimensions  $\rightarrow$  Brand Equity.

4.4.1 Brand dimension variables to Brand Equity

Correlation Statistics						
		Brand Equity	Brand Association	Brand Awareness	Percieved Quality	Brand Loyalty
Brand Association	Pearson Correlation	.488**	1			
	Sig. (2-tailed)	.000				
	N	380	380			
Brand Awareness	Pearson Correlation	.852**	.242**	1		
	Sig. (2-tailed)	.000	.000			
	N	380	380	380		
Percieved Quality	Pearson Correlation	.852**	.217**	.823**	1	
	Sig. (2-tailed)	.000	.000	.000		
	N	380	380	380	380	
Brand Loyalty	Pearson Correlation	.845**	.169**	.886**	.912**	1
	Sig. (2-tailed)	.000	.001	.000	.000	
	N	380	380	380	380	380

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

Table 4.4.1 Correlation Analysis brand dimension variables to brand equity (Source: survey data)

Regarding Predictor variable correlation - The rule indicates that;

Any Predictor variables should not correlate with each other (i.e. other predator variables) above the score value of .9 The Pearson correlation analysis shown table 4.4.1 indicates the relationship among independent variables is below .9 and can be accepted as valid.

Regarding Predictor variable correlation with the dependent (criterion) variable - The rule indicates that;

There should be at least a .2 score correlation or above to validate the correlation.

As indicated in table 4.4.1 indicated a significant relationship between brand equity and brand dimension variables. Since the standard correlation data indicated are above .2, it can be accepted.

Levels of significance in variance of predictor variables to the dependent variable is calculated as:

- Brand association  $r(378) \{ \text{where } n-2 = 378 \} = .488$ ; brand association accounts for 23% of the variance in brand equity percentage

- Brand awareness  $r(378)$  { where  $n-2 = 378$  } = .852; brand awareness accounts for 73% of the variance in brand equity percentage
- Perceived quality  $r(378)$  { where  $n-2 = 378$  } = .852; perceived quality accounts for 73% of the variance in brand equity percentage
- Brand Loyalty  $r(378)$  { where  $n-2 = 378$  } = .845; brand loyalty accounts for 71% of the variance in brand equity percentage.

**4.5 Regression Analysis**

This is a measure of how well we can predict the outcome of the brand equity (outcome variables) from the brand dimensions (predictor variables). Multiple Regression analysis is used for this study because the study will be analyzing multiple independent variables.

There will be

- ✓ Independent Variables also know in the study as Predictor variables; these are 4 brand dimensions (Brand Awareness, Brand Association, Perceived Quality, Brand loyalty) which will be predicting the outcome of the dependent variables Brand equity.

**General Assumptions**

- ✓ Sample size; where a minimum of 20 records needed for each independent variable
- ✓ The dependent variable need to be Normally distributed
- ✓ Multicollinearity between independent variables checked and if exist isolated. This is a check if the correlation between the independent variables is HIGH or not. If so they might be measuring the same thing!!!
- ✓ Screen for the outliers for both independent variable and dependent variable
- ✓ There should be a linear relationship between independent variable and dependent variable

**4.5.1 Sample Size Test**

<b>Variables</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>N</b>
Brand Equity	3.21	.785	380
Brand Association	3.89	.779	380
Brand Awareness	3.12	.799	380

Perceived Quality	3.06	.897	380
Brand Loyalty	2.97	.918	380

Table 4.5.1 Independent variables sample size (Source: survey data)

As indicated in the table below the sample size ( N ) is 380.

The rule indicates that;

A minimum of 20 records for each independent variables is required; which is 80 records minimum is needed. The data sample we have (N=380) is sufficient to satisfy the assumptions.

#### 4.5.2 Normal Distribution Test

For the regression model to be effective in prediction; the Brand equity (Dependent variable) needs to be normally distributed. Below we check descriptively and statistically the normal distribution of consumer-based brand equity.

Tests of Normality						
	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Brand Equity	.289	380	.000	.857	380	.000
a. Lilliefors Significance Correction						

Table 4.5.2.1 Descriptive Brand equity normal distribution test (Source: survey data)

On the Shapiro-Wilk statistical significance for the respondents' is below the acceptable score of below .05 therefore; the normality of the dependent variable is validated.

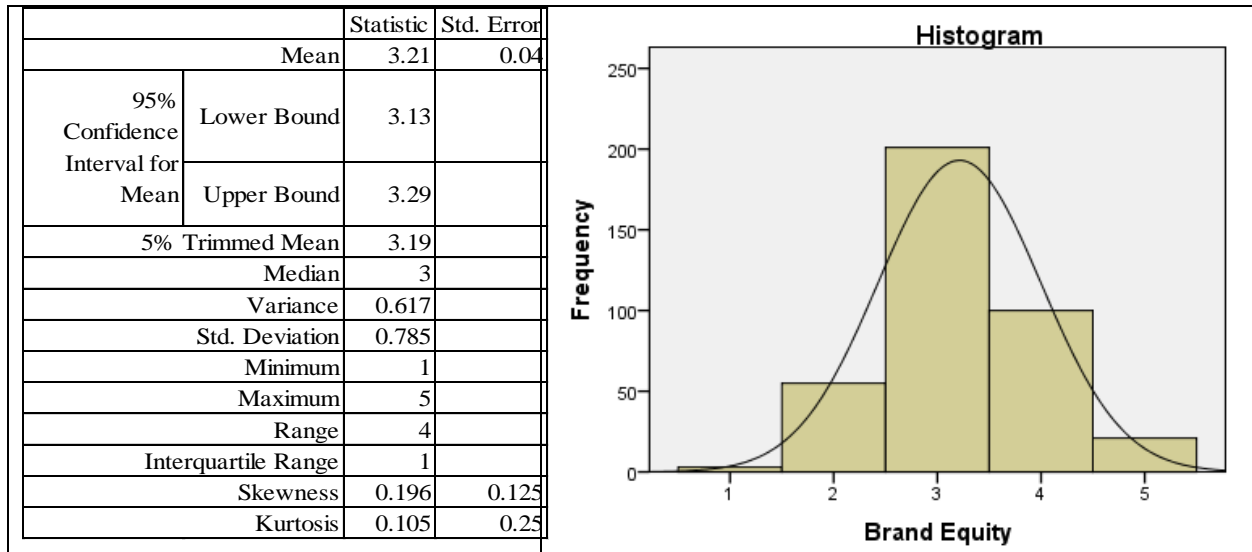
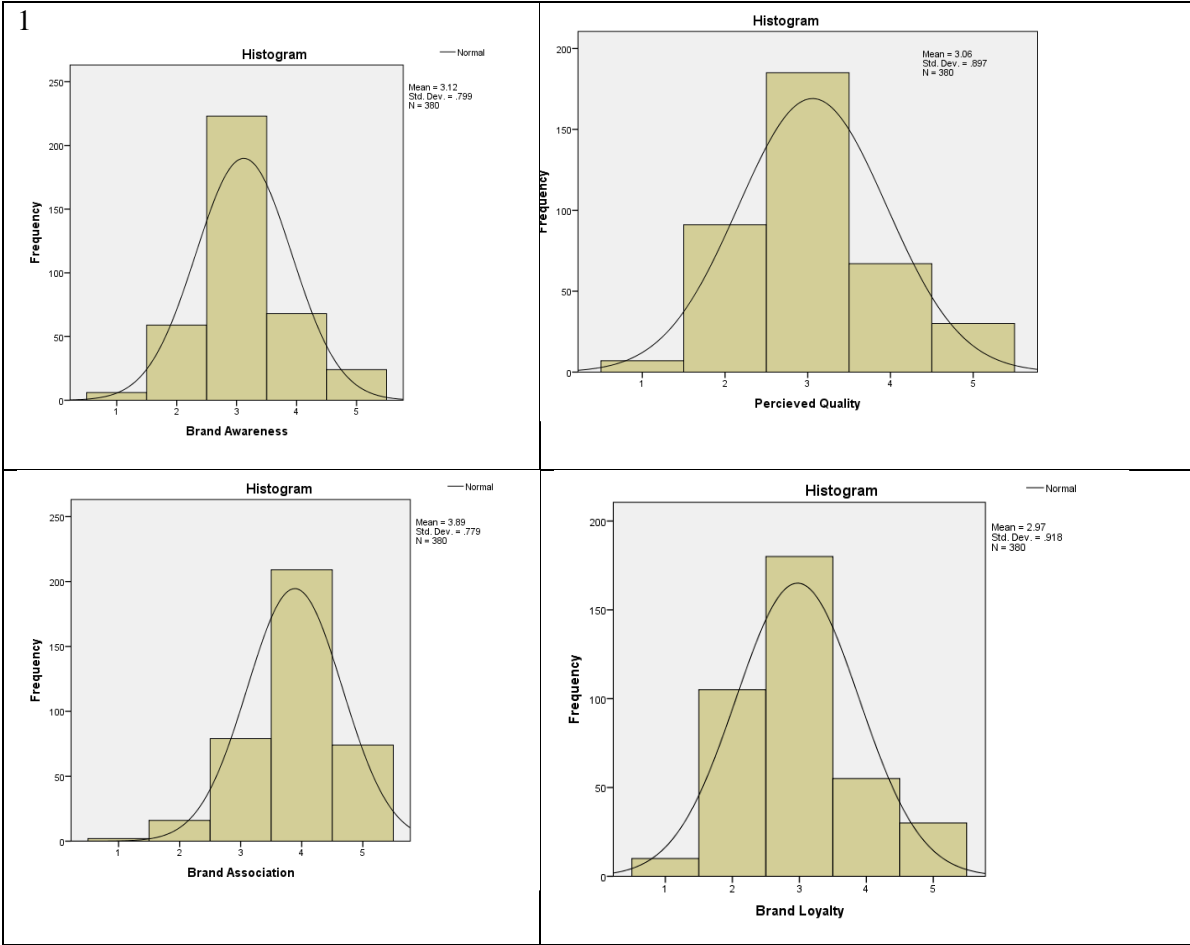


Fig 4.5.2.2 Statistical Brand equity normal distribution test (Source: survey data)

		Brand Association	Brand Awareness	Perceived Quality	Brand Loyalty
N	Valid	380	380	380	380
	Missing	0	0	0	0
Skewness		-.607	.346	.394	.463
Std. Error of Skewness		.125	.125	.125	.125
Kurtosis		.642	.636	-.042	.038
Std. Error of Kurtosis		.250	.250	.250	.250

Table 4.5.2.3 Normal Distribution of Independent variables (Source: survey data)





4.5.3 Linearity Test

Variables		Outcome	Independent Variables (Predictors)			
		Brand Equity	Brand Association	Brand Awareness	Perceived Quality	Brand Loyalty
Pearson Correlation	Brand Equity	1.000				
	Brand Association	.488	1.000			
	Brand Awareness	.852	.242	1.000		
	Perceived Quality	.852	.217	.823	1.000	
	Brand Loyalty	.845	.169	.886	.912	1.000

Table 4.5.3 Linearity test (Source: survey data)

The rule indicates that;

Correlation measurement between independent variables (predictor variables) with the Dependent variable (Outcome variable) should be above .2; **With** the data showing all the scores above .3 it is acceptable.

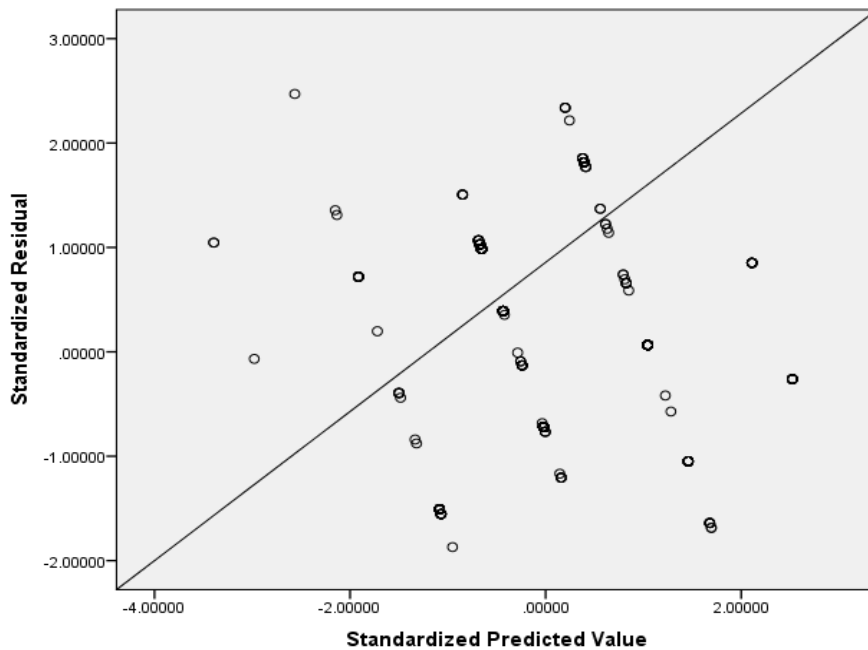


Fig 4.5.3 Scatter Plot Diagram - Linearity test (Source: survey data)

This shows a fairly scatter plots which can also be used to indicate that the data is linearly distributed.

#### 4.5.4 Multicollinearity Test

Given we have high score on the correlation between some the predictor variables; a Multicollinearity is established (Kothari, 2004).

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
(Constant)	-.376	.082		-4.603	.000					
Brand Association	.305	.019	.303	16.144	.000	.488	.640	.289	.913	1.095
Brand Awareness	.317	.039	.323	8.183	.000	.852	.389	.147	.206	4.847
Perceived Quality	.295	.039	.336	7.609	.000	.852	.366	.136	.164	6.088
Brand Loyalty	.173	.046	.202	3.718	.000	.845	.189	.067	.109	9.182

Table 4.5.4.1 The table above shows the Multicollinearity among independent variables (Source: survey data)

The general rule says (Grande)

- ✓ Multicollinearity measurement among independent variables should not exceed .7

Here we check the tolerance level (Tolerance) which measures that Independent variables are not explained by other independent variables. The acceptable score is above .10 According to the analysis data, all seems above the acceptable score.

Variance Inflation Factor (VIF) which calculates degree of Multicollinearity (Influence of correlations among independent variables) is expected to have acceptable score of below 10. According to the analysis data, all seems above the acceptable score.

#### 4.5.5 Homoscedasticity Test

This tests the consistency of a variance of constant error term “residual” in the regression model. The assumption of consistency / homogeneity across all level of predictor variables is referred to as Homoscedasticity. This can be check using a visual examination of the scatter plot.

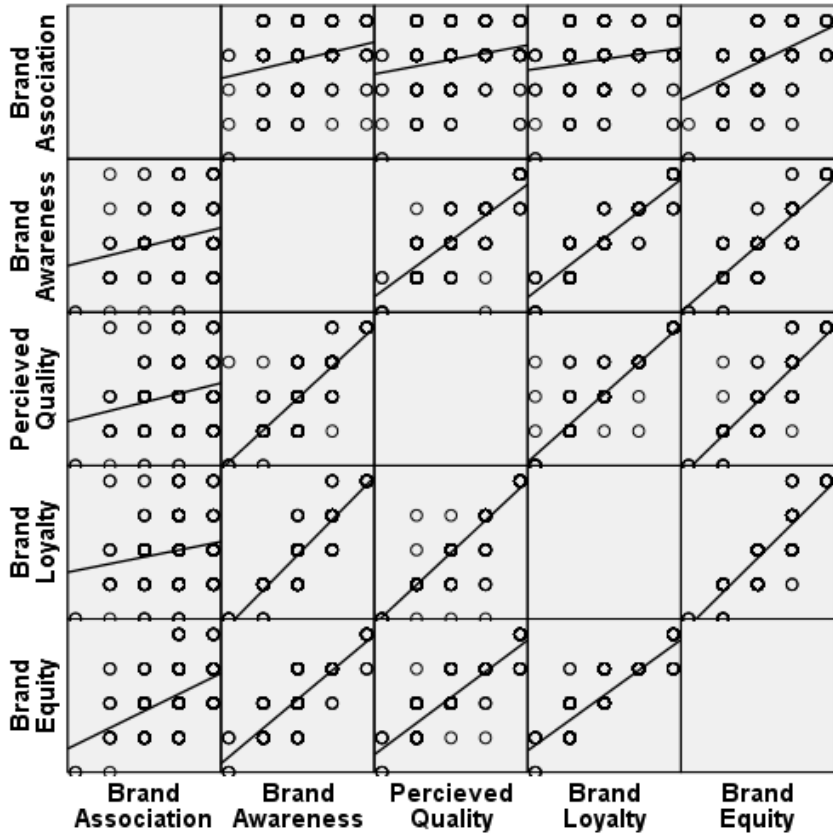


Table 4.5.7 Scatted plot diagram – Homoscedasticity test (Source: survey data)

4.5.6 Residual Test

In statistical models, a residual is the difference between the observed value and the mean value that the model predicts for that observation. Residual values are especially useful in regression and ANOVA procedures because they indicate the extent to which a model accounts for the variation in the observed data. (google).

Here we check the Outliers and extreme values; STD Residual range and the Dubrin-Watson statistic ranges will be used to measure acceptability range.

The rule indicates that; Dubrin-Watson statistic ranges should be between 1.5 – 2.5; STD Residual range should also be -2.0 – 2.0. As shown in the model summary in the table below both Dubrin & STD Residual test results are acceptable.

<b>Residuals Statistics</b>					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	0.71	5.07	3.21	0.737	380
Std. Predicted Value	-3.394	2.523	0	1	380
Standard Error of Predicted Value	0.016	0.113	0.029	0.013	380
Adjusted Predicted Value	0.7	5.07	3.21	0.737	380
Residual	-0.512	0.677	0	0.272	380
Std. Residual	-1.87	2.47	0	0.995	380
Stud. Residual	-2.052	2.499	0.001	1.004	380
Deleted Residual	-0.617	0.693	0	0.278	380
Stud. Deleted Residual	-2.061	2.517	0.001	1.006	380
Mahal. Distance	0.24	63.286	3.989	5.356	380
Cook's Distance	0	0.172	0.004	0.011	380
Centered Leverage Value	0.001	0.167	0.011	0.014	380

a. Dependent Variable: Brand Equity

Table 4.5.8.1 Table showing a residual test values (Source: survey data)

Another check we do for identifying outlier data is to check the Mahal. distance value; this can be check by calculating the critical value by taking the maximum score for the Mahal. distance which is 63.286 and comparing it with the acceptable score for our study data.

To find out the acceptable score for our data

1. We identify the degree of freedom which is equal to the number of independent variables (predictors); we have 4 predictors; therefore, has 4 degree of freedom.
2. We need a chi-square distribution table (attached Appendix –A) to find our critical value at 95% confidence (p=0.05) interval of 4-degree freedom; Result is 9.49

Degrees of Freedom		Probability of a larger value of $\chi^2$								
		0.99	0.95	0.90	0.75	0.50	0.25	0.10	0.05	0.01
1		0.000	0.004	0.016	0.102	0.455	1.32	2.71	3.84	6.63
2		0.020	0.103	0.211	0.575	1.386	2.77	4.61	5.99	9.21
3		0.115	0.352	0.584	1.212	2.366	4.11	6.25	7.81	11.34
4	# of variables	0.297	0.711	1.064	1.923	3.357	5.39	7.78	9.49	13.28
5		0.554	1.145	1.610	2.675	4.351	6.63	9.24	11.07	15.09
6		0.872	1.635	2.204	3.455	5.348	7.84	10.64	12.59	16.81
-		----	----	----	----	----	----	----	----	----

Fig 3. Chi-square Distribution

The rule states that:

Mahalanobis maximum value should be less than the critical value. In study data Mahal. distance value is 63.286 which is way above the 9.49 which indicate we have outliers in our data.

1. We exclude outliers that have a Mahal. distance value over **9.49**
2. We check for Cook’s distance extreme value; acceptable score value is below 1.
3. We check for Centered Leverage value to identify extreme values; to find out acceptable score value
  - a. 2 times # of independent variables =  $2 * 4 = 8$
  - b. Divide the result with the number of cases ( N ) =  $8/365 = 0.21$  ; please note that exclusion from the Mahal. distance value of over 9.49; excluded 49 records.

Residuals Statistics <sup>a</sup>					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.93	5.18	3.24	.714	316
Std. Predicted Value	-1.842	2.712	.000	1.000	316
Standard Error of Predicted Value	.016	.043	.026	.009	316
Adjusted Predicted Value	1.92	5.18	3.24	.714	316
Residual	-.439	.512	.000	.247	316
Std. Residual	-1.766	2.059	.000	.995	316
Stud. Residual	-1.791	2.072	.001	1.003	316
Deleted Residual	-.451	.519	.000	.251	316
Stud. Deleted Residual	-1.798	2.083	.001	1.006	316
Mahal. Distance	.257	8.576	2.991	2.622	316
Cook's Distance	.000	.033	.004	.006	316
Centered Leverage Value	.001	.027	.009	.008	316

Here the analysis to exclude extreme values from the centered leverage value removed 49 records to 316

All maximum values indicate that there are no critical extreme data (outliers) in the data .

Table 4.5.8.2 Table showing a residual test values (Source: survey data)

4.5.7 Regression analysis summary

Following a successful testing of all the assumptions, the data will be further summarized. SPSS is used process all variables.

Model Summary <sup>b</sup>										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.945 <sup>a</sup>	.893	.892	.248	.893	866.783	3	312	.000	2.127
a. Predictors: (Constant), Brand Loyalty, Brand Association, Brand Awareness										
b. Dependent Variable: Brand Equity										

Table 4.5.9 Model summary analysis (Source: survey data)

The model summary table shows the predictability of the predictors (independent variables) in the regression model. The multiple correlation coefficients between all the predictor variables (brand dimensions) and outcome variable (brand equity) is indicated in the ( R ) score of .945; this signifies a high relationship between the outcome variable (brand equity) and the predictor variables (brand dimensions); which by extension be explained as: the Customer Satisfaction & Purchase Intention can be directly related – to the level of 95% - to the predictor variables (Brand Association, Brand Awareness, Brand Loyalty & Perceived Quality).

The multiple regression also shows a coefficient of multiple determination (  $R^2$  ) = .893 which signifies the amount of variance explained by the predictor variables. This means that 89% of the variants involved in the brand equity (outcome) can be predicted by the independent variables (predictors). This can also be explained as: 89% of the variance (high or low level) of Customer Satisfaction & Purchase Intention be attributed to the combined linear effects of the predictor variables (Brand Association, Brand Awareness, Brand Loyalty & Perceived Quality) in the regression model. Each of the predictor variables have their own contributions; please refer to the coefficients summary table that compares the strength and direction of prediction of the predictor variables

#### 4.5.8 Variance analysis summary

Variance analysis; aka Analysis of Variance (ANOVA) is used to compare the mean of one dependent variable differ significantly over the other independent variables. ANOVA provides, the result of test of significance for R and R2 using F-Statistic.

ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	183.594	4	45.898	622.765	.000 <sup>b</sup>
	Residual	26.532	360	.074		
	Total	210.126	364			
a. Dependent Variable: Brand Equity						
b. Predictors: (Constant), Brand Loyalty, Brand Association, Brand Awareness, Perceived Quality						

Table 4.5.8 ANOVA summary analysis (Source: survey data)

The F-test in ANOVA table confirmed that the model developed is statistically significant (F=622.76, p<.01); which indicates that the variation explained by the model is not due to chance. As it is stated in this study, which aims to identify the best predictor independent variables of the dependent variable (brand equity). The Standardized Beta Coefficients – Beta (  $\beta$  ) is used to identify the strength of prediction. The regression coefficients explain the average amount of change in dependent variable that is caused by a unity of change in the independent variable. Thus the larger the Beta coefficient, the more strength the independent variable has in predicting the dependent variable; which is the Brand equity.

#### 4.5.9 Coefficients analysis summary

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.388	.089		-4.375	.000
	Brand Association	.303	.020	.292	15.028	.000
	Brand Awareness	.315	.040	.319	7.826	.000
	Perceived Quality	.403	.060	.462	6.762	.000
	Brand Loyalty	.069	.066	.081	1.054	.292
a. Dependent Variable: Brand Equity						

Table 4.5.9 Coefficients summary analysis (Source: survey data)



To identify which are best predictors of the dependent variable (Brand equity), which has been identified in the predictor / regression model of determination ( $R^2$ ) = .893 = 89% are shown in the standardized coefficients section in table 4.5.11 above. The statistical significance ( $p$ ) is also a crucial indicator of the approval / dismissal of predictor in the regression model based on its level of significance; Sig value < .05 is accepted as a predictor in the model.

Accordingly, from the independent variables (Brand Association, Brand Awareness, Perceived Quality and Brand Loyalty) all except Brand Loyalty has statistical significance ( $p < .05$ ). Brand Loyalty with ( $p = .292 > .05$ ) has a positive coefficient but statistically insignificant. Brand Association ( $\beta = .292$ ,  $p < .05$ ), Brand Awareness ( $\beta = .319$ ,  $p < .05$ ) and Perceived Quality ( $\beta = .462$ ,  $p < .05$ ) have all positive coefficient and are all statistically significant to be accepted in the model.

Out of the accepted predictors Perceived quality ( $\beta = .462$ ) is the best predictor followed by Brand awareness ( $\beta = .319$ ) and Brand Association ( $\beta = .292$ ) respectively; which indicates how much these variables have a significant impact on the brand equity; which can also be translated how much these variables have an impact over the Consumer satisfaction & Purchase intention of aquaddis bottled water.

#### 4.6 Finding & Hypothesis Interpretation

This study was conducted in order to measure factors affecting consumer-based brand equity and its impact on consumer satisfaction & purchase intention of aquaddis bottled water. The study chose four brand dimensions as determinants of strong brand equity build to analyse and measure their effect on the consumer satisfaction and purchase intention.

The questionnaire collecting data; based on the sample data size calculated; on the four dimension variables were checked for their reliability, validity & normal distribution. The findings of the study show that the majority of bottled water consumers consume aquaddis as their first choice and most bottled water consumers have a sense of awareness, loyalty, association & preference of bottled water brands in general. With detailed measurement on the independent variables brand (awareness, brand loyalty, brand association & purchase preference) different levels of correlation

with the brand equity emerged. According to the Pearson’s correlation coefficient analysis findings along with the study’s hypothesis construct; the following result were summarized.

Hypothesis	Finding	Interpretation
H1. Brand awareness has a positive influence on the overall brand equity.	( $\beta=319$ , $p<.05$ ) $p=.000$	HO: Rejected H1: Accepted
H1. Perceived Quality has a positive influence on the overall brand equity.	( $\beta=.462$ , $p<.05$ ) $p=.000$	HO: Rejected H1: Accepted
H1. Brand Loyalty has NO a positive influence on the overall brand equity.	( $\beta=.081$ , $p>0.5$ ) $p=.292$	HO: Accepted <b>H1: Rejected</b>
H1. Brand Association has a positive influence on the overall brand equity.	( $\beta=.292$ , $p<0.5$ ) $P=.000$	HO: Rejected H1: Accepted

Table: 4.6 Hypothesis testing summary (Source: survey data)

### Hypothesis 1

**Variable:** Brand Awareness

**Summation:** Brand awareness has a positive influence on the overall brand equity

**Findings:** A presented on the table above, the study indicates Brand awareness has a positive and significant effect on the overall Brand equity with standardized coefficient Beta ( $\beta$ ) value of ( $\beta=.319$ ) with statistically significant marker ( $p$ ) of .000 ( $p<.05$ )

**Conclusion:** Hypothesis is accepted. Brand awareness has a positive impact on Consumer satisfaction & Purchase Intention of aquaddis bottled water brand.

### Hypothesis 2

**Variable:** Perceived Quality

**Summation:** Perceived Quality has a positive influence on the overall brand equity.

**Findings:** A presented on the table above, the study indicates Perceived Quality has a positive and significant effect on the overall Brand equity with standardized coefficient Beta ( $\beta$ ) value of ( $\beta=.462$ ) with statistically significant marker ( $p$ ) of .000 ( $p<.05$ )

**Conclusion:** Hypothesis is accepted. Perceived Quality has a positive impact on Consumer satisfaction & Purchase Intention of aquaddis bottled water brand.

Hypothesis 3

**Variable:** Brand Loyalty

**Summation:** Brand Loyalty has a positive influence on the overall brand equity.

**Findings:** As presented on the table above, the study indicates Brand Loyalty has a positive and standardized coefficient Beta ( $\beta$ ) value of ( $\beta=.081$ ) which shows a significant effect on the overall Brand equity; However, the statistically significant marker (p) of .292 is above the acceptable threshold of ( $p<.05$ )

**Conclusion:** Hypothesis is rejected as it is statistically insignificant. Brand Loyalty has NO a positive impact on Consumer satisfaction & Purchase Intention of aquaddis bottled water brand.

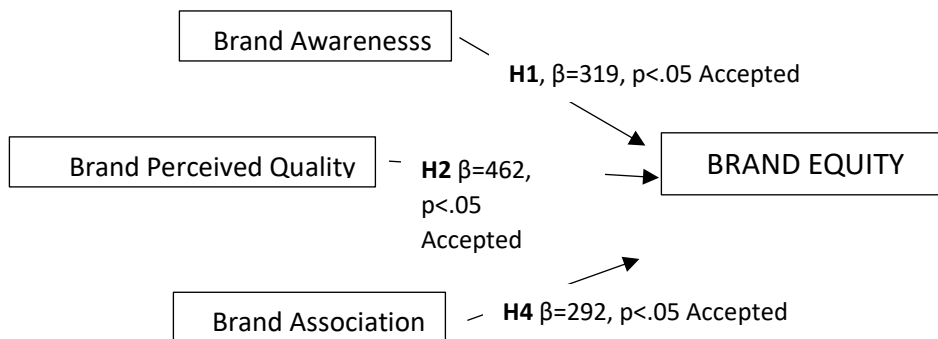
Hypothesis 4

**Variable:** Brand Association

**Summation:** Brand Association has a positive influence on the overall brand equity.

**Findings:** As presented on the table above, the study indicates Brand Association has a positive and significant effect on the overall Brand equity with standardized coefficient Beta ( $\beta$ ) value of ( $\beta=.292$ ) with statistically significant marker (p) of .000 ( $p<.05$ )

**Conclusion:** Hypothesis is accepted. Brand Association has a positive impact on Consumer satisfaction & Purchase Intention of aquaddis bottled water brand.



## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter reviews the research background, objectives and summarizes the study findings, conclusion, recommendation. Suggestions are provided. Finally, further areas of future research are discussed.

#### 5.1 Summary of Findings

The general objective of the study was to conduct a collection of consumer data & analysis of the data collected in order to identify the factors that affect consumer-based brand equity and its impact on customer satisfaction and purchase intention of aquaddis bottled water in Addis Ababa. The data collection was conducted on respondents with wide variety of sociodemographic profile. The respondents sociodemographic make up is summarized as:

99% of the questionnaire collected; Male respondents account for 55% and female 45%; over 70% of the respondents are in the age group of 20 – 40 years of age and with over 55% of the respondents are of 1<sup>st</sup> & 2<sup>nd</sup> degree holders.

Brand preference data shows aquaddis 26% is the most preferred brand followed by TOP 21%; Brand consumption reason indicates that 72% of the respondents are consuming bottled water all the time; whereas 28% respondent only consume bottled water IF Tap water is not deemed safe to drink.

The results of descriptive analysis indicate, the mean value of all the responses on Brand Association, Brand Awareness and Perceived Quality of the respondents was over 3.0 confirming a positive response for these independent variables. Brand Loyalty has lowest response 2.97; which indicates that most bottled water consumers have brand awareness, brand association and perceive quality of bottled water product but fewer see brand loyalty as a motivation for consuming it.

The result on correlations statistics which measures the relationship between predictor variables and the outcome variable (brand equity), shows a positive relationship. The respondents reply of the questionnaires, it has been observed and shown on table 4.3.5 that although, most of the respondents replied positively to most questions, brand awareness dimension of color of the label, perceived quality dimension of consistent advertising, brand loyalty dimension of perceived nutrition content and brand association dimension of longevity on trade makes up the most of the respondent's choice with standard mean value of 3.15, 2.79, 2.69, 3.87 respectively.

The result of the descriptive statistics analysis indicates that, most of the bottled aquaddis water consumers have brand awareness, perceived quality, brand association while fewer aquaddis bottled water consumers are loyal to the brand of their choice.

The predictor variables have a positive correlation with the criterion variable (brand equity) and by extension customer satisfaction and purchase preference. However, the data on brand loyalty is much lower indicating a weak predictability of brand loyalty variable.

The multiple regression (predictor) model analysis results show that all the predictor variables with an exception to brand loyalty have a strong significant effect on the consumer satisfaction and purchase preference.

## 5.2 Conclusion

The objective of this study was to identify the factors that affect consumer-based brand equity and its impact on customer satisfaction and purchase preference using aquaddis bottled water as a case study.

Referring to the research questions; Brand awareness, Brand association, Perceived quality and Brand Loyalty were identified as key determinants of brand equity for aquaddis bottled water. From the descriptive analysis data, consumers were happier (satisfied) and more influenced to buy the brand they have a good awareness of and has a good quality. It also indicates that consumers' approval of the brand is related to the consistent marketing present in the form of advertising

emphasizing quality and length of presence on trade. However, consumers seem less inclined to be loyal to any brand.

The prediction model is also showing the extent of predictor variables (Brand awareness, Brand association, Perceived quality and Brand Loyalty) to predict the strength of the brand equity (which in turn affects customer satisfaction & purchase intention) with a significant relationship and interdependency. However, Brand Loyalty had shown above acceptable level of multicollinearity over other independent variables and therefore, was deemed statistically insignificant.

#### Findings & aquaddis brand

Most of bottled water consumers identify an aquaddis brand from competitor brands by color of the label, perceived quality content, consistent advertising, and by longevity on trade. This is proven to be correct when it comes to aquaddis brand such that it has a distinct color feature on the logo, it has a high quality certification with the longest radio advertising with consistent messaging as well as being the second brand after highland to be introduced into Ethiopian market.

### 5.3 Recommendation

Based on the conclusions, the following recommendations were formulated;

- I. Bottled water consumers choose a brand from competitor brands by considering visual labelling, quality credentials and consistent marketing. Packaging and brand association factors (such as social activities, corporate social responsibilities ...etc.) did not seem to have made a big impact on consumers. This indicates that consumers are not approving of companies doing business “just to make money” rather they want to see a keen attitude to the society and environment.
- II. Awareness and Quality seem to have a big advantage on consumers. Awareness and quality variables were the strongest predictors for a winning bottled water brand and thus various marketing mix activities (i.e. advertising) are required to strengthen the competitiveness of the brand.

Finally,

To highlight the significance of the study to bottled water manufacturers to win in this ever crowded marketplace, the findings and conclusions of this study indicate that bottled water competitors should focus on marketing activities consistently to raise awareness as well as invest behind activities that support the community and the environment as brand loyalty is the key goal in securing a market share.

## References

- Aaker. (1991). *Managing Brand Equity*. New York, Free Press.
- Aaker. (1992). *Strategic Marketing Management*. US: The Free Press.
- Aaker. (1996). *Building Strong Brands*. New York: Free Press.
- AMA, & American Marketing Association. (n.d.). *American Marketing Association*. Retrieved from American Marketing Association: <https://www.ama.org/>
- Asghar, W. (2015). Impact of Advertisement and Sales Promotion on Consumer, Vol. 35, No. 2 (2015),. *Pakistan Journal of Social Sciences (PJSS)*, pp. 585-598.
- Atilgan, E., Aksoy, S., & Akinci, S. (2005). *Determinants of Brand Equity: Marketing Intelligence and Planning*. Turkey.
- Baalbaki, & Guzmán Sally. (2016). Consumer Based Brand Equity. *Reaserch Gate*.
- Baker, & Hart. (2003). *Product Strategy and Management (2nd Edition)*. Pearson Hall.
- Bell, B. &. (2007). *Business Research Methods (3rd. Edi)*. *Oxford University Press*.
- Brands, B. S. (1996). *Aaker, D. A. .* New York: The Free Press New York.
- Chang, H., & Liu, Y. (2009). Impact of Brand Equity on Brand preference and Purchase Intentions. *Service Industries Journal*.
- Cronso, J., & Ferling, T. (2009). Exploring the influence of brand. *Pshychology of Marketing*.
- Crowson, M. (n.d.). *Regression Analysis in SPSS*. Mike Crowson.


- De Cheratony, L. (2010). *From Brand vision to Brand Evaluation*. Routledge; 3rd Edition.
- Donthu, Y. a. (2000). *An Examination of Selected Marketing Mix Elements and Brand Equity*. Journal of the Academy of Marketing Science.
- Erasmus, Boshoff, & Rousseau. (2001). Consumer Decision-making models.
- Farjana, M. M. (2016). Identifying the Key Dimensions of Consumer-based Brand Equity Model:. *Science Alert*.
- Farquhar, P. H., Han, J. Y., & Ijiri, Y. (1991). Recognising and measuring brand assests. *Marketing Science Institute*, pp. 91-119.
- Fishbein, M., & Ajzen, I. (1975). A Bayesian analysis of attribution processes. *Psychological Bulletin*,, 82(2), 261–277.
- Grande, D. T. (n.d.). *How to interpret SPSS* . Video Slides.
- Ho, R. (2006). *Handbook of univariate & multivariate data analysis and interpretation with SPSS*. Florida: Chapman & Hall.
- Hoeffler, S., & Keller, L. (2003). The Marketing advantages of Strong Brands. *Journal of Brand Managment*.
- Hooper, D., Coughlan, J., & Muller, M. R. (2008). Structural Equation Modelling; Guidelines for determining Mode fit. *Journal of Business Research Methods*, 50 - 60.
- Israel, D. G. (2013). Determining Sample Size. 1 - 5.
- Kapferer. (1998). *Strategic Brand Management:Creating and Sustaining brand equity long term*. London: Kogan page.
- Kapferer. (2008). *The new Strategic Brand Management* . London: Kogan Page Ltd.
- Keller. (2001). Building Customer-based brand equity; A blue print for creating strong brands. *Marketing Science Institute (MSI)*, 107.
- Keller, K. (2011). *Strategic Brand management*. Kevin Keller; 4th Edition.
- Keller, L. K. (1993). Conceptualizing, Measuring & Managing Customer-based Brand Equity. *Journal of Marketing*, 57 (1) 1-22.
- Kim, H., Kim, W. G., & An, J. A. (2003). The effect of consumer-brand based equity on firms' fimamcial performance. *Journal of Consumer Marketing*, 20 (4). 335 -51.
- Knapp, & Daune, E. (2008). *The Brand Promise*. UK: McGraw Hill Education; 1st Edition.



- Kothari. (2004). *Research Methodology Methods & Techniques*. New Delhi, New age International (p) limited.
- Kotler and Keller, K. (2012). *Marketing Management. 14th Edition*,. Pearson Education.
- Kotler, P, K., & Armstrong. (2012). *Principles of Marketing*. New Jersey: Prentice Hall.
- Kotler, P., & Pfoertsch, W. (2010). *Ingredient Branding: Making the invisible visible*. New York: Springer Heidelberg.
- Kotler, P., Pfoertsch, W., & Waldermar. (2006). *Being Known or Being One of Many*. Germany: Springer Printing Co.
- Lasser, W., Mittal, B., & Sharma, A. (1995). Measuring Customer-based Brand Equity. *Journal of Consumer Marketing* , 11 - 19.
- Mahy, & Jobber. (2006). *Foundations of Marketing*. Macgraw Hill.
- Methodology, D. o. (n.d.). SPSS Tutorials. *Generating and Editing simple scatter plot*. Department of Methodology.
- Muncy, J. A., & Hunt, S. D. (1984). Advances in Consumer Research Volume 11. *Association for Consumer Research*, Pages 193-196.
- Ngan, N. H. (April 2019). BRAND EQUITY AND CONSUMER RESPONSES . *International Journal of Business, Economics and Law*, 3.
- Nguyen, H., & Ngan. (2019). BRAND EQUITY AND CONSUMER RESPONSES: CONCEPTUAL FRAMEWORK. *International Journal of Business, Economics and Law*, Vol. 18, Issue 2.
- Nicolino, P. F. (2000). *Brand Managment*. Indianapolis, USA: Alpha Books.
- Ntoumanis, N. (n.d.). Correlation & Simple Linear Regression. *Correlation & Simple Linear Regression*. Nicos Ntoumanis.
- Pappu, R., Quester, P. G., & Cooksey, R. W. (2005). Consumer-based brand equity: Improving the Measurment. *Journal of Product and Brand Management*, 143 - 154.
- Paramerwaran, J. K. (2015). *Strategic Brand Management*. India: Pearson Educational.
- Patwardhan, H., & Balasubramanian, K. S. (2011). Brand romance: A complementary approach to explain emotional attachment toward brands. *Journal of Product & Brand Management*, 290 - 310.
- Randal, G. (2000). *BRANDING, A practical guide to planning your strategy*. Kogan, 2nd Edition.
- Rocchi, M. (n.d.). Mixed & Repeated - Measures Factorial ANOVA. Meredith Rocchi.

- Rogers, B. H. (2008). *Handbook on Brand Experience Management*. Northampton, USA: Edward Elgar Publishing.
- Sherrington, M. (2003). *The alchemy of Brand-led growth*. New York: Palgrave Macmillan.
- Srivastava, R., & Shocker, A. D. (1991). *Brand Equity: A prespective of its meaning and measurement*. Cambridge MA: Marketing Science Institute.
- UKessays. (2020, 6 1). *Five Approaches to the Study of Consumer Behaviour*. Retrieved from UK Essays: <https://www.ukessays.com/essays/marketing/approaches-to-the-study-of-consumer-behaviour.php>
- Vinh, T. T. (2019). BRAND EQUITY: CONCEPTUAL FRAMEWORK . *Int. Journal of Business, Economics and Law*, P:14.
- Wiselers. (n.d.). SPSS - Multicollinearity Diagnostics . *Multiple Regression - Checking assumptions*. Weislers.
- Yoo, B., & Donthu, N. (2001). *Journal of Business Research. Developing and Validating a multi-dimensional consumer-based brand equity*, 1 - 14.
- Yoo, B., Donthu, N., & Lee, S. (2000). An examination of selected marketing mix elements and brand equity. *Journal of Academy of Marketing Science*, 195 - 212.
- Zeithaml, V. (1988). Consumer perceptions of price, quality and value. *Journal of Marketing*, 2-22.
- Zikmund. (2013). *Business Research Methods*. South-Western Cengage Learning, 2010.

## Appendix 1 – QUESTIONNAIRE - English

	<p>First, I would thank you for your time. My name is Amanuel Abate Belayneh and I am a graduate student at St. Mary's University. I am conducting this research for the completion of Masters' Degree in Marketing Management.</p> <p>The purpose of the study is <b>TO STUDY THE IMPACT OF BRAND EQUITY ON CONSUMER SATISFACTION AND PURCHASE PREFERENCE</b>. Your kind cooperation will help me to find reliable data and will be used only for this study. So, please try to answer all stated questions. Please mark your response with "v"</p> <p>If you have any question, please contact me through – <b>Phone No.</b> 0930470523 <b>Email:</b> amanue1.8elayneh@gmail.com</p>
-----------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

### Part One - Demographic profile – General information about respondents

1. **Gender:**

1. Male       2. Female

2. **Age:**

1. 16 – 20     2. 21 - 30     3. 31 – 40     4. 41 – 50     5. 51 – 60

3. **Education:**

1. Certificate       2. Diploma   
3. Degree       4. Masters       5. PHD

### Part Two - About a water consumption

4. Do you consume bottled water?

- Yes       No

5. If YES, how often do you consume Bottled water?

1. Every day                       2. When tap water is not available

**Part Three – Bottled water consumption by Brand**

6. Which of the following BRANDS have you consumed before?

1. aquaddis       2. TOP       3. ONE       4. ARKI   
 5. GOLD       6. DAILY       7. YES       8. S. SPRING

7. When was the last time you consumed aquaddis?

1. Today       2. This week       3. Last week       4. Last Month

Please use tick (√) mark in the answer boxes

**“1” Strongly Disagree “2” Disagree “3” Neutral “4” Agree “5” Strongly Agree**

		1	2	3	4	5
	<b>Brand Awareness</b>					
1	I can identify aquaddis by the details of the LOGO					
2	I can identify aquaddis by its packaging features					
3	I can identify aquaddis by looking at the COLOR & LABEL DESIGN only – without seeing the name of the brand					
4	I can identify aquaddis by listening to the DISTINCT advertising songs – without hearing the brand name					
	<b>Perceived Quality</b>					
1	I believe aquaddis is high quality because of it is priced high					
2	I believe aquaddis is high quality because it is consumed by lots of people					
3	I believe aquaddis is high quality because it is advertised more often					
4	I believe aquaddis is high quality because its packaging is better than other brands					

<b>Brand Loyalty</b>		1	2	3	4	5
1	I consume aquaddis because it has been in the market longer than other brands					
2	I consume aquaddis because it is a brand I know very well					
3	I consume aquaddis because of is always available in trade					
4	I consume aquaddis because I have consumed it for longer than other brands					
<b>Brand Association</b>		1	2	3	4	5
1	I consume aquaddis because my close friends and family consume it					
2	I consume aquaddis because I hear the Radio advertisement everyday					
3	I consume aquaddis because I has good nutrition content					
4	I consume aquaddis because I worked for the company					

**THANK YOU FOR TAKING TIME TO PARTICIPATE IN THIS QUESTIONNAIRE.**

Appendix 2 – QUESTIONNAIRE – Amharic

	<p><b>ውድ ተሳታፊዎች</b></p> <p>ይህ መጠይቅ የተዘጋጀው በአዲስ አበባ ውስጥ የታሸጉ የውሀ ምርቶችን የብራንድ እውቅና የገዢው/ደንበኛው ምርቱን የመግዛት ፍላጎት ላይ ያለውን ተፅዕኖ ለማወቅ ነው።</p> <p>የምርምር ወረቀቱ ዋና ዓላማ በቅድስትማሪያም ዩንቨርሲቲ በ<b>ማሃሀ</b> ፕሮግራም የማስተርስ ዲግሪ ከፊል ሚሚያ እንዲሆን የተዘጋጀ ነው። የሚፈለገውን መረጃ በመስጠት ለጥናቱ መሳካት የእርስዎ ቀና ትብብር በጣም ወሳኝ ነው። መረጃው ለትምህርት አላማ ብቻ የሚውል ሲሆን ሚስጥራዊነቱም የተጠበቀ ነው።</p> <p>ውድ ጊዜዎን ሰውተው መረጃውን በመስጠት ለምታደርጉልኝ ትብብር በቅድሚያ ማመስገን እወዳለሁ።</p> <p>በመጨረሻም መጠየቁን በሚሞሉበት ጊዜ ማንኛውም ግልፅ ያልሆነ ነገር ካጋጠሞት ከታች በተፃፉት አድራሻ መጠየቅ ይችላሉ።</p> <p>አማኑኤል አባተ ስልክ ቁጥር 0930470523</p>
--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**ክፍል አንድ - የምላሽ ሰጪዎች መገለጫ**

1. ያታ:
  2. ወንድ   2. ሴት
2. እድሜ:
  1. 16 - 20  2. 21 - 30  3. 31 - 40
  4. 41 - 50  5. 51 - 60
2. የትምህርት ደረጃ
  1. ሰርተፊኬት   2. ዲፕሎማ
  3. ዲግሪ   4. ማስተርስ  5. ፐኤቸዲ

**ክፍል ሁለት - ስለ ውሃ ፍጆታ**

3. የታሸገ ውሃ ይጠቀማሉ?

አዎ

አልጠቀምም

4. አዎ ካሉ የቧንቧ ውሃ ይጠቀማሉ?

አዎ

አልጠቀምም

5. አዎ ካሉ የታሸገ ውሀ በምን ያህል ጊዜ ይጠቀማሉ?

1. ሁልጊዜ

2. የቧንቧ ውሃ በማይኖርበት ጊዜ

**ክፍል ሶስት - የምርት ግንዛቤ እና ድግግሞሽ**

6. ከዚህ በፊት የትኛውን የምርት አይነት ተጠቅመዋል?

2. አኳኒ

2. ቶፕ

3. ዋን

4. አርኪ

5. ጎልድ

6. ዴይሊ

7. የስ

8. ሳውዝ ስፕሪንግ

7. በአብዛኛው የትኛውን የምርት አይነት ይጠቀማሉ?

1. አኳኒ

2. ቶፕ

3. ዋን

4. አርኪ

5. ጎልድ

6. ዴይሊ

7. የስ

8. ሳውዝ ስፕሪንግ

8. ምርጫዎ አኳኒ ካልሆነ ለመጨረሻ ጊዜ አኳኒን የተጠቀሙት መቼ ነው ?

1. ዛሬ       2. በዚህ ሳምንት       3. ባለፈው ሳምንት   
 4. ባለፈው ወር

እባክዎን ከዚህ በታች በተጠቀሱት ሀሳቦች ላይ ምን ይህል እንደሚስማሙ ለመግለፅ ከተጠቀሱት ምርጫዎች ውስጥ የእርሶን አቋም ይገልጻል የሚሉት ላይ ምልክት ይስጡ

- 1 አጥብቄ አልስማማም      2 አልስማማም      3 ምንም የምለው የለኝም      4 እስማማለሁ  
 5 በጣም እስማማለሁ

በመልዕክት ሳጥኖቹ ውስጥ እባክዎን (√) ምልክት ይጠቀሙ

		1	2	3	4	5
	<b>ስለ አኳአዲስ ምርት ሲያስቡ ምን መለኪያዎች በመጀመሪያ ወደ አእምሮዎ ይመጣሉ?</b>					
1	አርማውን በማየት					
2	የጠርሙሱን ቅርፅ በመመልከት					
3	ያለ አርማው የአስተሻሻግ ዲዛይኑን በመመልከት					
4	ያለ አርማው የተለየውን የቀለም ንድፍ በመመልከት					
	<b>ክፍል አራት- ስለ ጥራት ያለው ግንዛቤ</b>	1	2	3	4	5
1	አኳአዲስ ዋጋው ከፍተኛ ስለሆነ ከፍተኛ ጥራት እንዳለው አምናለሁ					



2	ብዙ ሰዎች አኳኒዳን ስለሚጠቀሙት ከፍተኛ ጥራት እንዳለው አምናለሁ					
3	ብዙ ጊዜ ማስታወቂያ ስለሚያስተላልፍ አኳኒዳን ከፍተኛ ጥራት እንዳለው አምናለሁ					
	<b>ክፍል አምስት - የምርት ታማኝነት</b>	1	2	3	4	5
1	ከሌሎች ምርቶች በላይ በገበያ ውስጥ ስለቆየ አኳኒዳን እጠቀማለሁ					
2	ለማህበራዊ ጉዳይ እንቅስቃሴዎች ባለው ቁርጠኝነት ምክንያት አኳኒዳን እጠቀማለሁ					
3	በገበያ ውስጥ ሁልጊዜ ስለሚገኝ አኳኒዳን እጠቀማለሁ					
	<b>ክፍል ስድስት - የምርት ስም ባህሪያት</b>	1	2	3	4	5
1	አርማውን ስለምወደው አኳኒዳን እጠቀማለሁ					
2	የሬዲዮ ማስታወቂያውን ሁልጊዜ ስለምሰማ አኳኒዳን እጠቀማለሁ					
3	ጥሩ የንጥረነገር ይዘት ስላለው አኳኒዳን እጠቀማለሁ					

## Appendix 3 – Chi-Square Distribution Chart

Percentage Points of the Chi-Square Distribution									
Degrees of Freedom	Probability of a larger value of $\chi^2$								
	0.99	0.95	0.90	0.75	0.50	0.25	0.10	0.05	0.01
1	0.000	0.004	0.016	0.102	0.455	1.32	2.71	3.84	6.63
2	0.020	0.103	0.211	0.575	1.386	2.77	4.61	5.99	9.21
3	0.115	0.352	0.584	1.212	2.366	4.11	6.25	7.81	11.34
4	0.297	0.711	1.064	1.923	3.357	5.39	7.78	9.49	13.28
5	0.554	1.145	1.610	2.675	4.351	6.63	9.24	11.07	15.09
6	0.872	1.635	2.204	3.455	5.348	7.84	10.64	12.59	16.81
7	1.239	2.167	2.833	4.255	6.346	9.04	12.02	14.07	18.48
8	1.647	2.733	3.490	5.071	7.344	10.22	13.36	15.51	20.09
9	2.088	3.325	4.168	5.899	8.343	11.39	14.68	16.92	21.67
10	2.558	3.940	4.865	6.737	9.342	12.55	15.99	18.31	23.21
11	3.053	4.575	5.578	7.584	10.341	13.70	17.28	19.68	24.72
12	3.571	5.226	6.304	8.438	11.340	14.85	18.55	21.03	26.22
13	4.107	5.892	7.042	9.299	12.340	15.98	19.81	22.36	27.69
14	4.660	6.571	7.790	10.165	13.339	17.12	21.06	23.68	29.14
15	5.229	7.261	8.547	11.037	14.339	18.25	22.31	25.00	30.58
16	5.812	7.962	9.312	11.912	15.338	19.37	23.54	26.30	32.00
17	6.408	8.672	10.085	12.792	16.338	20.49	24.77	27.59	33.41
18	7.015	9.390	10.865	13.675	17.338	21.60	25.99	28.87	34.80
19	7.633	10.117	11.651	14.562	18.338	22.72	27.20	30.14	36.19
20	8.260	10.851	12.443	15.452	19.337	23.83	28.41	31.41	37.57
22	9.542	12.338	14.041	17.240	21.337	26.04	30.81	33.92	40.29
24	10.856	13.848	15.659	19.037	23.337	28.24	33.20	36.42	42.98
26	12.198	15.379	17.292	20.843	25.336	30.43	35.56	38.89	45.64
28	13.565	16.928	18.939	22.657	27.336	32.62	37.92	41.34	48.28
30	14.953	18.493	20.599	24.478	29.336	34.80	40.26	43.77	50.89
40	22.164	26.509	29.051	33.660	39.335	45.62	51.80	55.76	63.69