

ASSESSING CONSUMER WILLINGNESS TO PAY FOR MALAWI ORGANIC  
COFFEE: EVIDENCE FROM A CONSUMER SURVEY

By

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To my father and mother, I dedicate this to you!

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## TABLE OF CONTENTS

	<u>page</u>
ACKNOWLEDGMENTS .....	4
LIST OF TABLES .....	8
LIST OF FIGURES .....	9
LIST OF ABBREVIATIONS .....	10
ABSTRACT .....	12
CHAPTER	
1 INTRODUCTION .....	14
General Problem .....	14
Specific Problem .....	18
Project Objectives .....	19
Testable Hypotheses .....	19
2 LITERATURE REVIEW .....	20
Overview of Organic Agriculture .....	20
Previous Studies on Consumer Preference and WTP for Organic Products ....	22
Previous Studies on Consumer Preference and WTP for Non Organic Products .....	32
Methods of Eliciting Consumer WTP .....	36
The Contingent Valuation Method (CVM) .....	37
The Choice Experiment (CE) .....	39
Experimental Auction .....	40
3 RESEARCH METHODS AND DATA .....	42
Theoretical Model .....	42
Model Estimation .....	43
Model Estimation under CVM .....	43

	Model Estimation under CE .....	48
4	DATA COLLECTION .....	49
	Design of CVM.....	53
	Design of the CE.....	55
5	RESULTS OF THE EMPIRICAL ANALYSIS .....	58
	Descriptive Statistics.....	58
	Willingness to Pay for Organic Coffee .....	64
	Motivation for the WTP for Organic Coffee.....	67
	Support towards Organic Coffee Production .....	68
	Empirical Analysis of Data from CVM .....	69
	Empirical Analysis of Data from CE .....	75
	Descriptive Statistics .....	76
	Results from Conditional Logit Model.....	76
	Comparison of Results from CVM and CE.....	80
6	CONCLUSION.....	82
	Study Limitations .....	84
	Recommendations and Further Research .....	85
APPENDIX		
A	SURVEY INSTRUMENT (VERSION A).....	87
B	SURVEY INSTRUMENT (VERSION B).....	98
LIST OF REFERENCES .....		110
BIOGRAPHICAL SKETCH.....		117

## LIST OF TABLES

<u>Table</u>		<u>page</u>
1-1	Total annual sales for tobacco in Malawi.....	15
4-1	Sample representativeness in terms of the demographic structure of the population of Malawi (gender, age and religion).....	51
4-2	Price levels for coffee in MK/250 grams (Version B) .....	57
5-1	Summary for descriptive statistics .....	59
5-2	Expressed price for organic versus actual price paid for coffee.....	66
5-3	Expressed price for organic versus actual price paid for coffee.....	67
5-4	Percentage of the sample per motivation factor for positive WTP .....	68
5-5	Percentage of the sample per motivation factor for negative WTP .....	68
5-6	Support for certification of organic coffee production.....	69
5-7	Estimated OLS model.....	72
5-8	Estimates for conditional logistic model.....	76
5-9	Comparisons of WTP price premiums between CVM and CE.....	81

## LIST OF FIGURES

<u>Figure</u>		<u>page</u>
4-1	Choice set in choice experiment.....	57
5-1	Frequency distribution of consumer WTP for organic coffee .....	65
5-2	Average market price for conventional coffee and WTP for organic coffee .....	65
5-3	Frequency distribution of tax .....	70
5-4	Frequency for choice of coffee .....	76

## LIST OF ABBREVIATIONS

BDM	Becker-De Groot-Marschak's
CAMAL	Coffee Association of Malawi
CE	Choice Experiment
CIA	Central Intelligence Agency
COOL	Country of Origin Labelling
DC	District of Colombia
DDT	Dichlorodiphenyltrichloroethane
EA	Enumeration Area
ETEI	Emissions Trading Education Initiative
GDP	Gross Domestic Product
GM	Genetically Modified
GMO	Genetically Modified Organisms
GOM	Government of Malawi
IFOAM	International Federation of Organic Agriculture
MCCCI	Malawi Confederation Chambers of Commerce and Industry
MCPCU	Mzuzu Coffee Planters Cooperation Union
MK	Malawi Kwacha
MoAFS	Ministry of Agriculture and Food Security
MSCE	Malawi School Certificate of Education
MT	Metric Tonnes
NOAA	National Oceanic Aviation Administration
NOP	National Organic Program
OLS	Ordinary Least Squares

SAS	Statistical Analysis Software
TCC	Tobacco Control Commission
UNCTAD	United Nations Conference on Trade and Development
UNIMA	University of Malawi
US\$	United States Dollar
USA	United States of America
WHO	World Health Organization
WTA	Willingness to Accept
WTP	Willingness to Pay

Exchange Rate = MK150/US\$

Abstract of Thesis Presented to the Graduate School  
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Tobacco is a major cash crop for Malawi; however its performance is currently dwindling mainly due to anti-smoking lobby by WHO. One of the potential alternatives to tobacco is coffee, the seventh largest export crop in Malawi and the second most commonly internationally traded commodity.

However, consumers are becoming more sensitive to the type of coffee they consume. Taste characteristics, label of origin and other unobservable credence attributes (e.g. organic) are becoming of great concern to consumers. It is against this background that demand for organic products is continuously growing worldwide. This study therefore aims at assessing Consumer WTP for organic coffee in Malawi and to determine important factors that influence consumer preference and WTP for organic coffee.

Data were collected from 129 participants through a household survey from three major cities of Malawi (Blantyre, Lilongwe and Mzuzu) using the CVM and CE. CVM data was analyzed using an OLS model while CE data used a Conditional Logistic Model.

Based on CVM, about 40% of the sample was WTP an average price of MK816.75 per 250g of organic coffee translating into a price premium of MK164.75 per 250g of organic coffee representing about 25% price premium over the average market price for conventional coffee of MK652 per 250g. Taking into consideration the whole sample, participants were WTP an average price of MK599.66 per 250g of organic coffee which is lower than the average market price of conventional coffee by about 8%. Only four variables were significant in influencing WTP and these are: actual price paid for coffee, being of 60 years and older, being in the high income group of over MK322, 000 per month, and an attitudinal variable depicting whether an individual thinks that organic products may offer more of some nutrients than their conventional counterparts.

Based on CE, people were WTP an average price of MK1, 444.38 per 250g of organic coffee translating to a price premium of MK 792.38 per 250 g of organic coffee which represents over 100% price premium over the average market price of conventional coffee. The significant variables that influenced the probability of choice of coffee were 'Organic' representing the method of production of coffee, 'Price of coffee', and 'None' representing that individuals did not choose either organic or conventional coffee. 'Organic' had a higher economic impact than 'Price' signifying that consumers' preference for coffee was mainly based on the method of production rather than price.

High price premiums were registered for organic coffee mainly due to health related issues. The majority of the sample opted for government subsidies in organic coffee for increased accessibility. Our results show that there exists a potential niche market for organic coffee in Malawi.

## CHAPTER 1 INTRODUCTION

### **General Problem**

Malawi is situated in the southeast of Africa. It is bordered by Zambia to the northwest, Tanzania to the northeast and Mozambique to the east, south and west of the country. The economy of Malawi is agro-based. The agricultural sector in the country employs about 80% of the labor force, contributes over 80% of foreign exchange earnings and accounts for 39% of the Gross Domestic Product (GDP) (MoAFS, 2010).

The agricultural sector in Malawi is dualistic in nature. It has the smallholder sub-sector, which contributes more than 70% to the agricultural GDP, and the estate sub-sector, which contributes less than 30% to agricultural GDP (MoAFS, 2010). The main food crops that are grown include maize, cassava, and sweet potatoes, while the main cash crops grown are tobacco, sugar, tea, coffee, macadamia nuts, and cashew nuts (MoAFS, 2010).

Tobacco is the major cash crop for Malawi and the major foreign exchange earner as well. Being a country without mineral resources, the crop is normally called the “green gold.” It is sold as an export crop through multinational companies such as Limbe Leaf and Alliance One including others. The crop accounts for 60% of the country’s exports, contributes about 13% of the GDP and 23% of the country’s tax base (Jaffee, 2003). Therefore, the crop has been crucial for economic growth of the country.

Nevertheless, tobacco production is currently dwindling due to a number of factors. For instance in 2007, according to the Tobacco Control Commission (TCC) of Malawi, total production was about 111 million tonnes against 155 million tonnes in

2006. In terms of foreign exchange earnings, the country registered export earnings of about US\$160 million in 2006 against US\$162.1 million in 2005. Generally, production and foreign exchange levels have been erratic for the past 10 years. (Refer to Table 1-1 for detailed estimates). Among others, this is highly attributed to antismoking campaigns led by public health activists with support of the World Health Organisation (WHO). To that effect, there are fears amongst stakeholders in the agricultural sector that this development is likely to result in a lot of producers abandoning the crop for other more lucrative ones.

Table 1-1. Total annual sales for tobacco in Malawi

Year	Volume (Tones)	Realization (US\$)
1995	130,181	201,562,572
1996	141,662	237,755,361
1997	158,113	248,406,791
1998	133,996	178,451,093
1999	134,386	186,784,038
2000	159,869	164,734,418
2001	124,669	143,880,881
2002	138,181	163,114,209
2003	134,326	144,061,678
2004	180,181	347,179,018
2005	145,267	162,061,730
2006	155,098	160,110,819
2007	110,715	195,547,819
2008	194,708	471,583,387
Total	2,020,352	3,190,547,231

Source: TCC

In this regard, the Government of Malawi (GOM) has recently laid down a number of strategies aimed at coming up with alternative crops with potential to replace tobacco as a major exchange earner for the country.

One of the policies is crop diversification which is principally implemented as a risk management strategy. In complement, GOM devoted its efforts to revitalize production and marketing of crops with high potential for growth such as coffee, cotton and others whose performance have been worsening in the recent past.

For instance, Arabica coffee which is the major type of coffee grown in Malawi is the seventh largest export crop for the country and remains an essential source of income for farmers. On average, it has an estimated production of over 4,176 mt annually (MCCCI, 2009). It is grown by both estate and smallholder farmers. The smallholder farmers are concentrated in the highland areas of the northern region of Malawi particularly in the districts of Chitipa, Rumphi, Mzimba and Nkhata-Bay. In the Southern region, the industry is dominated by large scale farmers most especially in Thyolo and Chiradzulu districts. Contrary to its poor performance in the past, the coffee sub-sector has seen great improvement in its performance in recent years. For example, in the northern region alone production increased from 2,250 mt in 2007 to 2,600 metric tonnes in 2008 and there are indications of continued improvements in the industry (Chirwa et al., 2008).

Coffee production areas in Malawi have favourable climatic conditions with altitudes ranging from 1,000 to 2,500 metres above sea level. It is for this reason that Malawi coffee has a very fine flavour with a balanced body and acidity. In addition, Malawi coffee is gaining popularity both domestically and globally. One of the most popular brands sold is 'Mzuzu coffee'. The brand has gained both international and local recognition. According to reports, the sale price of Mzuzu coffee has in general gone up registering a price premium of up to 47%. Malawian coffee is exported to The

Netherlands, Germany, South Africa, Switzerland, Japan, Australia, United States of America (USA), Italy, among others (MCCCI, 2009).

On the other hand, the world consumption of coffee is projected to increase from 6.7 million tonnes in 1998-2000 to 6.9 million tonnes in 2010 by 0.4% annually (FAO, 2003). In the meanwhile, consumers are becoming more sensitive to the type of coffee they consume. They are specifically conscious about search, experience and credence attributes of a product (as defined by Nelson (1970), and Darby and Karni (1973)). An example of a search attribute is colour; that for experience attributes is taste while that for credence attributes could be the type of production used to produce a particular product (e.g. organic or fair trade production). According to a number of market studies, consumers pay much attention to these attributes mainly due to health concerns associated with the products as well as environmental and social justice concerns associated with their production or marketing methods. It is for this reason that the world industry for organic products has been growing to meet the growing demand for food with special attributes. Evidently, in 2007, the global retail sales of organic products increased to US\$41.6 billion against US\$ 23 billion in 2002. Despite this alarming increase in demand, the organic industry still remains undersupplied worldwide (Willer, 2009).

Organic coffee has established a niche market within the market for organic foods. The primary markets for the product are North America and Europe. Currently, the two regions account for about 97% of the global sales for organic products (Willer, 2009). It is generally believed that because such countries have more affluent people with higher purchasing power, consumers in these countries are willing to pay high price premiums

for expensive products. In general, consumers in developed countries are willing to pay an average of 15% to 25% premium for organic coffee alone (Willer and Yussefi, 2007).

With the current performance of coffee production in Malawi coupled with adoption of Organic Agriculture in most countries in sub-Saharan Africa e.g. South Africa, Kenya, Tanzania, Uganda and others, there is a high potential for production of organic coffee in Malawi. Like in the other countries, organic coffee is likely to find niche markets in both, the domestic and international markets, thereby potentially increasing farmers' incomes and national incomes as well. Because coffee is the second most economically important commodity in the world after oil, (Pendergrast, 2006), there is a high possibility that the marketing of the crop will be sustainable and hence become one of the most suitable candidates replacing tobacco as the major foreign exchange earner for Malawi.

### **Specific Problem**

The critical question for the Government of Malawi to answer before supporting production of organic coffee is whether markets exist for the crop. Particularly, can Malawi organic coffee attract higher price premiums from domestic consumers as compared to conventional coffee? If so, what are the possible factors that would influence the consumer preferences that may determine the market segmentation of the organic coffee market? This study attempts to provide answers to these questions and thus offer valuable information to Malawian government policy makers seeking suitable substitutes for tobacco as major foreign exchange earners.

If the study shows higher Willingness to Pay (WTP) for organic coffee, it will suggest that there exists a clear niche market for organic coffee in the country. Policy makers will therefore be advised accordingly to promote production of organic coffee so

as to meet the potential demand. The potential growth of the domestic market for the crop will therefore be seen as a step towards targeting international markets that have relatively the highest level of demand for organic products in general. In complement to organic coffee, other crops with great potential for growth could also be promoted. Such a crop diversification strategy is likely to replace tobacco as the major foreign exchange earner for the country.

### **Project Objectives**

The overall objective of this study is to assess the potential demand for organic coffee in Malawi. This will be achieved through the following specific objectives:

1. To assess consumer preference and WTP for organically produced coffee versus conventional coffee.
2. To determine important factors that influence consumer preference and WTP for organic coffee.

### **Testable Hypotheses**

The following hypotheses will be tested:

1. Because of the perceived benefits associated with product attributes such as method of production (e.g. organic production), consumer WTP and preference for organic coffee is likely to be higher than that of conventional coffee across consumers.
2. Heterogeneous preferences exist among consumer and thus the WTP for organic coffee will vary across consumers' socio-demographic factors e.g. income, gender, age, level of education, including their perceptions.

## CHAPTER 2 LITERATURE REVIEW

### **Overview of Organic Agriculture**

Organic Agriculture is increasingly being practised in more than 141 countries of the world. There are also strong assumptions that uncertified organic production is being practised by more countries (Yussefi et al, 2007). Currently, about 32.2 million hectares of land are being subjected under organic production, representing 0.8% of the total land for agriculture worldwide and the rate is estimated to be increasing (Willer, 2009). The regions with the largest land under organic agriculture are Oceania, Europe and Latin America. The rate of increase is mainly a response to the global market for organic food which is rapidly increasing and mostly constitutes affluent countries (Sahota, 2007).

As already highlighted in Chapter 1, global sales for organic food increased from US\$ 23 billion in 2002 to US\$ 41.6 billion in 2007 (Willer, 2009). Although this is the case, the market for organic products still remains undersupplied because of underproduction of organic food globally. To that effect, many consuming countries are relying on imports but the supply is still insufficient.

The demand for organic products is concentrated in North America and Europe. In 2005, sales of organic products in North America were about US\$14.9 billion, representing 45% of the world's generated revenue. The sales of North America were dominated by the USA mainly due to the National Organic Program (NOP) of 2002 which propelled growth in the production of organic foods in the country. In recent years, Europe has overtaken North America as the largest consumer of organic foods and drinks mainly due to the appreciation of the Euro against the US dollar. Revenue for

organic products in Europe is about 75% of world's total revenue from organic food and beverages, (Sahota, 2007). The major countries include Germany, United Kingdom, France and Italy. Other emerging markets are Denmark, Sweden and the Netherlands.

It is thus clear that there is a great disparity between production and consumption of organic foods and products in the world. An additional threat to the market's sustainability is that consumption remains concentrated in Europe and America. There are thus fears that a slight change in consumption patterns in these two regions would likely cause a significant impact on the world production and trade trends. For instance, if these countries decide to stop importing organic products, there is likely going to be oversupply of the products in the producing countries thereby depressing their prices in those countries and the world at large. As such, organic producers are advised to develop their own domestic markets for their organic products rather than rely on export markets only. Among others, this would be used as a risk management strategy in their business of organic production and so sustain organic production worldwide (Sahota, 2007).

It is partly against this background that organic production is increasing in several African countries where domestic markets are also opening up. Certified production is mainly being practised in Uganda, Tanzania, Ghana, Ethiopia, Kenya and Zambia. The main certified crops produced are: Fresh Vegetables, Bananas, Citrus Fruits, Coffee, Tea, Cocoa, Sugar, Cotton and others (Elzakker, 2007). Although a large proportion of the production is geared for export markets e.g. North America, Europe and a little bit in Japan, regional markets have recently opened up. The major ones constitute the Republic of South Africa and the Gulf area.

Many studies have concluded that people with higher disposable incomes are the largest spenders on organic food (Sahota, 2007). This conclusion is therefore a threat to the sustainability of domestic markets of organic food in countries with relatively less affluent people. However, a number of studies have concluded otherwise. Among others, Rodriguez et al. (2007) ascertain that the relationship between income and consumers' WTP is very controversial. There exists a relationship between WTP and income among some segments of the market while in other segments the relationship does not exist. Other demographic variables tend to influence WTP for organic products e.g. education, consumer perceptions, age, price, religion, gender (Rodriguez et al, 2007; Zepeda and Li, 2007; Peterson et al., 2008; Engel, 2008). This current study also attempts to assess consumer preference for organic coffee in a domestic market, particularly to determine whether consumers in Malawi are willing to pay a higher premium for organic coffee than the conventional one.

### **Previous Studies on Consumer Preference and WTP for Organic Products**

A number of studies have been conducted on consumer preference and WTP for organic food, of these a few have been done on organic coffee. This section will highlight findings of studies on organic foods in general; those for non organic products and services will be highlighted in the next section. The non organic products include beef, fruits, pharmacist services, medication for Alzheimer's diseases, and ground water protection. From the literature review, we expect to gain general knowledge on consumer preference and WTP for organic foods.

Rodriguez et al, (2007) conducted a study on WTP for various organic foods in Argentina. The project was specifically aimed at estimating consumers' WTP for organic products available in the Argentinean domestic market with the view of providing useful

evidence to the government to support promotion of such crops, regulating processes and labelling programs. Data were collected from both organic and non organic food consumers using the Contingent Valuation Method (CVM). A Binomial Multiple Logistic Regression model was used to estimate the parameters of the targeted products (Regular Milk, Leafy Vegetables, Whole Wheat Flour, Fresh Chicken and Aromatic Herbs) by Maximum Likelihood. The dependent variable of the model was WTP for a particular product and the independent variables were 'organic price premium', 'income Level', 'risks and quality attributes perceptions' and 'socio-demographic characteristics'. Based on the notion that quality has become a key concept in Demand Theory (Lancaster, 1966; Antle, 1999) among others, the results of the study confirmed this as it turned out that Argentinean consumers were willing to pay price premiums of 6% to 200% in order to acquire the better quality products (Rodriguez et al, 2007). Based on the empirical analysis, there was a significant relation between consumer income and the WTP for the organic products in question. The other major factors determining the willingness to pay were 'scarce availability' and 'price' of the products that were seen as a hindrance to consumer access to products thereby acting as a threat to expansion of the domestic market in Argentina.

Another study on WTP for organic food was conducted by Millock et al. (2002). In his study he used both panel and survey data. Organic food was identified as a product with the 'Danish State Label.' The food attributes used in his study included environmental concerns, animal welfare, and food safety/healthy concerns. A comparison was made between results drawn from the use of CVM and those from observed WTP. Based on the results, participants valued the attribute of 'avoidance of

chemicals' the highest. However, ordering of the valued attributes did not differ at all across organic product types. The study conducted both in store interviews and in store experiments on purchases of organic products. The questionnaire that was used had four sets of questions: on purchase habits and food culture (choice of store, important product characteristics, statements on risks from eating certain foods), questions on organic food production (identification of the Danish Organic label, statements on organic production and its effects), questions on habits and environmental attitudes (use of recycled toilet paper, aluminium foil, membership of environmental associations, statements on consumer's role in environmental protection) and finally questions on WTP for four different products (milk, rye bread, potatoes and minced beef). According to the study, the majority of the sample was willing to pay more than the stated conventional market price for the products. About 59% of the sample was willing to pay more for the organic milk, 48% for potatoes, 51% for rye bread and 41% for minced beef. Specifically, the price premium for organic milk was 32.1%, 40.2% for organic potatoes, 23% for rye bread and 18.5% for minced beef. A logistic maximum likelihood was estimated (defined as willingness to pay for all four organic products). It was found that about 32% of the sample was indeed willing to pay more for all products.

In the same study using the actual purchase data to measure revealed WTP, about 55% of the sample were willing to pay more for organic milk, 35% were willing to pay more for organic rye bread, 14% of the sample were willing to pay more for organic potatoes while 6% were willing to pay more for minced beef. Results from the two methods found that elicited (stated) WTP is overestimated compared to the revealed (real) WTP and in this study the practise was dominant in milk. Surprisingly, for the

other products (organic rye bread, organic potatoes and organic minced beef), consumers were actually paying more than their stated WTP for the products. For future studies, the team expressed interest in modelling individual household's consumption of organic foods with demographical variables as independent factors such as income, geographic location, age, etc. This research focused on this area as one way of understanding the consumers' WTP for organic products, most especially the determining factors behind consumers' behaviour in organic coffee consumption.

In a related development, Didier and Lucie (2008) measured consumer's WTP for organic and fair trade chocolates. It was mainly aimed at measuring consumer preferences and WTP for organic and/or Fair Trade Labels. Two methods of data collection were used; experimental auction and survey. An experiment was used in order to measure the actual consumer WTP as the method creates a real bidding set up that reduces any social desirability bias (Noussair et al., 2004). Specifically, the Becker-DeGroot-Marschak's (BDM) mechanism was used for data collection. On the other hand, the survey was used to collect information to measure elicited WTP. Selection of the chocolates by consumers was made on two criteria: hedonic characteristics and the price level of the product. The bidding was done in 13 sessions each containing three stages. The first stage required that participants taste a bar of chocolate without any information of the chocolate; the participant thus attributed a hedonic rating for the chocolate and declared his/her WTP for the chocolate tasted. This was done in order to evaluate consumers' preferences and their WTP based on their liking of the product (e.g. taste). On the second stage the consumers declared their WTP for each chocolate based on information on labels as a way of determining their WTP for the label(organic

and fair trade) independent of liking. The last stage involved tasting the chocolates tasted from stage 1 but with comprehensive information. Two of the chocolates had organic and fair trade labels while the other two had neither organic nor fair trade labels. This was done in order to analyse the evolution of arbitrages between the hedonic evaluation of chocolates and the information provided. The results of the study specifically for stage 3 indicate that the organic and fair trade labelled chocolates received the highest bids compared to the standard ones confirming that the information on product attributes provided in this stage influenced consumer's WTP for the products positively. This study also conducted a consumer typology according to the valuation of the organic and fair trade labels. In this regard, the sample was divided into three clusters based on their WTP for chocolates using comprehensive information provided for the chocolates. Cluster 1 represented about 42% of the total sample; it had the least number of women (about 63% against 71% in the total sample), it included students and people without an occupation with average age of 35 years. Generally, the group constituted mainly non consumers and occasional consumers of organic products. The second cluster had 41% participants of the total sample; it had about 71% women, had people with average age of 45 years with professions as Executives, commercials sector workers and retired officers. Members of this group were regular consumers of organic and fair trade products. The last group had the least participants representing only 17% of the sample; it had about 88% women with people aged 32 years on average without specific professions. This group constituted participants who consume organic products moderately but fair trade products more occasionally. According to the study, the first cluster registered the lowest WTP for the chocolates; the second cluster

registered twice as much WTP as the previous cluster while the third cluster registered the highest WTP. These results clearly show that consumers' WTP for organic food varies across consumers' demographical factors e.g. age, gender, education, occupation etc. The study also compared the variation of consumers' WTP for the chocolates across the 3 groups. The findings showed that the additional information of the chocolates provided to the participants had varying influences over the valuation process. It was also noted that consumers in cluster 1 were more sensitive to price than the 'organic and fair trade label', those in group 2 were sensitive to the labels but without any conditions while those in cluster 3 were sensitive to labels but conditioned on taste. Lastly, a comparison test was carried out to assess the factors that motivated the consumers in the valuation process. The results showed that group 1 were more influenced by taste and health issues associated with the labels and not the environmental and the social concerns associated with them, to the contrary consumers in group 2 were mainly influenced by the environmental and the social concerns associated with the 'organic and fair trade labels' while consumers in group 3 were similar to those in group 2 apart from the fact that they considered taste as the main motivation factor as well. In conclusion, according to the results nearly half of the sample was insensitive to the 'organic and fair trade' labels. This proportion of the sample was mainly motivated by price in its choice of the chocolates, then taste and health related issues and lastly the environmental and social factors associated with the chocolates. The remaining proportion was mainly motivated by the environmental and social concerns associated with the labels as they were able to value the products to 20% to 30% of the product price. Although the environmental and social concerns were

some of the motivational factors, some consumers based their WTP on the liking of the products. The labels just enhanced the valuation process and varied a lot across consumers. The study therefore concluded that consumers were not ready to pay more for organic and fair trade products and so the market for such should not be overestimated.

Wikström (2003) measured WTP for sustainable coffee (organic and fair trade certified) in Sweden. He also made an attempt to determine the underlying factors for the choice of sustainable coffee. In his study he used choice experiments as a method of collecting data and conducted data analysis using a binary probit model. The analysis was based on the neoclassical demand theory. The study targeted 100 respondents who were required to make a choice between a number of alternatives of coffee provided to them in the choice experiments. In the end, the analysis had a total of 900 observations since each participant was required to make 9 choices. Results of the study showed that there was higher WTP for the organic certified coffee as compared to the fair trade coffee, although the monetary attribute of the coffee had a significant impact on the consumer utility. The implication of this conclusion is that consumers were willing to pay higher price premium for the two types of coffee; the choice was made at a minimum cost. On the other hand, social demographic factors and the attitude factors were significantly influential in the consumer choice of the coffee. The regular consumers of coffee were less likely to buy organic and fair trade coffee due to their high premiums, and consumers who were aware of environmental concerns, health benefits and other benefits of 'sustainable' coffee were more likely to buy the coffee than those without the knowledge. The results therefore concluded that there

was an existence of a market for both certified and fair trade certified coffee in Sweden as consumers were willing to pay high price premiums for the products under the study. In this light, recommendations were made to organisations in the industry to consider lowering the prices of these products as one way of expanding the market shares for their brands. In addition, organisations were encouraged to incorporate health benefits of the coffee in their marketing campaigns as about 20% of the respondents based their choice of the two types of coffee on the aspect of reduced levels of chemical substances in the products.

The Commission for Environmental Cooperation in 1999 conducted a consumer demand study on Mexican shade –grown coffee. Shade grown coffee is most of the times referred to as organic because it is generally grown naturally, it does not use heavy chemicals. The main purpose of the study was to assess the potential market for Mexican Shade grown coffee in USA, Canada and Mexico. Data collection was done through personal surveys and focus group discussions where individuals even conducted taste tests of Mexican Shade grown coffee compared with other brands. Based on the results, 22%, 42% and 50% of the people interviewed in USA, Canada and Mexico respectively were willing to pay \$1 more per pound for the coffee. Consumers were motivated to register WTP for the coffee because of its environmental friendliness. Quality and taste were also key factors in determining consumer choices. As such, the study recommended that emphasis should be done on quality and taste of the Mexican shade grown coffee in marketing campaigns.

Loureiro and Hine (2002) also assessed consumer preference and WTP for local (Colorado grown); organic and GMO free potatoes as one way of discovering their

potential niche markets. The study also focused on determining factors (socio-demographic factors and quality characteristics) of consumer response to a particular attribute of the products in question. Revealed consumer preference data were collected in a survey and the analysis was done using a multiple bounded probit model. The results showed that the locally grown potatoes had the highest WTP estimate of 9.37 cents while the organic and GMO free potatoes had 6.64 cents and 5.55 cents respectively. The social demographic variables and quality characteristics had different effects on WTP for the three attributes. For organic and GMO free potatoes, consumers who were sensitive to freshness and nutrition registered higher premiums; WTP was negatively related to age. In addition, there was also a negative relationship between WTP and the number of children per household. Even though the WTP was the highest for locally growth potatoes, the only variable that had statistically significant positive relation with WTP was consumers' concern for nutrition. Overall, the results indicated that there was a potential niche market for the locally grown potatoes in Colorado.

Engel (2008) calculated consumer WTP for major organic products (wine and fruit juice) in South Africa. He used the CVM in data collection. The study used the binary logit model to analyze consumer decision to purchase organic food or not and the ordered logit model to analyze the determinants of WTP for organic wine and fruit juice. Based on the results, the significant socio-demographic variables influencing the decision to purchase organic food were age, marital status (being married) and level of education. Age positively influenced the decision to purchase organic food; marital status had a negative influence over the decision to buy and level of education had a positive influence over the decision to buy. The results from ordered logit model

demonstrated that age, language (Afrikaans), head of household and citizenship significantly affected consumer WTP for organic products. Specifically, 'being of younger and middle age' and head of the household had a positive effect on WTP; language was negatively related to WTP as the majority of Afrikaans speakers have low disposable incomes. Overall, South Africans were willing to pay bid values of \$0.25, \$0.37 and \$0.49 more for organic fruit juice compared to conventional fruit juice.

For organic wine, the significant independent variables were age (younger and older), Afrikaans, English or language other than Afrikaans, English or Xhosa as the home language and Christian faith. Age was positively related to WTP, Afrikaans and home English speakers were negatively related to WTP and being Christian was positively related to WTP.

Peterson et al. (2008) made a contribution to the study of demand for non food organic goods. The study assessed consumers' WTP for various attributes of wool products (gloves) made in USA and Australia. The attributes used for the research included country of origin, environment focused (organic and pro-environment), animal focused, and price. In their study, choice experiments were used to collect data and data analysis was based on the conditional logit model. According to results; consumers were willing to pay \$1.20 more for a pair of USA wool glove compared to a pair of acrylic ones and WTP for Australian wool glove was \$0.25.

It was noted that the pro-environmental label was valued more than the organic label by 14 cents. This could be attributed to the relatively low recognition of organic clothing than food by the participating consumers. In addition, consumer preferences for

the gloves varied by socio-economic and psychographic characteristics e.g. gender, age, income, education attainment, location and beliefs of animal rights.

In a study aimed at assessing household's WTP for "green" goods (organic cotton sportswear), Casadesus-Masanell et al. (2009) used sales data to elicit consumer revealed preferences and WTP. The study showed that consumers were willing to pay significant premiums for organic cotton clothes regardless of the related costs associated with the apparel.

Recently, Hustvedt and Bernard (2008) examined consumer WTP for three credence attributes of organic socks made from cotton and corn. The attributes assessed were: origin (imported, US and Texas), type, and production method [conventional, organic and non-genetically modified (GM)]. Data were collected through experimental auctions and were analyzed using a Tobit regression model. Bidding in the first round was conducted without information about the credence attributes while in the second round respondents were provided with various attribute information. The model included demographic variables as possible factors determining WTP for the attributes. According to the results, consumers were willing to pay the highest premium of \$1.86 for organic socks, which was slightly higher than the premium for non-GM socks. Regarding the effect of demographics, females were less willing to pay for the U.S. fibers than men, and Hispanics were less willing to pay for organic or non GM fiber. Among others, the study concluded that there is a potential market for organic garments in USA, which is in line with the results of Casadesus-Masanell (2009).

### **Previous Studies on Consumer Preference and WTP for Non Organic Products**

Methodologies used in consumer preference studies are vital to the analyses of the current study. In this regard, this chapter highlights previous studies on consumer

WTP for non organic products. The major aim was to explore the methodologies used in pursuing these studies, which later assisted in the selection of appropriate data collection and analysis methods that are most suitable to the research objectives.

Umberger et al. (2002) assessed the consumer preference and WTP for domestic corn-fed beef against international grass-fed beef. The study targeted two locations in the USA, Chicago and San Francisco. Data were collected through panel taste testing and experimental auctions (fourth-price Vickrey Auction). The taste test was conducted to elicit consumer's preference over beef flavour between the two types of beef and the auction was conducted to elicit consumer's WTP for the preferred steak. The collected data were analyzed using two types of models. Data on preference were analyzed using a multinomial logit model based on random utility theory. The dependent variable was 'flavour preference' (0 for consumers preferring corn fed beef over grass-fed, 1 for those indifferent and 2 for those preferring grass-fed beef over the corn-fed beef), the independent variables included: location, age, gender, ethnic, income, education, family size and other factors representing characteristics of the consumer. In the analysis of data on WTP, an OLS regression model was used. The dependent variable was 'bid difference' (the difference between the bid prices between the beef types) and the dependent variables were the same as that used in the logit model. The study found that on average, consumers preferred the domestic steak on all sensory qualities and they were willing to pay a 30.6% premium for corn-fed beef. To be specific, about 62% of the participants were willing to pay an average premium of \$1.61 more per pound for the corn-fed beef, 23% were willing to pay a premium of \$1.36 more per pound for the grass-fed beef and only 15% of the consumers were indifferent. These results show

that there exist respective niche markets for the two types (corn-fed and grass-fed) of beef as well as beef with country of origin labelling. The demographic factors such as age, ethnicity, beef knowledge and quality grade were seen to have some influence over the flavour preference. However, these factors did not have any influence over the bid difference. It was thus difficult to predict the type of consumers willing to pay for the product they prefer.

Mabiso (2005) estimated the WTP for Country of Origin Labelling (COOL) for American fresh apples and tomatoes and established the major determining factors for the WTP. In the study, experimental auctions (Vickrey-fifth bid sealed price) were used for data collection. The study used the double hurdle probit model for analysis of the data. The findings indicated that 99% of the consumers were willing to pay \$0.49/lb more for apples labelled 'USA grown', 72% of the participants were willing to pay \$0.48/lb more for tomatoes labelled 'USA grown' as compared to identical ones without the labels. The demographic and psychographic variables such as food quality perceptions and consumers' location had significant relationships with WTP.

Numerous studies on valuation of goods and services have been done in the health sector as well. Dong-Churl (2000) measured WTP for pharmacists' services directed toward reducing the risk of medication-related problems. The study also attempted to determine factors that have a significant influence on WTP. Like most of the studies highlighted above, Dong collected data using the CVM. Data analysis was based on logistic regression and semi log regression models. Overall, there was WTP for the pharmacists' services. For instance, the mean WTP for pharmacy services ranged from \$4.02 to \$5.48 per prescription. Of the factors used in the regressions,

magnitude of risk reduction had an influence on WTP; income was positively related to WTP although it was not statistically significant.

Werner et al. (2002) examined primary caregivers' WTP for medication for Alzheimer's diseases. Data were collected using two methods. The first one was through experimental auctions and the second approach used a questionnaire with open ended questions. The data collected were analyzed using an econometric model with WTP as the dependent variable and psychological factors, social-demographic factors and other characteristic variables as independent variables. According to the results, the mean WTP for the treatment was \$188.45 (using open ended questions) and some independent variables such as income, age, cognitive status and periods of caring for the sick had a significant impact on the WTP.

Aulong and Rinaudo (2008) assessed population WTP for ground water protection in the Upper Rhine Valley. The valuation was elicited based on two scenarios (restoring drinking water quality and eliminating all traces of polluting substances). They used the standard contingent valuation method and analyzed the data using three models. The logit model was used to assess whether or not participants were willing to pay for proposed scenario; a linear regression which excluded some of the variables (protest answers) was used to elicit stated WTP while the Tobit model was used to capture the same but included the variables capturing protest answers. Based on the results, 62% of the respondents were willing to pay for the first scenario at a mean WTP of \$59.6 per household while 52% were willing to pay for the second scenario at a mean WTP of \$107.72 per household. It was also noted that some of the independent variables used in the three models were statistically significant. For the linear logit model such

variables included 'realism of the scenario,' 'number of children in the household,' 'income' and the 'number of known polluting substances.' For the other models (the linear regression and the Tobit model), the statistically significant variables were 'knowledge of the water bill,' 'income,' 'concerns about groundwater pollution,' 'leisure' and 'use and non use values of groundwater.'

Gao and Schroeder (2009) investigated the effects of additional beef steak attributes on consumer WTP in two different US markets. They used Choice Experiment (CE) and analyzed the data using Random parameter logit models. The survey had four questionnaires; two of the questionnaires were aimed at collecting data to test the effect of additional attributes when cue attributes exists while the others tested the effect of additional attributes when no cue attributes are available. Results from both sets of questionnaires showed consistent results of the effect of additional attribute information on consumer WTP. Based on the results, response of additional attribute information was twofold. In some instances, WTP for the most important attributes decreased when consumers were provided with additional attribute information whilst in certain instances it was the opposite, WTP was positively related with additional information of the most important attributes of the study. It was thus concluded that the varying WTP for the attributes was conditioned on the relationship existing between the attributes and the additional ones.

### **Methods of Eliciting Consumer WTP**

In reviewing literature, there exist a number of techniques that are used in estimation of WTP for products. This includes the CVM, Experimental Auctions, Hedonic Pricing models, Conjoint Analysis, and others. Amongst these, the CVM has proved to be the most widely used method in many market research studies. However,

the Experimental Auctions are more reliable and are currently being used in market research the most. Below is a detailed summary of some of the methods.

### **The Contingent Valuation Method (CVM)**

The CVM is one of the “stated preference” models used to elicit consumer preferences and WTP for products. It is used to attach monetary value to products most especially when their markets do not exist. The valuation is based on the change in attributes of a particular product such as prices and quality. Consumer preference for the product is therefore assessed based on the monetary value attached to it. The valuation process is also extended to services. The method thus creates a hypothetical market situation for those goods. Through the valuation process, the data collected forms what consumers are willing to pay for a particular product.

In CVM, the valuation of the products is done using a questionnaire which is administered through mail, telephone and face-to-face interviews. The survey instrument used offers the respondents an opportunity to make an economic decision on the non or market goods (Rahmatian, 2005). The valuation process is therefore contingent upon the simulated market presented to the respondents. Product valuation is done through bidding. The bidding takes different formats e.g. open ended questions, bidding game, payment card, dichotomous choice questions and randomized card sorting. In open ended questions, participants disclose their WTP without the use of a starting bid level. The bidding game uses a number of discrete choice questions but one open ended WTP question and also provides a starting bid value. In payment cards, visual aids bearing product monetary values for attribute changes are used while the in dichotomous choice questions researchers use yes or no questions on whether

consumers are willing to pay for a particular product at a certain price. In addition, this format uses additional follow up question specifying lower bid levels.

Carson et al. (1994) documented the advantages of CVM. According to him, CVM is a flexible tool for product valuation, it is easy to apply and cost effective. Aulong et al. (2008), Werner et al. (2002), Dong-Churl (2000), Rodriguez et al. (2007), Engel (2008), Millock et al (2002) and others used the method in their respective studies as highlighted in the literature review above.

However, being hypothetical methods of eliciting consumers' willingness to pay, the CVM has got a number of flaws. The major one is of response bias, which mainly emanates from the use of open ended questions. Mitchell et al. (1989) reported biases on the use of open ended questions mainly due to high non response rates. In addition, participants overstate their preferences, which most of the times is different from their actual purchase behaviour. Many consumers state high WTP but are less willing to pay the exact amount during actual purchases.

Nevertheless, based on Rahmatian (2005), CVM are more reliable when one is using test-retest (conducting CVM on a different sample of the same population overtime) or when convergent validity checks are employed. This compares results obtained from CVM with other methods e.g. CE, travel cost or hedonic. These precautionary measures ensure that results based on CVM are more reliable even with the presence of hypothetical biases.

After assessing the reliability of the CVM, the National Oceanic Aviation Administration (NOAA) (1993) recommended that the CVM should incorporate the following:

- “1. The use of face-to-face interviews,
2. The use of WTP as opposed to WTA,
3. Provision of comprehensive information about a product to be valued,
4. The need to remind consumers of the budget constraints they are subjected to in the course of the valuation process,
5. Inform the participants the possible substitutes of the product under valuation,
6. Need to use probing to ensure that respondents understand issues being asked.”

This study adopted these recommendations during its implementation.

### **The Choice Experiment (CE)**

Like the CVM, CE is also a stated preference method based upon the Lancaster's utility model of consumer economics (Lancaster, 1966). In this method, individuals are given a hypothetical setting and asked to choose their preferred alternative among several alternatives in a choice set and they are usually asked to perform a sequence of such choices.

Each alternative is described by a number of attributes or characteristics. A monetary value is included as one of the attributes, along with other attributes of importance, when describing the profile of the alternative. Thus, when individuals make their choice, they implicitly make trade-offs between the levels of the attributes in the different alternatives presented in a choice set.

According to Alpizar et al. (2001), there are four major steps that need to be followed when designing Choice Experiments and these are:

- “1. Definition of attributes, attribute levels and customisation,
2. Experimental design,
3. Experimental context and questionnaire development, and
4. Choice of sample and sampling strategy.”

Within the stated preference models, the CE is currently being widely used.

Among others this is highly due to the fact that their use reduces some of the potential

biases created by the use of CVM. More information is elicited from each respondent compared to CVM and it allows for the possibility of testing for internal consistency.

Based on our literature review, Gao and Schroder (2009), Peterson et al. (2008) and Wikstrom (2003) used CE in their respective studies.

### **Experimental Auction**

Unlike the other two models, Experimental Auction is a revealed preference model. It is used to capture revealed (actual) WTP for a particular attribute of a product as it creates a real market auction bidding environment. The Vickrey sealed-bid, second-price auction is the most commonly used experimental auction model. This requires participants to submit written bids of a particular product in a real auction environment (Friedman et al., 1994). In a sealed bid, second price auction, bids are ranked from highest to lowest. The highest bidder wins the bid and purchases the product at the second highest price. Unlike the CVM and the CE, it is advantageous in the sense that it is designed to reveal true preferences; the use of real money for bidding in addition to other factors like repetitive bidding ensures reliability of results from this methodology. The method also reports less bias by non responses (Fox et al., 1995). However, the major flaw of the Experimental Auction is that it is very expensive to implement. Werner et al (2002), Mabiso (2005), Umberger et al. (2002), Hustvedt and Bernard (2008), Didier and Lucie (2008) and others used Experimental Auctions in order to estimate WTP in their studies (details in literature review above).

It is very clear according to published studies that revealed preference models are preferred to stated preference models because of their reliability. However, due to the target (sample) of this study and resource constraints the CVM and the CE were used as methods of data collection. CVM is flexible and easy to use and most importantly

they are easier to implement in developing countries than industrialised countries (Whittington, 1998). The main purpose of multiple valuation techniques is for convergent validity of the estimates. If the results from the two models (CVM and CE) converge, this is likely to give policy makers the confidence to reliably base their decisions on the results.

The analysis of data collected from CVM will be based on an Ordinary Least Squares Regression Model while that of CE will be based on a Conditional Logistic Model.

CHAPTER 3  
RESEARCH METHODS AND DATA

**Theoretical Model**

The focus of the current study is on assessing consumers' WTP for Malawi organic coffee. Estimation of consumers' preference and WTP of products is based on consumer cognitive demand theories and random utility models. The random utility is based on the assumption that individual utility is a function of observable product attributes, individual characteristics and an unobservable random component. Such as

$$U_{ij} = \beta'_{ij} X_{ij} + \varepsilon_{ij} \dots \dots \dots (3-1)$$

Where  $X_{ij}$  is a row vector of independent variables. These variables could represent characteristics specific to the individual and also attributes of the choices subjected to the consumer;  $\beta_{ij}$  is a vector of estimated coefficients; and  $\varepsilon_{ij}$  is an error term. It is assumed that the error term is independently and identically distributed with certain distribution (Greene, 1998). Based on this framework, it is also assumed that a consumer chooses the attribute combination or a product that gives him or her the maximum utility. The CVM and the CE that the study employed are in tandem with random utility theory and Lancaster's theory of utility maximization. According to Thurstone (1927), Random Utility Theory specifically explains the way a consumer makes his choices out of a set of choices provided to him. On the other hand, the Lancaster Theory asserts to disaggregate utilities of products into utilities derived from respective attributes (Lancaster, 1966). In the CVM, the error term is usually assumed to be normally distributed while in the CE, it is normally assumed to follow an extreme maxima value distribution which will result in Conditional Logit Models (Hoffman and Duncan, 1988).

## Model Estimation

As already mentioned above, the current study used two models based on the type of data collection procedure. Ordinary Least Squares Model was used to estimate consumer WTP using data from CVM while the Conditional Logistic Model was used to analyze data collected through the CE method.

### Model Estimation under CVM

Within the framework of Random Utility Theory, WTP is estimated using Ordinary Least Squares Regression Models among other models. The theory's assumption of independence and normal distribution of the error terms is thus in line with one of the Gauss Markov assumptions of the OLS which also asserts that the error term be normally distributed. In the estimation of WTP for beef from USA and Argentina, Umberger et al. (2002) used an OLS model. She also investigated the impact of socio-demographic variables on consumer taste preferences and WTP. The current study used a similar model as below:

$$Y_i = B_j X_i + \varepsilon_i \dots\dots\dots(3-2)$$

Where:

Y = the bid price premium (the difference between the maximum price an individual is willing to pay for Malawi Organic Coffee and the average price of Malawi Conventional coffee)

X<sub>i</sub> represents the regressors as follows:

Actprice = the actual price consumers pay for coffee at domestic market

*Demographic Variables:*

Female= gender (1= Female)

Age= (1= 15-24 years, 2=25-39 years, 3=40-59 and 4=60 years and older)

Education = (1=at least degree education, 2= at least college certification but no degree, 3= Secondary School qualification (M.S.C.E) and 4=Elementary School certificate)

Income= (1=MK66, 000 and below, 2= MK67,000-MK321,000 and 3=MK322,000 and above)

Denomination=(1=Presbyterian, 2= Catholics, 3=Anglican, 4=Pentecostals, 5= Sevethday Adventist, 6=Muslims and 7= Other denominations)

*Attitudinal Variables:*

OrgFertr = if one believes that organic coffee is grown without the use of fertilizers (1=strongly agree, 2=agree, 3=uncertain, 4=disagree,5=strongly disagree)

Orgchm = if one believes that organic coffee is grown without the use of pesticides or chemicals (1=strongly agree, 2=agree, 3=uncertain, 4=disagree, 5=strongly disagree)

Orgnat = if one believes that by buying organic products you are supporting natural and healthiest way to grow crops (1=strongly agree, 2=agree, 3=uncertain, 4=disagree,5=strongly disagree)

Orgsup = if one believes that by buying organic coffee you are supporting farmers (1=strongly agree, 2=agree, 3=uncertain, 4=disagree,5=strongly disagree)

Orgris = if one believes that by drinking organic coffee there is lower risk of ingesting chemicals (1=strongly agree, 2=agree, 3=uncertain,4=disagree,5=strongly disagree)

Orgnut = if one believes that organically grown food may offer more of some

nutrients than conventional counterparts (1=strongly agree, 2=agree, 3=uncertain, 4=disagree, 5=strongly disagree)

Orgtas = if one believes that organically grown food have better taste than conventional counterparts (1=strongly agree, 2=agree, 3=uncertain, 4=disagree, 5=strongly disagree)

Model 3-2 is the original model with 13 independent variables. Out of the 13 variables, 12 are discrete variables namely; 'female,' 'age,' 'education,' 'income,' 'denomination,' 'Orgfert,' 'Orgchm,' 'Orgnat,' 'Orgsup,' 'Orgris,' 'Orgnut,' and 'Orgtas.' 'Price' is the only continuous variable in the model. Running the model in its original form would create problems most especially in interpretation of the estimates of the coefficients of the polytomous variables (those taking more than two levels). This is so because the intervals of the levels may not be standard except for the attitudinal variables whose intervals are assumed to be standard in our study. Dummy coding of these variables was therefore essential in order to address this problem. In dummy coding, each of the polytomous variables apart from the attitudinal variables was made binary, thus taking the value of either 1 or 0. Instead of having 13 independent variables, this modification resulted in having a total of 27 independent variables in the model. Nineteen (19) of these were dummy variables, seven were discrete (polytomous) while only one was continuous.

Traditionally, the model with 27 regressors as explained above is normally run by dropping one of the dummy variables per each group of the polytomous variables in order to set it as a base group. Among others, this addresses the problem of dummy variable trap and so makes the model easy to estimate. In this case, the intercept of the

estimated model assumes the value of all five of the base groups. Interpretation of the estimates of the coefficients of the dummy variables in the model is thus done in comparison to the intercept. However, it becomes so complicated to make such interpretations in a situation whereby the base groups are more than one as one is laboured to remember all of them when making the comparisons, among other things. According to Jauregui (2007), the best approach is therefore to perform an effect coding of the dummy variables. With the effect coding, the intercept takes the value of the average household of the sample instead of a particular base group hence interpretation of results becomes easier. For the sake of illustration, let's take 'income' variable, which has three levels according to model 3-2. In effect coding the first stage requires that the variable be decomposed into three dummy variables representing each of the three levels and this is represented in equation 3-3 below.

$$Y = \alpha_0 + \alpha_1 D_1 + \alpha_2 D_2 + \alpha_3 D_3 \dots\dots\dots (3-3)$$

Where y = dependent variable, D<sub>i</sub> are the dummy variables representing the three income categories and α<sub>i</sub> are estimates of the coefficients of the dummy variables.

The process also requires that the original variable 'income' be weighted in such a way that the sum of their respective coefficients is equal to zero at the mean of the dummy variables as in Equation 3-4:

$$\alpha_1 \bar{D}_1 + \alpha_2 \bar{D}_2 + \alpha_3 \bar{D}_3 = 0 \dots\dots\dots (3-4)$$

where  $\bar{D}_i$  represent the mean of the respective income dummy variables

This implies that

$$\alpha_3 = -\alpha_1 (\bar{D}_1 / \bar{D}_2) - \alpha_2 (\bar{D}_2 / \bar{D}_3) \dots\dots\dots (3-5)$$

If Equation 3-5 is inserted in Equation 3-3, the following is yielded:

$$Y = \alpha_0 + \alpha_1 D_1 + \alpha_2 D_2 - (\alpha_1 * \overline{D_1 / D_3} + \alpha_2 * \overline{D_2 / D_3}) D_3 \dots\dots\dots(3-6)$$

This eventually is transformed into:

$$Y = \alpha_0 + \alpha_1 (D_1 - D_3 * \overline{D_1 / D_3}) + \alpha_2 (D_2 - D_3 * \overline{D_2 / D_3}) \dots\dots\dots(3-7)$$

let  $(D_1 - D_3 * \overline{D_1 / D_3}) = \text{DIncome}_1$  representing the restricted variable for the first dummy of 'income,'

and  $(D_2 - D_3 * \overline{D_2 / D_3}) = \text{DIncome}_2$  representing the restricted variable for the second dummy of 'income.'

Model 3-7 is what is eventually run as the model with restricted variables. The dummy variable of the third income category ( $D_3$ ) is what has been dropped from the original model to avoid dummy variable trap. When all the discrete variables are at their means, the restricted variables which in our illustration are 'DIncome<sub>1</sub>' and 'DIncome<sub>2</sub>' equal zero (0). This is what transforms the intercept to represent the average household of the sample.

The process was replicated to the other polytomous variables and we finally run a model containing all variables as outlined in Model 3-2. Instead of having thirteen (13) variables as in Model 3-2, we eventually had 23 ( $27 - 4 = 23$  variables) in our final model. The variables add up to 23 because we factored out 4 variables, each from the set of the polytomous variables to avoid dummy variable trap. It should therefore be noted that (Female) was not restricted because it is not a polytomous variable; interpretation of its coefficient will therefore be in comparison to its base group (Male) and not the average household. The attitudinal variables were not restricted as well. Interpretation of these variables will therefore be done similarly to continuous variables

based on the assumption that their respective intervals (1 for strongly agree, ..., 5 for strongly disagree) are constant as explained above.

### Model Estimation under CE

The second model that was estimated in our study is the Conditional Logistic Model. The model is based on the Lancaster's theory of utility maximization. Based on this theory, a consumer chooses the product that maximizes his or her utility. The probability that an alternative  $j$  is chosen among  $J$  alternatives is:

$$\text{Pr ob}(U_{ij} > U_{jk}) \text{ for all other } k \neq j \quad (\text{Greene, 1997}).$$

$$\text{Assuming } U_{ij} = V_{ij} + \varepsilon_{ij}$$

The random component  $\varepsilon_{ij}$  is independent and identically distributed following an extreme maxima value distribution. In this case, the probability of an alternative  $j$  can be chosen as below:

$$\text{Prob}[Y_i = \text{choice } j] = \frac{e^{v_{ij}}}{\sum e^{v_{ij}}}$$

Where  $Y_i$  is a random variable that indicates the choice made by the  $i^{\text{th}}$  individual and is equal to  $0, 1, \dots, J$  depending on consumer preference;  $V_{ij}$  is the utility an individual obtained and is determined by individual specific characteristics and product attributes. In our current study, consumer utility is assumed to be a function of price and the method of production of a product such as:

$$V_{ij} = \beta_0 + \beta_1 X_{j1} + \beta_2 X_{j2}$$

Where  $X_{j1}$  is the price of coffee,  $X_{j2}$  is the dummy of organic coffee.

## CHAPTER 4 DATA COLLECTION

Data collection was conducted using two stated preference methods, namely: CVM and the CE. The multiple valuation techniques were used mainly for convergent validity of the estimates from the two models. In order to conform to the recommendations of NOAA (1993), face-to-face household interviews were conducted in data collection with an aim of reducing hypothetical bias when one is using CVM.

According to Cochran (1977), a formula for determining a sample size expressed as a percentage is;

$$n = \frac{(t^2)(p)(q)}{(j^2)} \dots\dots\dots(4-1)$$

where  $t^2$  = the standard deviation score that represents the probability level of a variable of falling within a confidence interval when the variable is normally distributed

$(p)(q)$  = Variance

$j^2$  = confidence interval

The following are the results after incorporating our data variables into the formula:

$$n = \frac{(1.96^2)(.5)(.5)}{(.05^2)}$$

$$n \approx 384$$

The probability level and confidence interval of 1.96 and 0.05 respectively were used as these are the commonly used estimates and normally accord estimation process efficiency. The variables making up the variance represent the proportion of consumers and non consumers of coffee according to our study. Since it was difficult to source the

specific estimates for these proportions, Czaja and Jonny (1995) recommends that a 50% proportion for each is ideal. We thus needed to collect a sample size of about 384 to represent the target population of our study. However, due to budgetary constraints, time and other factors, the study managed to collect a sample size of 129. This is still a significant figure considering that it is still a large sample and it was randomly collected.

The survey therefore targeted 129 participants in the three main cities of Malawi. These are: Blantyre, Lilongwe and Mzuzu in the Southern, Central and Northern regions respectively. The sample was randomly selected using the Systematic Random Sample Method in order to reduce response biases. This was based on a sampling frame collected from the Malawi National Statistics Office (NSO) of the 2008 Census Household list. According to the methodology used by NSO in conducting surveys, the country is divided into clusters and then further broken into Enumeration Areas (EAs). Maps of these clusters including their respective EAs were used to locate the households that were selected in the sample. Selection of households was done in such a way that diverse income categories of the Malawi population be represented in our sample. This was done by first dividing our target population into three major clusters representing the low, middle and high income groups. For instance, households of people with high income levels were selected from the low density clusters while those of people with low incomes were selected from the high density clusters. Households of participants of the middle class were selected from the clusters in the middle of the two. It should however be noted that collection of data on household incomes was not limited to the three main income groups, ten (10) categories of household income data were collected guided by the three main categories (Refer Appendices A and B). This

information was used for descriptive statistics. On the other hand, the ten categories were compressed into three income brackets that were eventually used for estimation of the OLS.

The survey targeted people of at least eighteen (18) years of age although the minimum age captured in the survey instrument used as per Appendices A and B is fifteen (15). This was done so, because the study adopted the age categories normally used in surveys conducted in Malawi. It should be emphasized that only those with a minimum age of 18 were targeted in the survey.

Apart from the age, there were no other restrictions in terms of the characteristics of an individual so long as they were able to speak either the local language or English. The survey targeted both consumers and non consumers of coffee. The non consumers were interviewed most especially to get their perceptions on organic coffee. Table 4-1 presents some of the demographic structure of our sample in relation to the population of Malawi to show the sample's representativeness to the population. This will be in terms of gender, age and religious affiliation.

Table 4-1. Sample representativeness in terms of the demographic structure of the population of Malawi (gender, age and religion)

<b>Demographic Variable</b>	<b>Category</b>	<b>Sample (%)</b>	<b>Population (%)</b>
Gender	Male	32%	49%
	Female	68%	51%
Denomination	Christians	98%	80%
	Muslims	2%	13%
Age	15-64 years	98%	52%
	65 years and older	2%	3%

Source: For Population figures – Gender Census Report 2008, and Denomination and Age - CIA World Fact book. For Sample figures – Author's Analysis

Our sample estimates do not converge with the population estimates although they both portray a similar pattern. The distribution of gender is skewed towards females for both the survey sample and the population. Sixty-eight percent (68%) of our sample are women while 51% of the population are females. This could be highly attributed to the fact that the interviews were mostly conducted during working hours when most men were on duty. In addition, most men insisted that their wives be interviewed in situations where both were available to make sure that there was a good rapport since all interviewers were also females. In terms of denomination, both structures show that the country is dominated by Christians. About 98% of our sample were Christians while 80% of the Malawi population are Christians. Among others, this could be due to the fact that the Muslim population is not very significant in the cities (Blantyre, Lilongwe and Mzuzu) that the survey targeted. The dominant denominations were Presbyterians and Catholics representing 36% and 20% of the sample respectively. This is in line with CIA World Fact book which states that 80% of Christians in Malawi constitute the major denominations of Presbyterians and Catholics with the former taking a higher percentage. According to age distribution, our target population were people of at least 18 years. Since the comparison is done with categories provided by the CIA World Fact book; this leaves greater proportion of our sample in the age category (15-64 years). However, on the elderly population (65 years and older), the estimates are close to each other. About 2% of our sample were participants belonging to this age group which is close to 3% of the population of Malawi. Based on this comparison, our sample qualifies to be representative of the Malawi population.

## **Design of CVM**

The CVM is a survey instrument used to obtain preferences of respondents in monetary values for changes in the price or quality of a particular good or services (Engel, 2008). The current study used a well structured questionnaire to collect information from participating consumers. In order to save on time both CVM questions and CE questions were captured on the same instrument (Refer Appendices A and B for detailed survey instruments). The survey instruments had five main parts, in all parts discrete questions were asked except for the one that captured the WTP for organic coffee. The first part had questions aimed at collecting information related to consumer consumption pattern of coffee. Participants were asked whether they drink coffee or not, in what quantities they take the coffee (how many cups per day) and when they normally take the coffee (breakfast, lunch, supper or in between meals).

The second part contained questions that were aimed at collecting participants' information on their perception of organic products or organic agriculture in general. In this section a number of sentiments related to organic products and production were read out and the consumer was required to either strongly agree or just agree or disagree or strongly disagree. There was also an option of 'uncertain' for those who were not sure.

The third part was an open-ended question that asked consumers to provide their WTP for organic coffee. Before giving out the WTP estimate, a definition of organic products/production was read out to participants to make sure they have the knowledge of the coffee to be valued. Two packets of coffee were then shown to the participants; one was conventional while the other was organic by assumption (this was done because Malawi does not grow organic coffee yet). The packaging was done in such a

way that all coffee attributes were held constant i.e. brand, quantity, taste, country of origin, etc., apart from type of production and price. Participants were then asked to assume they were in a grocery shop to make a coffee purchase. They were then asked to bid for the organic coffee through the 'bidding game' format of the CVM that the survey adopted. The bench mark price that was used in the bidding process was the *average market price for conventional coffee* in Malawi which was MK 652 per 250g. The average price was calculated using retail coffee prices collected from the Consumer Association of Malawi. The survey did not use the *actual price* paid for coffee on the domestic market as reported by the survey participants, as the bench mark price because there was a possibility that some of the coffee purchased could be organic though imported. The WTP question that was asked by participants during the bidding session was; "if the conventional coffee cost MK652 per 250 grams, how willing are you to pay for the organic coffee?" Consumers' preference for organic coffee was thus revealed through the calculated price premium for organic coffee (Expressed WTP for organic coffee minus average market price for conventional coffee (MK 652 per 250 g). If the price premium was positive (if a participant was willing to pay more than MK 652 for organic coffee), the implication was that he preferred organic to conventional and if the price premium for a participant was negative (he/she was willing to pay less than MK 652 for organic coffee), the implication was he preferred conventional coffee to organic. Consumers were also required to give out the reasons to back up their willingness to pay for the organic coffee. These reasons acted as their motivation for their preference for coffee. After giving out the reasons, the participating consumers

were asked to provide information of the actual price they pay for coffee on the domestic market.

The fourth category of the questionnaire had the CE questions whose details will be elaborated in the subsequent section of CE design. The last part had discrete questions aimed at capturing socio-demographic information of the participants. These included age, marital status, income, level of education, number of children under 18 years staying in their household, occupation (whether they work with an environmental related organisation) and denomination.

Lastly consumers were asked to choose an approach that would contribute towards the production of organic coffee in Malawi from the three approaches given (leaving every cost of production to producers, through government subsidies, or through consumer taxes), if one chose through taxes he/she was required to estimate the rate of tax he would desire to contribute.

### **Design of the CE**

As already highlighted, the fourth part of the questionnaire had questions of the CE. The survey had two types of questionnaires (Versions A and B), in which the order of the products in a choice set, and the order of the choice sets were different to avoid certain types of order effects. Each participant was required to answer one version of the questionnaires.

Design of the CE was based on the fractional factorial design in SAS to maximize the D-efficiency. In the choice experiment, each respondent was asked to choose between 'Organic Coffee' and 'Conventional Coffee' at corresponding price level. In addition, there was a third option for 'None' to cater for those who neither preferred any type of coffee. Due to the fact that organic products are relatively new to Malawian

consumers, Organic Coffee with lower price was not treated as one dominant choice. Therefore, the choice experiment included some sets of choice options with Organic Coffee having prices lower than Conventional Coffee counterpart. The final choice experiment composed of 13 sets of choice options with the D-efficiency of 63%. The lower D-efficiency resulted from the use of 7 level real coffee prices in the CE design. The prices used in the CE were prices for the major brands of coffee for the past four months (May to August 2009) in Malawi. Less price level may increase the D-efficiency of the CE design, but the real prices we used make the choice scenario facing respondents more realistic. In addition, the learning efforts of the respondents were reduced, which may be more important than small improvement in the statistical efficiency. In order to eliminate the potential order effect, the order of the Organic and Conventional Coffee were changed after reaching a certain choice set in the choice experiment. For instance, the order was changed after reaching the 7<sup>th</sup> choice set under Version A and it changed after the 6<sup>th</sup> choice set under Version B. Refer Figure 4-1 for an example of a choice set in the CE. An example of the combination and ordering of prices is as in Table 4-2.

Please choose a 250 grams packet of coffee as you are shopping in the market, or choose *None* option if you are not satisfied with both coffees.

	<b>Organic</b>	<b>Conventional</b>	
	<b>Coffee</b>	<b>Coffee</b>	<b>None</b>
Price	MK720/ 250 g	MK660/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 4-1. Choice set in choice experiment

Table 4-2. Price levels for coffee in MK/250 grams (Version B)

Organic coffee	Conventional coffee
795	729
795	720
729	795
729	485
720	699
720	660
Conventional coffee	Organic coffee
795	699
699	699
720	660
485	485
475	485
729	475
475	475

## CHAPTER 5 RESULTS OF THE EMPIRICAL ANALYSIS

This chapter presents empirical analyzes of our data. The presentation will be twofold; the first section will highlight results based on CVM and the second one will include those from the CE methodology. In each respective section, descriptive statistics will first be presented before results from the models.

It should be noted that amongst the 129 individuals that were interviewed in the survey, nobody refused to divulge any information that was required. As such, there were no incomplete questionnaires hence 100% response rate. This could be due to the use of face-to-face interviews that gave enough room for probing, clarification of questions, and others. One refusal was encountered but this was addressed by selecting the appropriate alternative household using the random sampling method that was employed under the study. As already explained under the section of data collection, the survey collected five categories of information from the respondents, the next section outlines descriptive statistics of our sample.

### **Descriptive Statistics**

This section gives out the major summary of descriptive statistics of the sample (Refer to Table 5-1 for details).

The survey interviewed a total of 129 participants in the three major cities of the country. About 31.78% of the respondents were from the city of Blantyre while Lilongwe and Mzuzu cities had the same percentage of about 34.11% of the sample.

Out of the 129 respondents, 31.78% were male, while the majority about 68.22%, were female. This could be attributed highly to the fact that the population distribution of Malawi is skewed towards women and secondly the interviews were conducted during

working hours when most men were at work. This is based on the fact that most women in developing countries are unemployed due to low levels of literacy when compared to men among other things.

Table 5-1. Summary for descriptive statistics

No.	Name of variable	Variable category	No. of participants	Percentage of sample
1.	Gender	Male	41	31.78%
		Female	88	68.22%
2.	Marital Status	Married	68	52.71%
		Divorced	11	8.53%
		Single	43	33.33%
		Other (divorced and widowed)	7	5.43%
3.	Children under 18 years old (multiple answer)	Under 2 years	28	21.71%
		2 to 5 years	42	32.56%
		6 to 12 years	56	43.41%
		13 to 18 years	82	63.57%
		None	24	18.6%
4.	Age	15 to 19 years	23	17.83
		20 to 24 years	24	18.6%
		25 to 29 years	20	15.5%
		30 to 34 years	19	14.73%
		35 to 39 years	10	7.75%
		40 to 44 years	10	7.75%
		45 to 49 years	4	3.1%
		50 to 54 years	7	5.43%
		55 to 59 years	6	4.65%
		60 to 64 years	4	3.1%
		65 years and older	2	1.55%

Table 5-1. Continued

No.	Name of variable	of Variable category	No. of participants	Percentage of sample
5.	Education	Completed post-graduate degree	2	1.55%
		Completed university undergraduate degree	3	2.33%
		Attended university undergraduate	3	2.33%
		Completed college degree	4	3.1%
		Completed college diploma	19	14.73%
		Attended some college	15	11.63%
		Some post secondary technical school	7	5.43%
		Completed high school certificate (e.g. MSCE)	29	22.48%
		Attended some high school (e.g. MSCE)	29	22.48%
		Completed elementary/primary school	11	8.53%
		Attended some elementary/primary school	7	5.43%

Table 5-1. Continued

No.	Name of variable	Variable category	No. of participants	Percentage of sample		
6.	Income	MK 15,000 and below	20	15.5%		
		MK16,000 to 66,000	MK 44	34.11%		
		MK67,000 to 117,000	19	14.73%		
		MK118,000 to 168,000	16	12.4%		
		MK169,000 to 219,000	6	4.65%		
		MK220,000 to 270,000	2	1.55%		
		MK271,000 to 321,000	MK 2	1.55%		
		MK322,000 to 423,000	2	1.55%		
		MK424,000 to 525,000	7	5.43%		
		MK526,000 and above	11	8.53%		
		7.	Occupation(if one works with an environmental related organization)	Yes	16	12.4%
				No	113	87.6%
		8.	Denomination	Presbyterians	47	36.43%
				Catholics	26	20.16%
Anglicans	2			1.55%		
Pentecostals	23			17.83%		
Seventh Day Adventist	14			10.85%		

Table 5-1. Continued

No.	Name of variable	of Variable category	No. of participants	Percentage of sample
		Muslims	3	2.33%
		Other denominations	14	10.85%
9.	City	Blantyre	41	31.78%
		Lilongwe	44	34.11%
		Mzuzu	44	34.11%
10.	Drink coffee	Yes	110	85.27%
		No	19	14.73%
11.	Frequency of coffee consumption	One cup a day	41	37.27%
		Two cups a day	49	44.55%
		Three to five cups a day	6	5.45%
		Six to ten cups	0	0%
		More than ten cups a day	0	0%
		Other	14	12.73%
12.	Drinking time (multiple)	Breakfast	100	90.9%
		Lunch	6	5.45%
		Dinner	9	8.18%
		In between meals	62	56.36%

As already alluded to, the survey targeted people of at least 18 years of age. According to our sample the age group that registered the largest number of respondents was the '20 to 24 years' representing 18.6% of the sample, then the '15 to 19 years,' '25 to 29 years', '30 to 34 years' representing 17.83%, 15.5% and 14.73%,

respectively of our sample. The 65 years and older age category registered the least number of respondents at about 1.55% of the sample.

In terms of education, our target group included individuals with at least an Elementary or Primary School qualification. According to our sample, the majority were individuals with the highest Secondary School qualification (M.S.C.E) and those who attended Secondary School but have Junior Certificates of Education qualification (J.C.E) both representing 22.48% of the total respondents. About 14.73% of the sample completed their College Diploma while 11.63% have College Certificates. The category of individuals with post graduate school qualification had the least number of respondents representing just 1.6% of the total sample.

We had 10 income categories in the survey with 'MK15, 000 (≈US\$100) and below' as the minimum and 'MK 525,000 (≈US\$3500) and above' as the maximum group of monthly net earnings. The income category with the highest number of respondents was the 'MK16,000 (≈US\$106.67) to MK66,000 (≈US\$440)' representing 34.11% of the sample followed by the minimum income group 'MK15,000 (≈US\$100) and below' representing 15.5% of our sample then the 'MK67,000 (≈US\$446.67) to MK117,000 (≈US\$780)' followed by the 'MK118,000 (≈US\$786.67) to MK168,000 (≈US\$1,120)' representing 14.73% and 12.4% of the total sample respectively. The 'MK271, 000 (≈US\$1,806) to MK 321,000 (≈US\$2,140)' and the 'MK 322,000 (≈US\$2,146.67) to MK 423,000 (≈US\$2,820)' had the least number of respondents both representing 1.55% of the total sample.

Malawi has a variety of denominations and quite a number of them were represented in our sample. The proportion of Presbyterians were the highest in all the

cities representing about 36.43% of the total sample followed by Catholics who represented 20.16% of the sample. The least were Anglicans with a representation of only 1.55% of the sample.

Based on the sample only 12.4% of the total respondents work with organisations dealing with organic farming, food safety and environmental related against 87.6% who are not associated with such type of organisations.

In terms of coffee consumption pattern which is very crucial in this study, the majority of the respondents drink coffee representing 85.27% of the total sample against only 14.73% who do not drink coffee at all. Of the majority, most people take two cups of coffee a day representing 44.55% of the coffee consumers and mostly at breakfast and in the evening. About 12.73% of the coffee consumers do not drink coffee often, just once in a while. No one in the sample takes more than five cups a day.

### **Willingness to Pay for Organic Coffee**

Based on the CVM, about 40% of the sample were willing to pay a high price premium for organic coffee against 57% that were not willing to pay high price premiums for organic coffee. About 3% were indifferent. (Refer to Figure 5-1). Based on our results, the 40% were willing to pay an average price of MK 816.75 per 250 g of organic coffee representing a price premium of MK164.75 per 250 g which indicates a 25% price premium over the average market price for conventional coffee of MK652 per 25g (Refer to Figure 5-2). On the other hand, the 40% reported that they actually paid an average price of MK539.87 per 250 g of coffee (either conventional or organic) found on the domestic market. This demonstrates that these consumers were willing to pay an extra MK 276.89 for 250 g of organic coffee representing a 51% price increase for organic coffee on top of the reported actual price for coffee. (Refer Table 5-2).

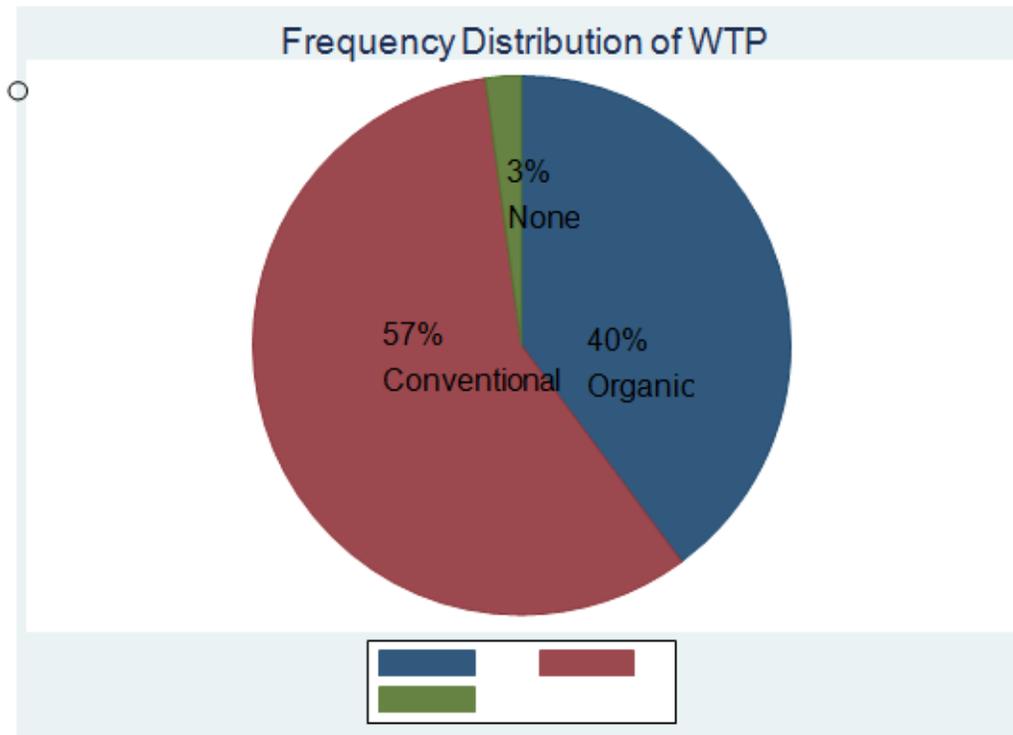


Figure 5-1. Frequency distribution of consumer WTP for organic coffee

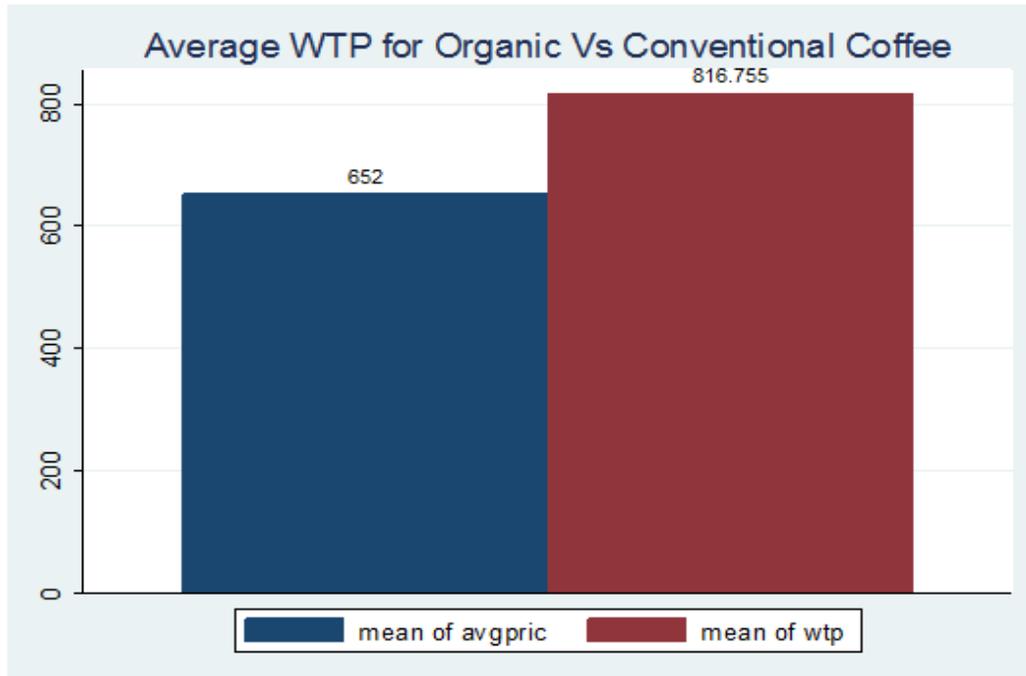


Figure 5-2. Average market price for conventional coffee and WTP for organic coffee

Table 5-2. Expressed price for organic versus actual price paid for coffee<sup>1</sup>

Description	Average price (MK/250g)	% Increase over reported actual price paid for coffee
Reported actual price paid for coffee <sup>2</sup>	539.87	0%
Expressed price for organic coffee	816.75	51%

Note: <sup>1</sup>The table is for the 40% of the sample

<sup>2</sup>Average price paid for coffee on domestic market as reported by survey respondents

However, taking into consideration every participant of the survey, our results show that there was no willingness to pay for organic coffee. According to Table 5-3 below, which summarizes results for all respondents (not just the 40% of the sample who were willing to pay high price premiums for organic coffee); individuals were willing to pay an average price of MK599.65 per 250 g of organic coffee. This price is below the average market price for conventional coffee by MK 52.34 per 250g. Regarding the average price paid for coffee on the domestic market as reported by survey respondents, participants actually paid an average price of MK483.56 per 250g of coffee.

Taking into consideration the total sample, our results also indicated that respondents were willing to pay an additional MK116.09 for 250 g of organic coffee on top of the reported actual price paid for coffee representing an extra 24% price increase over the reported price (MK 483.56 per 250 g). This is similar to the 40% of the sample who were also willing to pay an extra price for organic coffee on top of the actual price they pay for coffee signifying a relatively high value they attached to organic coffee.

Table 5-3. Expressed price for organic versus actual price paid for coffee

Description	Average price (MK/250g)	% Increase over reported actual price paid for coffee
Reported actual price paid for coffee	488.56	0%
Expressed price for organic coffee	599.65	24%

Note: These estimates are for total sample (including the 40%)

### **Motivation for the WTP for Organic Coffee**

The survey instrument used in the study also collected information that enabled us to distinguish the specific reasons that prompted respective consumers to value organic coffee with high price premiums as well as low price premium compared to the conventional coffee. These questions were multiple in natures in the sense that consumers were allowed to give out as many reasons as possible. According to Table 5-4 below, the major reason that motivated consumers to register high price premiums for organic coffee might be the health issues associated with organic products. This is most especially due to the fact that they are grown without the use of synthetic fertilisers and so have low content of chemical substances that are hazardous to one's health. About 33% of the respondents based their motivation on health related issues while 24% based it on the specific fact of low use of chemicals in organic production. These findings are similar to those by Rodriguez et al. (2006), Wikstrom (2003), Loureiro and Hine (2002), Didier and Lucie (2008), and Zanolli and Naspetti (2001). In these studies WTP and preferences for organic products were influenced to a significant extent by health related issues associated with organic products.

On the other side, the major reason for low WTP for organic coffee was mainly due to the fact that participants believed that organic production ought to be cheaper

than conventional production since it does not use inorganic fertilizers that are relatively expensive than organic manure. About 50% of the sample attributed their low willingness to pay to this reason (Refer Table 5-5).

Table 5-4. Percentage of the sample per motivation factor for positive WTP

Reason for positive WTP	Percentage of the sample
Avoid possible chemical substances	24%
It gives value for money	3.9%
To support local farmer	16.28%
Organic coffee has purer taste	9.3%
To protect environment	12.4%
It makes me different	0%
I feel better	3.1%
Health related reasons	33.3%

Table 5-5. Percentage of the sample per motivation factor for negative WTP

Factor for negative WTP	Percentage of the sample
I can not afford organic	10.9%
Factor for negative WTP	Percentage of the Sample
I do not know how it taste	0.78%
I do not care what type	0%
No need to change coffee habits	1.6%
Its cheap to produce	49.6%

### **Support towards Organic Coffee Production**

Information on some of the aspects that contribute to the high price premiums of organic coffee was shared at the end of the interview. One of the aspects is the certification process, which is relatively costly compared with other issues factored into the cost of production. Participants were then asked to choose the best approach they

felt could contribute towards the certification fee associated with organic coffee.

According to Table 5-6 below, about 75% of the sample felt that the contribution should be made through government subsidies in order to make it more accessible by many people, 14% chose to contribute through consumer taxes while 11% thought the whole cost should be left to the producers themselves. A significant proportion of the 11% pointed out that eventually the cost will still be transferred to the consumer through high price premiums so found the option of taxes to be similar to the one they chose and secondly they felt government should be relieved as it is already subsidising a number of industries (like the agricultural input subsidy programme).

Table 5-6. Support for certification of organic coffee production

Variable category	No. of participants	% of the sample
Cost to be left to producer alone	14	10.85%
Consumer taxes	18	13.95%
Government subsidies	97	75.19%

According to Figure 5-3, the 14 % of the participants were willing to support organic production through taxes of an average of 2%.

### **Empirical Analysis of Data from CVM**

The regression model that was run to estimate consumer WTP for organic coffee using the CVM methodology is Model 3-8 as specified in chapter 3. The process of how we arrived at this final model will not be explained in this section as it has already been well elaborated in chapter 3. However, it should be noted that not all variables described under the descriptive summary were included in the model. It should also be highlighted that some of the categories appearing in Table 5-1 above are not appearing in the regression model as they were compressed into lesser categorical levels mainly due to

the fact that frequency distribution was scanty across the categories and also to avoid having too many dummy variables in our model that could significantly reduce the degrees of freedom of the regression model. For instance in Table 5-1, 'age' variable has 11 categories that were compressed into 4 categories in OLS model; the 'education' variable had also 11 categories but these were compressed into 4 categories as well in the OLS model and lastly the 'income' variable had 10 categories and these were divided into three income categories in the regression model.

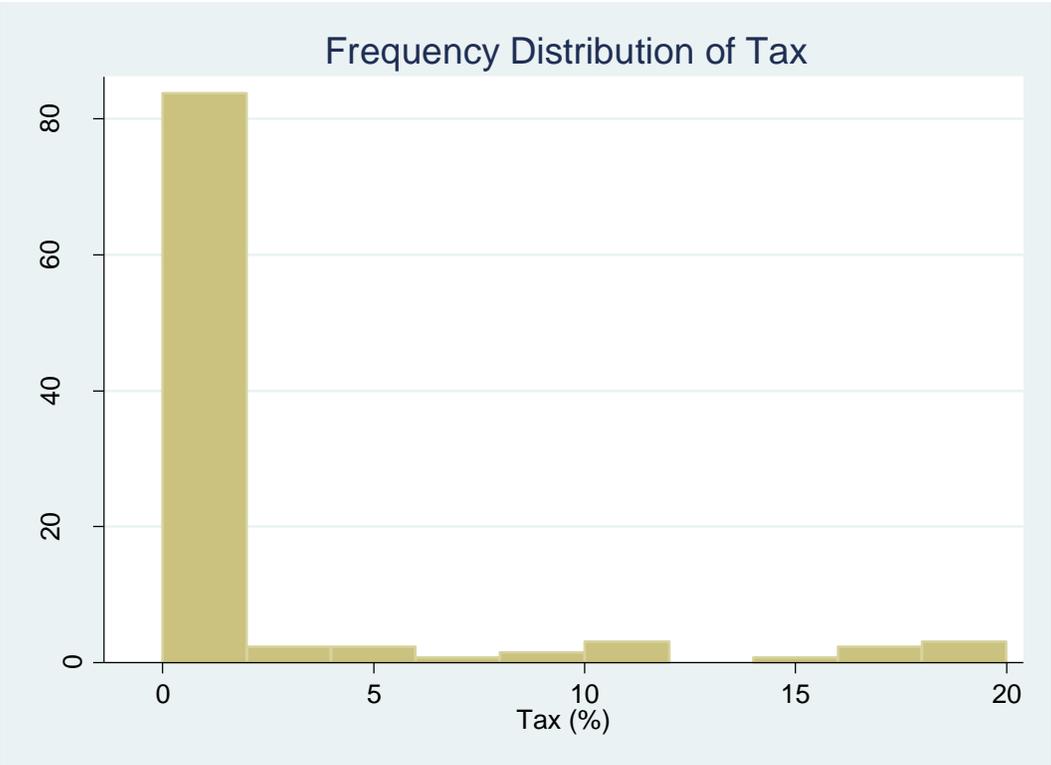


Figure 5-3. Frequency distribution of tax

Prior to model estimation, all 23 regressors were tested for collinearity. The variables were correlated with each other but no problem of multicollinearity existed. Most of the coefficients of correlation between the variables were below 0.5 and a few close to 0.7 such as dummy variables within the same group e.g. amongst the

education and denomination groups. In addition, the number of our variables is in such a way that ' $n > K + 1$ ' → '129 > 24.' This supports one of the Gauss Markov assumptions of no perfect collinearity; hence our model can be estimated by OLS (Wooldridge J.M, 2009, pg. 86).

The data that were collected in the current study is cross-sectional; as such it is likely to have the problem of heteroskedasticity. Since our sample size is large enough, we did not conduct a special test of heteroskedasticity. Instead, we reported heteroskedasticity robust standard errors to address the problem of heteroskedasticity. This is a convenient approach of addressing heteroskedasticity that data may be subjected to without even knowing its form (Wooldridge, 2009). Table 5-7 therefore represents the results of our estimated model. Based on Table 5-7, our  $R^2$  is 0.233, indicating that about 23.3% variation in the dependent variable can be explained by the regressors in the model. The F-Statistic is quite large and significant at 5% level. As such, it supports the  $R^2$  for the purposes of both prediction of our model and explanation of relationship between the independent variables (Marti, 2008). The significance of the F-Statistic implies that at least one of the variables in the model was able to explain our dependent variable (diffwtp).

As already stated in chapter 3, our model has 23 independent variables, these were expected to explain the dependent variable in our model. Out of these 23 variables which represent 13 original variables, four variables were statistically significant. These are: actpric (actual price for coffee), Dage\_d (60 years and older), Dincome\_c (high income of over MK322, 000 per month) and Orgnut (attitudinal value depicting as to

Table 5-7. Estimated OLS model

Name of variable	Coefficient of variable	Robust error	standard	T-statistics	P-values
Actpric	0.175	0.070		2.520	0.013**
Female	-58.851	47.331		-1.240	0.216
Dage_b	37.719	27.417		1.380	0.172
Dage_c	-2.765	45.123		-0.060	0.951
Dage_d	-122.108	57.782		-2.110	0.037 **
Deduc_b	-20.287	28.598		-0.710	0.480
Dedu_c	4.113	22.260		0.180	0.854
Deduc_d	-40.316	48.435		-0.830	0.407
Dincome_b	-34.326	28.729		-1.190	0.235
Dincome_c	132.082	53.063		2.490	0.014 **
Ddeno_pres	6.443	30.013		0.210	0.830
Ddeno_cath	28.021	42.828		0.650	0.514
Ddeno_angl	-129.288	87.474		-1.480	0.142
Ddeno_Pent	-1.026	38.221		0.030	0.979
Ddeno_Sev	-8.428	52.920		-0.160	0.874
DdenoIsl	53.916	64.213		0.840	0.403
Orgfert	13.198	17.651		0.750	0.456
Orgchm	3.595	17.160		0.210	0.834
Orgnat	11.126	25.816		0.430	0.667
Orgsup	-2.174	31.122		-0.070	0.944
Orgris	-11.106	22.436		-0.490	0.622
Orgnut	-32.309	18.633		-1.730	0.086 *
Orgtas	-0.744	20.411		-0.040	0.971
n = 129	F-Statistic = 1.830	** 5% * 10% significant levels		R <sup>2</sup> = 0.233	

whether an individual thinks organic products offer more of some nutrients than their conventional counterparts). This is in line with a number of studies that conclude that consumer demographic variables are key determining factors of WTP for organic products. These include studies by Peterson et al. (2008), Mabiso (2005) and others.

Our findings therefore support the second hypothesis of our study that consumer WTP for organic coffee is influenced by consumer socio-demographic variables.

Price (actpric) was significant at 5% level and had a positive sign although its coefficient was quite small. It means if price of conventional coffee paid by respondents increased by 100 units the consumer WTP for organic coffee would increase by MK17.51 per 250 g. A number of studies on WTP have also concluded that price is an important determining factor of WTP for organic product (Rodriguez et al. (2007); Wang and Sun (2003); Thomas (2009).

Age (60 years and older) was significant at 5% level of significance and it has a negative coefficient which is relatively large compared to that of price. An individual of 65 years of age or older would be likely to pay a price premium of MK 122.11 per 250 g of organic coffee less than an average individual. This could be attributed to the fact that organic production is a relatively new concept in Malawi and so individuals of this age group are not conversant with their benefits. It is so surprising because elder people are expected to be sensitive with the type of foods they eat as most of people falling in this age group are more prone to diseases like cancer than the average individual. Engel (2008) found that age influenced WTP for organic fruits positively, the 'younger and middle aged' were willing to pay high price premiums which is similar to our study. Peterson et al. (2008) and Loureiro and Hine (2002) concluded that age had a significant impact on WTP as well.

Dincome\_c (high income of over MK322, 000 per month) was highly significant at 5% level just like price. Income is positively impacting our dependent variable and has a high economic impact on the dependent variable evident by the largest coefficient

estimate as expected. If an individual belongs to the high income bracket, he is likely to pay a price premium of MK132.08 per 250 g of organic coffee more than an average individual. This supports the notion that organic products are normally demanded by people with high affluence (Willer and Yussefi, 2007). In a related development, a number of studies have come up with a similar conclusion. Peterson et al. (2008), Dong-Churl (2000), Werner et al. (2002) and Aulong et al. (2008) found that income had a significant effect on WTP for respective products under valuation in their studies. Nevertheless, Rodriguez et al (2007) reported that the relationship between income and WTP is very controversial.

Orgnut (whether an individual thinks organic products offer more of some nutrients than their conventional counterparts) is significant at 10% level assuming a negative value. It therefore means that the more an individual agrees that organic products offer more of some nutrients than their conventional counterparts, the more the individual is willing to pay high price premiums for organic coffee. For instance, if an individual increases his extent of agreement to this sentiment by one level (e.g. from just 'agree' to the higher level of 'strongly agree' the individual is likely to increase his WTP for organic coffee by MK 32.31 per 250 g of the coffee. This relationship was expected since out of experience an individual would attach a relatively high value to a product which is more nutritious than the one with low levels of nutrition. In his study of Rodriguez et al. (2006) concluded that consumers' perceptions on organic products were the key and better determinants of WTP for the products than the socio-demographic variables of the consumers. Our study therefore confirmed this although the other six attitudinal variables were insignificant.

Gender, Education, all denomination variables and six of the attitudinal variables (orgfert, orgchm, orgnat, orgsup, orgris and orgtas) were insignificant in our study. Likewise psychographic and socio-demographic variables of consumers did not have any significant influence on WTP for beef (Umberger et al. 2002). Rodriguez et al. (2007) even alluded to the fact that the relation between education and willingness to pay is also controversial just as with income. However, in his study, there was a significant positive relationship between lower levels of education and WTP for organic products. In addition, Peterson et al. (2008), Engel (2008), Zepeda and Li (2007) and others also reported that there were significant relationships between some of the demographic variables including gender and education in their respective research. Engel (2008) found that there was a significant positive relationship between being Christian and WTP for organic fruits, and religious affiliation was also one of the significant factors determining WTP in a study by Zepeda and Li (2007).

### **Empirical Analysis of Data from CE**

As already highlighted above, the survey conducted had 129 observations. In the Choice Experiments, an individual was asked to choose one option amongst the three options provided to him/her. He/she was supposed to choose either organic coffee, conventional coffee or the 'None' option. The experiment had 13 choice sets which meant that the process of choosing the preferred coffee was done 13 times. In the analysis conducted, each option in a set was turned into an independent observation thereby resulting into '3 x 13 = 39' observations per each participant. Eventually we had a total of 5028 observations in the choice experiment.

A test of collinearity was done amongst the independent variables (Organic, price and None) and the results showed that no variable was perfect collinear to each other.

## Descriptive Statistics

Based on Figure 5-4, about 54% of the participants expressed their preference for organic coffee, about 40% chose conventional coffee while only 6% were indifferent.

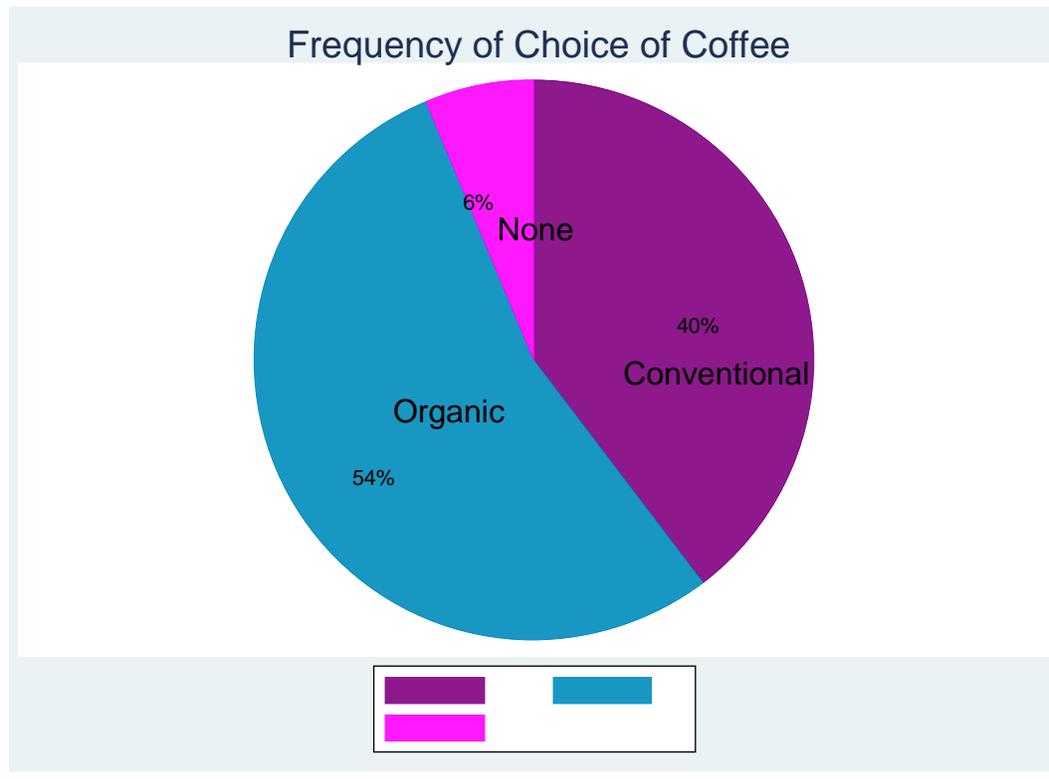


Figure 5-4. Frequency for choice of coffee

## Results from Conditional Logit Model

A Conditional Logistic Regression Model was used to analyze data collected from the CE. Below is a table of the estimated model:

Table 5-8. Estimates for conditional logistic model

Variable	Coefficient	Z-statistics	P-value
Organic	3.129	33.770	0.000 ***
Price	-0.004	-5.730	0.000 ***
None	-3.520	-7.410	0.000 ***
n=5028	LR=2533.950	P-value = 0.000	***1% significant level

The estimated model (Table 5-8) has a likelihood ratio of 2534, its P-value is very low (0.000) suggesting that the overall model is highly significant. It therefore implies that at least one of the independent variables used was able to influence our dependent variable (probability of choosing a type of coffee). All of our variables were statistically significant with very small P-Values ( $P < 0.000$ ).

Based on our model, the coefficient of 'Organic' was 3.13; this implies that holding the other independent variables constant, the log of odds in favour of the 'choice of organic coffee' against that for conventional coffee increased by 3.13. It therefore means that the likelihood for the choice of organic coffee was higher than that for conventional coffee. The variable had a coefficient which was larger than that of 'price.' This indicates that consumers based their coffee preferences more on the method of production of the coffee than the other attributes such as price. Similarly, in another study a certain segment of participants were more sensitive to labels (organic and fair-trade) than price and taste of the products bearing the labels (Didier and Lucie, 2008). In addition, Thomas (2009) found that the method of production among other variables was significant in influencing consumers' decision to buy organic oranges. To the contrary, Boxall et al. (2007) concluded that price and not the method of production was a significant determinant for increased probabilities that a consumer would purchase organic bread. Contrary to our findings, both price and the method of production were insignificant in influencing a participant's decision to buy organic carrots (Thomas, 2009).

On the other hand, the coefficient estimate for 'price' was about -0.004. Price is therefore the regressor with the smallest coefficient estimate among the three

regressors used in our model. This means that with a unit increase in the price for coffee, there was a decrease in the log of odds in favor of a consumer choice for a particular type of coffee of only 0.004, holding other regressors constant. Based on this, it is clear that 'price' did not have a large economic impact on consumer choice for coffee. The participants were thus less sensitive to price when they were making their respective choices for coffee. Our findings are both in support and in contradictory to a number of previous studies. Thomas (2009) concluded that price was insignificant in impacting consumers' preference over organic carrots, as already highlighted though it was significant in impacting consumers' preference for organic oranges. In addition, although price was significant, group 1 of participants were more sensitive to price and least to labels of the organic chocolates under valuation in a study by Didier. and Lucie (2008). Our findings point out that 'method of production' is more influential in affecting consumer choice for coffee than the 'price.'

Lastly, the coefficient for 'none' was -3.52; this is the largest compared with that of the other independent variables. Based on this, it means that the log of odds in favor of the option 'None' (that a consumer would not choose either of the two types of coffee) decreased by 3.52, holding other variables constant. This makes sense since only about 6% of the individuals opted for the 'None' option. Most participants chose organic while others chose conventional coffee.

Based on the analysis, an attempt was done to calculate the WTP for organic coffee as below:

$$WTP = \frac{a_1}{-b_1} \dots\dots\dots(5-1)$$

Where  $a_1$  is the coefficient for organic coffee, and

$b_1$  is the coefficient for price

$$WTP = \frac{3.129}{-0.004}$$

$$WTP = 782.25$$

Based on Equation 5-1, the WTP for organic coffee was MK782.25 per 250g which represents the price premium consumers were willing to pay for 250 g of organic coffee. It therefore means that consumers were willing to pay an average price of MK 1,434.25 per 250 g of organic coffee (MK 652 + 782.25) which represents over 100% price premium for organic coffee over the average market price for conventional coffee of MK 652 per 250 g of coffee.

Our results really show that a segment of consumers were indeed willing to pay high price premiums for organic coffee compared to conventional coffee. The preference for organic coffee was mainly made based on its type of production and to a lesser extent its price. This could probably be due to the consumers' perceived benefits related to organic production and its products. These findings therefore support our first hypothesis which states that 'because of the perceived benefits associated with product attributes such as method of production (e.g. organic production) consumers' WTP and preference for organic coffee is likely to be higher than that of conventional coffee.'

According to past research, it is very clear that product attributes impact the purchasing behavior of consumers differently. In our study, the method of production of coffee was more influential than price in influencing consumers' preference for coffee. Studies conducted by Didier and Lucie (2008) are in support of our results. Casadesus-Masanell et al (2009) also concluded that WTP for organic garments was registered by consumers regardless of other related costs (including price) associated with the

garments. However, consumer behaviour is not only influenced by product attributes; other key factors that influence consumer choice of products are consumer characteristics. In our study, these were only factored in the OLS regression that was run prior to the Conditional Logistic Model. However, some studies used Generalized Logit Models having both product attributes and consumer characteristics as factors influencing consumer behavior in purchasing a number of products. This could give out more realistic results as it would allow for interactions of the two types of regressors in influencing consumer behavior among other things.

### **Comparison of Results from CVM and CE**

Based on our findings, it is very clear that results from the two models used did not converge (Refer to Table 5-9) below. Based on the CVM, the total sample of the survey was not willing to pay high price premiums for organic coffee. Participants were willing to pay an average price of MK599.65 per 250g of organic coffee which is lower than the average market price for conventional coffee by MK52.35 per 250 g. However, the 40% were willing to pay high price premiums for organic coffee with an average price of MK816.75 per 250 g of organic coffee. This represented a price premium of MK164.75 for 250 g of organic coffee over the average market price of conventional coffee. On the other hand, according to CE, consumers were willing to pay an average price of MK 1,434.25 per 250 g of organic coffee representing a price premium of MK 782.25 per 250g of organic coffee which represents over 100% price premium over the average market price for conventional coffee.

The divergence of the results could be due to the obvious fact that the methodologies are different yielding two different results. However, convergence of results particularly for overall sample, would have given policy makers the confidence to

adopt the results and use them to make well informed decisions regarding organic coffee. Adoption of the results from the respective methodologies should therefore be treated with caution since at this stage it is tricky to conclude which ones could be close to the reality. This therefore calls for need to conduct a similar study using 'Revealed Preference Models' of eliciting WTP for products as these are commended for their reliability as compared to the 'Stated Preference Models.'

Table 5-9. Comparisons of WTP price premiums between CVM and CE

<u>Methodology</u>	<u>Type of coffee</u>	<u>WTP (MK per 250g)</u>
CVM <sup>a</sup>	Organic	(52.34)
CVM <sup>b</sup>	Organic	164.75
CE <sup>c</sup>	Organic	782.25

<sup>a</sup> Price premium for overall sample and is negative

<sup>b</sup> Price premium for 40% of sample who expressed high price premiums for organic coffee

<sup>c</sup> Price premium for overall sample

## CHAPTER 6 CONCLUSION

Our study analyzed consumer WTP for Malawi Organic Coffee. The study used two different methodologies of eliciting WTP which were both stated models. These include CVM and CE. Information from participants was collected using a survey targeting 129 participants. Data from CVM was analyzed using an OLS model while that from CE was analyzed using a Conditional Logistic Model.

Our results showed that there is WTP for organic coffee in Malawi. Based on CVM, about 40% of the participants were willing to pay a price premium of MK164.75 per 250 g of organic coffee. Nevertheless, when responses of all participants were considered, participants were not willing to pay high price premiums for organic coffee. They were willing to pay MK52.34 less per 250 g of organic coffee than the average market price for conventional coffee. Based on CE, participants were willing to pay a price premium of MK782.25 per 250 g of organic coffee. Many studies have indeed drawn similar results that certain segments of consumers have a WTP for organic products that is higher than their conventional counterparts. These include Rodriguez et al. (2007), Engel (2008), Wikstrom (2003), Casadesus-Masanell et al. (2009), Dong-Churl (2000), Werner et al. (2002) and Aulong et al. (2008), just to mention some. However, some studies have contradicting results. For instance, WTP was higher for fair trade products than organic products in studies by Didier and Lucie (2008), and Loureiro and Lotade (2005). Similarly, WTP for organic potatoes was not higher than that for local potatoes (Loureiro and Hine, 2002).

Results from the two models both confirm and contradict results from previous studies. For instance, out of the 23 independent variables in the OLS model, only four

were statistically significant. These are: actpric (actual price for coffee), Dage\_d (60 years and older), Dincome\_c (high income of over MK322, 000 per month) and Orgnut (attitudinal variable depicting whether participants think that organic products offer more of some nutrients than their conventional counterparts). This indeed confirms studies by Peterson et al. (2008) and Mabiso (2005) including many others that assert that consumer demographic variables are key determining factors of WTP for organic products although Rodriguez et al. (2006) concludes otherwise. In his study he reported that consumers' perceptions on organic products are better determinants of WTP than socio-demographic variables.

Gender, Education, all denomination variables and six of the attitudinal variables (Orgfert, orgchm, orgnat, orgsup, orgris and orgtas) were insignificant in our study. This is in line with Umberger et al. 2002 who concluded that psychographic and socio-demographic variables of consumers did not have any significant influence on WTP. Rodriguez et al. (2007) even alluded to the fact that relation between education and willingness to pay is also controversial.

According to the Conditional Logistic Model, 'organic', 'price' and 'none' were significant variables influencing the choice for coffee. Organic had a higher economic impact than price over the choice of coffee which implies that the choice for coffee was highly influenced by the type of production of coffee. This confirms previous studies by (Didier and Lucie , 2008) and Thomas (2009) that the method of production was more important in influencing consumer decision to buy organic products than the price attribute.

The major reason that motivated individuals to register higher price premiums for organic coffee than conventional coffee was health related issues. Most people (about 33%) believed that organic coffee is a healthy drink since its production does not use inorganic fertilizers.

In order to support organic production through contribution towards certification fee of the product, about 75% of the individuals opted for government subsidies, 14% opted to contribute through taxes of 2% on average while 11% chose to leave it all to the producer.

Based on our results, consumer choices of coffee are based on the method of production and to a lesser extent the price of coffee. Generally people feel that organic coffee is healthy compared to conventional coffee. Therefore, it is very likely that there exists a niche market for organic coffee in Malawi.

### **Study Limitations**

Overall, the study had a number of limitations that were brought about due to mainly resource constraints (budgetary and time). This resulted into challenges as follows:

First and foremost, the use of Stated Preference Models allowed for some hypothetical biases which could have been reduced if the Revealed Preference Models were used. Initially the study wanted to use Experimental Auctions as a method of data collection, which renders results that are more reliable than those from Stated Preference Models (e.g. CVM and CE). However, since this is so expensive to implement, we opted to use both the CVM and CE, which are relatively cheaper. The two models were used for purposes of convergent validity check of results.

Secondly, the study wanted to target over 300 participants but we only interviewed 129 people due to budget constraints since we were using face-to-face household surveys. A larger sample size is ideal in order to capture a number of participants with divergent characteristics to represent the population and hence improve the efficiency of the statistics used in making inferences.

Lastly, the study wanted to target the USA and EU markets since they form the largest market for organic products in the world. However, due to time constraint it was not possible to conduct the survey in the USA hence the current focus of targeting the domestic as a step forward towards targeting the international market.

### **Recommendations and Further Research**

The study recommends the following to be implemented in order to come up with more reliable results on WTP for organic coffee in Malawi and thereafter to promote organic production in Malawi.

A similar study should be conducted using Revealed Stated Preference Models (preferably Experimental Auctions). It should also consider using over 300 observations to make sure that all segments of consumers in Malawi are represented in the sample. This will ensure that the results are more reliable.

A similar study should also be conducted targeting the international market, preferable the USA and Europe since the two form the largest market for organic products in the world. It would thus be feasible to produce organic coffee targeting the international market in addition to the domestic market since the international market fetches higher piece premiums for organic products than the domestic market due to the fact that the international market has consumers that are affluent.

If the government decides to adopt production of organic coffee, there will be need for a coherent policy for organic production in Malawi. Within this broad policy framework, there will be need for a specific strategy for organic coffee production whereby responsibilities of the main actors in the industry will be spelt out. This includes the Government as a policy regulator, donors as financiers, producers, processors, marketers, just to mention a few. Proper strategies on transferring the technology to farmers need to be developed in the policy including proper strategies to support the production to ensure that the type of production is sustainable and is contributing significantly to economic growth of the agricultural sector in Malawi and the economy as a whole. Since organic products are generally more expensive than conventional ones, the Government should consider implementing subsidies in organic coffee production among others, to make sure that the products are accessible by many people at affordable price (Rodriquez et al. 2006).

APPENDIX A  
SURVEY INSTRUMENT (VERSION A)

***Assessing Consumer WTP for Malawi's Organic Coffee:  
Evidence from a Consumer Survey***

ID for Respondent .....

Name of Interviewer.....

Supervisor .....

Remarks by Supervisor .....

Date of Interview.....

***PART A: Consumption Pattern for Coffee: This part attempts to assess participants' consumption pattern of coffee.***

**1. Do you drink coffee?**

- (1) Yes
- (2) No

***(If no, skip to part b)***

**2. How often do you drink coffee?**

- (1) One cup a day
- (2) Two cups a day
- (3) Three to five cups a day
- (4) Six to ten cups
- (5) More than ten cups a day
- (8) Other (Specify).....

**3. When do you normally drink the coffee?  
*(Check all that apply)***

- (a) At Breakfast
- (b) At Lunch
- (c) At Dinner
- (d) In between meals

**Part B: Quiz on General Knowledge of Organic Coffee and Coffee in general**

The quiz is aimed at assessing consumers' perception over organic coffee as well as coffee in general. In order to assess the attitude, the options of the answers will be one of (Strongly Agree, Agree, Uncertain, Disagree, and Strongly Disagree)

**4. Coffee is the world's second most valuable "traded" commodity behind only petroleum.**

- (1) Strongly Agree
- (2) Agree
- (3) Uncertain
- (4) Disagree
- (5) Strongly Disagree

**5. Many coffee producing countries use highly toxic chemicals that have been banned or restricted in many countries (e.g. DDT).**

- (1) Strongly Agree
- (2) Agree
- (3) Uncertain
- (4) Disagree
- (5) Strongly Disagree

**6. Organic coffee is grown without the use of synthetic fertilizers.**

- (1) Strongly Agree
- (2) Agree
- (3) Uncertain
- (4) Disagree

(5) Strongly Disagree

**7. Organic coffee is grown without the use of any pesticides or chemicals.**

(1) Strongly Agree

(2) Agree

(3) Uncertain

(4) Disagree

(5) Strongly Disagree

**8. By buying organic products you as a consumer are supporting the natural and healthiest way to grow crops**

(1) Strongly Agree

(2) Agree

(3) Uncertain

(4) Disagree

(5) Strongly Disagree

**9. By buying organic coffee you are supporting the small holder farmer.**

(1) Strongly Agree

(2) Agree

(3) Uncertain

(4) Disagree

(5) Strongly Disagree

**10. By drinking organic coffee there is lower risk of ingesting synthetics or chemicals.**

(1) Strongly Agree

(2) Agree

(3) Uncertain

(4) Disagree

(5) Strongly Disagree

**11. Organically grown food may offer more of some nutrients than their conventionally produced counterparts.**

(1) Strongly Agree

(2) Agree

(3) Uncertain

(4) Disagree

(5) Strongly Disagree

**12. Organically grown food have better taste than their conventionally produced counterparts.**

(1) Strongly Agree

(2) Agree

(3) Uncertain

(4) Disagree

(5) Strongly Disagree

**13. Europe and North America form the largest market for organic products.**

(1) Strongly Agree

(2) Agree

- (3) Uncertain
- (4) Disagree
- (5) Strongly Disagree

**14. Malawi grows organic coffee which is also sold as an export crop.**

- (1) Strongly Agree
- (2) Agree
- (3) Uncertain
- (4) Disagree
- (5) Strongly Disagree

**Part C: Questions on WTP**

**Definition of Organic Coffee:**

Organic coffee is coffee that has been certified as having been grown without the use of inorganic fertilizers, synthetic pesticides, herbicides, or other chemicals. It can also refer to farms which incorporate **socially responsible** activities such as **recycling**, **composting**, **soil health** and environmental protections.

**15. The average price for Malawi conventional coffee is MK 652 per 250 g.**

**How much are you willing to pay for organic coffee per 250 g?**

.....

**16. If the WTP is positive, why would you be willing to pay more for it?  
(Check all that apply)**

- (a) To avoid possible chemical substances in my coffee
- (b) The organic coffee will give me the most value for the money
- (c) To support local farmers
- (d) Its got a purer taste
- (e) To help protect environment
- (f) It makes me different from people drinking conventional coffee
- (g) I feel better to drink organic coffee
- (h) Other, specify .....

17. If there's no WTP, what are the reasons:

*(Check all that apply)*

- (a) I would wish to pay more for Organic coffee but I can't afford it
- (b) I hesitate to choose organic coffee since I don't know how it tastes
- (c) I don't care whether the coffee I buy is organic or not
- (d) I see no reason to change my coffee habits
- (e) Other, specify.....

18. In your last purchase, how much did you pay for a 250 g of coffee?

.....

**Part D: Choice Experiments (CE)**

In this category, you are required to choose either 250 grams packet of organic coffee or conventional coffee as you are shopping in the market, or choose *None* option if you are not satisfied with both coffees. You will do this for 13 combinations.

Combination 1

	Conventional Coffee	Organic Coffee	None
Price	MK795/ 250 g	MK699/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 2

	Conventional Coffee	Organic Coffee	None
Price	MK699/ 250 g	MK699/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 3

	Conventional Coffee	Organic Coffee	None
Price	MK720/ 250 g	MK660/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 4

	<b>Conventional Coffee</b>	<b>Organic Coffee</b>	<b>None</b>
Price	MK485/ 250 g	MK485/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 5

	<b>Conventional Coffee</b>	<b>Organic Coffee</b>	<b>None</b>
Price	MK475/ 250 g	MK485/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 6

	<b>Conventional Coffee</b>	<b>Organic Coffee</b>	<b>None</b>
Price	MK729/ 250 g	MK475/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 7

	<b>Conventional Coffee</b>	<b>Organic Coffee</b>	<b>None</b>
Price	MK475/ 250 g	MK475/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 8

	<b>Organic Coffee</b>	<b>Conventional Coffee</b>	<b>None</b>
Price	MK 795/ 250 g	MK729/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 9

	<b>Organic Coffee</b>	<b>Conventional Coffee</b>	<b>None</b>
Price	MK720/ 250 g	MK660/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 10

	Organic Coffee	Conventional Coffee	None
Price	MK729/ 250 g	MK795/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 11

	Organic Coffee	Conventional Coffee	None
Price	MK720/ 250 g	MK699/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 12

	Organic Coffee	Conventional Coffee	None
Price	MK729/ 250 g	MK485/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 13

	Organic Coffee	Conventional Coffee	None
Price	MK795/ 250 g	MK720/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Part E: Questions on Socio-Demographics**

**31. Gender of the respondent:**

- (1) Male
- (2) Female

**32. What is your marital status?**

- (1) Married
- (2) Divorced
- (3) Single

(8) Other, Specify.....

**33.** Do you have children living in your household that fall into these age categories?  
***(Check all that apply)***

- (a) Under 2 years
- (b) 2 to 5 years
- (c) 6 to 12 years
- (d) 13 to 18 years
- (e) None

**34. How old are you?**

- (1) 15 to 19 years
- (2) 20 to 24 years
- (3) 25 to 29 years
- (4) 30 to 34 years
- (5) 35 to 39 years
- (6) 40 to 44 years
- (7) 45 to 49 years
- (8) 50 to 54 years
- (9) 55 to 59 years
- (10) 60 to 64 years
- (11) 65 years and older

**35. What's your highest level of education?**

- (1) Completed post-graduate degree (Masters or Ph.D)
- (2) Completed University Undergraduate Degree
- (3) Attended University Undergraduate
- (4) Completed College Degree
- (5) Completed College Diploma
- (6) Attended Some College
- (7) Some Post Secondary Technical School
- (8) Completed High School Certificate/Secondary School (e.g. MSCE)

- (9) Attended Some High School/Secondary School Certificate (e.g. MSCE)
- (10) Completed Elementary/Primary School
- (11) Attended Some Elementary/Primary school

**36. What is your net monthly total household income?**

- (1) MK15, 000 and below
- (2) MK16, 000 to MK66, 000
- (3) MK67, 000 to MK117, 000
- (4) MK118, 000 to MK168, 000
- (5) MK169, 000 to MK219, 000
- (6) MK220, 000 to MK270, 000
- (7) MK271, 000 to MK321, 000
- (8) MK372, 000 to MK423, 000
- (9) MK474, 000 to MK525, 000
- (10) MK526, 000 and above

**37. Do you work with an organization that deals with issues related to Organic farming, food safety and other environmental related issues?**

- (1) Yes
- (2) No

*(If No, go to 39)*

**38. Which Organization.....**

**39. You belong to which denomination?**

- (1) Presbyterian
- (2) Catholic
- (3) Anglican
- (4) Pentecostal
- (5) Seventh day Adventist
- (6) Islam
- (8) Other, specify.....

**40. In which city do you reside in?**

- (1) Blantyre
- (2) Lilongwe
- (3) Mzuzu

**41. Organic coffee may bring relatively high incomes to a farmer and the nation as a whole and thus likely be one of the alternatives for tobacco as a major foreign exchange earner for the country. However, the certification fee of organic coffee may be high. Who do you think should pay for the higher cost related to organic coffee certification?**

- (1) The producer as part of his/her cost of production
- (2) The Consumer through taxes
- (3) The Government through subsidies

**42. If answer is (2) in 41, how much tax would you be willing to pay in support of organic coffee certification?**

.....

APPENDIX B  
SURVEY INSTRUMENT (VERSION B)

***Assessing Consumer WTP for Malawi's Organic Coffee:  
Evidence from a Consumer Survey***

ID for Respondent .....

Name of Interviewer.....

Supervisor .....

Remarks by Supervisor .....

Date of Interview.....

***PART A: Consumption Pattern for Coffee: This part attempts to assess participants' consumption pattern of coffee.***

**1. Do you drink coffee?**

- (1) Yes
- (2) No

***(If no, skip to part b)***

**2. How often do you drink coffee?**

- (1) One cup a day
- (2) Two cups a day
- (3) Three to five cups a day
- (4) Six to ten cups
- (5) More than ten cups a day
- (8) Other (Specify).....

**3. When do you normally drink the coffee?**

***(Check all that apply)***

- (a) At Breakfast
- (b) At Lunch
- (c) At Dinner
- (d) In between meals

***Part B: Quiz on General Knowledge of Organic Coffee and Coffee in general***

The quiz is aimed at assessing consumers' perception over organic coffee as well as coffee in general. In order to assess the attitude, the options of the answers will be one of (Strongly Agree, Agree, Uncertain, Disagree, and Strongly Disagree)

**4. Coffee is the world's second most valuable "traded" commodity behind only petroleum.**

- (1) Strongly Agree
- (2) Agree
- (3) Uncertain
- (4) Disagree
- (5) Strongly Disagree

**5. Many coffee producing countries use highly toxic chemicals that have been banned or restricted in many countries (e.g. DDT).**

- (1) Strongly Agree
- (2) Agree

- (3) Uncertain
- (4) Disagree
- (5) Strongly Disagree

**6. Organic coffee is grown without the use of synthetic fertilizers.**

- (1) Strongly Agree
- (2) Agree
- (3) Uncertain
- (4) Disagree
- (5) Strongly Disagree

**7. Organic coffee is grown without the use of any pesticides or chemicals.**

- (1) Strongly Agree
- (2) Agree
- (3) Uncertain
- (4) Disagree
- (5) Strongly Disagree

**8. By buying organic products you as a consumer are supporting the natural and healthiest way to grow crops**

- (1) Strongly Agree
- (2) Agree
- (3) Uncertain
- (4) Disagree
- (5) Strongly Disagree

**9. By buying organic coffee you are supporting the small holder farmer.**

- (1) Strongly Agree
- (2) Agree
- (3) Uncertain
- (4) Disagree
- (5) Strongly Disagree

**10. By drinking organic coffee there is lower risk of ingesting synthetics or chemicals.**

- (1) Strongly Agree
- (2) Agree
- (3) Uncertain
- (4) Disagree
- (5) Strongly Disagree

**11. Organically grown food may offer more of some nutrients than their conventionally produced counterparts.**

(1) Strongly Agree

(2) Agree

(3) Uncertain

(4) Disagree

(5) Strongly Disagree

**12. Organically grown food have better taste than their conventionally produced counterparts.**

(1) Strongly Agree

(2) Agree

(3) Uncertain

(4) Disagree

(5) Strongly Disagree

**13. Europe and North America form the largest market for organic products.**

(1) Strongly Agree

(2) Agree

(3) Uncertain

(4) Disagree

(5) Strongly Disagree

**14. Malawi grows organic coffee which is also sold as an export crop.**

- (1) Strongly Agree
- (2) Agree
- (3) Uncertain
- (4) Disagree
- (5) Strongly Disagree

***Part C: Questions on WTP***

**Definition of Organic Coffee:**

Organic coffee is coffee that has been certified as having been grown without the use of inorganic fertilizers, synthetic pesticides, herbicides, or other chemicals. It can also refer to farms which incorporate [socially responsible](#) activities such as [recycling](#), [composting](#), [soil health](#) and environmental protections.

**15. The average price for Malawi conventional coffee is MK 652 per 250 g.**

**How much are you willing to pay for organic coffee per 250 g?**

.....

**16. If the WTP is positive, why would you be willing to pay more for it?  
(Check all that apply)**

- (a) To avoid possible chemical substances in my coffee
- (b) The organic coffee will give me the most value for the money
- (c) To support local farmers
- (d) Its got a purer taste
- (e) To help protect environment
- (f) It makes me different from people drinking conventional coffee

- (g) I feel better to drink organic coffee
- (h) Other, specify .....

**17. If there's no WTP, what are the reasons:**

*(Check all that apply)*

- (a) I would wish to pay more for Organic coffee but I can't afford it
- (b) I hesitate to choose organic coffee since I don't know how it tastes
- (c) I don't care whether the coffee I buy is organic or not
- (d) I see no reason to change my coffee habits
- (e) Other, specify.....

**18. In your last purchase, how much did you pay for a 250 g of coffee?**

.....

**Part D: Choice Experiments (CE)**

In this category, you are required to choose either 250 grams packet of organic coffee or conventional coffee as you are shopping in the market, or choose *None* option if you are not satisfied with both coffees. You will do this for 13 combinations.

Combination 1

	Organic Coffee	Conventional Coffee	None
Price	MK 795/ 250 g	MK729/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 2

	Organic Coffee	Conventional Coffee	None
Price	MK795/ 250 g	MK720/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 3

	Organic Coffee	Conventional Coffee	None

Price	MK729/ 250 g	MK795/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 4

	<b>Organic Coffee</b>	<b>Conventional Coffee</b>	<b>None</b>
Price	MK729/ 250 g	MK485/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 5

	<b>Organic Coffee</b>	<b>Conventional Coffee</b>	<b>None</b>
Price	MK720/ 250 g	MK699/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 6

	<b>Organic Coffee</b>	<b>Conventional Coffee</b>	<b>None</b>
Price	MK720/ 250 g	MK660/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 7

	<b>Conventional Coffee</b>	<b>Organic Coffee</b>	<b>None</b>
Price	MK795/ 250 g	MK699/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 8

	<b>Conventional Coffee</b>	<b>Organic Coffee</b>	<b>None</b>
Price	MK699/ 250 g	MK699/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 9

	<b>Conventional Coffee</b>	<b>Organic Coffee</b>	<b>None</b>
--	----------------------------	-----------------------	-------------

Price	MK720/ 250 g	MK660/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 10

	<b>Conventional Coffee</b>	<b>Organic Coffee</b>	<b>None</b>
Price	MK485/ 250 g	MK485/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 11

	<b>Conventional Coffee</b>	<b>Organic Coffee</b>	<b>None</b>
Price	MK475/ 250 g	MK485/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 12

	<b>Conventional Coffee</b>	<b>Organic Coffee</b>	<b>None</b>
Price	MK729/ 250 g	MK475/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination 13

	<b>Conventional Coffee</b>	<b>Organic Coffee</b>	<b>None</b>
Price	MK475/ 250 g	MK475/250 g	
I Choose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Part E: Questions on Socio-Demographics**

**31. Gender of the respondent:**

- (1) Male
- (2) Female

**32. What is your marital status?**

- (1) Married
- (2) Divorced
- (3) Single
- (8) Other, Specify.....

**33. Do you have children living in your household that fall into these age categories?  
(Check all that apply)**

- (a) Under 2 years
- (b) 2 to 5 years
- (c) 6 to 12 years
- (d) 13 to 18 years
- (e) None

**34. How old are you?**

- (1) 15 to 19 years
- (2) 20 to 24 years
- (3) 25 to 29 years
- (4) 30 to 34 years
- (5) 35 to 39 years
- (6) 40 to 44 years
- (7) 45 to 49 years
- (8) 50 to 54 years
- (9) 55 to 59 years
- (10) 60 to 64 years
- (11) 65 years and older

**35. What's your highest level of education?**

- (1) Completed post-graduate degree (Masters or Ph.D)
- (2) Completed University Undergraduate Degree

- (3) Attended University Undergraduate
- (4) Completed College Degree
- (5) Completed College Diploma
- (6) Attended Some College
- (7) Some Post Secondary Technical School
- (8) Completed High School Certificate/Secondary School (e.g. MSCE)
- (9) Attended Some High School/Secondary School Certificate (e.g. MSCE)
- (10) Completed Elementary/Primary School
- (11) Attended Some Elementary/Primary school

**36. What is your net monthly total household income?**

- (1) MK15, 000 and below
- (2) MK16, 000 to MK66, 000
- (3) MK67, 000 to MK117, 000
- (4) MK118, 000 to MK168, 000
- (5) MK169, 000 to MK219, 000
- (6) MK220, 000 to MK270, 000
- (7) MK271, 000 to MK321, 000
- (8) MK372, 000 to MK423, 000
- (9) MK474, 000 to MK525, 000
- (10) MK526, 000 and above

**37. Do you work with an organization that deals with issues related to Organic farming, food safety and other environmental related issues?**

- (1) Yes
- (2) No

*(If No, go to 39)*

**38. Which Organization.....**

**39. You belong to which denomination?**

- (1) Presbyterian

- (2) Catholic
- (3) Anglican
- (4) Pentecostal
- (5) Seventh day Adventist
- (6) Islam
- (8) Other, specify.....

**40. In which city do you reside in?**

- (1) Blantyre
- (2) Lilongwe
- (3) Mzuzu

**41. Organic coffee may bring relatively high incomes to a farmer and the nation as a whole and thus likely be one of the alternatives for tobacco as a major foreign exchange earner for the country. However, the certification fee of organic coffee may be high. Who do you think should pay for the higher cost related to organic coffee certification?**

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**42. If answer is (2) in 41, how much tax would you be willing to pay in support of organic coffee certification?**

.....

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## BIOGRAPHICAL SKETCH

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