

# Factors Affecting Mobile Phone Purchase in the Greater Accra Region of Ghana: A Binary Logit Model Approach

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## Abstract

This paper investigated the factors affecting mobile phone purchase decision in the Greater Accra Region of Ghana, using a binary logit regression model approach. Through a multiple-stage random sampling technique, structured questionnaire was used to collect primary data from 200 mobile phone users in four districts in the study area. Results of the descriptive statistic show that Nokia and Samsung phones were the two main brands of phones used by majority of the respondents interviewed. In addition, of the 54 percent of respondents who expressed their intention to acquire new phones majority were male, between the ages of 21-30 years and has tertiary level of education. The result of the binary logit regression model revealed that advanced technology features such as internet browsing and durability or quality of mobile phone handsets are the two main factors that are likely to positively and significantly affect mobile phone purchase decision. It is therefore recommended that manufacturers and marketers of mobile phone handsets should produce and market more durable and high quality mobile phone handsets with modern technology features that are targeted at the educated youth.

**Keywords:** mobile phone, purchase, binary, logit, model, Greater Accra, Ghana

## 1. Introduction

Ghana liberalized its telecommunication sector in the early 1990s to provide consumers with better, new and less costly telecom services (Nyarko & Quartey, 2009). This was done through the introduction of a five-year Accelerated Development Programme (ADP) in 1994, with the objective of increasing telephone coverage in the country, by allowing private participation in all sectors of the telecom industry (Frimpong, 2007). As a result of this development, the telecom sector in Ghana experienced tremendous growth and has contributed significantly to the growth of the country over the past two decades. The number of telecom service operators licensed to operate in Ghana has increased from two in the 1990s to six by 2010 and are providing a wide range of services to their subscribers (National Communications Authority, 2011). According to the National Communications Authority (NCA), the sector regulator, the telecom market experienced a growth of 10.8 percent in 2010 and achieved a penetration rate of 73.8 percent, with mobile telephone accounting for 97.97 percent of total access lines of about 16,651,168 (ISSER, 2011). It is also estimated that in 2010, the telecommunication sector contributed 2 percent to Ghana's Gross Domestic Product (GDP) and generated about 10 percent of government's total revenue. Besides, mobile operators and certified mobile phone dealers in Ghana employ over 6,000 full time workers and over 1.5 million people, whose employment relates to the industry, through retailing of telecom accessories and scratch cards (Teppeh, 2011). The opportunities that exist in the telecom market in enhancing Ghana's economic growth seem endless. Indeed, the growing demand for mobile telephony services in Ghana has resulted in the creation of a wide mobile phone handset market. Marketing of mobile handsets has therefore taken a vibrant upturn, with new sophisticated handsets being introduced every now and then.

Mobile phones are one of the modern telecommunication technologies that have emerged over the past decades to facilitate communication among people within and across countries. It has become a key communication tool and an essential part of everyday lives in the world today (Chisenga, Entua-Mensah, & Sam, 2007). The office cleaner, through the market woman, auto mechanic to the businessman and the Chief Executive Officer of both private and public institutions in Ghana, use mobile phones in their day-to-day activities. Mobile phones are not only used for making calls, but among other functions, for text-messages as well as for internet browsing. The proliferation of mobile telephony has helped to streamlined business processes, reduced cost and increased the

productivity of workers, including those in the informal sector who contributes the bulk of the national workforce (Teppeh, 2011). Ghanaians are therefore craving to own mobile handsets with multiple functions, ranging from making calls to entertainment features such as music player, multimedia messaging and internet browsing. Manufacturers and marketers of mobile phone handsets are producing and marketing various brands and specifications of mobile handsets, targeted at different segments of user communities (NCA, 2009).

Although Ghana can boast of only one mobile phone manufacturer, Rlg Communications Limited, there are several brands and sizes of mobile phone handsets with different ranges of prices on the Ghanaian market. It is therefore important that with the growing market demand for mobile phone handsets in Ghana, manufacturers and marketers understand the future purchase behavior of consumers in order to produce and market mobile phone handsets that meet consumers' taste for profitability.

Despite the fact that mobile phone handsets have become a fundamental and an integral part of personal communication across the world during the last decade, consumer research has devoted little attention to understanding the factors that influence the choice of mobile phone buying decision (Karjaluoto et al., 2005). Moreover, studies that have attempted to examine mobile phone purchase decision used less rigorous analytical approaches (Pakola, Pietilä, Svento, & Karjaluoto, 2007; Malasi, 2012). In Ghana, studies have focused on the choice of mobile network providers (Bassey, Aboagye-Asamoah, Nsiah-Ababio, Sarpong, & Obeng-Tuffoh, 2011) but not mobile phone purchase decision. To the best of the author's knowledge, studies that use rigorous analytical techniques such as the logit regression model to examine mobile phone purchase decision in Ghana are limited (Aidoo & Nyamedor, 2008). This raises the main research question: what are the factors affecting mobile phone purchase decision in Ghana? Indeed, examining consumer purchase decision of mobile phones in Ghana is relevant at ensuring that mobile handsets are produced and marketed to meet the taste of consumers. The main objective of this paper is therefore to investigate the factors affecting mobile phone purchase decision in the Greater Accra Region of Ghana, using the binary logit regression model. The paper further seeks to identify and rank the challenges facing mobile phone users in the Greater Accra Region of Ghana. This study is relevant in a number of ways. First of all, a better understanding of future purchases of mobile phone handsets in Ghana will enable manufacturers and marketers to develop a better and more effective marketing strategy for their products. Besides, it will also help mobile handset manufacturers and marketers to recognize the potential attribute positioning errors, if any, in the mobile phone market in Ghana. Finally, the study will help to identify the main challenges facing mobile phone users for appropriate recommendations to be made to address them.

The rest of the paper is presented as follows. The next section presents a review of literature on consumer purchase behavior as well as empirical literature on factors affecting mobile phone purchase decision across the world and in Ghana. This is followed by the section on the materials and method used for the study. It includes a description of the study area, data collection and the analytical technique employed to analyze the data. This is then followed by the section on discussion of the results. The paper ends with conclusions and recommendations to manufacturers, marketers as well as telecom service providers in Ghana.

## **2. Literature Review**

### *2.1 Consumer Purchase Behavior*

The concept of consumer behavior in the marketing of products is very critical in the survival and profitability of any business. Studies on consumer behavior regard consumers as key determinants of organizational success and it has been found that the most successful organizations are those that are customer-centered (Blackwell, Miniard, & Engel, 2006). By definition, consumer behavior is "the decision process and physical activity individuals engage in when evaluating, acquiring, using or disposing of goods and services (Loudon & Bitu, 1994). According to Schiffman and Kanuk (2000), consumer behaviour is about how people make their decisions on personal or household products, with the use of their available resources such as time, money and effort. Gabbort and Hogg (1998) and Blackwell et al. (2006) on the other hand defined consumer behavior as the activities and processes in which individuals or groups choose, buy, use or dispose products, services, ideas or experiences. One importance of this concept is that, since companies deal with consumers who vary in nature, understanding their behaviors help a company to identify what is important to the consumer and suggests the important influences on their decision-making process. This enables producers to provide products and services that meet the needs of their target market. It can also influence the commercial health of an industry in the sense that, it provides a clue for which industry to survive, companies to succeed and also which products to excel (Blackwell et al., 2006). Moreover, by understanding the reasons for which consumers buy a product and their buying habits, firms can make use of such information to devise corresponding marketing strategies in response to consumers'

needs (Blackwell et al., 2006). This allows for tailor-made products and services to be made by companies to enhance customer value and thus facilitate repeat purchase (Gabbott & Hogg, 1998).

Several models have been developed to explain consumer purchasing behaviour. Although these models vary in form of presentation, most of them are composed of stages (Rayport & Jaworski, 2003; Blackwell et al., 2006). Engel, Blackwell, and Miniard (1990) have proposed a model which views consumers' purchase as a process that goes through a five step problem solving process. Similarly, Arnould, Price, and Zinkhan (2004) have also proposed the circle of consumption that recognizes purchasing process as a loop, comprising acquisition of goods and services, consumption as well as disposal of used goods. However, depending on the purchase decision faced by the consumer, each of the process is carried out. Producers need to realize that depending on the circumstances surrounding the purchase, the importance of each step may vary. As far as consumer decision making process is concerned, consumers need to go through seven steps before reaching their final decision. These steps are Need recognition, Information search, pre-purchase, evaluation, purchase, consumption and Post-purchase evaluation and divestment (Blackwell et al., 2006). They argued that most consumer research would primarily be based on these seven stages, regardless of the different terms and consolidation of stages.

The first and crucial stage of consumer decision-making process is the need recognition, when the consumer recognizes a problem or need or responds to a marketing stimulus. After the need recognition, the consumer searches for more useful information about various alternatives in order to satisfy his or her need. The stage of information search can be internal and external. Internal search is the process of recalling information from consumer's knowledge or previous experiences with a product or services. External on the other hand is the information from outside the environment such as family, friends or e-mail. After getting the information of alternative products or services, the consumer then compares among alternatives to be able to decide on the one that fulfils his needs. In this stage, consumers pay particular attention to the attributes which are most relevant to their needs (Kolter, Wong, Saunders, & Armstrong, 2005). The consumer commonly use attributes such as quantity, size, quality and price to judge a brand. During the evaluation process, the consumer selects the product or service which initiates the decision-making process. After the evaluation stage, the consumer then decides to purchase the product. This is followed by stages five, six and seven put under the post-purchase stage. The consumer begins consuming the product in stage five whereas in stage six, consumers evaluate the consumption process. This gives rise to satisfaction when consumers' expectations are higher than the perceived performance and vice versa (Blackwell et al., 2006). In the last stage, the satisfaction or dissatisfaction with the purchase made will then influence the consumer's decision process for the next similar purchase.

However, in the case of the classical problem solving buying process behavior, it is almost always the case that consumers go for information search before taking purchase decision. And it is also common in such behavior that consumers' decision practice is directed by previously made likings for some specific alternatives. It therefore shows that customers are expected to formulate their selection decision that they conducted rather than a detailed evaluation of all the possible alternatives (Moorthy, Ratchford, & Talukdar, 1997). Larcoche, Papadopoulos, Heslop, and Bergeron (2003) opined that along with information search, evaluation of alternatives is an important activity that determines consumer's choice, often influenced by his perceived values based on his past experiences. A buyer therefore automatically eliminates a brand that does not meet his set principles. Based on the models proposed by Blackwell et al., (2006) and other related models (Engel, et al., 1985), the purchase decision for a new mobile phone handset by a consumer follows the same buying process, but in some instances it may also be affected by symbolic preferences linked to some brands.

## *2.2 Factors Affecting Purchase Decision of Mobile Phone*

Review of literature shows that a number of factors influence consumer choice of mobile phones across the world. Karjaluoto et al. (2005) explored consumers' choice criteria in mobile phone markets in Finland, focusing on factors that influence intention to acquire new mobile phones on one hand and factors that influence mobile phone change on the other. With the use of a series of focus group interviews with 79 graduate students in one study, followed by another survey of 196 respondents, the authors found that although the choice of a mobile phone is a subjective choice situation, there are some general factors that seem to guide the choices. The studies classified the factors into seven categories: innovative services, multimedia, design, brand and basic properties, outside influence, price and reliability. The authors found that factor innovative services and factor multimedia were the most important factors that affect mobile phone choice. The authors also found from the two studies that while technical problems were the basic reason to change mobile phone among students; price, brand, interface, and properties were the most influential factors affecting the actual choice between brands.

Pakola et al. (2007) also investigated consumer behaviour in mobile phone markets in Finland. The authors surveyed 397 consumer purchasing motives and revealed that consumers' choice of purchasing mobile phone was mostly affected by price. The authors again found that price was regarded as the most important motives affecting the decision to purchase current mobile phone model for consumers in Finland. According to the authors, price might have dominated the decision making in the sample more than it does for the whole population, as the average net income in the target groups was relatively low. Although price was found to be an important variable affecting consumer choice, audibility was practically speaking of equal importance.

Aidoo and Nyamedor (2008) examined the factors that determine choice of mobile phone brand among residents of Kumasi metropolis in Ghana. A questionnaire was used to collect data from 300 respondents in Kumasi. The chi-square and factor analysis, were the main statistical tools used for the analysis. Also, a combination of statistical software (SPSS and Minitab) was used for the analysis. The authors found that 76 percent of the respondents owned mobile phone and also most people did not use mobile phone because of its high cost. The analysis also revealed that the most used mobile phone was Nokia and the affordable mobile phone price ranges from GH¢50.00–GH¢100.00. It was also revealed that brand of mobile phone used by the consumer is associated with educational level attainment and occupational status of the consumer. Two factors were obtained as being the number of factors underlying choice of brand of mobile phone. The first most important factor was reliable quality of the mobile phone brand and the other was user-friendliness of the brand of the mobile phone.

Singla and Bansal (2010) identified and compared key attributes that influence mobile phone purchasing between Sangrur and Ludhiana consumers in India. The samples were collected from 795 consumers from Ludhiana and Sangrur Districts. According to the authors, mobile phone users wanted their handsets to be loaded with multiple functions, entertainment being the most important among them. They wanted their mobile phones to be fully loaded with top end features, but at the same time they wanted all these at affordable costs.

Mokhlis and Yaakop (2012) also studied the importance of different choice criteria in mobile phone selection among Malaysian consumers. A quantitative analysis drawing data from 376 university students was employed and analyzed using SPSS. Descriptive statistics, factor analysis, and Friedman test were employed in the study. The principal components factor analysis resulted in seven independent dimensions: innovative features, image, price, personal recommendation, durability and portable aspects, media influence, and post-sales service. According to the authors, the top three most important factors influencing consumer choice of mobile phone handsets were: innovative features, recommendation and price. The authors recommended that the promotion of new mobile phone models should go beyond highlighting properties to highlighting what users can do with all the technical features.

Saif, Razaq, Amad, and Gul (2012) discuss the factors that affect/motivate Pakistani consumers in their mobile phone choice decision. A sample of 100 people was taken by using the sampling method of Convenience Sampling (or Accidental Sampling). Through the use of questionnaire in registering consumers' perception, four important factors (price, size/shape, new technology features and brand name) were selected and analyzed. The study shows that consumer's value new technology features as the most important variable amongst all and it also acts as a motivational force that influences them to go for a new handset purchase decision. The authors also found that when selecting between different mobile phone handsets, consumers prefer well known brands instead of non familiar brands or Chinese handsets. The study further shows that price does affect consumers' choice for a mobile phone but becomes less important of a factor as consumers move from low monthly income to higher income earning consumers. Consumers in Pakistan are well aware of the new technology trends in the mobile phone industry. The study also revealed that male respondents were more interested in the new technological developments in the mobile phone industry as compared to female respondents.

Malasi (2012) examined the influence of product attributes on mobile phone preference among undergraduate university students in Kenya, using a descriptive research design. A stratified random sampling method was used to select the elements of the population. Data was collected through the administration of questionnaires and analyzed using the SPSS software. The author indicated that varying the product attributes' has an influence on the undergraduate students' preferences on mobile phones. Various aspects of product and brand attributes such as colour themes, visible name labels, and mobile phone with variety of models, packaging for safety, degree of awareness on safety issues, look and design of the phone were considered. Findings indicated that these attributes have a significant influence on the student's preference of mobile phone. Although, most of the respondents would not consider these attributes to be important when making the decision of which mobile phone to purchase. The author concluded that students were at position to differentiate between the mobile phone offerings hence they decide which best suits their needs using the attributes.

Khan and Rohi (2013) determined all those factors which affect the youth's brand choice for purpose of mobile phones. Data for the study was collected from the private university students of City University and Sarhad University, Peshawar. The study used a self-administered questionnaire, which was distributed randomly among 110 students, to measure their brand choice criteria. The responses were measured by using descriptive statistics, regression and coefficient analysis. The authors found that quality, brand image and recommendations by family and friends were the key variables that influence the brand choice of youths for mobile handset purchase in Peshawar Pakistan. The authors recommended that marketers should consider and prioritize these three main factors, especially when targeting the younger consumers. According to the authors, other variables that have a positive significant relation to brand choice should also be focused on.

It is clear from the review of empirical literature on factors affecting mobile phone purchase across the world that mobile phone brand, price, quality, design and special features are the main factors that affect mobile phone purchasing decision of consumers. This paper therefore analyzes the extent to which these factors affect mobile phone purchase decision in the Greater Accra Region of Ghana, using the binary logistic regression model.

### 3. Materials and Method of Analysis

#### 3.1 Study Area

The study was carried out in the Greater Accra Region, located in the coastal belt of Ghana and lies between longitudes  $1^{\circ} 8' E - 0^{\circ} 30' W$  and latitude  $5^{\circ} 70' - 6^{\circ} 8' N$  of the equator. The region shares borders with Volta Region to the east, Eastern Region to the north and Central Region to the west. It is the smallest region among the 10 regions in the country, with a total land size of 3.24 thousand square kilometers (1.4 percent of the country's total land area) and a population of about 2.9 million. The Greater Accra Region houses the capital city, Accra as well as the head offices of Government's Ministries, Departments and Agencies. Commercial activities are concentrated in this region. The Greater Accra region was purposively selected for the study because it is the seat of government and the hub of business and commercial activities.

#### 3.2 Data Collection

A multistage random sampling technique was used to select the sample size for the study. In the first stage, four (4) districts (Accra Metropolitan Assembly, Tema Metropolitan Assembly, GA East and GA West District Assemblies) were purposively selected. These are districts with a high concentration of commercial activities. In the second stage, two (2) towns from each district were then selected from the four districts to obtain a total of eight (8) towns. Finally, simple random sampling method was then applied to randomly select 25 mobile phone users from each of the eight towns to obtain a total of 200 mobile phone users in the study area.

Structured questionnaire was used to collect primary data on respondents' demographic characteristics, factors affecting phone purchase and challenges facing respondents using their phones from 200 mobile phone users.

#### 3.3 Analytical Framework

##### 3.3.1 Theoretical Framework: The Binary Logit Model

Consumer decision making process for a product is usually guided by already formed preferences for a particular alternative (Moorthy et al., 1997). A consumer's choice for a product, which is a bundle of attributes, is based on maximizing satisfaction subject to his budget constraints. This choice depends on whether the consumer is satisfied or dissatisfied with the product purchased. Therefore, a consumer may either purchase or not purchase a product, resulting in two mutually exclusive alternatives. The framework for estimating phenomena in which the dependent variable is binary has its roots in threshold theory of decision making. According to this theory, decision is taken only after the strength of a stimulus increases beyond the individual's reaction threshold (Hill and Kau, 1981). Thus, once a mobile phone consumer faces a choice, he has a reaction threshold which yields a binary dependent variable  $y_i$  that takes on the value of zero (0) if the consumer does not have the intention to re-purchase similar mobile phone and one (1) if he has the intention to re-purchase similar phone handset, and influenced by several factors  $x_i$ . The probability of observing the 1 is given as:

$$P_i \left( y_i = \frac{1}{x_i \beta_i} \right) = F(-x_i \beta_i) \quad (1)$$

Where  $F$  is a continuous cumulative distribution function, strictly increasing function that takes a real value and returns, a value which ranges from 0 and 1. The probability of observing the zeros is also given as:

$$P_i \left( y_i - \frac{0}{x_i \beta_i} \right) = 1 - F(-x_i \beta_i) \quad (2)$$

Given such specification, a maximum likelihood estimate is used to estimate the parameters of the model. The dependent variable is unobserved latent variable that is linearly related to  $y_i$  by the equation:

$$y_i = \beta_i x_i + u_i \quad (3)$$

Where  $u_i$  is a random disturbance term. The observed dependent variable is determined by whether  $y_i$  exceeds a threshold value or otherwise and this is given as:

$$y_i = \begin{cases} 1 & \text{if } y_i^* > 0 \\ 0 & \text{if } y_i^* \leq 0 \end{cases} \quad (4)$$

Where  $y_i^*$  is the threshold value for  $y_i$  and is assumed to be normally distributed. The Common models used for estimating such parameters include Linear Probability Model (LPM), Logit and Probit models (Maddala, 2005). The LPM though the simplest is deficient because the probability does not always lie between zero and one (Gujarati, 1988), leaving the choice between logit and probit, which are widely used in practice. Meanwhile, according to Johnston and DiNardo (1997), the difference between the logit and probit models is rarely large to discriminate between them because both seem to produce similar result. This paper uses the Logit model to analyze mobile phone purchase decision of consumers in the Greater Accra Region of Ghana.

The binary logit model guarantees that the estimated probabilities lie in the 0–1 range and that it is nonlinearly related to the explanatory variables (Gujarati, 1995). By taking the logarithm of the odds ratio, what appears to be a highly nonlinear model becomes linear in the parameters. The logit model is therefore specified as:

$$L_i = \ln \left( \frac{P_i}{1-P_i} \right) = \beta_0 + \sum \beta_j X_{ji} \quad (5)$$

Where  $P_i$  is the probability of a consumer purchasing a mobile phone and  $(1-P_i)$  is the probability of not purchasing a mobile phone.  $L$  is the log of the odds ratio and is not only linear in  $X$ , but also linear in the estimated parameters. The  $\beta$ s are the estimated parameters. The relative effect of each explanatory variable ( $X_{ji}$ ) on the probability of consumer's purchasing decision is measured by differentiating with respect to  $X_{ji}$ . That is:

$$\frac{dP_i}{dX_{ji}} = \beta_j P(1-P) \quad (6)$$

This shows that the rate of change in probability with respect to  $X$  involves not only  $\beta_s$ , but also the level of probability from which the change is measured. The  $\beta_s$  measures the change in  $L$  for a unit change in  $X$ . It tells how the log-odds in favour of a change in the purchasing decision as the explanatory variables change by a unit.

### 3.3.2 Specification of Empirical Model

This paper uses the binary logit regression model to analyze the factors affecting mobile phone purchase in the Greater Accra Region of Ghana. The logit model, which is based on cumulative logistic probability functions, is computationally easier to use and has the advantage to predict the probability of consumers to purchase mobile. Following Gujarati (1995) and Adeogun, Ajana, Ayinla, Yarhere, and Adeogun (2008), the empirical model used is specified as:

$$L_i = \ln \left( \frac{P_i}{1-P_i} \right) = \beta_0 + \beta_1 PRCE_i + \beta_2 FTURES_i + \beta_3 ACCPTS_i + \beta_4 DRBLTY_i + \epsilon_i \quad (7)$$

Where the dependent variable is measured by dichotomous variable: consumers who have the intention to re-purchase similar mobile phone handset and consumers who do not have the intention to re-purchase. Some mobile phone attributes were then identified and hypothesized as affecting consumer's purchase decision of mobile phone handsets. PRCE is a dummy variable indicating whether or not price influence mobile phone purchase. Consumers will purchase a product when its price is reduced. However, price is sometimes associated with quality. An increase in price is less likely to influence consumers to purchase mobile phone. Thus, price variable is expected to have a negative coefficient. FTURES is also a dummy variable indicating whether or not technology features influence mobile phone handset purchase. Consumers are more likely to purchase a mobile phone with modern technology features such as Bluetooth. It is therefore hypothesized to have a positive coefficient. ACCPTS is a dummy indicating whether or not consumers have access to phone accessories. The consumer is more likely to buy a mobile handset with accessories. Thus, access to phone accessories variable in

the model is expected to have a positive coefficient. Finally, DRBLTY is also a dummy indicating whether or not durability or quality of mobile phone influence purchase decision. The more durable a phone brand is, the more likely the consumer will purchase it. Hence, the coefficient of durability or quality of phone is expected to be positive.  $\beta_s$  are the estimated coefficients and  $\epsilon$  is the error term.

To identify and rank the challenges facing mobile phone users in the study area, the responses of the respondents were tabulated and their frequencies were reported. Based on the proportion of respondents reporting a challenge, the most important challenge to the least were noted and ranked. The challenge with the highest proportion is ranked first while the challenge with the lowest proportion is ranked last.

#### 4. Results and Discussion

##### 4.1 Descriptive Statistics of the Socio-Demographic Characteristics of Respondents

Table 1 presents the descriptive statistics of the demographic characteristics on gender, age group, marital status and educational level of mobile phone users interviewed in the Greater Accra Region of Ghana. The result shows that while about 56 percent of the respondents interviewed are males, 44 percent are females, suggesting a male dominated respondents. It also shows that majority of about 62 percent of the respondents interviewed are between the age group of 21-30 years and 63 percent of the respondents are single. This suggests that more than half of the respondents interviewed fall within the youthful age group and are not married. Besides, 76 percent of the respondents have tertiary level education, suggesting well educated respondents. The implication is that a lot of young and educated people are using mobile phones that manufacturers and marketers of mobile phones can take advantage of to produce and market tailor-made phones targeted at these groups of people.

Table 1. Descriptive statistics of the demographic characteristics of mobile phone users

Variable		Frequency	Percentage (%)
Gender	Male	111	55.5
	Female	89	44.3
Age Group (Yrs)	Up to 20	6	3.0
	21-30	123	61.5
	31-40	57	28.5
	41-50	13	6.5
	Above 50	1	0.5
Marital Status	Single	126	63.0
	Married	73	36.5
	Divorced	1	0.5
Educational Level	Illiterate	3	1.5
	Basic	7	3.5
	Secondary/Tech/Voc	33	16.5
	Post-Secondary	5	2.5
	Tertiary	152	76.0

Source: Field Data, 2011.

Table 2 also presents the descriptive statistics of the brand of phones, years of using current phone, number of phones used so far and network subscribed by mobile phone users interviewed. It shows that Nokia and Samsung brands are the two main brands of mobile phones being used by respondents in the study area. The two brands of phones together constitute about 74 percent of phones used by the respondents interviewed. While about 53 percent of the respondents are using Nokia brand, 21 percent are using Samsung. This is an indication of consumer preference for Nokia and Samsung brands of phones among the respondents. This result confirms studies by Aidoo and Nyamedor (2008) who also found majority of respondents using Nokia brand. The implication is that users of Nokia and Samsung phones may continue to use them if producers and marketers of these phone brands produce and market products that have attributes that meet the taste of their consumers. Meanwhile, about 65 percent of respondents have so far used at least three phones. Besides, majority of 35 percent of respondents have been using their current mobile handsets for over 5 years. The study again revealed that 52 percent of respondents have been subscribed to their current network for over five years. While about 50 percent of the respondents are MTN subscribers, 19 percent and 13 percent of the respondents are TIGO and VODAFON subscribers respectively. This finding is consistent with Bassey et al., (2011) who also found 53

percent of MTN subscriber base. This is an indication that MTN has the largest subscribers who may continue to enjoy their services if they are satisfied with the services they provide for enhanced profits.

It was again found that most of the respondents (52 percent) indicated their intention to purchase new mobile phones for advanced technology phones with features such as Bluetooth, multimedia messages, FM Radio, internet access among others. The wave of advanced technology in recent years is increasing the desire of mobile phone consumers to experience these features. Consumers are therefore yearning to own mobile phones that have these technology features.

Table 2. Descriptive statistics of mobile phone characteristics of respondents

Variable		Frequency	Percentage (%)
Brand of phone Being used now	Nokia	107	3.5
	Samsung	41	20.5
	Motorola	6	3.0
	Sonny Ericson	35	17.5
	Others	11	5.5
Years of using Current phone	up to One	51	25.5
	Two	24	12.0
	Three	27	13.5
	Four	28	14.0
	Five and more	70	35.0
Number of phones Used so far	One	17	8.5
	Two	51	25.5
	Three	50	25.0
	Four	81	40.5
	Five and above	1	0.5
Duration of Subscription (years)	Up to one year	23	11.5
	Two	25	12.5
	Three	18	9.0
	Four	31	15.5
	Five and above	103	51.5
Network subscribed	TIGO	38	19.0
	MTN	99	49.5
	VODAFONE	28	14.0
	EXPRESSO	9	4.5
	AIRTEL	26	13.0

Source: Field Data, 2011.

Moreover, the results show that of the 52 percent of respondents who expressed intention to acquire new mobile phones, 58 percent are male, about 67 percent are between the ages of 21-30 years, 79 percent have tertiary education level and about 71 percent are single. The main reason given by the respondents for the intent to acquire new phones is to have mobile phones with advanced technology features. This result suggests that males and unmarried consumers are more interested in purchasing technology phones than their female and married counterparts. It also indicates that the youth and educated consumers are interested in acquiring technology phones than those who are adults and are less educated. The implication of this is that young and educated people have a higher preference for mobile phones with advanced technology features, which producers and marketers of mobile phone handsets may take advantage of to meet to enhance their profit.

Table 3 shows the descriptive statistics, mean and standard deviation of the factors consumers consider when purchasing mobile phone. The factors are the price of the phone, quality, technology features, brand, size and access to mobile phone accessories. These are the same factors used in the binary logit regression model. The result shows that durability or quality of mobile phone handsets and technology features are the two most important factors consumers in the study area consider when making mobile phone purchase decision. While quality or durability of mobile phone brand comes first with a mean value of 0.89 and a standard deviation of 0.33, technology features of phones comes second with a mean value of 0.88 and a standard deviation of 0.34.

The least factor, size, which consumers consider in their phone purchase decision, has a mean of 0.54 and a standard deviation of 0.50. This result is confirmed by the logit regression model in Table 4.

Table 3. Descriptive statistics of the factors affecting mobile phone purchase

Factors Affecting Mobile Phone Purchase	Mean	Standard Deviation
Price of Phone	0.62	0.49
Quality of Phone	0.89	0.33
Technology Features	0.88	0.34
Brand of Phone	0.75	0.45
Phone Size	0.54	0.50
Access to Phone Parts	0.60	0.46

Source: Field Data, 2011.

#### 4.2 Binary Logit Regression Result of Factors Affecting Mobile Phone Purchase

The logit regression model was used to quantitatively analyze the extent to which price, technology features, durability and access to mobile phone accessories affect mobile phone purchase decision in the Greater Accra Region of Ghana. As shown in Table 4, though some of the variables in the logit regression model estimated were not significant, the signs of the coefficients of all variables are consistent with study expectations. The results show that technology features and durability or quality of mobile phone handsets are the two main factors that positively and significantly affect mobile phone purchase decision in the study area. The mean dependent variable, intention to purchase new mobile phone, is 0.53. The diagnostic test of the estimated model shows that the F-statistics of the regression model is significant at 1 percent level. This suggests that indeed price, durability or quality, technology features of handsets and access to mobile phone accessories variables used in the model together affect mobile phone purchase decision significantly at 1 percent.

The two main factors which significantly affect mobile phone purchase decision in Table 4 are technology features and durability or quality of mobile phone handsets. With recent wave in mobile phone technology, users of mobile phone are yearning to own mobile phones with advanced technology features such as Bluetooth, camera, FM radio. It is not surprising that technology feature has the greatest impact on mobile phone purchase than the other three variables in the model. Technology features variable was found to positively and significantly affect mobile phone purchase at 1 percent level. This suggests that advanced technology feature of phone handset is more likely to influence mobile phone purchase. Since consumers are very much interested in technology features such as internet access, they are more likely to buy a phone brand with these advanced features. This result is consistent with Singla and Bansal (2010), Karjaluoto et al. (2005) and O'Keefe (2004) who found technology features of phone handsets to be the main factor that influence mobile phone purchase.

Table 4. Binary logistic regression results of factors affecting mobile phone purchase

Variable	Coefficient	Standard error	Z-stats	Probability
Constant	-1.804***	0.526	-3.428	0.001
Price of Phone	-0.028	0.302	-0.092	0.927
Access to accessories	0.297	0.325	0.914	0.361
Technology Features	1.334***	0.506	2.642	0.008
Durability	0.744**	0.343	2.167	0.030
Mean Dependent Variable	0.531			
Standard deviation of dependent Variable	0.500			
Standard Error of Regression	0.481			
Sum Squared Residual	50.565			
McFadden R-squared	0.071			
Probability (LR Stat)	0.000***			
Log Likelihood	-143.847			

Source: Field Data, 2011. Note: Asterisks indicate significance level for one-tail tests; \*\*\* denote 1%; \*\* denote 5% and \* denotes 1% confidence level.

The quality of a product is an important attribute that consumers consider when purchasing a product. Consumers will therefore prefer to buy and use a phone brand that is durable and last for a long time. The result of this study shows that durability or quality of mobile phone brand variable positively and significantly affects mobile phone purchase at 5 percent level. This suggests that the more durable or quality a brand of phone handset is, the more likely consumers will purchase that brand. Consumers will therefore buy a brand of phone that is more durable and last for long. When a brand of mobile phone is durable consumers are able to use it for a longer period before replacing it. This result is consistent with Liu (2002) who found that consumers would purchase a perceived quality phone brand which they had used before or had been recommended by friends, families and expects in the mobile phone industry. Khan and Rohi (2013) also found phone quality as a key variable that influence the brand choice of youths for mobile handset purchase in Peshawar Pakistan.

The results as presented in Table 4 show that price and access to phone accessories are the factors that do not significantly affect mobile phone purchase decision. The price variable in the model was estimated to be negative 0.028, suggesting an indirect relationship with intention to purchase mobile phone. This implies that a decrease in the price of mobile phone handsets is more likely to influence the purchase of mobile phone handsets among the respondents in the study area. Though consumers tend to associate high price products with quality, generally rational consumers will always want to buy a product with a lower price. The coefficient of the price variable though not significant, meets the expected negative sign of the study. Mobile phone users are therefore more likely to purchase a brand of mobile phone when its price is reduced. This result is consistent with Kajaluoto, et al., (2003) who found that many consumers are highly price sensitive (elastic demand), hence an increase in the price of mobile phone may shift consumers to other competitive brands of mobile phone handsets. Pakola et al. (2005), Amad (2011) and Mokhlis and Yaakop (2012) all found price to be an important factor affecting the decision to purchase current mobile phone model among respondents.

Another important variable that is likely to influence mobile phone purchase decision is access to phone accessories. The use of mobile phones requires that accessories are easily available to consumers to buy when their phones get damaged. In the event that the mobile phone of a user gets damaged and consumers are unable to get its accessories, then purchasing that brand of phone becomes difficult for consumers. Hence, consumers are more likely to purchase a brand of mobile phone whose accessories are easily accessible. The result of the binary logistic regression shows that, though not significant, access to phone accessories variable positively affects mobile phone purchase of respondents in the study area. This suggests that getting access to mobile phone accessories such as batteries, chargers and screen covers is more likely to influence mobile phone purchase. Consumers will therefore not purchase a brand of mobile phone whose accessories are difficult to come by. Producers and marketers of mobile phone need to ensure that the phones they produce and market have available parts for consumers to easily access when they need them.

#### 4.3 Challenges Facing Mobile Phone Users in the Study Area

Respondents were asked to mention two main challenges they face using mobile phones. Based on the proportion of mobile phone users indicating the challenge, the challenges were ranked from the most important to the least. The results as presented in Table 5 show that network challenge, high call rates, quality of mobile phone batteries and limited phone features are the main challenges facing respondents in the study area.

Table 5. Ranked challenges facing mobile phone users in the study area

Challenges	Percentage (%)	Rank
Network Related Problems	75	1
High Call Rates	25	2
Quality of Phone Batteries	23	3
Limited Phone Features	21	4
Availability of Phone Accessories	9	5

Source: Field Data, 2011: Mobile Phone users could list up to two problems, hence the percentage can add to more than 100 per cent. Problems listed by less than 9 per cent of processing industries are not shown.

Network related challenge ranked 1<sup>st</sup> as the most important challenge facing mobile phone users in the study area. About 75 percent of the respondents indicated that low connectivity, congestion and limited coverage are the network related challenge facing them. They argue that due to this and call drops they get frustrated when making calls. This does not excite mobile phone users communicating with their friends, family and loved ones.

It is therefore important that telecommunication providers in Ghana improve upon their facilities or invest more into acquiring modern equipments to enable mobile phone users make calls easily with minimal stress. Moreover, regulatory agencies such as the National Communication Authority (NCA) should come out with standards for service providers to meet. The NCA should also enforce the penalty charges lashed on service providers who do not meet the minimum service quality. This will go a long way to ensure that telecom service companies delivery quality service to their consumers.

The second ranked challenge facing mobile phone users is the high cost of service charges by telecommunication providers. Twenty-five percent of the respondents indicated that the high cost of making call is affecting their ability to make more calls. Despite the increasing competition in the telecom sector in Ghana, it seems consumers of telecom services are not benefiting much from their services. It will therefore be important for competition to be enhanced and made more effective for consumers to benefit from reduced call rate. Moreover, service providers should to introduce varieties of products to enable subscribers enjoy variety of products.

Finally, limited phone features ranks third as another major challenge facing mobile phone users in the study area. Twenty-one percent of the respondents indicated that their inability to have technology phone features is preventing them to move with current development. Mobile phone users want to have many and advanced features such as internet and radio on their phones. This will enable them to use their phones for varieties of purposes, apart from just making and receiving calls. Manufactures and marketers of mobile phone should also produce and market modern technology phones with features that will meet the taste of consumers.

## 5. Conclusions and Recommendations

This study analyzed the factors affecting mobile phone purchase decision in the Greater Accra Region of Ghana, using the binary logit regression model. Data was obtained from 200 mobile phone users, using structured questionnaire. The study revealed that majority of the respondents who expressed their intention to acquire new phones were male, age between 21-30, single and have attained education up to the tertiary level. The study also shows that the two main factors significantly affecting mobile phone purchase in the study area are advanced technology features and durability or quality of mobile phone handsets. Furthermore, poor connectivity, network congestion and battery problems were the main challenges facing users of mobile phones interviewed.

It is therefore recommended that manufactures and marketers of mobile phones should consider producing and selling phones with modern technology features that are more durable and highly quality. They should also produce and market phones that are targeted at the educated youth. Service providers should improve upon their equipments or invest more into modern equipments to enable them address the network challenges for better quality service. Finally, the National Communication Authority should also sanction service providers who fail to meet a minimum quality of service. This will encourage better service delivery among telecom service providers and to provide services at competitive rate to consumers.

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