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## DETERMINANTS OF CUSTOMER LOYALTY AND SUBSCRIBER CHURN OF MOBILE PHONE SERVICES IN GHANA

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### ABSTRACT

*This paper investigates determinants of customer loyalty and subscriber churn among Ghanaian tertiary students. The study addresses two research questions: What factors are responsible for customer loyalty in mobile telephony? What factors influence mobile users to change mobile telephone provider? The study employed binary logit model and used a sample survey data. The results indicate that students' mobile switching behaviour is affected by factors relating to customer service, service quality and mobile service price. Also, customer loyalty of students is dependent on call quality and brand image. The results have implications that mobile service providers should consider their service quality, prices, customer service and brand image to retain subscribers.*

### JEL CLASSIFICATION

L86, L96, O33.

### KEYWORDS

Mobile telephone service, customer loyalty, subscriber churn.

### 1. INTRODUCTION

Mobile telephony facilitates personal communication and business transactions. The use of mobile phones for personal and business purposes has been phenomenal in the last few decades. According to International Telecommunication Union (2011), mobile phone subscribers reached 5.4 billion worldwide in 2010. It is also estimated that about 90 percent of the world population has access to mobile telecom networks. In the developed countries, mobile markets have reached saturation levels with average subscriptions of 116 per 100 inhabitants. Between 2005 and 2010 mobile subscription in developing countries increased from 53 percent to 73 percent (ITU, 2011).

Mobile subscriptions in most African countries have increased remarkably and Ghana is no exception. The country's teledensity is one of the highest in the sub-region. According to the National Communication Authority (NCA), Ghana's mobile phone penetration reached 74 percent in 2010. There are five mobile service providers providing mobile telephone services to variety of subscribers. Intense competition in the market among the five operators for subscribers has resulted in a rapid growth of users. The service providers are MTN, Vodafone, tiGo, Expresso and Airtel.

According to NCA, mobile subscription crossed the 17 million mark by the end of 2010. The mobile market is gradually getting saturated and operators are adopting policies to retain their existing subscribers. They are also implementing marketing strategies to lure and attract subscribers from other networks. An interesting question that needs to be answered is: what will compel some clients of one provider to switch to other providers? Or why will clients of one provider refuse to switch to other providers? Given that mobile telephony plays a critical role in promoting business and personal communication, the way forward to approach the improvement in service delivery is to gain a deeper understanding about why some customers change mobile telephony networks and others do not. There is therefore the need to undertake empirical investigation on the customer loyalty and switching behaviour in mobile telecommunication.

A lot of empirical studies have been done on mobile telecommunication in Ghana (Overå, 2005; Chabossou, Stork, Stork & Zahonog, 2008; Sey, 2008). However, none of these studies considered customer loyalty and subscriber churn in Ghanaian mobile telecom market. This study therefore seeks to investigate the determinants of customer loyalty and subscriber churn in the Ghanaian mobile telephony market, focusing on tertiary students mobile phone users. The study addresses two research questions: What factors are responsible for customer loyalty in mobile telephony? What factors influence mobile phone users to change mobile telephone provider? These questions are worth investigating because with the number of mobile telephone providers increasing in Ghana, some customers mostly the youth have been found to be switching from one service provider to another. At the same time others remain loyal to their service providers, citing many reasons for doing so.

The paper is organised as follows. The second section follows with the literature review. The third section looks at overview of the Ghanaian mobile telephony market. Section 4 deals with the methods of the study. This section outlines the survey method and describes the model as well as the estimation technique. Section 7 presents the estimation results and discussion. Section 6 provides the conclusions and policy implications.

### 2. LITERATURE REVIEW

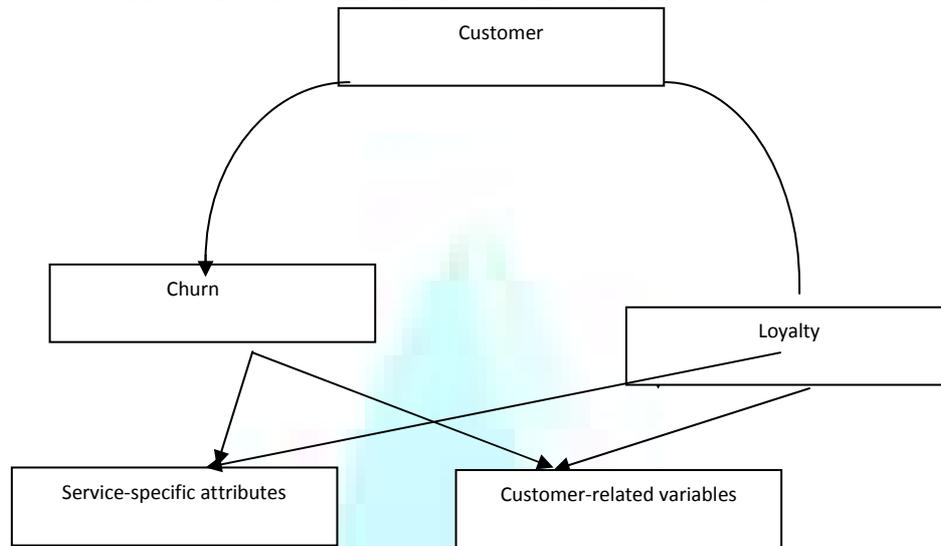
Chander, Laha, Krishna (2006) define customer churn as the tendency of customers to stop doing business with a firm or vendor within a period of time. Customer churn simply means customer defection. In mobile telephony customers defect by changing service providers. Kim and Yoon (2004) argued that customers tend to switch mobile service providers when they are dissatisfied with the services offered them.

Keaveney (1995) discovered that core service failures determine customer switching behaviour in services industries. Ahn, Han and Lee (2006) in their study found that call-quality related factors influence customer churn.

Lee, Lee and Feick (2001) developed three measures of customer loyalty in mobile telephone service from a number of measures provided by Narayandas (1996). The measures are i) willingness to recommend preferred provider to others; ii) repurchase intent and iii) resistance to switching to a competitor's service that is superior to the preferred provider's service. The first measure, willingness to recommend preferred provider to others, shows a strong form of customer loyalty. In this case the customer is not only interested in continuing doing business with the provider but also is willing get more customers for the provider.

The literature shows that customer loyalty and subscriber churn are influenced by customer characteristics and operator-specific attributes. The conceptual framework for customer loyalty and subscriber loyalty is shown in Figure 1. The mobile customer decides to switch to a new service provider or remain with the current service provider. The switching decision is influenced by the customer own characteristics and operator-related variables.

FIGURE 1: CONCEPTUAL FRAMEWORK FOR CUSTOMER CHURN AND CUSTOMER LOYALTY



Source: Researchers' own conceptualization

3. OVERVIEW OF GHANAIAN MOBILE TELEPHONY MARKET

Mobile telephone service in Ghana started in the early 1990s by private telecom network. The state-owned telecom network joined the mobile telephony market some years later. Mobile telephone service was a result of reform undertaken in the telecommunication sub-sector. The sector reform started with the launch of the Accelerated Development Plan (ADP) in 1994. This policy was meant to liberalise and revamp sector through the participation of the private sector as a way of meeting the needs of Ghanaians (Atubra and Frempong, 1999). The private telecom networks focused first on mobile telephone services. Some later added fixed telephone services.

The first company to start mobile telephone service in Ghana was Millicom Ghana limited (mobitel), a subsidiary of Millicom International Cellular S.A of UK/Luxembourg. The company started operation in 1992. A year later, Celtel entered the mobile telephony market. Scancom Ghana Limited entered the market in 1996 and two other mobile operators, Onetouch and Zain, entered the market in 2000 and 2008 respectively. The mobile telephony market in Ghana has been characterized by frequent takeovers and acquisitions. These developments have resulted in rebranding of most of the companies in the market. Scancom, Celtel, Onetouch and Zainallhave been renamed as MTN Ghana, Espresso, Vodafone and Airtel respectively. Though the ownership structure of Millicom has not changed since it entered the market, its brand name was changed from Buzz to tiGo in March 2006 to conform to global branding strategy (Sey, 2008).

Ghana's mobile telephony market is one of the fastest growing and most competitive markets in the country. Mobile telephony remains the dominant mode of access and accounts for 98.2 percent of total telephone lines. It is important to note that greater majority of mobile subscribers are prepaid. Prepaid subscribers account for over 90 percent of total mobile subscribers. By the end of 2010 MTN Ghana was the market leader with a share of 50%. This was followed by TiGo with a market share of 22.93%. Vodafone was third with a market share of 15.4%. Airtel took the fourth place with the market share of 10%. Espresso trailed with a market share of 1.7%. The market share is likely to change due to acquisition of licence by one of African mobile giants, Globacom International. The company is yet to commence operation. It has promised to roll-out innovative products and services at very affordable rates when it begins operation. Also, the Ministry of Communication together with the NCA Ghana is on the process to implement mobile number portability in the mobile telephony market by July this year. This policy when implemented would give consumers flexibility of choice but as to whether the policy would have a dramatic impact on the mobile telephone service industry is yet to be seen.

4. METHODOLOGY

ECONOMETRIC MODEL

The mobile customer decision to switch service provider or not is dichotomous and can be analysed using binary logit model based on discrete choice theory. Discrete choice theory is the study of behavior in situations where the individual selects from a finite set of choices. It assumes that an individual is likely to choose an alternative over others when the level of its utility to him is greater than the utility of other alternatives (Kim & Yoon, 2004).

In this study, the set of alternatives is 'to switch' and 'to remain'. The factors that influence the decision of mobile subscriber on whether to switch to other mobile operator are divided into operator attributes and individual-specific factors. The level of utility that the *n*th obtains from either churning or remaining with the current provider can be expressed as an indirect utility function in terms of *Z<sub>jn</sub>* (Provider *j*'s service attributes) and *S<sub>n</sub>* (individual- specific factors).

$$U_{jn} = U(Z_{jn}, S_n) \quad j = (\text{switch, remain}) \tag{1}$$

The indirect utility in (1) can be decomposed into an observed (*V<sub>jn</sub>*) and an unobserved ( $\epsilon_{jn}$ ) components.

$$U_{jn} = V_{jn} + \epsilon_{jn} \tag{2}$$

A binomial logit model is used to relate the probability of a mobile subscriber switching a provider or remaining loyal to a set of explanatory variables which include service attributes and individual-specific variables. The model is expressed as

$$P_i \equiv \Pr[y = 1 | x] = F(x_i' \beta) \tag{1}$$

Where  $P_i$  is the probability that the *i*th mobile subscriber will switch service provider,  $x_i'$  is the vector of explanatory variables,  $\beta$  is the vector of parameters to be estimated, and *F* indicates the logistic cumulative distribution function.

EMPIRICAL MODELS

The empirical models considered for the analysis of customer loyalty and subscriber churn are presented below

$$CL_i = \alpha + \beta_1 Inc_i + \beta_2 Subdu_i + \beta_3 Qua_i + \beta_4 NetCov + \beta_5 Pr_i + \beta_6 BIM_i + \epsilon_i \tag{2}$$

$$SC_i = \alpha + \beta_1 INC_i + \beta_2 Subdu_i + \beta_3 ICS + \beta_4 HPS_i + \beta_5 HC_i + \beta_6 SD_i + \beta_7 LWCS_i + \epsilon_i \tag{3}$$

Where Inc= Income; Subdu= subscription duration; Cqua = call quality; Netcov = Network coverage; Pr = prices of services; BIM = brand image; ICS= Impolite customer services; HPS= High prices of services HC=Hidden charges; SD = service disruption; LWCS = long waiting time for customer services; and  $\epsilon$ = error term. The dependent variables are customer loyalty and subscriber churn. Customer loyalty variable was set to 1 if the subscriber is willing to recommend current service provider to others and 0 if otherwise. For subscriber churn, a value of 1 was set for those willing to switch current service provider and 0 for those not willing to switch service provider.

The explanatory variables include service attributes and customer-related variables. The customer-related variables considered in the two models are income and subscription duration. Subscription duration was measured as the years of subscription with current network while income was measured as the average monthly income received by subscribers. For age, we considered the actual completed age of subscribers. The service attributes considered in the customer loyalty model are: call quality, network coverage, pricing and brand image. Instead of using the service attributes directly, the level of satisfaction of the attributes was considered. A five-point likert scale was adopted to evaluate the level of satisfaction of the alternative service attributes.

For the subscriber churn model, the explanatory variables included high prices of services, impolite customer services, hidden charges, service disruption and long waiting time for customer services. The likeliness of these variables affecting subscriber churn was evaluated using a five-scale likert scale.

**DATA SOURCE**

Data for the study was obtained through survey of tertiary students in Ghana. The population for the study is students of the University of Cape Coast. The study adopted stratified sampling technique to select 813(5%) out of 16260 students of the university. The sampling was done according to courses or programmes of study. The data for the faculties/ schools were obtained from the students’ records management unit for the 2010/2011 academic year. The distribution of the students selected for the study is shown in Table 1.

**TABLE 1: DISTRIBUTION OF STUDENTS SAMPLED FOR THE STUDY**

Faculty/School	No. of Students	Selected Students
Agriculture	675	34
Arts	1457	73
Business	1842	92
Education	5746	287
Social sciences	2576	129
Biological Sciences	1656	83
Physical Sciences	2101	105
Medical Sciences	192	10
Total	16245	813

The data for the study was collected using questionnaire. The questionnaire was pretested with 25 students. This was done to validate the questionnaire. The questionnaire was fine-tuned after the pre-test before the main data was collected. Eight hundred and thirteen questionnaires were administered to the selected students but 603(74%) copies of the questionnaire were completed and returned. The remaining 210 (26%) questionnaires could not be retrieved from the field because of various reasons.

**ESTIMATION TECHNIQUE**

The dependent variables are qualitative. Therefore, the ordinary least square technique becomes inappropriate for estimation. The appropriate technique for estimating the logit model is the maximum likelihood estimation. The technique was used to estimate the parameters of our regression models. The Wald test was used to examine the overall fitness of the regressions models. The results of the Wald test indicate that the regression models were of good fit. To be specific, the Wald test statistic for the customer loyalty model was 72.73 with P-value < 0.01. For the subscriber churn model, the Wald test statistic was 23.41 with the P-value of < 0.01. Thus, the regression models were very significant. In order to cater for the problem of heteroscedasticity which is inherent in cross sectional data, the robust coefficients are reported for all the explanatory variables.

**5. RESULTS**

**TABLE 2: DESCRIPTIVE STATISTICS OF SUBSCRIBERS**

	No. of observations	Mean	Minimum	Maximum
Age in years	603	23.06	16	51
Monthly income in Ghana cedis	603	150.30	10	1500
Subscription duration in years	603	5.35	1	13

Table 2 presents the descriptive statistics of subscribers. The ages of student mobile phone subscribers ranged from 16 years to 51 years with the mean age being 23years. The minimum income received by subscribers in a month was 10 Ghana cedis with the highest being 1500 Ghana cedis. The mean income was about 150 Ghana cedis. The average years of subscription for the mobile users were about 5 years.

Table 3 shows that a larger majority of subscribers, 78.5 percent, were willing to recommend their current networks to others while 42.1 percent of subscribers were willing to switch their current service providers.

**TABLE 3: DESCRIPTIVE STATISTICS OF CUSTOMER LOYALTY AND SUBSCRIBER CHURN**

	Yes	No
Loyalty (subscriber willing to recommend current network to someone)	474 (78.5)	129 (21.4)
Churn (subscriber willing to switch current service provider)	254 (42.1)	349 (57.9)
Total	603 (100.0)	603 (100.0)

**ESTIMATED RESULTS AND DISCUSSION**

In Table 4, we present the estimated results for variables used to explain customer loyalty. The results reveal that call quality and brand image significantly determine customer loyalty. The estimated parameters of call quality and brand image are positive and significant at 1 percent. The positive coefficient of call quality indicates that a subscriber is more likely to stay with the current service provider when call quality improves. In general, consumers would want to stick to service provider offering quality services to them.

TABLE 4: ESTIMATED RESULTS FOR CUSTOMER LOYALTY

Variable	Robust Coeff.	Odds ratio	P-value
INC	0.0012	1.0013	0.109
Subdu	-0.0419	0.9588	0.370
Cqua	1.6936	5.8457	0.000***
Netcov	0.2578	1.0910	0.756
Pr	0.3957	1.4732	0.136
BIM	0.8146	2.2561	0.000***
Constant	-1.1280		0.004***
No. of Obs =603 Wald Chi2(6) =72.73 Prob>Chi2 =0.0000 Pseudo R2 = 0.1274			

Note: \*\*\*indicates statistical significance at 1% level.

The positive coefficient of brand image indicates that improvement in brand image is necessary to retain customers. This stresses the need for service providers to build strong image if they are to retain subscribers. This finding confirms the works of Kim and Yoon (2004) and Lai et al (2009). The results show that customer loyalty is not influenced by network coverage and prices of providers. The estimated coefficients of these variables were not significant.

As can be seen from Table 5, customer-related variables (i.e. income and subscription duration) are not significant in explaining customer loyalty. The insignificant coefficient of subscription duration implies that years of subscription do not create lock-in effects on students' mobile phone users. This finding is consistent with the work of Kim and Yoon (2004) which reported insignificant results for subscription duration in their study.

TABLE 5: ESTIMATED RESULTS FOR SUBSCRIBER CHURN

Variable	Robust Coeff.	Odds ratio	P-value
INC	0.0006	1.0008	0.291
Subdu	-0.0311	0.9626	0.337
ICS	-0.4613	0.6528	0.019**
HPS	0.6702	2.0563	0.022**
HC	-0.4542	0.6386	0.085*
SD	0.4089	1.2759	0.002***
LWCS	0.2767	1.4940	0.083*
Constant	-0.7558		0.005***
No. of Obs =603 Wald Chi2(6) =23.41 Prob>Chi2 =0.0014 Pseudo R2 = 0.0328			

Note: \*\*\*, \*\* and \* indicate statistical significance at 1%, 5% and 10% levels respectively

As shown in Table 5, impolite customer services, high prices of services, hidden charges, service disruption and long waiting time for customer services significantly determine subscriber churn. This implies that when consumers are satisfied with the tariff level they tend to stay with their service providers. The findings are consistent with the work of Sathish et al (2011). Our results have implication that mobile service providers can discourage subscriber churn by offering lower prices and avoid hidden charges. In the same way, reducing service disruptions and improving customer service could result in lower churning. Just like the customer loyalty model, customer-related variables were not statistically significant in explaining subscriber churn of mobile telephone services.

## 6. CONCLUSIONS AND POLICY IMPLICATIONS

This paper sought to investigate the determinants of customer loyalty and subscriber churn of Ghanaian tertiary students' mobile phone users. The main conclusions of the study are considered below. It was realised that call quality and brand image affect customer loyalty in mobile service industry. A strong correlation was found between high prices of service and subscriber churn. Service disruption was found to be an important determinant of subscriber churn. Customer loyalty and churn are not related to customer-related variables. Thus, the decision to retain subscribers is at the discretion of service providers. The policy implications derived from the results of the study are as follows. There is the need for mobile service providers to build strong corporate image to retain subscribers. Also, improvement in call quality is necessary to retain subscribers. The study shows that high services prices determine subscriber churn so mobile service providers should offer low prices to retain subscribers. The study reveals that service disruption leads to subscriber churn so mobile phone providers should improve service quality to discourage churn.

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