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Mobile Number Portability: On the Switching Trends among Subscribers within the Telecommunication Industry in a Ghanaian City

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ABSTRACT

The proliferation of mobile telecommunication service providers in the country has prompted concerns about service quality within the industry. Mobile Number Portability was introduced by the National Communications Authority (NCA) as part of a broader campaign aimed at ensuring uninhibited switch from one telecom service provider to another. With a combination of both qualitative and quantitative investigative techniques, an initial attempt is made by this paper to produce results achieved through a representative sample of 200 respondents of different network customers to determine the pattern of switch from one service provider to another. Findings suggest the instrumentality of income, service difficulties, and customer service as well as usage costs as being the overriding consideration of porting intentions among subscribers.

Keywords: Number portability, switching behavior, subscriber, customer service

INTRODUCTION

The ever-increasing use of mobile telephony in Ghana with its attendant heavy mobile penetration rate over the recent past continues to transform the mobile telecommunications industry in different but meaningful ways. Dominant among these ways is the mobile number portability (MNP) phenomenon. MNP simply identifies a situation of allowing a mobile phone subscriber to switch his/her loyalty from one mobile telecoms operator to another with the possibility of simultaneously retaining the same mobile number (Lee, Kim, Lee, & Park, 2003; Smura, 2004). One of the most challenging jobs for today's network providers is the ability to retain their customers. In order to encourage reasonable competitive pricing and ensure high customer satisfaction via enhanced service delivery in the telecommunication operations in Ghana, the National Communications Authority (NCA) introduced a new functionality called MNP following parliamentary approval on the July 7, 2011.

MNP has attracted a horde of research enthusiasts who have developed and applied the concept in diverse epistemological and empirical perspectives. Ranging from policy approaches in the implementation of number portability (Garcia-Murillo, 2007), through customer satisfaction in relation to quality of service (Nimako, Azumah, Donkor, & Veronica, 2010), the effect of

regulatory policy on prices as well as demand for mobile services (Grzybowski, 2005) to motivations for a switch from one operator to another (Kumar, Vani & Vandana, 2011; Xavier & Ypsilanti, 2008).

The objective of this paper was to understand the switching behavior of mobile subscribers as a way of analyzing the effect that MNP has on the operations of mobile telecoms. Again, the paper is determined to flesh out the issues responsible for motivating a shift from one network to another. This is crucial to providing insights into and an indication of the degree to which MNP has impacted on the operational dynamics of mobile network operators in Ghana. Knowledge about this impact endeavor could be vital to initiating an evidence-driven recommendation to inform matters connected with MNP in Ghana. It is on the strength of these issues that makes this research question pertinent. Why do consumers switch their loyalty from one mobile operator to another? What are the circumstances responsible for shifting between mobile telecoms operators among consumers? Providing answers to these questions intends to extend our current conceptualization of the subject matter, thereby enriching the literature on MNP studies.

Following this background is an account of the pertinent literature that teases out the diverse treatment of MNP from both epistemological and empirical standpoints. The techniques of the methods of research are provided next with an explanation of the different techniques of data collection and an overview of the mechanics of data interpretation. Presentation of findings precedes the interpretation of the data from the field in the form of discussions as the paper ends with a concluding remark connected with future research directions as well as practical and managerial implications.

PERSPECTIVES ON MOBILE NUMBER PORTABILITY

Stakeholders in the mobile telecoms fraternity consider MNP as a relevant policy framework crucial to ensuring healthy competition (Lyons, 2006), even though it is the considered understanding of Shin (2006) that MNP does not readily signal competition in the mobile market. This notwithstanding, it has been observed elsewhere that the practice of MNP heralds, for instance, better quality of service and reduced prices in the cost of calls (Park, 2010). It is appropriate to link the situation of moving from one network to another as switching intention (Lin, 2010; Shin & Kim, 2008) which inherently possesses an attitudinal factor shrouded in the desire on the part of the switcher (customer) to derive benefit from this activity (Horrocks & Lewin, 2000). Issues about the evolution of MNP over a certain period of time have also been explored elsewhere, (see, for example, Anjum & Dua, 2012) just as the extent to which promotional offers and service affordability influence subscriber portability has been adequately addressed (Kumaresh & Sekar, 2012).

MNP is viewed as a means of promoting competition and enhancing service innovation in the telecommunication industry (Buehler & Haucap, 2004; Durukan, Bozaci, & Dogan, 2011). Accordingly, Shin (2006) advances the argument that MNP aids to create an equal playing field and encourages the entry of new mobile operators. Thus with MNP new firms are assured of a stay in the telecommunication industry once they provide attractively competitive services. In a

radical point of departure, informed by the concept of property rights, Buehler, Dewenter and Haucap (2005), suggest the idea of MNP takes away property rights away from networks operators to the subscriber. This property rights notion, logically, gives subscribers quite a significant ability in the way they shift the balance of mobile network power among the telecoms operators.

ANTECEDENT AND MECHANICS OF MNP MODEL

After the Singaporean experience as the first national entity to implement MNP in 1997, more have followed in like manner. These include the United Kingdom, Spain, Switzerland, Germany, the United States, Malta, Slovenia, India, Georgia, Kenya, South Africa, among others. The MNP framework is driven by diverse academic efforts that have investigated the effect of MNP on subscribers switching behavior (Russell, 2010). This strand of research framework is underpinned by three factors that underscore the mobile user intention for shifting service providers as demonstrated by service quality, service affordability and promotional offers. These variables provide the necessary explanatory power to understand the effect of MNP on subscribers' switching attitude.

Intention for Switching. In analyzing the decision to change network operators by mobile subscribers, intention for switching is applied to probe the motivation for customers' intention to switch their service providers (Roos, 1999). Intention to switch services in the telecommunication industry emphasizes a strong desire to change one network provider to another. Previous studies have accounted for the various influencing factors of customer switching behavior in the mobile telecoms industry. Within the Korean mobile market, for instance, Kim and Yoon (2004) examined the determinants of customer switching behavior as a correlation between the degree of customer satisfaction and loyalty as against enhanced quality of call, brand image and the kind of handset. A similar work by Kim, Park, and Jeong (2004) makes an unequivocal case that, service quality (including call quality), value-added services, and customer support influence customer loyalty to network providers they subscribe. Similarly, Kim and Kwon (2003) analyses other determinants, which influence mobile subscribers behavior by applying a conditional logic regression models based on customer survey. They realized that in the Korean telecommunication industry operators with large number of subscribers increase the attractiveness of mobile subscribers.

Moreover, mobile operators also need the subscribers' characteristics to be able to capture all kinds of subscribers' needs. In order words, network operators must raise customer-switching costs using these determinants with the uttermost interest of keeping existing customers. Maicas, Polo and Sese (2009) were of the view that switching cost has become a serious and significant barrier to competition in the telecommunication market.

Service Quality. In their work, Zeithaml, Berry, and Parasuraman (1996) provide an interesting model for quality of service. According to them, this quality determines the subscribers' behavior and thus influences their decision either to remain or switch their loyalty to another mobile telecoms operator. They are of the view that superior services quality of network leads to favorable intentions. The group further categorizes service quality in five broad dimensions of

reliability, responsiveness, assurance, empathy, and tangibles. A similar research was conducted by Wang and Lo (2002) on the integrated framework of services quality, customer value satisfaction and behavioral intentions of customers in China.

Services Affordability. Service affordability can indicate to the monetary cost of items that a customer is willing and able to buy at any period. Kollmann (2000) reiterated the point that price is an important determinant in the telecommunication market across countries of the world. He argues that service providers must develop different tariffs for different product (price discrimination) to meet different customer satisfaction and preference (Gabrielsen & Vagstad, 2003). With the ever-increasing demand for network usages in different geographical jurisdictions, it is feasible for mobile network provider to continue to design strategies sympathetic to the notion of service affordability as means of attracting more customers and possibly retaining them if they are able to give them competitive call rates.

Promotional Offers. Network operators offer promotional packages with the intention to woo customers and consumers alike to purchase a given commodity or a service. A survey by Alvarez and Casielles (2005) clearly emphasize the idea that promotional activities undertaken by network operator's act as a catalyst which lead to a tremendous increase in product purchases. In addition, Chinnadurai and Kalpana (2006) evaluated the competitive trend in the telecommunications sectors by analyzing the change in trend of consumer taste and preference. The situation has prompted many network operators to change their operational strategies by adopting and changing promotional needs of customers. It is appropriate to suggest the crucial role that advertisement plays in enticing customers and how that promotional advertisement in the telecommunication industry.

RESEARCH METHODS AND INTERPRETATION TECHNIQUES

One of the appropriate ways to find out how the implementation of the MNP policy meets users' expectation is to solicit for their views on the effects of MNP (Dix, Finlay, Abowd, & Beale, 1998). To this end, the study devoted a six-month period to the survey of customers who have switched their network operators within the first half of 2012. This period was considered reasonably timely because it allowed sufficient space to understand the porting behavior of customers following the implementation of the MNP by the NCA. The sixth-month period was also crucially significant as it allows space for switchers' introspection on their porting behavior. To this end, both primary and secondary data sources have been adopted for rationale behind customers' switching intentions.

Primary and Secondary Data

This study uses the query techniques to obtain information from the identified respondents. It must be noted that the use of questionnaires is a relatively inexpensive way to gather data from a potentially large number of respondents and a meaningful means of reaching quite a number of respondents large enough to allow a more meaningful statistical analysis of the results. The study concentrated on the impact of MNP on subscribers' behaviors and perceptions in Ghana—using Kumasi metropolis as a case. The choice of Kumasi is relevant on a couple of counts. In the first

place, Kumasi is conveniently closer to the investigators and therefore provides a reasonably fair basis for understanding the dynamics of the attitude of the people involved. Secondly, Kumasi as the second largest city in Ghana reflects a population of metropolitan dimension and therefore provides the opportunity to undertake this study from people with diverse backgrounds. The survey method, which was employed in gathering information from respondents, consists of direct visits, interviews and questionnaires. Some informal interviews were also conducted by asking operational managers of the various network operators about their views and strategies for post MNP implementation. This informal approach provides the chance to know some of the information gaps identified during the formal survey and interview process.

Sampling and Survey Technique

In sampling techniques, Leedy and Ormrod, (2000) claim that sampling provides the possibility of a large number of respondents with the view to generalizing. They therefore suggest that convenient sampling of the population is more appropriate and considered more suitable for the intentions of this study. In view of this, non-probability sampling method was applied. Given the urban identity of the study, the sample consists of 200 individuals representing different statuses of personalities including business people, professionals, students and employees in both private and public organizations.

The respondents were made to indicate how and the extent to which factors such as income, service problems, usage cost and customer service impact their switching intention. Improper consumer service, unknowledgeable employees, long waiting times for customer service, billing errors, poor network coverage, frequent and sporadic network breakdowns, hidden charges, expensive SMS (short messaging service) charges, high Internet charges, influence from families and friends, numbers considered 'special', etc. affect switching behavior of subscribers.

Miscellaneous materials

Apart from the already-stated data-gathering mechanics, books and web materials, especially monthly reports on porting figures from the NCA websites were applied for seasonal and trend analysis.

Model Specifications

In this survey, a Binary Logit model was used. The main model (equation 1) measures the probability of a subscriber's willingness to switch network operator. Thus, the model has a qualitative dependent variable with binary or dichotomous responses. According to Gujarati (2003), in models where the dependent variable is qualitative, the objective is to find the probability of something happening. Thus, in this study the probability that a particular subscriber is willing to switch network operator is specified as:

$$P_i = \Pr(y_i = 1) = \frac{e^{x\beta}}{1 + e^{x\beta}} \text{----- (1)}$$

In addition, the probability that a particular subscriber is not willing to switch network operator is expressed as:

$$(1 - P_i) = \Pr(y_i = 0) = \frac{1}{1 + e^{X\beta}}$$

Thus, the odds ratio i.e. the ratio of the probability that a subscriber is willing to switch network operator to the probability that a subscriber is not willing to switch network operator is written as:

$$\frac{P_i}{1 - P_i} = \frac{1 + e^{X\beta}}{1 + e^{-X\beta}} \text{ ----- (2)}$$

The logarithm of the ratio P_i and $(1 - P_i)$ is the log-odds ratio and the log-odds ratio is a linear function of the explanatory variables. That is:

$$\log_e \frac{P_i}{1 - P_i} = \beta_0 + \sum_{j=1}^k \beta_j x_{ij} \text{ ----- (3)}$$

This equation uses the natural log of the odds and is called the logistic transformation, which is otherwise known as Logit. The Logit model (L) has features that include:

- As P goes from 0 to 1, the logit L goes from $-\infty$ to $+\infty$. That is, although the probabilities (of necessity) lie between 0 and 1, the logits are not so bounded.
- Although L is linear in the explanatory variables, the probabilities themselves are not.
- If L, the logit is positive, it means that when the value of the regressor(s) increases, the odds are that the regressand equals 1 (meaning some event of interest happens) increases. If L is negative, the odds are that the regressand equals 1 decrease as the value of explanatory variables increase.
- The X and the β represent independent variable and the extent to which the independent affects the switching preference of the subscribers respectively.

		Lowest	Mid-Point	Highest Level
Probability	P	0	.5	1
Odds	P / 1 - p	0	1	$+\infty$
Log Odds	Log (p / 1 - p) Logit P	$-\infty$	0	$+\infty$

Table 1: Ranges of Probability, Odds and Log-Odds.

Based on the above formulations, logistic linear regression model was used to estimate the impact of customer service, service problems, usage costs and income on switching preference.

Model specification. Model 1

$$S=f(C, P, U, I)$$

$$S=\beta_1 + \beta_2 C + \beta_3 P + \beta_4 U + \beta_5 I + \mu \text{ ----- (4)}$$

Where, S=Switching preference, C=Customer service, P=Service problems, U=Usage costs
I=Income, μ =Is white noise (include all omitted variables that can influence the dependent variables)

β_s =Parameters to be estimated to measure the impact of customer service, service problems, usage costs and income on switching preference.

Switching factors

Customer Service. Customer service was coded as 3 for high customer service, 2 average customer services, 1 low customer services and 0 for indeterminate answer.

Service Problems. Service problems was coded as 3 for high service problems, 2 average service problems, 1 low service problems and 0 for indeterminate answer.

Usage Costs. Usage cost was coded as 3 for high usage cost, 2 average usage cost, 3 low usage cost and 0 for indeterminate answer.

Switching. Respondents were asked to indicate whether they have switched or not. Those who have switched were coded as 1 and 0 for those who have not.

Incomes of the respondents. The respondents were also asked to give their annual earnings in Ghana cedis (GH¢). Data were recorded with Microsoft Excel and analyzed by the use of Statistical Package for Social Sciences (SPSS). Most of the variables impacting on switching preferences of subscribers are presented in a form of frequencies, percentages, means and regression form.

FINDINGS

MNP in Context

As already intimated, Kumasi was chosen because it provides a true reflection and representation of people from different tribal backgrounds in the country. Therefore any results obtained can offer a general idea of the situation in the country. The city also has the highest mobile number subscriber penetration rate of around 80 percent as per NCA third quarter report in 2011. The metropolis is characterized by small, medium and large-scale industrial activities in such areas as pharmaceuticals and medical accessories, mechanical and electrical engineering works, logging and saw milling, alcoholic beverages and textiles, footwear, cosmetics, soap making, carpentry and joinery, foam and plastic, printing and stationery and metal works.

The NCA came into being via the instrumentality of the National Communication Act 769 of 1996. The national agency is charged with the responsibility of regulating cable, radio, wire, television, satellite and allied means of technology communications. The essence is to guarantee systematic progress and efficient functioning of communication services in Ghana. There was massive public sensitization campaign prior to the implementation of MNP on July 1, 2011. The rationale was to explain the processes and the implications involved to potential "porters" subscribers. This largely took the form of workshops, seminars and advertisements for the major stakeholders.

The service providers for the MNP consisted of Porting Access (PortingXS) from the Netherlands and CIS Ghana, Ltd., the local counterpart. The process of porting to another network provider means a visit to the premises of the service provider of a subscriber's wish. The new network provider then deals with the relevant details and works through a central mechanism to establish links with the customer's previous mobile service provider. The customer will then be in a position to operate on the new network moments later and to receive calls and text messages via the original number, as well as to place calls and inform the receiver using the original number.

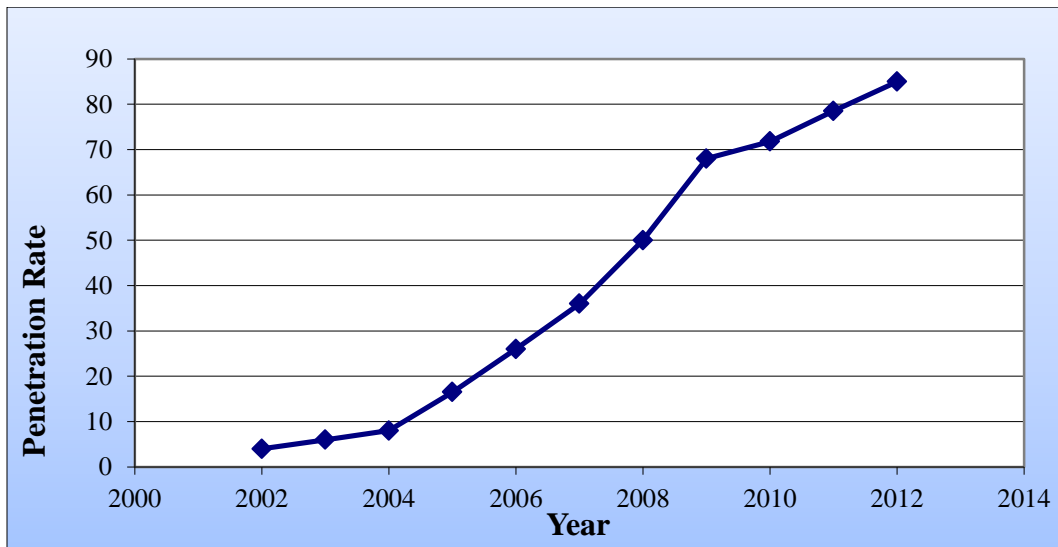


Figure 1: Trend of Mobile Penetration in Ghana for a Ten-Year Period (NCA, 2011).

The commercial activities in the metropolis have increased the demand for telecommunication services and this is the more reason why all the telecommunication networks have made Kumasi a significant base for their operations. Upon the implementation of the policy of allowing private telecoms operators into the telecoms industry, Ghana assigned various network codes to different mobile companies. All the six mobile telecoms companies involved, namely, Airtel, Expresso, Glo, MTN, Tigo and Vodafone had 026, 028, 023, 024/054, 027 and 020 as their respective codes.

The implication of this is that a subscriber is identified by a specific mobile network codes before the MNP implementation. After the implementation of the policy, it is now possible for a subscriber to switch their loyalty between mobile telecoms operators and still keep their original numbers. By the end of August 2011, about eight weeks into the resumption of MNP, 64,657 mobile phone subscribers had taken advantage of this new arrangement to switch to a different operator while keeping their original numbers. However, latest figures from the NCA indicate that from the launch date of July 7, 2011, until the end of the second year 817,202 porting requests have been completed.

The Tables 2, 3 and 4 (presented below) show how respondents subscribe to telecommunication services.

Mobile Network Operators	Number	Percent
MTN	82	41.0
VODAFONE	66	33.0
TIGO	10	5.0
AIRTEL	30	15.0
EXPRESSO	12	6.0
Total	200	100.0

Table 2: Respondents and their Network Service Providers from Field Data.

Porting Rationale	Respondents	Percentage
To experience new network	8	11.5
Higher tariff charged by old service provider	33	47.5
Promotional activities undertaking by the new operator	1	2
Poor quality of service delivery by the old service provider	22	31.5
Poor quality of customer care by the old service provider	5	7
Others	1	2
Total	70	100

Table 3: Motivating Rationale for Subscriber Portability.

Factor	Frequency	Percentage
High usage costs	185	92.5
Average usage costs	6	3
Low usage costs	0	0
Indeterminate	9	4.5
Total	200	100

Table 4: Usage Costs on the Switching Behavior.

INTENTIONALITY, SWITCHING BEHAVIOUR AND CUSTOMER LOYALTY

Economic Motivation

Cho, Ferreira and Telang (2013) argued that an influencing factor in mobile usage is the implications on the user's welfare occasioned by a reduction in the cost of telephony. Average monthly income from primary occupation was used as an indication of respondent's income. With the average income of respondents being GHC 644.436 per month (approximately \$325),

the earning capacities of respondents are quiet high. This establishes the idea that increases in economic activities go hand in hand with increases in general income of inhabitants. From the two hundred (200) individuals interviewed, 176 (representing 88 percent) indicated that subscribing to their network has impacted positively on their business operations.

Some of the respondents made their intention clear that they only subscribe to network because of the nature of their business as it helps them to engage in dynamic interactions with their customers. With average respondent engaged in petty trading, mobile phone usage is expected to facilitate their communication with their business associates. One businessman remarked, “*Now with mobile phone, I just have to call my business associates and tell them when to supply my goods for sale and within a short period they will just supply the goods.*” The effect of what he said gives the impression that the use of mobile phone can have direct link with business operations.

Respondents provided an account of the amount they spent on recharge cards within a month and their responses indicate that on average they spend the equivalent of between \$20 and \$30 a month on recharge cards. This confirms the fact that greater proportions of respondents spend a lot on recharge cards in relation to their incomes as indicated above. The impression gathered for this trend was partly as a result of the nature of their work or business, the price of recharge cards, frequency of calls made and others.

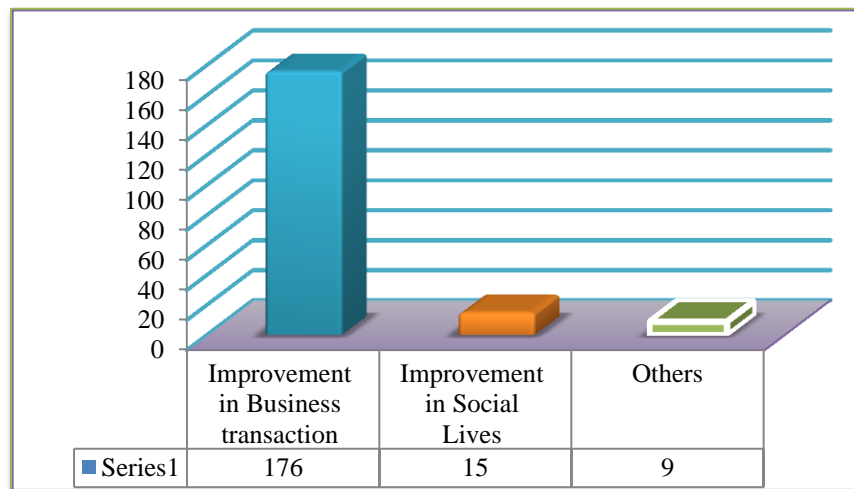


Figure 2: The Impact of Portability on the Lives of Subscribers.

Analytical Aid (The Logit Regression Equation)

This section explores the impact of switching factors (Income, Customer service, Service Problems and Usage costs) on the probability that subscribers are willing to switch or remain with the same network operator. Thus, the model has a qualitative dependent variable S (i.e. the switching preferences of respondents) and the independent variables, which are binary or dichotomous responses. The SPSS (version 16) result of the Logit regression is used to estimate the model in equation (4) above and the result is contained in Table 5 below. From Logit regression a proper interpretation of the coefficients β_i is done by exponentiating the coefficient

and interprets them as odd ratios. Data collected from respondents were analyzed using Logistics Regression Model in SPSS (version 16) and Table 5 shows the output results. From Table 4:

- 1) As Log odds approaches $-\infty$, Odds approaches zero and P approaches zero which means that a mobile subscriber is not likely to switch from a network operator.
- 2) As Log Odds approaches zero, Odds approaches 1 and P approaches 0.5, which means that a subscriber may or may not switch network operator (i.e., equal chance for switching or not switching).

		Lowest Level	Mid-Point	Highest Level
Probability	P	0	.5	1
Odds	P 1-p	0	1	$+\infty$
Log Odds	Log (p/1-p) Logit P	$-\infty$	0	$+\infty$

Let P=Probability that a mobile subscriber will switch network operator.

Then, 1-P=Probability that a mobile subscriber will not switch a network operator.

Table 5: An Equal Chance between Switching and Non-switching Intention.

Independent Variables	β_i	Sig.	e^{β_i}
Income (I)	-.002	.002	.998
Low customer service (C_1)	-.416	.734	.660
Average customer service (C_2)	-.713	.553	.490
High customer service (C_3)	-.871	.483	.419
Low service problem (P_1)	.439	.524	1.551
Average service problem (P_2)	1.502	.040	4.492
High service problem (P_3)	4.647	.022	104.280
Low usage cost (U_1)	.386	.625	1.472
Average usage cost (U_2)	2.137	.010	8.472
High usage cost (U_3)	1.788	.042	5.980
Constant (K)	1.332	.276	3.787

Cox & Snell R square: 0.589, Nagelkerke R square: 0.825

Wald chi- square: 97.853, sig. : 0.001 - sig identifies the significance level, and in this situation the event has a 1000th chance of occurrence.

Table 6: Model Summary—The SPSS Logit Regression Output Result

- 3) As Log Odds approaches $+\infty$, Odds approaches $+\infty$ and P approaches 1, meaning a subscriber will remain with same network operator.

The Log-Odds ratio:

$$\log_e \frac{P_i}{1 - P_i} = \beta_0 + \sum_{j=1}^k \beta_j x_{ij} \text{ Where } x_{ij} = \text{independent variables.}$$

Equation (1) shows that the values of interest are from Table 4 are β_i values.

Using variables that are significant (i.e. sig. <0.05), the model can be represented as:

$$\text{Logit (P)} = \beta_0 + \beta_1 C + \beta_2 P + \beta_3 U + \beta_4 I + \mu$$

$$\text{Logit (p)} = 1.332 - 0.002I + 2.137U_2 + 4.647P_1 + 1.502P_2 + 1.788U_3 - 0.871C_3 \text{ ----- (5)}$$

From Table 5, there is an obvious negative relationship between willingness to switch and the income of the respondents—this is also statistically significant. The negative relationship between willingness to switch and the income of customers indicate that as income of customers increases they will not be willing to switch but remain with the same network operator (i.e., switching will decrease). With GH¢1.00 increase income, mobile subscribers are 0.998 times ($e^{-0.002}=0.998$) more not willing to switch to different network provided all other factors are held constant.

Customer Service Implications on Switching Preferences

With respect to customer service, the result from Table 5 above suggests that high customer service, average customer services and low customer services were however not statistically significant in determining the willingness of network subscriber to switch or remain with the same network provider. Estimates from Table 5 suggest that there is an encouraging relationship between willingness to switch and the high service problems and average service problems and this is statistically significant. The positive relationship between willingness to switch and the high service problems and average service problems means that as high and average service problems emerge, subscribers will be more willing to switch and not remain with the same network operator. The results show that subscribers are 104.280 times ($e^{4.647}=104.280$) and 4.492 times ($e^{1.502}=4.492$) more willing to switch to different network if high service problems average service problems respectively increases. Low services problem was however not statistically significant in determining the willingness of network subscriber to switch or remain with the same network provider.

It is clear from Table 5 that there is a positive relationship between willingness to switch to different network and the high usage cost and average usage cost and this reveals significant statistical implications. The impression suggests that as usage cost increases subscribers will be more willing to switch and not remain with the same network operator. The results show that subscribers are 5.980 times ($e^{1.788}=5.980$) and 8.472 times ($e^{2.137}=8.472$) more willing to switch to different network if high and average usage cost increases. However, low usage cost was not statistically significant in determining the willingness of network subscriber to switch or remain with the same network provider. This situation is illustrated in figure 2 below.

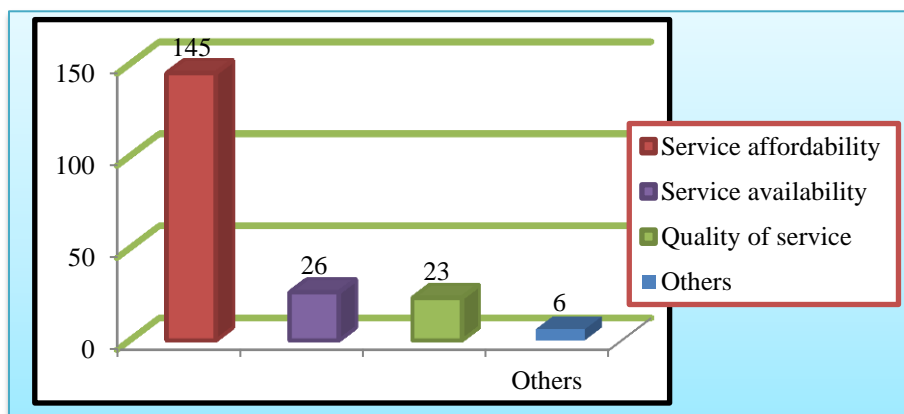


Figure 3: Rationale for the Subscription of Particular Service Providers.

The chi-square value of 97.853 indicates that the independent variables (Income, Service problems, Usage cost and Customer service) explain changes in dependent variable (switching preference) by 97.85 percent. The Cox and Snell's R^2 (0.589) and Nagelkerke's R^2 (0.825) which measure compares the actual results obtained from respondents to the outcome predicted by the model. These two R^2 's accounting (0.589 for Cox and Snell's R^2 and 0.825 for Nagelkerke's R^2) are above 0.5 and therefore the model's explanatory power is high, though 1.0 is the ideal case. Perhaps there may be other more explanatory variables to account for the switching preference of subscribers in the era of mobile number portability. Again, there was positive relationship between willingness to switch and the high service problems and average service problems and this was statistically meaningful. This is supportive of the constructive relationship between willingness to switch to different network and the high usage cost and average usage cost.

CONCLUDING THOUGHTS

It is clear that virtually all subscribers understand the concept of MNP and expressed their opinions in diverse forms. They believe that the industry has now become truly competitive because subscribers have the right to switch operators at minimum cost with least convenience. As a result, the implementation of MNP has equipped consumers with the flexibility to change operators with their original number intact. The current findings provide new and important insight regarding the relationship between subscribers switching intentions and switching characteristics (usage cost, service problem, customer care and income). Cox and Snell's R^2 (0.589) and Nagelkerke's R^2 (0.825) were above 0.5, some of the estimated coefficients of explanatory variables were significant at 5 percent level which means the model has commendably high predictive power. It was found that there is a negative relationship between willingness to switch and the income of the respondents and this was statistically revealing. The study shows that if the income of a subscriber increases by GH¢1.0 (\$.50), they are slightly not willing to switch their network. High customer service, average customer services and low customer services were however not statistically significant in determining the willingness of network subscribers to switch or remain with the same network provider.

This study also established the idea that network operators have adopted different strategies in response to customers' ability and power to decide which network to belong to whom. More customer care outlets have been set up while network coverage and quality have relatively improved. Promotional activities like free calls during off-peak periods, double credit upon recharging, electronic money transfers, etc., have been intensified. These strategies have been adopted to entice subscribers to stay on networks and to entice new ones as subscribers appear to be reasonably sensitive to these dynamics. MNP has brought fierce competition in the market and this is seen in the area of continue decrease in prices and increase in promotional activities. However there is the need for the NCA should do more by way of educating subscribers on advantages of switching to service providers with comparatively better service offering. The NCA can also put pressure the telecoms operators to endeavor to reduce the time for porting in as means of reducing the discomfort and frustration sometimes encountered by potential subscribers.

One practical implication is the tendency for a particular network to experience massive network traffic as a result of increased subscriber switches to that network. To this end, network breakdown could be foreseen in such a circumstance, especially when the overriding interest of these operators is numbers and not particularly on enhanced service quality. Secondly, and from a business standpoint, network operators are more likely to adopt, sometimes, unhealthy porting practices that entice subscribers to switch without appreciating the full consequences of their porting action. Avenues to future research can be directed at the extent to which subscribers regretted switching their loyalty. In other words, some kind of academic attention is needed to determine the level of remorse that characterizes subscribers' switching intentions. The feasibility of this future research direction can be aided by application of the cognitive dissonance theoretical framework.

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