Exploring Consumer Behaviour towards Mobile Number Portability (MNP) in Ghana: Pursuing Sustainable MNP Adoption

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Abstract

The mobile number portability (MNP) innovation in Ghana is expected to benefit consumers, industry players and the society as it is capable of inducing strong switching efficacy and increase competition among mobile network operators in Ghana. However, there is relatively little empirical research on consumer behaviour towards MNP adoption in the Ghana mobile telecom context. This paper attempts to fill this gap by examining consumer behaviour towards MNP in Ghana. Through a cross-sectional survey design involving 736 mobile subscribers from six telecoms in Ghana where MNP policy has recently been introduced, the results indicate that most respondents rated their perception of level of knowledge of MNP and usefulness of MNP low. Moreover, most respondents had unfavourable attitude towards MNP and perceived the porting time as unduly long and slow. Gender and age influenced consumer perception of MNP adoption. The implications of these findings to theory and practitioners have been discussed, limitation are noted and directions for future research are proposed. The paper advances our knowledge in consumer behaviour towards technological innovations in the mobile telecommunication industry in developing countries.

Keywords: number portability; demography; switching efficacy; mobile telecom industry

**Introduction**

In the past two decades, the mobile telecommunication industry has seen the innovation of mobile number portability (MNP) policy and its implementation in both developed and developing countries. The MNP innovation simply allows mobile subscribers to retain their mobile SIM numbers while changing to use other service providers such as voice calls. MNP facility is intended to enhance effective service delivery by mobile operators and to provide consumers considerable freedom to switch between and among service providers in an attempt to increase consumer empowerment (Buehler and Haucap 2004; Lin, Chlamtac, and Yu 2003; Reinke 1998).

MNP was first introduced in Singapore in 1997, followed by UK, Hong Kong and the Netherlands in 1999. As of 2013, a number of other countries across the globe have successfully introduced MNP in their telecom industry (Buehler and Haucap 2004; Larkotey et al. 2012; Odunaike 2010; Tiamiyu and Mejabi 2012). In Africa, MNP has been implemented in countries such as Egypt, Ghana, Nigeria, Kenya, and South Africa. In West Africa, Ghana was the first to introduce the MNP policy followed by Nigeria.

In Ghana, the MNP policy was officially launched in Ghana’s mobile telecommunication industry (GMTI) on July 7, 2011 (NCA 2012). This was done by National Communication Authority (NCA), the industry regulator, in close collaboration with the mobile telecom operators. There are six mobile telecom brands and operators, namely, MTN, Tigo, Kasapa, Vodafone, Airtel and Glo (NCA, 2013). MNP system in Ghana allows mobile subscribers to change from one network to another without changing any part of their mobile number (NCA, 2013). The NCA (2013) report shows that 817, 202 mobile numbers were successfully ported by the end of the second year since MNP was introduced. This figure represents 1.6% of the total active mobile numbers in Ghana. According to the report, majority of the customers who have ported their mobile numbers have remained on their network which they switched to. They indicated that they were also satisfied with the process and the choice they made. The rate of success of porting requests submitted rose from 75% to 82%, with an average porting speed of 5 minutes 25 seconds between 2012 and 2013.

By September 2013, MTN had loss of 275, 963, representing 2.19% of their customer base while Tigo and Vodafone consistently had great gains in porting representing 5.12% and 1.63% of their customer base respectively. According to NCA (2012, 14), one of the key challenges facing the MNP implementation is that some mobile telecom service providers still experience operational and technical problems that are yet to be resolved. In addition, there is low consumer awareness and education of the facility. Apart from this, NCA’s (2013, p. 9) report also reveals that some dubious behaviour by agents of mobile networks has continued as they deceive customers who are not well-educated and knowledgeable in many ways about the policy.

The main problem of this study stems from the fact that there is the need to increase scholars’ understanding of consumer behavour towards MNP adoption from developing country perspective and provide management and telecom regulators evidence-based research for the effective management of MNP in developing and emerging countries. There is very little empirical research on consumer behaviour towards MNP adoption in developing countries in general and in Ghana telecom industry in particular. Much of the past studies on consumer adoption of MNP has been extensively conducted in developed country mobile telecom contexts (Buehler and Haucap 2004; Lee et al. 2006; Lin, Chlamtac and Yu 2003; Maicas, Polo, and Javier 2009; Oftel 1997; Ovum 2000; Reinke 1998; Shin and Kim 2007; Seo, Ranganathan, and Babad 2008). Relatively few research has been done in the area of adoption of MNP innovation in developing economies and Sub-Sahara Africa (SSA) developing countries contexts (e.g., Abdramon and Mejabi 2012; Chweya 2013; Odunaike 2010; Tiamiyu and Mejabi 2012; Suthar, Sharma, and Gwal 2012) and in Ghana in particular (e.g. Agyekum, Tchao, and Affum 2013; Larkotey et al. 2012). In Ghana, much of the literature that exist on MNP (e.g., Agyekum et al. 2012) mainly provide secondary data from NCA’s website and lacks rigorous empirical data from consumers’ perspective. Given that the adoption of MNP policy will be beneficial to mobile subscribers and that their adoption is crucial to sustainability of the MNP success, it becomes critically important to provide more empirical evidence regarding mobile subscribers’ behaviour towards the MNP policy from consumers’ perspective and provide recommendations for policy makers, mobile telecom managers and all relevant stakeholders. Therefore, the main purpose of the paper is to examine consumer behaviour towards the MNP policy in Ghana since the implementation of the policy in July 2011. The study is guided by the following specific objectives:

1. To examine consumer attitude and perception towards MNP policy in Ghana
2. To examine the influence of demographic variables (gender, age, income, education and marital status) on consumer behaviour towards MNP policy in Ghana.

**Literature Review and conceptual framework**

*MNP research in developed country context*

Much of literature on our understanding of MNP can be traced to attempts by scholars to provide a framework of network competition and switching cost. Reinke (1998) argues that even if number portability can increase the competition in the telecommunication market, the means by which number portability is implemented may either ensure or threaten competition and universal service. Aoki and Small (1999) found that MNP can cause welfare change of consumers and producers. Srinagesh and Mitchell (1999) analysed MNP in US mobile market and found that MNP has signiﬁcantly contributed to the effective competition in the US mobile market.

According to Gans et al. (2001), MNP can be socially beneficial to stimulating participants’ search for better services, and give consumers’ ownership of their phone number and a right to port a number. Park et al. (2004) conduct a statistical analysis to estimate the impact of MNP on the competition and social welfare and conclude that the MNP has achieved effective competition in mobile market, but MNP has not contributed to social welfare.

Buehler and Haucap (2004) also investigate the effect of MNP implementation on consumers’ welfare, especially in terms of the effect of MNP on level of information available to consumers. They argue that under MNP, number preﬁx has no indicative power. Since callers are not able to distinguish between on- and off-network phone numbers, they may end up paying higher than average bills. In effect, with MNP implementation while the new mobile operator beneﬁts, the incumbent will typically lose. They argue that MNP may result consumer ignorance which may limit the benefit of MNP for consumers. Their results further show that MNP will enhance consumer welfare if mobile termination rates are regulated by telecom industry regulators and the set up costs for MNP are not prohibitive

There has been a growing interest in the MNP effects on customer behaviours in the past. In the USA, Shin (2006) investigates subscribers’ perception and behaviour towards MNP and found that, although MNP implementation is expected to lower switching cost and benefit consumers, carriers have increased subscriber lock-in by making subscribers sign long-term contracts, by increasing termination charges, and by imposing the burden of hidden costs. In effect, this adversely affects the effectiveness of MNP; subscribers still feel the high level of switching barriers after the introduction of MNP, there has been little effect on the competition in the USA mobile market.

Lee et al. (2004) conclude that MNP is an important cause of decreasing switching cost. Similarly, Gerpott et al. (2001) investigate the structural relationships of subscriber retention, subscriber satisfaction, and loyalty in German mobile subscribers. Their ﬁndings show that customer support has a signiﬁcant impact on subscriber loyalty which in turn inﬂuences a subscriber’s intention to terminate/extend the contractual relationship with his/her mobile carrier.

Kim et al. (2003) use the Gerpott et al.’s (2004) model and apply it to Korean mobile market whose ﬁndings show that switching cost like switching number is considered as a formation factor of an important subscriber loyalty, preventing subscriber from churning for other carriers. Bjorkroth (2005) researches into the cost of MNP administration in Finland mobile carriers before and after MNP. Bjorkroth (2005) found that switching cost is lowered considerably and that the threshold to switch from the largest operator has been considerably lowered since the introduction of MNP. This was attributed to decreasing informational costs and contractual costs.

Shin and Kim (2007) investigate subscribers’ behaviour and perceptions toward switching after the introducing of MNP in Korean telecom industry. They observe that there is a lack of understanding of the full implications of MNP, which means that MNP has not always translated into consumer beneﬁts. Their results show that MNP has not signiﬁcantly contributed to the regulator’s goal of removing switching barriers that are prevalent in subscribers’ perception, and that though MNP has lower switching costs, the remaining potential switching costs are still large.

They, however, admit that MNP has indirectly enhanced switching barriers through the increased subscriber lock-in strategy and its tactics. Their findings are partially consistent with other studies on Korean MNP such as Park et al. (2007) and Lee et al. (2006), which report a brand effect among subscribers that they feel MNP demands differently. Although number portability is designed to beneﬁt consumers, it becomes possible that the corresponding increase in marginal cost of production reduces consumer surplus and makes entrants and consumers worse off.

Aoki and Small (1999) ﬁnd that it is also possible for consumers to receive fewer beneﬁts following a reduction in the cost of switching between carriers. The authors note MNP is not always and everywhere socially beneﬁcial, therefore future studies may further research on this discrepancy.

Thus, previous studies have emphasised the relevance of MNP but have noted the discrepancy found across countries regarding the benefits of MNP. These studies have also suggested that regulators should not just enforce MNP, but need to develop socially desirable and economically competitive policy. Regulators are also to seek to reduce consumer ignorance (or misconception) and raise customers’ perceptions on MNP. This argument can be supported by previous research of Wright (2002) and Gand and King (2000) who investigate the effects of consumer ignorance of relevant pricing and suggest that MNP may deteriorate the customers’ price information. It has also been noted that regulators face difﬁcult practical decisions of MNP when and how to implement it, and how to reap these beneﬁts (Shin and Kim, 2007).

*MNP Research in Developing Country Context*

Relatively few studies have been done in MNP in developing country context. In South Africa, Chweya (2013) found that MNP implementation is intensifying competition among industry players. Customers have been worried over service quality issues and especially delays in the porting process. Odunaike (2010) studied MNP among college students. He notes that there is evidence of little or no participation of MNP among college students, and argues that the threats poised by MNP functionalities regarding the loss of customer base automatically have great impact on the costing which in turn impacted on the high online connectivity rate among the college students.

Dube (2011) also found that in South Africa, policy and regulations on MNP had both positive and negative effects. They maintain that although consumers are now able to switch operators whilst keeping their numbers, prices still remain uncompetitive and quality of service is yet to improve. Since MNP implementation has not been able to reduce prices according to consumers’ expectation. This is likely to affect potential mobile subscribers’ attitude, perceived benefit of the MNP facility and therefore consumer adoption of MNP in mobile telecom industry (MTI) in South Africa.

In Nigeria, prior to the implementation of MNP, Tiamiyu and Mejabi (2012) studied subscribers’ attitude towards MNP. They found out that while most subscribers supported the implementation of MNP in Nigeria, a significant proportion believed that tariffs would not drop as long as the power problem continued. Furthermore, their results showed that demographic variables such as marital status, income and age had influence on subscriber attitudes, with age influencing most aspects of the subscriber attitudes and perceptions towards MNP in Nigeria.

In Kenya, Kagwathi et al. (2013) found ten factors that influence mobile number portability adoption. These factors include exit barriers, other cost, challenging and delay porting process, customer service, satisfaction, competition incentive among others. Similarly, Ooko, Nzomoi, and Mumo (2014) found that after the introduction of MNP in Kenya on April 1st 2011, the porting process has not been so smooth and identified ten factors that influenced mobile number portability including exit barriers, cost, process, customer service, satisfaction among others.

In Ghana, existing literature on MNP has focused only on a review of MNP and the implementation architecture, relying mostly on secondary data provided by NCA (e.g. Agyekum et al. 2013; Larkotey et al. 2012). More recently, Nimako et al. (2014) demonstrate that, in Ghana, MNP can significantly reduce switching cost, and that MNP adoption is able to influence switching intentions through consumer curiosity, attitude towards switching and perceived switching cost. However, Nimako et al. (2014) did not examine the influence of demographic variables on consumers’ behaviour dimensions towards MNP adoption.

*Demographic influence and MNP adoption*

There is relatively very little empirical research on demographic influence on MNP adoption in general. Mittal and Kamakura (2001) found that higher disposable amount available to the consumer lead to negative incentive to switch. Homburg and Giering (2001) found that age has a negative relationship with porting rates. Ooko et al. (2014) found that some demographic variables such as the period of usage, age, average amount spent on airtime have a significant, but minimal influence on the intention to switch through MNP in Kenya telecom industry. Abdramon and Mejabi (2012) found that, in Nigeria, some demographic variables such as age had the strongest influence on subscriber attitudes towards MNP. While they found gender and educational level had significantly no influence on subscriber attitude towards MNP implementation, income and marital status had very little influence on consumer attitude towards MNP implementation. These limited findings on subscriber demography-MNP relationship suggest that some unique consumer characteristics may influence MNP depending on each research context.

From the literature reviewed so far, it is evidenced that more research is needed to understand consumer behaviour towards MNP adoption in developing country telecom context. The present study, therefore, explores consumer behaviour towards MNP adoption in GMTI. The present study extends existing and the influence of demographic variables on different aspects of consumer behaviour towards MNP adoption.

*Conceptual framework*

The conceptual framework is depicted in Figure 1. Past studies have made significant efforts to provide theoretical framework to explain the factors that influence consumer behaviour in general and their adoption of innovation in different research contexts. Notably among the theories that help explain consumer behaviour and innovation adoption are: Theory of Planned Behaviour (TPB) by Ajzen 1991, Technology Adoption Theory (TAM) by Davis, Bagozzi, and Warshaw (1989), Theory of Innovation Diffusion (TID) by Rogers (1962; 2003), The Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. (2003); and The Unified Theory of Acceptance and Use of Technology2 (UTAUT2) by Venkatesh, Thong, James and Xu (2012).

Figure 1. Conceptual framework for the study

A review of these theories reveals a number of factors and aspects of consumer behaviour towards the adoption and use of innovation. These include consumer attitude towards a behaviour or innovation, perceived ease of use (or effort expectancy), perceived usefulness (or performance expectancy), perceived behaviour control or self-efficacy, social influence, consumer knowledge of innovation, among others (Hoehle, Scornavacca, and Huff 2012; Venkatesh, et al. 2012). These consumer behaviour aspects have been found to be influenced by consumer demographic variables such as gender, age, income, education, marital status, among others (Venkatesh et al. 2003; Venkatesh et al. 2012), and in particular in the context of MNP adoption (Abdramon and Mejabi 2012; Homburg and Giering 2001; Ooko et al. 2014). More recently, Nimako et al. (2014, p. 121) show that *“Fundamentally, MNP policy implementation provides the opportunity to switch, serves as an essential tool and resource to switch, and a facilitating condition that influences consumers’ belief in their ability to switch.”* The authors first used the term MNP-induced switching efficacy to refer to an *“externally oriented factor that provides the facilitating condition, resources, and opportunity to induce confidence in consumers’ ability to switch.”* (Nimako et al., p. 123).

Therefore, the conceptual framework (see Figure 1) examines consumer behaviour towards MNP policy by evaluating consumer behaviour aspects such as perceived usefulness of MNP, MNP-induced switching-efficacy, perceived porting effort and time, attitude towards MNP, level of consumer knowledge of MNP policy. It will also assess the influence of consumer demographic variables such as gender, age, income, education, marital status on the aspects of consumer behaviour towards MNP policy.

**Methodology**

The population consisted of 26,591,124 individual subscribers as of April, 2013 (NCA 2013) from all the six mobile telecommunication operators in Ghana, operating under these brand names: MTN Ghana, Vodafone Ghana, Airtel Ghana, Tigo, Expresso and Glo Ghana. The appropriate sample size was estimated using Yamane’s (1967) formula that yielded a minimum sample size of 400. In order to collect data of high quality that reflect customers’ opinion and have quality of good representativeness, a survey was conducted from a cross-section of subscribers of mobile telecom service providers across the country in July 2013. The survey yielded a usable 736 questionnaires returned representing 73.6% response rate for analysis.

A self-administered, structured questionnaire was developed and pre-tested to a sample of twenty (20) customers. Adjustments were made based on the pre-test to get a more effective instrument. After that the questionnaire was finally administered to mobile subscribers through personal contact by researchers for nearly three weeks. Since high predictive validity was a major concern, a five-point Likert scale was used, as recommended in previous work (Danaher and Haddrell 1996), to measure variables for the eleven research constructs. The Likert scale ranged from strongly disagree to strongly agree, coded 1 to 5 respectively. In all, the 14 measurement items were derived from previous studies and modified within the context of the mobile subscribers in GMTI as shown in Table 1. The questionnaire also contained respondents’ demographic data: gender, age, education, income, marital status, and whether customer has ported their mobile number or not.

**Data analysis methods**

A descriptive analysis was conducted using SPSS 16.0 to analyse the mean ranking of each of the consumer behaviour aspects in the research model. Secondly, a non-parametric Kruskal-Wallis Analysis of variance (ANOVA) was conducted to test the difference in consumer behaviour towards MNP policy among demographic groups. The results of the descriptive and K-Wallis ANOVA are presented in Table 2.

Table 1. Constructs and measurement items

|  |  |  |  |
| --- | --- | --- | --- |
| **Constructs** | **Code** | **Measurement items** | **Source** |
| Knowledge of MNP | KNMNP1 | How much knowledge do you have about the mobile number portability (MNP) policy by which you can switch to ….? | Developed based on Cordell (1997); Roger (2003). |
| KNMNP2 | To what extent do you really understand how the whole MNP works? |
| Perceived Usefulness of MNP | PUMNP1 | To what extent do you think the MNP is useful a policy? | Davis et al. (1989); Legris et al. (2004) |
| PUMNP2 | To what extent do you think the MNP will benefit you? |
| Attitude towards MNP | ATTMNP1 | I think the idea of MNP policy is ……. | Developed based on Lee et al. (2005); Park (2009) |
| ATTMNP2 | I believe adopting the MNP policy is … |
| ATTMNP3 | Generally I have positive attitude towards the MNP policy. |
| MNP-induced Self- Efficacy | MNPSEF1 | The Mobile Number Portability policy (MNP) can help me to switch easily to use other mobile network services in Ghana | Developed based on Ajzen (1991); Ajzen and Fishbein (2000, 2005). |
| MNPSEF2 | I belief that in Ghana, with the MNP, now I have every opportunity to switch to any mobile telecom network I like. |
| MNPSEF3 | I belief that with the MNP, I can easily switch to any mobile network I like. |
| Porting time | PPC1 | To what extent do you think the process of porting your mobile number is time consuming? | Gans and King (2000); |
| Attitude towards switching | ATTSW1 | For me switching from one mobile network to another is … | Venkatesh et al. (2012); Ajzen and Fishbein (2000, 2005) etc. |
| ATTSW2 | For me changing from one network to another is a decision that is…… |
| ATTSW3 | The idea of changing from one mobile network to another is to me a …… attitude. |

Table 2. Consumer behaviour towards MNP and influence of demography

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **Kruskal-Wallis ANOVA for test of differences among sub-groups** | | | | | | | | | |
|  |  |  |  | **Gender** | | **Age** | | **Education** | | **Income** | | **Marital status** | |
| **Consumer behaviour aspects** | **Mean** | **Std.D.** | **Remarks** | Male,  n = 498 | Female n =238 | YON, n.= 525 | OLD,  n = 211 | LED,  n = 304 | HED,  n = 432 | LY,  n = 365 | HY,  n = 371 | SING  n = 265 | MAR,  n = 454 |
| Knowledge of MNP | 3.37 | 1.26 | Low | 348.62 | 410.09 | 358.50 | 393.38 | 344.13 | 403.13 | 382.00 | 355.22 | 356.16 | 367.90 |
|  |  |  |  | X2 = 13.863 | Sig.= 0.000\* | X2 = 4.171 | X2 = 0.041\* | X2 = 14.156 | Sig.= 0.000\* | X2 = 3.007 | Sign.= 0.671 | X2 = 0.551 | Sign.= 0.458 |
| MNP switching efficacy | 2.31 | 1.08 | Low | 354.09 | 398.66 | 358.33 | 393.80 | 378.68 | 361.34 | 388.32 | 349.00 | 348.16 | 381.56 |
|  |  |  |  | X2 = 7.402 | Sig.= 0.007\* | X2 = 4.381 | Sig.= 0.036\* | X2 = 1.242 | Sig.= 0.265 | X2 = 6.582 | Sign.= 0.010\* | X2 = 4.528 | Sig. = 0.033\* |
| Attitude towards MNP | 2.30 | 0.87 | Low | 356.94 | 392.68 | 361.44 | 386.07 | 366.83 | 369.68 | 381.64 | 355.57 | 356.62 | 367.13 |
|  |  |  |  | X2 = 4.697 | Sig.= 0.030\* | X2 = 2.085 | Sig.= 0.149 | X2 = 0.033 | Sig. = 0.856 | X2 = 2.854 | Sign.= 0.091 | X2 = 0.442 | Sig.= 0.506 |
| Perceived usefulness of MNP policy | 2.11 | 1.12 | Low | 347.46 | 412.53 | 367.15 | 371.86 | 357.44 | 376.28 | 376.67 | 360.46 | 366.31 | 350.59 |
|  |  |  |  | X2 = 15.857 | Sig.= 0.000\* | X2 = 0.078 | Sig.= 0.780 | X2 = 1.474 | Sig.= 0.225 | X2 = 1.124 | Sign.= 0.289 | X2 = 1.007 | Sig.= 0.316 |
| Perceived porting time cost of MNP | 3.171 | 1.23 | High | 376.20 | 352.39 | 359.49 | 390.91 | 370.79 | 366.89 | 362.22 | 374.68 | 350.25 | 377.99 |
|  |  |  |  | X2 = 2.141 | Sig.= 0.143 | X2 = 3.484 | Sign.= 0.062 | X2 = 0.064 | Sig.= 0.801 | X2 = 0.671 | Sign.= 0.413 | X2 = 0.316 | Sig.= 0.077 |

N = 736, scale strongly agree to strongly disagree, coded 1 – 5 respectively, \* all p-values are significant at 0.05; all chi-square values have one (1) degree of freedom; young consumers - below 32, old – above 32; low education (LED)– below degree, high education (HED)– degree; low income (LY) – less than GH 500 per month, high income (HY) more than GH 500 per month; Single (SING) – single not married, married (MAR) – married

**Results**

*Respondents’ background characteristics*

For the characteristics of the respondents, in terms of gender, 67.7% of the respondents were males and 32.3% were females. 20.7% of the respondents were below 25 years, 67.3% of them were within the ages of 25-36 years, 11.4% were between 37 and 50 years, and .6% were 50 years and above. This implies that majority of them were in the economically active population. All respondents were educated with about 58.7% of them having tertiary level of education, while about 5% and 33% had Senior High School (SHS) and post-SHS education respectively. About 3% had other forms of education. In terms of income, 33.5% of respondents earned monthly income up to GH¢500, while 43.9% earned between GH¢500 and GH¢1000, about 6.5% earned monthly income above GH¢1000. This indicates that most of them earned considerably low incomes. In terms of marital status, 61.7% of the respondents were married, about 36% were single (not married) and about 2% of them were in other marital category such as divorced, separated widowed, etc. The rest of the results are presented according the research objectives.

*Research objective one: consumer attitude and perception towards mobile number portability in Ghana*

The results from Table 1 show that, generally, consumer perception of the perceived porting time is high (mean = 3.1). Due to the measurement scale (see Table 1) for this variable, the mean should be interpreted as disagree. This means considerably most of the respondents perceived the time and effort involved in the porting process to be high. The level of consumer knowledge of MNP is low (mean = 3.71), implying that most of the respondents perceive their level of knowledge and understanding of MNP policy and processes as considerably low. The consumers’ switching efficacy induced by MNP is low (mean = 2.31), implying that most of the respondents’ perception about the fact that they can switch through the MNP platform is considerably low. The results also indicate that perceived usefulness of MNP is low (mean = 2.11), implying that most of the respondents do not perceive MNP innovation as useful to them. Finally, consumers’ attitude towards MNP is considerably unfavourable (mean = 2.30).

*Research objective two: influence of demographic factors*

The results from Table 1 also indicate the, generally, some consumer demographics significantly influence different consumer behaviour towards MNP policy in Ghana. Specifically, perceived level of MNP knowledge is influenced by gender, age and education. Specifically more females have more knowledge perception of MNP than males, older responders have more MNP knowledge than younger ones, and in terms of education, higher education respondents appear to have more knowledge than lower education. Switching efficacy is influenced by gender, age, income and marital status. Specifically, females have higher switching efficacy than males, older respondents have higher efficacy than younger ones, lower incomes earners tend to belief they have higher switching efficacy through MNP than high income group, married respondents tend to have higher switching efficacy than singles. Attitude towards switching was influenced by only gender; females rated their attitude towards MNP more favourably than their male counterparts. Perceived usefulness of MNP was influenced by only gender; females rated their perceived usefulness of MNP higher than males. Perceived cost of porting time was not influenced by any demographic variable.

**Discussion**

The overarching purpose of this study was to provide empirical evidence on consumer behaviour towards MNP innovation in the mobile telecom network in Ghana. It also sought to assess which demographic variables have significant influence on consumer behaviour towards MNP policy. Findings on consumer behaviour towards MNP adoption appear to be consistent with much of the literature on MNP adoption among consumer in other mobile telecom industries.

The present study found that, generally, consumer perception of the perceived porting time during the porting process is high. This finding is consistent with a number of previous studies that found that delays in the porting process can affect consumer perception and adoption of MNP (Chweya 2013; Kagwathi et al. 2013; Kangangi 2011). The finding implies that, even though consumers stand to benefit when they adopt MNP, as consumers consider the porting process to be more and more effort demanding and time consuming, the less likely will they be motivated to accept and port their mobile numbers to other networks. In GMTI, In spite of the fact that average porting speed has been stable around 5 minutes 25 seconds between 2012 and 2013 (NCA 2013), the results indicate that consumers’ still perceived porting time to be high. Comparing this with other countries, porting speed is worse in countries like Kenya (2 days), USA (2 hours) and in the Republic of Ireland (20 minutes). Ghana, however, can beat the porting time downwards as done in Astralia (3 minutes) and New Zealand (seconds) (Kangangi 2011).

Related to the porting time is delays in the porting process which is likely to negatively affect different types of customers and subscribers. In this regard, Chweya (2013, p. 124) notes that in Kenya, “There have been cases in courts where customers accuse some providers of delays in porting hence loss of business.” To overcome porting delays, it is recommended that industry regulators, mobile network operators and all relevant stakeholders who facilitate any aspect of the MNP porting process should endeavour to speed up the porting process, make it more and more easier to complete within an insignificantly shorter period, and make purposeful attempts to reduce mobile subscribers’ effort in the whole porting process.

Also, the results show that consumers’ switching efficacy induced by MNP is low and that subscribers’ perception of the usefulness of MNP is considerably low. Moreover, the present study found that generally, the level of mobile subscribers’ knowledge of MNP is low in Ghana. The implication of this finding is though MNP is supposed to benefit mobile subscribers, as long as consumers’ level of knowledge is low, the full understanding of the benefits of the MNP and how they can take advantage of the innovation will elude them. The role of knowledge of innovation among end-users or potential innovation adopters has been emphasized long in the innovation literature (Roger 2003; Nimako et al. 2014).

Knowledge of innovation has been found to be a key driver of virtually all types of innovations in electronic environment and other social contexts (Cordell 1997; Park 2009; Roger 2003). More recently and specifically, consumer knowledge of MNP has been found to be a key driver of switching efficacy, positive attitude towards MNP policy and even consumer curiosity to adopt MNP innovation (Nimako et al. 2014). In a similar study in Korean telecom industry, Shin and Kim (2008) investigate subscribers’ behaviour and perceptions toward switching after the introduction of MNP and observe that there is a lack of understanding of the full implications of MNP. This means that MNP has not always translated into consumer beneﬁts. Wright (2002) and Gand and King (2000) found that consumer ignorance of relevant pricing in the MNP policy may deteriorate the customers’ price in price information, which can reduce consumer benefit of MNP. These findings have implication for more intensive and effective consumer education on MNP using all available media in Ghana’s mobile telecom industry by the industry regulator, NCA, together with mobile network operators and all relevant stakeholders (Nimako et al. 2014).

Furthermore, the present study found that, generally, respondents have unfavourable attitude towards MNP. This situation is quite disheartening because consumers’ attitude towards any innovation has been found to be a key driver of their adoption and use of the innovation (Davis et al. 1989; Park 2009; Roger 2003). Therefore, if consumers’ attitude is unfavourable, as it is in the case of MNP in Ghana, then the innovative policy of MNP might not be able to drive consumer adoption significantly over an appreciable time period.

Generally, several factors have been found to influence consumers’ attitude towards most behaviour and adoption of many innovations including perceived ease of use (or effort expectancy), perceived usefulness (or performance expectancy), social influence and other external facilitating conditions such as education, training and self-efficacy (Ajzen 1991, Ajzen and Fisbein 2000, 2004; Davis et al. 1989). These findings on attitude have important implications for management and policy makers in mobile telecom industry in developing country to develop effective strategies to manage induce positive consumer attitude towards MNP policy. Practically, the findings provide some hope that, even though in practice consumers may have some unfavourable attitude towards MNP, especially at the initial stages of its introduction as it is in Ghana, with the necessary consumer education, MNP could have positive results on consumer adoption of MNP and switching intentions.

On the demographic characteristics and consumer behaviour towards MNP, the findings of the present study indicate that gender has considerable influence on consumer behaviour towards MNP in Ghana, which is different from the finding of Abdramon and Mejabi (2012) which suggests that gender had no significant influence on attitude towards MNP in Nigeria telecom industry. Apart from gender, age also had influence on most consumer behaviour such as perceived level of MNP knowledge and switching efficacy, confirming some previous studies (Abdramon and Mejabi 2012; Homburg and Giering, 2001; Ooko et al. 2014). Moreover, education, income and marital status of subscribers had insignificantly little influence on consumer behaviour towards the adoption of MNP, providing support for similar finding in existing MNP literature (Abdramon and Mejabi 2012; Homburg and Giering 2001; Ooko et al. 2014).

These findings suggest that gender and age are most likely to be unique demographic factors in influencing mobile subscriber behaviour towards MNP adoption in Ghana. However, age appears to be very important demographic factor that might influence consumer behaviour towards the adoption of MNP among mobile subscribers in both developed and developing countries.

**Implications of findings**

*Theoretical contribution*

In spite of the fact that the present paper focused more on managerial relevance, it has some theoretical significance as well. Theoretically, the paper provides empirical evidence of the nature of consumer behaviour towards MNP adoption in mobile telecoms in general and GMTI in particular, and how consumer demography influences consumer behaviour towards MNP adoption. This contributions is two-fold. First it has helped increase knowledge of MNP in developing country SSA context. Second, the consistency and deviations of the findings from existing studies on MNP provide avenues for further development of theoretical models to enhance scholars’ understanding of MNP adoption in general.

As pointed out in the literature review, relatively few studies have been done in MNP in developing country context (e.g., Chweya 2013; Dube 2011; Odunaike 2010; Tiamiyu and Mejabi 2012). In Ghana, while existing literature on MNP has focused only on a review of MNP and the implementation architecture, relying mostly on secondary data provided by NCA (e.g. Agyekum et al. 2013; Larkotey et al. 2012), the present paper has contributed to increasing our theoretical understanding of some of the key consumer behaviour factors related to the adoption of MNP in GMTI. The fact that this study relied on empirical data from consumer perspective adds to the importance of the results as basis for developing evidence-based policies and strategies for managing MNP in SSA and Ghana in particular.

*Managerial contribution*

The findings suggest four important areas of managerial implications. Generally, there is the need for management, mobile telecoms and industry regulators, to promote MNP adoption through marketing promotion, consumer education and by reducing other switching barriers in order to reap the full benefit of MNP implementation by service providers and regulators, its adoption by consumers.

First, in order to achieve the desired MNP objectives of facilitating switching and increasing competition in the mobile telecom industry, both industry regulators and individual network service providers should put in collaborative effort to encourage consumer adoption of the MNP policy through effective marketing promotional activities. Such promotional activities should include the use of all available media such as TV broadcast, consumer networks, consumer welfare symposia, radio and FM stations, internet and text messaging, viral marketing, advertisement and event sponsorship avenues, creating online forums, chats, social network pages and complaint channels for MNP, among others.

Second, the findings provide some hope that, even though in practice consumers may have some unfavourable behaviour towards MNP, especially at the initial stages of its introduction as it is in Ghana, with the necessary consumer education, MNP could have positive results on consumer adoption of MNP and switching intentions. Managerially, it implies that Ghana’s mobile telecom industry regulator, NCA, together with mobile network operators and all relevant stakeholders should make efforts to increase consumer education and knowledge of MNP policy and its adoption. In addition, industry regulator, NCA, mobile operators and other stakeholders should find ways of rewarding consumer for their loyalty towards MNP adoption and promotion in Ghana. In this regard, Kangangi (2011) maintains that porting is likely to be high where marketing campaigns are intense.

Such education should provide consistent emphasis on the meaning of MNP, its benefits, porting process, information required of mobile subscribers for success porting process, designated places for porting, who to contact for porting and at what time periods, complaint avenues, among others (Nimako et al. 2014). The consumer education could be a key factors in influencing positively consumers’ behaviour towards MNP in terms of level of knowledge, perceived usefulness, porting costs, positive attitude towards MNP, consumer curiosity to adopt MNP and switching efficacy.

As consumer education increases for MNP adoption, it could indirectly influence positively other consumer switching behaviour such as consumer attitude towards switching, perceived switching cost, peer influence to switch, among others, in order to achieve a ripple effect on consumer switching in general as expected for effective competition in mobile telecommunication industry developing countries, especially, GMTI.

Third, to encourage consumer adoption, mobile network providers and industry regulators should endeavour to reduce other switching barriers, especially long porting time and efforts that results in delays in porting process. Delays in the porting process which is likely to negatively affect different types of customers and subscribers, since porting time has been found to induce significant effect on intention to switch through porting mobile number (Ooko et al. 2014). In this regard, Chweya (2013, p.124) notes that in Kenya, “There have been cases in courts where customers accuse some providers of delays in porting hence loss of business.” Ooko et al. (2014, p. 91) also maintain that, “increasing the speed of porting is crucial for fostering the use of MNP, and that porting time depends both on the technical porting systems and on the willingness of networks to speed up the porting process.” In Ghana, in spite of the fact that average porting speed has been stable around 5 minutes 25 seconds between 2012 and 2013 (NCA, 2013), consumers’ still perceived porting time to be high. The porting time and consumer efforts that results in delays and frustrations should be reduced considerably as done in Astralia (3 minutes) and New Zealand (seconds) (Kangangi 2011). It is, therefore, recommended that industry regulators, mobile network operators and all relevant stakeholders who facilitate any aspect of the MNP porting process should endeavour to speed up the porting process, make it more and more easier to complete within a insignificantly shorter period, and make purposeful attempts to reduce mobile subscribers’ effort in the whole porting process.

Fourth, the findings on the differences in consumer behaviour towards MNP in Ghana among various consumer demographic groups have implication for promotion and education on MNP by industry regulator and mobile telecom service providers. Notably communications and strategies to enhance consumer perception and attitude towards MNP adoption in Ghana should be gender-sensitive, and should take into consideration subscribers’ age, educational, income and marital status difference.

**Limitations, future research and conclusion**

The main limitation of the study is that it is limited to the Ghana mobile telecom industry. Moreover, it did not also examine the influence of other demographic variables such as consumer personality traits, number of phones used, consumer phone/mobile device preferences and previous networks switched. It is, therefore, recommended that future research should examine how these demographic variables and others influence consumers’ behaivour towards MNP adoption. Finally, future research should extent the study to other African countries where MNP has been adopted.

**Conclusion**

The aim of this study was to examine consumer behaviour towards the adoption of MNP in SSA, using Ghana mobile telecom industry as the research context. The findings are that, generally, consumer behaviour towards MNP adoption appear to be unfavourable in many aspects in GMTI. Specifically, the findings indicate that most of the respondents perceived the porting process to be too time consuming and effort demanding. The level of consumer knowledge and understanding of MNP policy and its processes is considerably low. Most respondents’ perception of their switching efficacy induced by MNP is considerably low. Perceived usefulness of MNP is low and consumers’ attitude towards MNP appears considerably unfavourable. It also found support for the effect of demographic factors on consumer behaviour towards MNP in Ghana. The findings have implications for consumer education and strategic management direction for managing MNP with respect to consumer behaviour, and also provides important avenues for future research.

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